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Hypoactive sexual desire disorder in a population-based study of Brazilian women: associated factors classified according to their importance

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Abstract

Objective: The etiology of hypoactive sexual desire disorder (HSDD) is known to be multifactorial, involving biological, psychosexual, and context-related factors. The objective of the present study was to analyze the factors associated with female HSDD and to stratify these factors according to their importance.

Methods: This was a population-based, hierarchical study conducted in Brazil, based on data from previous research on the Brazilian Sexual Life Study, conducted between November 2002 and February 2003 in various Brazilian cities. The primary study consisted of a self-administered and anonymous questionnaire, addressing sociodemographic parameters, general health, life habits, behavior, and complaints related to sexual function. The association between HSDD and various other factors was assessed. The data were evaluated by hierarchical multiple regression analysis.

Results: The prevalence of HSDD in this sample was 9.5%. Associations were found with cardiovascular disease, breast cancer, posttraumatic stress, poorer education level, being older, being married, a lack of information on sexuality in childhood/adolescence, and a limited sexual repertoire. Women who consumed moderate amounts of alcohol were found to be less likely to have HSDD.

Conclusions: Analysis of the associated factors classified in order of importance and analysis of the characteristics of the sexual relationships provide additional information to currently available data on the traditional concepts of HSDD.

Key Words: Sexual dysfunction – Female hypoactive sexual desire disorder – Population-based sample.

Sexual desire is determined by the interaction of three domains: desire, beliefs and values, and motivation. The biological component (desire) is a consequence of neuroendocrine mechanisms that stimulate spontaneous, endogenous sexual interest. Beliefs and values are the result of a social component that promotes expectation and the idealization of sexual activity. Motivation depends on interpersonal and emotional factors.[1]

Hypoactive sexual desire disorder (HSDD) is defined according to the *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision* as persistently or recurrently deficient (or absent) sexual fantasies and desire for sexual activity. The judgment of deficiency or absence is made by the clinician taking into account factors that affect sexual functioning, such as age and the context of the person's life.[2]

The definition of HSDD in the *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision* has been criticized over the past decade. Proposed new criteria that take empirical findings and diversity between women into account are being recommended by experts. The American Foundation for Urologic Disease has defined HSDD as absent or diminished feelings of sexual interest or desire, absent sexual thoughts or fantasies, and a lack of responsive desire. Motivations (defined here as reasons/incentives) for attempting to become sexually aroused are scarce or absent. The lack of interest goes beyond the normal decrease that occurs as a function of the aging process and the duration of the relationship.[3] The epidemiological studies that have evaluated distress related to sexual dysfunction in women have consistently reported a much lower prevalence of dysfunction when distress is taken into consideration.[4] Clinicians and patients have also reported problems regarding the terms used to define HSDD. The term *HSDD* was found to be poorly

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acknowledged, whereas *decrease in sexual desire* is the preferred term. *Distress*, currently a compulsory component for a diagnosis of HSDD, was an unpopular term. To patients, this term implied a state of fear or anxiety and a degree of severity that did not reflect their feelings regarding the condition.[5]

The prevalence of HSDD varies from 5% to 55%, depending on the sample population under evaluation, the instrument used for assessment, and the diagnostic criteria applied.[6,7] The etiology of HSDD is multifactorial and includes biological, psychosexual, and context-related factors. HSDD is not common as a single complaint in women of reproductive age.

In younger women, the complaint emerges within the context of dysfunctional personal relationships, chronic disease, depression, and gynecological disorders. On the other hand, in older women, HSDD as a single complaint is common.[8] The menopausal transition and menopause have been reported to exert an aggravating effect on HSDD. This complex condition is experienced by all women going through the physical and emotional changes associated with a decrease in the production of ovarian sex hormones. The fall in estrogen production that affects estrogen receptors in various different body systems evokes consequences ranging from effects on cognitive function to local response. When there is an abrupt fall in estrogen and androgen production, as occurs after surgical menopause or chemotherapy, the adverse effect on HSDD is even greater.[7] Nearly three of every four women who have bilateral oophorectomy are at risk of having HSDD, and this risk increases when the time since surgical menopause is less than 5 years.[9] However, some studies have shown that hormonal changes at least 1 year after oophorectomy performed in conjunction with perimenopausal hysterectomy provoked no significant alterations in postoperative sexual or psychological well-being.[10-12] Although women who have undergone bilateral oophorectomy experience loss of ovarian hormones, differences in the percentage of women with HSDD of those who have undergone surgical menopause suggest the role of cultural factors in determining how low sexual desire is perceived.[13]

Studies show that of all the factors that affect female sexual desire, the aging process is the most significant. Although the proportion of women with low desire increased with age, the proportion of women distressed about their low desire decreased with age[8,14] and with menopause status. Personal distress caused by HSDD was lower among postmenopausal women (36.2%) compared with premenopausal women (64.5%).[15]

Chronic diseases that could affect the critical physiological requirements for directly and indirectly maintaining women's sexual function, such as normal sex steroid levels, autonomic/somatic nerves, and arterial inflow/perfusion pressure to the female genital organs, may lead to HSDD.[16-18] Hypertension and antihypertensive medications seem to affect blood flow integrity and may be linked to HSDD. Few studies have been carried out on the sexual function of hypertensive women to investigate either the effects of the disease or the adverse effects of antihypertensive agents.[19-22] Abu Ali et al[23] reported a prevalence of sexual dysfunction of 59.6% in women with diabetes 50 years or older compared with 45.6% in women without diabetes (P = 0.003). Dysfunction related to desire, arousal, lubrication, and orgasm was more common in persons with diabetes than in those without diabetes. No association was found between sexual dysfunction and hypertension in this group of women with diabetes.[23]

Psychiatric conditions such as depression, anxiety, panic, and stress may be linked to HSDD. The use of medication such as serotonin reuptake inhibitors, hormone antagonists, and chemotherapy is also associated with HSDD.[16] Alcohol and illicit drug use should also be taken into consideration.[24] Psychological and sociocultural factors may also be involved, as well as issues related to the relationship between the couple.[25,26] The Study of Women's Health Across the Nation[27] showed that feelings for the partner and attitudes related to sex and aging had a greater effect on most aspects of sexual function than did the process of going through the menopausal transition. In another study, the degree of emotional closeness with the partner was positively associated with desire and orgasm.[28]

These causes are not mutually exclusive and may overlap. In view of the controversies regarding the importance of the many different factors that may lead to HSDD and the role of cultural issues, a study was considered essential to evaluate these causes.[6,29,30]

The objective of the present study was to analyze the factors associated with female HSDD by conducting a population-based study in Brazil and to stratify these factors according to their importance.

METHODS

The present study used data from previous research, the Brazilian Sexual Life Study, in which 7,022 participants, 45.4% of whom were women, were evaluated between November 2002 and February 2003.[31] The participants in this study were individuals older than 18 years who were approached in city squares, beaches, and shopping centers around the country. The study was carried out in 18 Brazilian cities and covered all the geographical regions of the country, respecting the population density of each city.

A self-administered and anonymous questionnaire dealing with sociodemographic variables, general health, life habits, behavior, and complaints concerning sexual function was given to the study sample. Data concerning HSDD were obtained from answers to a direct question on whether or not sexual desire was present, with this variable being dichotomized for the purpose of analysis into absence of sexual desire (n = 266) or presence of sexual desire (n = 2,539). Associations were investigated between HSDD and

- sociodemographic data: age, marital status, education level, number of children, and employment status;
- habits: alcohol consumption, smoking, illicit drug use, and excessive use of medication;

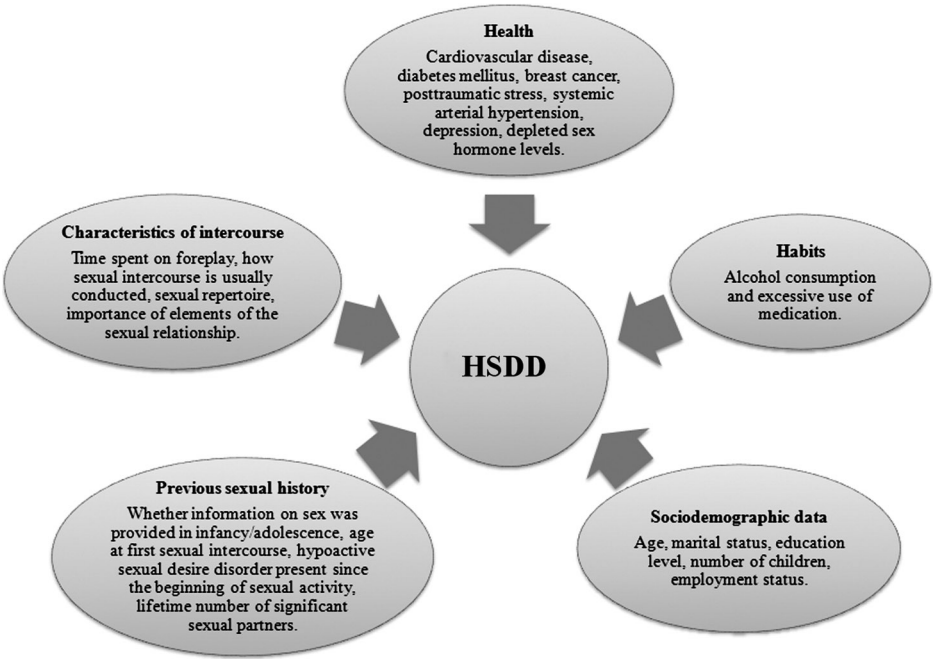

FIG. 1. Theoretical model for the investigation of factors associated with HSDD in women, structured into hierarchical segments. HSDD, hypoactive sexual desire disorder.

- sexual history: whether information was provided on sex in childhood/adolescence, age at first intercourse, impaired sexual desire at the beginning of sexual life, and the lifetime number of significant sexual partners;
- characteristics of intercourse: initiation of sexual intercourse (spontaneous, stimulated by partner, or forced), type of foreplay (absent, too fast, satisfactory, or too long), usual schedule of sexual intercourse (set time or particular situations), sexual repertoire (kisses, embraces, masturbation, vaginal penetration, oral sex, and anal sex), and effect of different aspects (interest, intimacy and attraction to partner, stable relationship with partner, sufficient tranquility and time for intercourse, presence or absence of affection, and appropriate atmosphere and environment); and
- diseases (self-reported data): cardiovascular disease, diabetes mellitus, breast cancer, posttraumatic stress, hypertension, depression, and depleted sexual hormones.

The study was approved by the ethics committee of the Clinical Hospital, Medical School, University of São Paulo.

Statistical analysis

First, a univariate analysis of the variables pertaining to each segment was performed.[32] Next, the analysis used hierarchical models to determine the appropriate variables for the

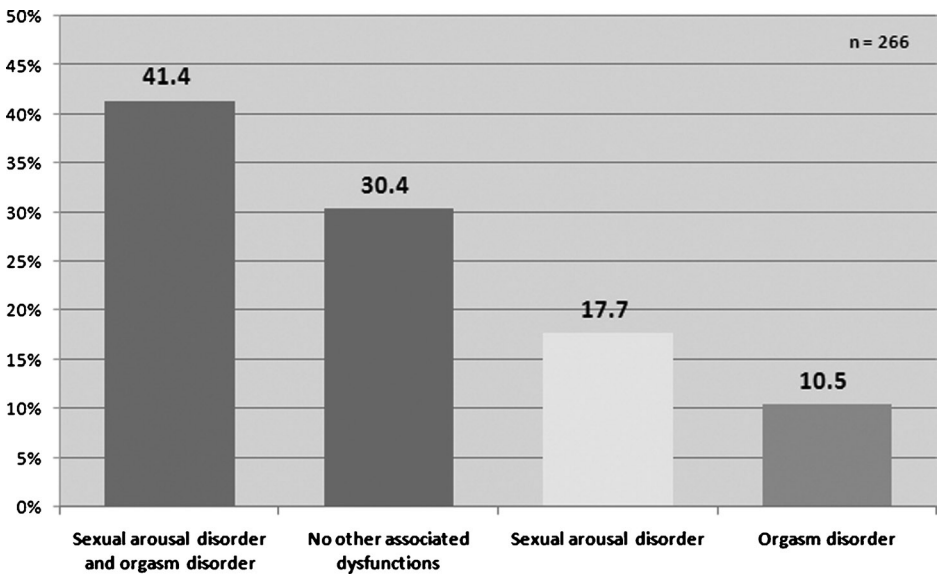

FIG. 2. Brazilian women with hypoactive sexual desire disorder distributed according to the presence or absence of other associated types of sexual dysfunction. Data obtained from the Brazilian Sexual Life Study.[31]

TABLE 1. *Total frequency distribution of cases of HSDD and the odds ratios for the presence of HSDD according to sociodemographic variables*

Variables	Categories	Total sample	Cases of HSDD, no. (%)	Odds ratio (95% CI)	*P*
Age group, y					
	18-39	1,701	117 (6.9)	1.0	
	40-49	597	54 (9.0)	1.3 (1.0-1.9)	0.084
	50-59	335	50 (14.9)	2.4 (1.7-3.4)	<0.0001
	60-69	113	29 (25.7)	4.7 (2.9-7.4)	<0.0001
	≥70	31	10 (32.3)	6.4 (3.0-14.0)	<0.0001
Marital status					
	Married/in stable union	1,335	144 (10.8)	1.0	
	Single	1,054	77 (7.3)	0.6 (0.5-0.9)	0.004
	Divorced/separated	322	22 (6.8)	0.6 (0.4-0.9)	0.036
	Widowed	87	21 (24.1)	2.6 (1.6-4.4)	<0.0001
Education level					
	University	1,580	110 (7.0)	1.0	
	High school	3,973	111 (11.4)	1.7 (1.3-2.3)	<0.0001
	Primary school	231	44 (19.0)	3.1 (2.1-4.6)	<0.0001
Number of children					
	None	900	62 (6.9)	1.0	
	One	516	49 (9.5)	1.4 (0.9-2.1)	0.080
	Two or more	966	118 (12.2)	1.9 (1.4-2.6)	<0.0001
Employment status					
	Employed	1,874	145 (7.7)	1.0	
	Unemployed	435	40 (9.2)	1.2 (0.8-1.7)	0.314
	Retired	168	33 (19.6)	2.9 (1.9-4.4)	<0.0001

HSDD, hypoactive sexual desire disorder.

model, using the forward stepwise method to identify the factors associated with the presence or absence of HSDD.[33,34] Consequently, the associated factors that were analyzed were grouped into segments and classified according to their importance in the genesis and/or maintenance of HSDD, as shown in Fig. 1.

A *P* value lower than 0.20 was adopted as representing the critical level for the selection of variables. Those variables with a *P* value greater than 0.20 were maintained as adjustment factors.[33]

After adjustment in accordance with the variables in the same segment and those in hierarchically higher segments, the associations between the variables investigated and HSDD for which *P* values of 0.05 or lower were considered statistically significant. This situation indicated the existence of an independent effect, that is, one that referred to the variable in analysis.

RESULTS

A total of 2,805 women completed the study questionnaire on hypoactive sexual desire (with respect to the presence or absence of desire), whereas 385 women (12.1%) were excluded from the analysis because they failed to answer the question that specifically referred to sexual desire. When the group that answered was compared with the group that failed to answer this question, the women who did not answer were found to have more diabetes ($P = 0.023$), more hypertension ($P < 0.0001$), and higher mean age ($P < 0.0001$) and be less likely to be university educated ($P < 0.0001$), less likely to consume alcohol ($P < 0.0001$), less likely to have had information on sex in childhood and adolescence ($P < 0.0001$), and less likely to practice oral sex ($P < 0.0001$).

The prevalence of HSDD in the sample was 9.5%. The prevalence of female sexual arousal disorder was 26.6%, whereas orgasmic dysfunction was reported by 26.2%. Furthermore, 69.6% of women with HSDD reported concomitant problems related to arousal and orgasm, whereas 30.4% reported HSDD alone (Fig. 2).

In the univariate analysis, the statistically significant ($P < 0.005$) sociodemographic variables associated with HSDD were age group older than 50 years, being married, and poorer education level (Table 1). The statistically significant health-related variables associated with HSDD (Table 2) consisted of cardiovascular disease, diabetes, breast cancer, and posttraumatic stress. As shown in Table 3, moderate alcohol

TABLE 2. *Total frequency distribution of cases of HSDD and odds ratios for HSDD according to health-related variables*

Variables	Categories	Total sample	Cases of HSDD, no. (%)	Odds ratio (95% CI)	*P*
Cardiovascular disease					
	No	2,316	208 (9.0)	1.0	
	Yes	48	13 (27.1)	3.8 (2.0-7.2)	<0.0001
Diabetes					
	No	2,322	212 (9.1)	1.0	
	Yes	42	9 (21.4)	2.7 (1.3-5.7)	0.009
Breast cancer					
	No	2,269	204 (9.0)	1.0	
	Yes	95	17 (17.9)	2.2 (1.3-3.8)	0.004
Posttraumatic stress					
	No	2,157	191 (8.9)	1.0	
	Yes	207	30 (14.5)	1.7 (1.1-2.6)	0.009
Hypertension					
	No	2,195	198 (9.0)	1.0	
	Yes	169	23 (13.6)	1.6 (1.0-2.5)	0.05
Depression					
	No	2,075	186 (9.0)	1.0	
	Yes	289	35 (12.1)	1.4 (0.9-2.0)	0.086
Decrease in sex hormone levels					
	No	2,111	193 (9.1)	1.0	
	Yes	253	28 (11.1)	1.2 (0.8-1.9)	0.321

HSDD, hypoactive sexual desire disorder.

TABLE 3. *Total frequency distribution of cases of HSDD and odds ratios for HSDD according to variables referring to life habits and sexual history*

Variables	Categories	Total sample	Cases of HSDD, no. (%)	Odds ratio (95% CI)	*P*
Alcohol consumption					
	No	1,726	186 (10.8)	1.0	
	Former drinker	53	8 (15.1)	1.5 (0.7-3.2)	0.323
	Moderate use	688	36 (5.2)	0.4 (0.3-0.7)	<0.0001
	Abuse/addiction	102	9 (8.8)	0.8 (0.4-1.6)	0.536
Excessive use of medication					
	No	2,309	215 (9.3)	1.0	
	Yes	55	13 (23.6)	3.0 (1.6-5.7)	0.001
Information on sex in childhood/adolescence					
	Yes	2,331	186 (8.0)	1.0	
	No	445	74 (16.6)	2.3 (1.7-3.0)	<0.0001
HSDD at the beginning of sexual life					
	No	1,169	109 (9.3)	1.0	
	Yes	189	35 (18.5)	2.2 (1.4-3.3)	<0.0001
Age at first intercourse, y					
	9-17	915	67 (7.3)	1.0	
	18-20	990	79 (8.0)	1.1 (0.8-1.5)	0.590
	≥21	740	81 (10.9)	1.5 (1.1-2.2)	0.011
Lifetime number of significant sexual partners					
	None to one	845	94 (11.1)	1.0	
	Two to three	1,174	83 (7.1)	0.6 (0.4-0.8)	0.002
	Four or more	563	50 (8.9)	0.8 (0.5-1.1)	0.174

HSDD, hypoactive sexual desire disorder.

consumption, having been given information on sex in childhood and adolescence, and having had two or three significant sexual partners lifelong were factors found to be less associated with HSDD, whereas the use of medication and the presence of HSDD at the beginning of a woman's sexual life were factors significantly associated with current HSDD (Table 3). With respect to the characteristics related to intercourse, statistically significant associations ($P < 0.005$) were found in that the frequency of HSDD was lower among women who valued the following various components of the relationship with their partner: partner's interest, intimacy, physical attraction, commitment, sufficient time for intercourse, a relationship than involved affection, and an appropriate atmosphere and environment for intercourse. Women who reported a sexual

TABLE 4. *Total frequency distribution of cases of HSDD and odds ratios for HSDD according to variables referring to the characteristics of intercourse*

Variables	Categories	Total sample	Cases of HSDD, no. (%)	Odds ratio (95% CI)	*P*
Characteristics of initiation of sexual intercourse					
	Spontaneous	1,433	50 (3.4)	1.0	
	With initial stimulation	716	46 (6.4)	1.9 (1.2-2.9)	0.002
	Initiated by partner	445	65 (14.6)	4.7 (3.2-6.9)	<0.0001
	Forced	40	40 (100)	4.4 (0.0)	0.997
Time of foreplay					
	Satisfactory	1,794	112 (6.2)	1.0	
	No foreplay	78	19 (24.4)	4.8 (2.8-8.4)	<0.0001
	Too fast	277	44 (15.9)	2.8 (1.9-4.1)	<0.0001
	Too protracted	549	45 (8.2)	1.3 (0.9-1.9)	0.110
How is intercourse normally					
	Unscheduled	1,678	87 (5.2)	1.0	
	Scheduled	342	57 (16.7)	3.6 (2.5-5.2)	<0.0001
	In special circumstances	177	24 (13.6)	2.9 (1.8-4.6)	<0.0001
	Scheduled during the week and unscheduled at the weekends	196	16 (8.2)	1.6 (0.9-2.8)	0.086
Kisses	Yes	2,455	151 (6.2)	1.0	
	No	263	65 (24.7)	5.0 (3.6-6.9)	<0.0001
Embraces	Yes	2,250	133 (5.9)	1.0	
	No	466	82 (17.6)	3.4 (2.5-4.6)	<0.0001
Masturbation	Yes	1,227	61 (5.0)	1.0	
	No	1,483	154 (10.4)	2.2 (1.6-3.0)	<0.0001
Vaginal penetration	Yes	2,220	141 (6.4)	1.0	
	No	492	74 (15.0)	2.6 (1.9-3.5)	<0.0001
Oral sex	Yes	1,730	80 (4.6)	1.0	
	No	982	135 (13.7)	3.3 (2.5-4.4)	<0.0001
Anal sex	Yes	420	17 (4.0)	1.0	
	No	2,283	198 (8.7)	2.2 (1.3-3.7)	0.002

HSDD, hypoactive sexual desire disorder.

repertoire that included kissing, embracing, masturbation, anal sex, oral sex, and vaginal penetration were found to be less likely to have HSDD (Table 4). Table 5 shows the results of the hierarchical multiple analysis in accordance with the levels proposed in the theoretical model illustrated in Fig. 1. This analysis showed HSDD to be positively associated with having cardiovascular disease, breast cancer, posttraumatic stress, and poorer education; being older; being married; having a lack of information on sexuality in childhood and adolescence; and having a more limited sexual repertoire. HSDD was found to be less common in women who consumed moderate amounts of alcohol.

TABLE 5. *Factors associated with hypoactive sexual desire disorder in women*

Variables	Odds ratio (95% CI)	*P*
Model 1: Health		
Cardiovascular disease		
No	1.0	
Yes	3.4 (1.8-6.6)	<0.0001
Breast cancer		
No	1.0	
Yes	2.0 (1.2-3.6)	0.011
Posttraumatic stress		
No	1.0	
Yes	1.7 (1.1-2.6)	0.013
Model 2: Sociodemographic data[a]		
Age group		
18-39 y	1.0	
40-49 y	1.4 (1.0-2.1)	0.063
50-59 y	2.3 (1.5-3.5)	<0.0001
60-69 y	3.4 (1.9-6.0)	<0.0001
≥70 y	4.4 (1.6-11.9)	0.003
Marital status		
Married/in stable union	1.0	
Single	0.8 (0.5-1.1)	0.169
Divorced/separated	0.5 (0.3-0.9)	0.022
Widowed	1.3 (0.7-2.5)	0.391
Education level		
University	1.0	
High school	1.9 (1.3-2.6)	<0.0001
Primary school	2.9 (1.9-4.6)	<0.0001
Model 3: Habits[b]		
Alcohol consumption		
No	1.0	
Former drinker	1.2 (0.4-3.0)	0.740
Moderate use	0.5 (0.4-0.8)	0.006
Abuse/addiction	1.1 (0.5-2.4)	0.742
Model 4: Sexual history[c]		
Information in childhood regarding sex		
Yes	1.0	
No	1.5 (1.0-2.2)	0.031
Model 5: Characteristics of intercourse[d]		
Characteristics of first sexual intercourse		
Spontaneous	1.0	
With initial stimulation	1.9 (1.2-3.1)	0.008
Initiated by partner	3.4 (2.1-5.5)	<0.0001
Forced	2.4 (0.0-)	0.998
Time spent on foreplay		
Satisfactory	1.0	
No foreplay	1.3 (0.5-4.0)	0.524
Too fast	2.2 (1.3-3.7)	0.003
Too protracted	1.8 (1.1-2.9)	0.021
Oral sex		
Yes	1.0	
No	2.1 (1.4-3.1)	<0.0001

Models of hierarchical multiple logistic regression.
[a]Adjusted in accordance with the segment on health.
[b]Adjusted according to the segments on health and sociodemographic data.
[c]Adjusted according to the segments on health, sociodemographic data, and habits.
[d]Adjusted according to the segments on health, sociodemographic data, habits, and sexual history.

DISCUSSION

The objective of the present study was to analyze the factors associated with female HSDD and stratify them according to their importance.

The most important strong point of this study lies in the fact that it is a large population-based study, involving 18 different cities, in which sexual experiences were evaluated. The women included in the study were approached in city squares, beaches, and shopping centers around the country. Population-based studies on HSDD are important because it has been suggested that cultural factors may play a role in determining how low sexual desire is perceived.[11]

A systematic analysis of the factors associated with HSDD was performed according to their order of importance, including an assessment of the characteristics related to sexual intercourse, which contributed toward supplying further information on the subject, supplementing the data provided in the report of the International Consensus Development Conference on Female Sexual Dysfunction.[3]

The prevalence of HSDD in the present study was 9.5%. With respect to the specific question applied to assess this disorder, the responses were dichotomized into the presence or absence of desire; intermediate cases were not considered in the analysis. Higher indexes for HSDD in population-based studies result from the inclusion of less severe cases.

Nevertheless, the women excluded from the sample (those who failed to respond to the question on HSDD) were found to have more factors associated with this sexual disorder. This suggests that the prevalence of HSDD found in the study may be underestimated and could in fact include the nonresponders (12.1% of the total sample of women).

Goldstein et al[5] performed a study with the objective of learning how clinicians could communicate more effectively with patients who have HSDD by exploring the language used by patients and clinicians in the United States, France, and Germany when describing the symptoms, causes, and associated factors related to HSDD. These investigators found that the term HSDD was poorly recognized, whereas decrease in sexual desire is the preferred term. Of the women with HSDD, 69.6% also reported concomitant complaints of arousal and orgasm, whereas 30.4% reported HSDD alone (Fig. 2). Data from the literature show that around 20% of women undergoing treatment for sexual dysfunction have HSDD alone, whereas the majority (75%) also report problems with arousal and orgasm.[30] These findings suggest a strong relationship between the different domains of sexual response.[34]

Multiple regression analysis showed an association of cardiovascular disease, breast cancer, and posttraumatic stress with HSDD, identified in the health segment. The findings of this study are in agreement with data published in the literature. Studies carried out in women with cardiovascular

disease also report sexual difficulties in over 57% of cases, particularly impaired sexual desire.[35] In a study carried out in a sample of 50 women with breast cancer, 64% of participants also reported a lack of sexual desire, whereas 48% reported diminished desire.[36] The physical and hormonal changes and the negative emotional repercussions of this disease contribute to inhibiting desire.[37] In a study conducted with victims of sexual or nonsexual torture, more than half the women diagnosed with posttraumatic stress were found to have at least one form of sexual dysfunction.[38]

Of the sociodemographic factors, poorer education level and being older were found to be significantly associated with HSDD, and these findings are also in agreement with reports from other studies.[39-41] Schooling exerts an effect on life habits and on conditions of access to both education and health care.[42]

Being older was also associated with HSDD. Comorbidities, lack of a sexually active partner, and being in the climacteric, a period that is associated with a fall in ovarian sex hormones that affects estrogen receptors in various different body systems, lead to consequences ranging from effects on cognitive function to local response, factors that are common in the aging process of women and may explain the greater risk of HSDD found in women in these age groups.[43]

Another finding from the same segment was the association between marital status and HSDD. Findings in the literature are controversial. In a study carried out by Kadri et al,[44] HSDD was more common among married women than among single women. Shifren et al[45] also found distressing problems with desire to be twice as high in married women compared with single women, but even higher in women without a current partner. Compared with married women in the present study, the risk of HSDD was 50% lower among divorced women. It is possible that the type of relationship that develops within a marriage, with no challenges and no need for conquest, is less stimulating to sexual desire than in the case of divorced women.[46]

In the segment on habits, the only association found was that women who consumed moderate amounts of alcohol were less likely to have HSDD, suggesting a need for more studies to reinforce whether this association is a consequence of the direct effect of alcohol or whether women who drink moderately have a higher degree of socialization and consequently a greater facility for sexual interaction. In the Massachusetts Male Aging Study, this same association was found for men.[47]

With respect to the segment on sexual history, only the item regarding whether information on sexuality was provided in childhood and adolescence was found to be significantly associated with HSDD. Combating myths, taboos, and erroneous concepts with factual information may prevent sexual difficulties in adult life.[48]

The segment on the characteristics of sexual intercourse showed an association between a more limited sexual repertoire (less likely to participate in the activities mentioned in the questionnaire: embraces, kisses, masturbation, vaginal and anal penetration, and principally oral sex) and HSDD. A lack of spontaneity in initiating sexual activity and a need for stimulation from the woman's partner and for the partner to take the initiative were factors also significantly associated with the presence of HSDD. In the case of these women, foreplay is also hampered by being too fast or too protracted or by having certain characteristics: when foreplay takes too long, a greater effort seems to be made by the couple to achieve arousal; however, when foreplay is too brief, the woman's need to become aroused before penetration is not being taken into consideration, either because of the woman's lack of interest or because of her partner's unawareness.[49]

The present study should be interpreted within the context of its limitations. Because of its cross-sectional design, it was not possible to determine the causality between the several variables and the presence of HSDD. Moreover, the results were based on self-response answers that were unconfirmed by a specific validating questionnaire or by laboratory tests indicating the etiology of HSDD. Furthermore, the method of recruiting potential participants in public places in major Brazilian cities may constitute a limitation to the study because women who habitually stay at home or reside in small towns or in the suburbs (and poorer areas) would not be included.

The objective of proposing an analysis system to classify the factors associated with HSDD according to their importance was to minimize the possibility of obtaining statistically significant findings with no clinical significance. Because the variables in the hierarchically higher segments continue in the logistic regression model after new variables are included in the lower segments, those referring to health were considered the most important, whereas the characteristics referring to the woman's relationship with her partner were considered less important. The complaint in younger women emerges mainly in the context of dysfunctional personal relationships, and in older women, it seems to be linked to organic factors.[43]

HSDD not only jeopardizes sexual intercourse but also seems to interfere extensively in the relationship as a whole, making the diversity of sexual practices less tolerated, compromising foreplay activities, and always placing the initiative for sexual contact in the hands of the partner.

Based on the stratification of the different segments and the fact that the study was based on data from a previous epidemiological study, these present findings seem relevant and will add to existing knowledge on the interrelationship between factors that affect female sexual desire.

CONCLUSIONS

In addition to the aging process, cardiovascular disease, posttraumatic stress, and breast cancer are associated with HSDD. HSDD not only compromises sexual intercourse but may also interfere more widely in the relationship, restricting the sexual repertoire of the couple, hampering foreplay, and inhibiting initiation of the sexual act, which becomes more dependent on the partner's initiative. Better education level, more sexual partners, and moderate alcohol consumption were factors found to be less associated with women with HSDD. Analysis of the associated factors classified according to their

importance and analysis of the characteristics of the sexual relationships provide additional information to currently available data on the traditional concepts of HSDD.

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