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Review article

Prevalence of female sexual dysfunction in Brazil: A systematic review[☆]



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ABSTRACT

The aim of this systematic review is to investigate the prevalence of female sexual dysfunction in the Brazilian population. This is a systematic review conducted in July 2016 in which four databases were searched: MEDLINE/Pubmed, Scopus, LILACS, and Cinahl. Two investigators extracted the primary data, which were fully analyzed, and applied the inclusion/exclusion criteria. The search found 113 results, and 20 of them compounded the scope of this study. Only four of the studies showed good methodology quality. The main diagnostics criteria used were validated questionnaires specific for sexual function assessment. Regarding the variation of prevalence values, female sexual dysfunction ranged from 13.3% to 79.3% of the studied population, while this value for changes in sexual desire ranged from 11% to 75%, arousal from 8% to 68.2%, lubrication from 29.1% to 41.4%, orgasm from 18% to 55.4%, and satisfaction from 3.3% to 42%; sexual activity frequency ranged from 55.8% to 78.5%, dyspareunia from 1.2% to 56.1%, and pleasure modifications was not addressed. Beside the divergences among studies, there is still a high prevalence of female sexual dysfunction in Brazil.

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Introduction

Female sexual dysfunction (FSD) is a gynecologic disorder, described as an alteration in at least one of four main domains of sexual function—arousal, plateau, orgasm, and outcome—as the effect of physiological, emotional, or interpersonal events [1,2]. The most common complaints in FSD include hypoactive sexual desire, low sexual arousal, difficulties in reaching orgasm, and dyspareunia [3].

[☆] The present study was developed on Santa Catarina State University (UDESC), Florianópolis (SC), Brazil.

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FSD can occur due to several anatomical conditions such as genital mutilation; pathological conditions such as endometriosis, gynecological cancer, urinary infections, urinary incontinence, endocrine alterations, and degenerative and vascular diseases; and also by psychological problems such as depression and the use of psychoactive drugs [4,5].

FSD may have influence on conjugal life by reducing sexual satisfaction causing psychological conflicts [6]. It is associated with a decrease in the quality of life implied in social life and thus have consequences on public health. Thus, there is the need for action of health professionals through medical, psychological and physical treatments [7].

Due to a lack of consensus on Brazilian FSD prevalence among studies and the limited scientific production in sexuality, there is a necessity for new epidemiological research of FSD in Brazil. Through this, it will be possible provide the best understanding of different health professionals about preventive measures and the promotion of female sexual health. Thereby, the aim of this systematic review is to investigate the prevalence of female sexual dysfunction in Brazil (Fig. 1).

Materials and methods

Search strategies

This systematic review followed the recommendations stated by Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) [8]. Four databases were accessed in July 2016: MEDLINE/Pubmed, Scopus, LILACS, and Cinahl. The terms used were “female sexual dysfunction’, epidemiology, Brazil” combined

with the Boolean operator AND in the advanced field. No research filters were added.

Screening studies

After the electronic search, the duplicates were excluded, and 2 independent authors selected the potential relevant studies based on their titles and abstracts. A third author decided which studies should be fully read if the first two authors disagreed. After all the studies were fully read, the exclusion criteria were applied. All the included studies had their reference lists screened to find other relevant studies that the search might not have found from the databases.

The included studies comprised the following inclusion criteria: research conducted on Brazilian population; approaching complete FSD or a subsection; and studies published in English or in Portuguese. The exclusion criteria were: studies with men or children; lack information about FSD prevalence; studies with review, conference, experimental qualitative, validation, pilot, or poster designs; and duplicated studies or unavailability.

Data extraction and quality assessment

The methodological quality was assessed by 2 independent authors. Internal validity was verified according to the 14-item Standard Quality Assessment Criteria for Evaluating Primary Research Papers from a Variety of Fields [9]: (1) Was the question/objective sufficiently described? (2) Was the study design evident and appropriate? (3) Was the method of subject/comparison group selection or source of information/input

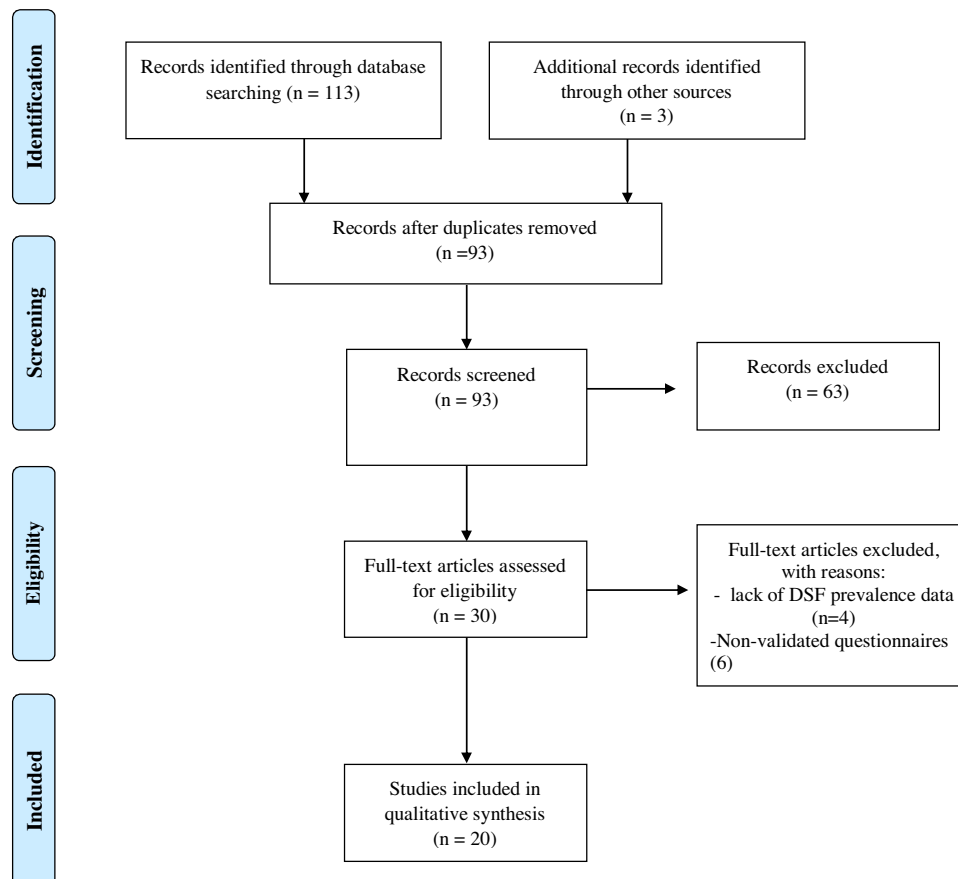


Fig. 1. Flow-diagram describing the process of studies selection about prevalence and female sexual dysfunction, based on PRISMA guideline (2009).

Table 1
Methodological quality assessment of included studies.

Authors	Items														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Almeida (2011)	+	+	+	+	NA	NA	NA	+	+	+	+	±	+	+	95%
Cabral (2013)	+	+	+	+	NA	NA	NA	+	+	+	+	NA	+	±	95%
Diehl (2013)	+	+	±	+	NA	NA	NA	+	+	+	+	±	+	±	86%
Ferreira (2007)	+	+	+	+	NA	NA	NA	+	+	+	+	NA	+	+	100%
Ferreira (2013)	+	-	+	+	NA	NA	NA	+	+	+	±	±	+	±	77%
Kummer (2009)	+	-	+	+	NA	NA	NA	+	+	+	+	±	+	+	86%
Leite (2009)	+	+	±	+	NA	NA	NA	+	+	+	±	±	+	±	82%
Lima (2013)	+	+	+	+	NA	NA	NA	+	+	±	+	±	+	±	86%
Martins & Silva (2013)	+	+	±	-	NA	NA	NA	±	±	±	+	±	±	±	59%
Naldoni (2011)	+	+	+	+	NA	NA	NA	+	+	+	-	-	+	+	82%
Nascimento (2015)	+	+	±	+	±	NA	NA	+	±	+	±	±	+	+	95%
Ribeiro (2012)	+	+	±	±	NA	NA	NA	+	+	+	±	NA	-	±	70%
Santos (2012)	+	±	±	+	-	-	NA	+	±	+	±	+	+	±	65%
Souza (2013)	+	+	+	+	NA	NA	NA	+	+	+	±	±	+	+	90%
Vacanti & Caramelli (2005)	+	±	+	+	NA	NA	NA	+	±	+	±	±	+	+	82%
Valadares (2008-1)	+	+	+	+	NA	NA	NA	+	+	+	+	+	+	+	100%
Valadares (2008-2)	+	+	+	+	NA	NA	NA	+	+	+	+	+	+	+	100%
Valadares (2008-3)	+	+	+	+	NA	NA	NA	+	+	+	+	+	+	+	100%
Vaz (2011)	+	+	NA	+	NA	NA	NA	NA	+	NA	NA	±	+	+	93%
Veras (2011)	+	-	-	±	-	NA	NA	+	±	+	±	-	+	±	50%

NA: not applied; += attended criteria; ± = criteria partially attended; N = criteria not-attended.

variables described and appropriate? (4) Were the subject (and comparison group, if applicable) characteristics sufficiently described? (5) If interventional and random allocation was possible, was it described? (6) If interventional and blinding of investigators was possible, was it reported? (7) If interventional and blinding of subjects was possible, was it reported? (8) Were the outcome and (if applicable) exposure measures well defined and robust to measurement/misclassification bias? Were the assessed means reported? (9) Was the sample size appropriate? (10) Were the analytic methods described/justified and appropriate? (11) Was some estimate of variance reported for the main results? (12) Controlled for confounding? (13) Were the results reported in sufficient detail? (14) Was the conclusion supported by the results? The criteria were considered present (+), not present (-), partially attended (±), and not applied (N/A).

Results

The database searches retrieved 113 studies. After applying exclusion criteria, 30 studies were included for full analysis, 4 were excluded due to lack FSD prevalence data and 6 were excluded because they used non-validated questionnaires. Therefore, 20 studies entered to the present review. The full procedure is described on Table 1. The study's results were clustered by: city (state); diagnostic criteria; participants (age); and FSD prevalence, which was presented according their specific domains, such as desire, arousal, lubrication, and orgasm disorders, alteration of satisfaction and pleasure, dyspareunia, and hypoactive sexual activity (Table 2). Regarding publication period, the first article retrieved is from 2005 [10]; meanwhile, the newest is from 2015 [11], showing a higher interest in publishing about this subject between 2013 and 2015.

The studies included by this systematic review used validated questionnaires to assess sexual dysfunction among women: Female Sexual Function Index (FSFI), Short Personal Experiences Questionnaire (SPEQ), Arizona Sexual Experience Scale (ASEX), Common Terminology Criteria Adverse Event Scale (CTCAE), Pregnancy and Sexual Function Questionnaire (PSFQ), Brief Index of Sexual Functioning, and Beck Depression Inventory (BDI). For more information, see Table 2. All the studies had the diagnosis of FSD given by a doctor or another healthcare professional.

When FSD prevalence was observed by means of defining characteristics, the main aspects studied were desire, orgasm, and

dyspareunia; however, the prevalence was not available. Moreover, lubrication and hypoactive sexual activity were the objects of study from 4 of 20 articles included in this systematic review. Within the selected studies, 17 analyzed the prevalence of FSD, which ranged from 13.3% [12] to 79.3% [13], and polycystic ovarian syndrome and the final stage of renal disease were also evaluated. This last prevalence rate, when analyzed with only healthy women, reaches a value of 67% [14].

In continuity with the information contemplated on Table 2, hypoactive sexual desire was the subject of study in 7 articles. Its prevalence ranged from 11% [15] to 75% [16] in women aged between 20 and 39 years and with Parkinson Disease (PD), respectively. Meanwhile, arousal disorder was studied in 3 articles. The smallest prevalence was 8%¹⁵, and the highest was 68.2% [11]. Lubrication disorder ranged from 29.1% during gestation [17] to 41.4% in hypertensive women [11]. Only 3 studies aimed to verify the prevalence of orgasm disorder, whose values ranged from 18% among women aged from 20 to 39 years [15] to 55.4% in hypertensive women [11].

Only 2 studies verified sexual satisfaction, which decreased in 3.3% of women before first gestation [17] and in 42% of hypertensive women [11]. The frequency of pleasure disorder was not investigated. Among the other studied aspects, dyspareunia was verified in 5 studies, ranging from 1.2% of women before gestation [17] to 56.1% of hypertensive women [11]. The frequency of sexual activity was addressed by only one study, in females with pelvic irradiation this rate ranged from 78.5% to 55.8%, representing respectively the sexual activity pre and 3-years post-radiotherapy [18].

Analyzing the prevalence of FSD by region on Brazil, 14 studies were from southeast, ranging from 13.3% [12] to 66.7% [19] of women. The Northeast Region produced 5 studies, and the prevalence ranged from 31.2% [20] to 79.3% [13]. The only study performed on the North [17] showed a prevalence from 23.9% to 67.7%; however, no studies with this subject have been realized so far in the South Region of the country. Studies realized on the Midwest did not show these rates.

The sociodemographic aspects varied among the included studies; the average age of minors was 17.2 years [20], and the highest was 60 years [18]. Most of the women were married or in stable unions and were declared as Caucasian [19]. The women's educational levels and family incomes were both low but their family income varied to average. Concerning the morbidities and

Table 2
Synthesis of included studies about prevalence and female sexual dysfunction.

Author/year	City/State	Instrument	Participants/age (y)	Prevalence									
				Sexual Dysfunction	Hypoactive sexual desire	Excitement disorder	Lubrication disorder	Orgasm disorder	Satisfaction disorder	Pleasure disorder	dyspareunia	Hypoactive sexual activity	
Almeida (2011)	Campinas/SP	Female Sexual Function Index (FSFI)	166 G1:58 with ovarian premature failure/22-51 G2:58 healthy women/22-51	62.10% 37.80%	-	-	-	-	-	-	-	-	-
Cabral (2013)	Natal/RN	Female Sexual Function Index (FSFI)	370 middle-age women/40-65	67%	-	-	-	-	-	-	-	-	-
Diehl (2013)	São Paulo/SP	Arizona Sexual Experience Scale (ASEX)	105 women with alcohol, tobacco, and illicit drugs dependence/18-65	34.2%	-	-	-	-	-	-	-	-	-
Ferreira (2007)	Recife/PE	Brief Index of Sexual Functioning	100 women/20-39	36%	11%	8%	-	18%	-	-	-	13%	-
Ferreira (2013)	Brasília/DF and São Paulo/SP	Female Sexual Function Index (FSFI)	163 women with rheumatic disease/18-69	18.4%	-	-	-	-	-	-	-	-	-
Kummer (2009)	Belo Horizonte/MG	Beck Depression Inventory (BDI)	54 women with Parkinson disease/18-	-	75%	-	-	-	-	-	-	-	-
Leite (2009)	Maceió/AL	Female Sexual Function Index (FSFI)	271 teenage women/20-20- G1: up to 19 and adults G2: healthy gestants/20-	1 st trimester: G1-40.8%; G2-46.6%. 2nd trimester: G1-31.2%; G2-34.2%. 3rd trimester: G1-63.2%; G2-73.3%.	-	-	-	-	-	-	-	-	-
Lima (2013)	Rio Branco/AC	Pregnancy and Sexual Function Questionnaire (PSFQ)	778 primiparous women/13-43	23.9% before gestation; 67.7% during gestation	20.2% before gestation; 51% during gestation	-	29.1% during gestation	-	3.3% before gestation; 10.8% during gestation	-	1.2% before gestation; 14.4% during gestation	-	-
Martins e Silva (2013)	Maceió/AL	Female Sexual Function Index (FSFI)	23 obese women and overweight/30-	78.3%	-	-	-	-	-	-	-	-	-
Naldoni (2011)	Poços de Calda/MG	Female Sexual Function Index (FSFI)	137 gestants/14-39	61%	-	-	-	-	-	-	-	-	-
Nascimento (2015)	Rio de Janeiro/RJ	Female Sexual Function Index (FSFI)	157 hypertensive women/18-59	-	68.2%	68.2%	41.4%	55.4%	42%	-	56.1%	-	-
Ribeiro (2012)	São Paulo/SP	Female Sexual Function Index (FSFI)	44 women with gestational diabetes/20- 43 healthy gestants/20-	59% 63%	42% 50%	-	-	-	-	-	-	-	-
Santos (2012)	Fortaleza/CE	Female Sexual Function Index (FSFI)	58 final stage of kidney disease/18-55	79.30%	-	-	-	-	-	-	-	-	-
Souza (2013)	São Paulo/SP	Female Sexual Function Index (FSFI)	88 gestants - 33 with diabetes Mellitus/55 low risk	66.7% (DM)/38.9%(BR)	-	-	-	-	-	-	-	-	-
Vacanti & Caramelli (2005)	São Paulo/SP	Questionnaire about sexual behavior	6 interned for acute myocardial infarction (18-75)	50%	50%	33.30%	-	33.30%	-	-	-	-	-

Table 2 (Continued)

Author/year	City/State	Instrument	Participants/age (y)	Prevalence	Sexual Dysfunction	Hypoactive sexual desire	Excitement disorder	Lubrication disorder	Orgasm disorder	Satisfaction disorder	Pleasure disorder	dyspareunia	Hypoactive sexual activity
Valadares (2008-1)	Belo Horizonte/ MG	Short Personal Experiences Questionnaire (SPEQ)	200 middle-age women/40–65	-	-	-	-	-	-	-	-	39.50%	-
Valadares (2008-2)	Belo Horizonte/ MG	Short Personal Experiences Questionnaire (SPEQ)	276 middle-age women/40–65	42.5% less than 50 yrs	59.3% more than 50 yrs	-	-	-	-	-	-	-	-
Valadares (2008-3)	Belo Horizonte/ MG	Short Personal Experiences Questionnaire (SPEQ)	315 middle-age women/40–65	35.90%	-	-	-	-	-	-	-	-	-
Vaz (2011)	Campinas/ SP	Common Terminology Criteria Adverse Event Scale (CTCAE) Arizona Sexual Escala de Experiência (ASEX)	107 women with pelvic irradiation/21–75	-	-	21.1–26.9%	-	0–33.3%	-	-	-	20–50%	55.8–78.5%
Veras (2011)	Rio de Janeiro/RJ	Arizona Sexual Escala de Experiência (ASEX)	88 women with polycystic ovarian syndrome/19–35	13.3%	-	-	-	-	-	-	-	-	-

G1: group 1; G2: group 2.

associated risk factors, FSD was related to menopause [14,21–23], hypertension [10,11,21–23], obesity, [14,21], diabetes [10,21,23], depression [23,24], cardiac diseases [10,21], and neurologic diseases [21,25].

According to methodology quality assessment, 4 studies reached 100% of the pre-established criteria [15,22–24] and showed good/satisfactory methodological quality in the general studies. More information is addressed on Table 1.

Comments

After the previous detailed search, this is the first systematic review performed with the objective of analyzing the results of studies aimed at investigating the prevalence of FSD in the Brazilian population. The evidence of the 20 included studies suggests that this dysfunction, when assessed by validated questionnaires in a healthy population, might be present in up to 67.7% of Brazilian women [14].

The intrinsic aspects of the studies included in this systematic review, such as assessment instrument, age, marital status, educational level, family income, and associated morbidities, are related to the presence of sexual dysfunction, which makes representing a cutoff value among the Brazilian female population impossible. The discrepancies between the FSD prevalence values probably occurred due to differences in the studied populations.

Regarding the prevalence of sociodemographic characteristics, most of the women are middle-aged [14,21–24]. This is justified due to symptoms that follow the climacteric period, such as hot flushes, depression, vaginal dryness, endocrine oscillations, and disturbed esthetics, reflecting the psychology and sexual functions of these women [21].

Being married does not imply having sexual function disorders. Cabral et al., [14] observed that 87.2% of divorced women presented FSD, while this rate among married and single women ranged from 61.8% to 65.6%, respectively. In general, the presence of a partner positively influences the sexual function of women [26]. Women with an excellent relationship referred to higher desire, arousal, and satisfaction and a better FSFI score when compared to women who classified their relationship as satisfactory [27]. Therefore, the quality of women's relationships and feelings of their partner must be considered, rather than the frequency of sexual activity [26]. Previous studies showed a direct relation between educational level and family income with sexual function [16,28]. This condition can be explained by a better understanding of health and healthier physical and emotional lifestyle, which implies dealing well with adverse situations related to sexuality [16,29].

Within FSD domains, hypoactive sexual desire was highlighted as the most prevalent FSD, being found in 75% of women with PD [16], followed by dyspareunia, which ranged from 13% [15] to 56.1% [11] of women. Basson et al., [30] considered physical dissatisfaction as well as previous emotional experiences such as hypoactive sexual desire, decreased lubrication and dyspareunia as discouraging new relationships. This situation makes the other phases of feminine sexual response difficult.

On the other hand, Veras et al. [12] showed lower rates of FSD; their sample was composed of women aged between 19 and 35 years old with polycystic ovarian syndrome (POS). This study compared these women with a control group with POS (27.2 years/frequent use of oral contraceptives). These results are capable to explain why the sexual function was not prejudiced among the 44% of POS women under treatment with metformin. In agreement with Hahn et al. [31], the treatment with metformin can improve sexual satisfaction and increases the frequency of sexual relations.

Concerning the studies with pregnant women [17,19,20,28,32], FSD was more prevalent during the third trimester (73.3%), which is characterized by significant alterations in women's bodies, by

the presence of fatigue and anxiety, and also by the proximity of labor; all these characteristics leads to a hypoactive sexual desire and a decrease on sexual activities [20]. Lima et al., [17] studied younger women with an average age of 19 years. In the North Region of Brazil, 26% of all live births are from teenage mothers. Gestation during this life period comprises family conflicts, sexual maturation, and higher responsibilities, which can lead to contradictory feelings that interfere with sexual function [17].

Some metabolic commitment, physical and psychological neuropathies, heart diseases, rheumatic diseases, cancers, hypertension, obesity, depression, and drug dependence negatively interfere sexual function and provoke disturbed body image and self-esteem [10,11,25,33–35], which can lead to anxiety and fear of failure during intercourse [10].

FSD prevalence studies performed around the world found hypoactive sexual desire to be the most prevalent in the U.K., Finland, Australia, and Iran. This condition existed in 26% to 75% of the populations [36,37]. Regarding anorgasmia, 11% of Australian women reported this sexual dysfunction [36]. In Brazil, these values ranged from 23.9% [17] to 79.3% [13] in different populations. In addition, studies conducted in South and Central America verified that the lack of sexual interest ranged from 16% to 24% and the difficulty with lubrication reached values between 15% and 22%; meanwhile, anorgasmia complaints ranged from 13% to 19% [38].

In summary, expressive values were found among Brazilian women regarding FSD, as a high-quality sexual life improves the mental and physical well-being [39,40], some reflections about the importance of national health politics regarding female sexual function are needed.

Several limitations concerning the FSD prevalence rates on Brazil must be considered, such as language publication restricted some times to Portuguese, the restricted use of databases, excluding unindexed papers, a lack of age limitations on the sample populations of included studies, and the divergent methodological quality of these studies.

Towards divergence among sample characteristics, such as age, baseline disease, marital status and used instruments to assess sexual function hinders the creation of a national health public politics for improving this question, because the approach is unique for each situation. Therefore, more high quality observational prospective studies addressing this subject are imperious on Brazil, specially restricting age and baseline diseases, also on choosing the instrument of evaluation. All these details are required in future studies to improve its internal consistency and draw a faithful conclusion of sexual function among Brazilian women.

The results of this present systematic review among Brazilian women with sexual dysfunction show a high prevalence, especially involving middle-aged women, with a baseline disease level and low educational level. The widely-used instrument for assessing sexual function was FSFI, with hypoactive sexual desire, lack of orgasm, and dyspareunia being the more frequent sexual disorders. Therefore, national health politics regarding sexual function are required to provide awareness, prevention, early diagnosis, and treatment of these conditions.

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Conflicts of interest

The authors declare no conflict of interest

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