

Evaluation of Sexual Dysfunction in Brazilian Women with Infertility Undergoing Assisted Reproduction Treatment

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Abstract

Purpose: The increase in infertility around the world has a negative impact on sexual desire and function. The objective of this study was to evaluate the presence of sexual dysfunction in women diagnosed with infertility, comparing them with healthy controls.

Methods: This is a cross-sectional study based on online questionnaire. Infertile women and healthy controls filled a questionnaire about epidemiological and assisted reproduction data. The infertile patients answered the Female Sexual Function Index (FSFI) and the Short-Form Health Survey (SF-12) questionnaires to assess sexual performance, physical, and mental health. The control group answered only to the FSFI.

Results: The survey was completed by 357 subjects: 157 infertility patients and 200 matched controls. All medians of the FSFI domains of patients in the infertility group are lower ($p=0.036$) when compared to controls, especially the scores in the arousal and lubrication domains ($p=0.003$ and $p<0.0001$, respectively). In this group, most are in good physical health and half are in good mental health. The depression rate was 12.7%. Patients who have depression have worse FSFI scores ($p=0.009$). Depression and sexual dysfunction were experienced by 27.4% ($n=17$) patients ($p<0.0001$). Worse mental health was related to patients at higher risk for sexual dysfunction ($p<0.0001$).

Conclusion: In our sample of women undergoing infertility treatment, we found that the FSFI scores were significantly lower than in the control group, mainly in the arousal and lubrication domains. Additionally, it was found that the worse the mental health, the greater the possibility of sexual dysfunction in this group.

Keywords: Sexual dysfunction, Infertility, Gynecology, Assisted reproduction

Introduction

Sexual dysfunction refers to a problem that prevents people from feeling satisfaction with sexual activity [1]. Couple infertility and sexual dysfunction are two conditions considered delicate and embarrassing, and that have a high prevalence in the general population [2]. Behavioral and cultural factors may be involved in the statistics of sexual dysfunction in each country. It is estimated that 8-12% of couples are diagnosed with infertility [3].

The use of assisted reproduction has allowed many infertile couples to progress towards pregnancy, but the therapeutic process is a condition of psychological stress that can affect their quality of life, as well as the couple's affective and sexual relationship [4]. Treatment with assisted reproduction has made great progress in the last four decades, with a great impact on the treatment of infertility [5]. The diagnosis of infertility is, in itself, a major stress factor, especially for women who feel their identity has been undermined, often overwhelmed by social pressure [6]. The relationship

between sexuality and infertility is a topic of great relevance, and patients who undergo assisted reproduction deserve the attention of health professionals in an interdisciplinary manner [7].

This study aimed to evaluate the prevalence of sexual dysfunction and verify the quality of life in Brazilian women diagnosed with infertility and who were being followed up with assisted reproduction.

Methods

Ethical approval

This study was approved by the Ethics Committee (EC) of Universidade Positivo, on September 2nd, 2020 (protocol number 4,261,000). All study participants agreed and signed to the Informed Consent Form (ICF).

Recruitment

This is a convenience sample that included 18 to 50-year old, heterosexual, sexually active women, living in Brazil and who were diagnosed with infertility, according to the criteria of the American Society of Reproductive Medicine [8]. The diagnosis of infertility is given after failure to conceive after 12 months or more with regular unprotected sexual intercourse [8]. Above 35 years, the investigation for infertility should be started after 6 months of trying [9].

Foreign patients; patients with a previous diagnosis of major depression and substance abuse; patients with other medical conditions that are often associated with sexual dysfunction (e.g., genital tract abnormalities, diabetes, heart disease, kidney failure, autoimmune disease) were excluded.

Women who were being followed up at one of the human reproduction clinics partnered in the study were invited to participate when they went to the clinic to start treatment. At that time, they received guidance and the link to respond. Those who accepted and signed the consent form, answered in a personal, self-declared, anonymous, and voluntary way the online questionnaires made available between the months of May 2019 to June 2021.

Questionnaires

The data collection tools used in the study were:

1. Epidemiological data (age; marital status).
2. Previous clinical data: use of antidepressants; ovulation induction medication; diagnosis of depression; number of pregnancy attempts and type of treatment (ovulation induction for programmed intercourse, artificial insemination or IVF).
3. SF-12: the SF-12 questionnaire is translated and validated

for use in the Brazilian population. It assesses 12 physical and mental health items, including physical functioning (function limitations due to bodily problems and pain), general perceptions of health, vitality, and social functioning (role limitations due to emotional problems), and mental health [10]. Cut-off score of ≤ 50 for physical health score and ≤ 42 for mental health score.

FSFI: this is a translated and validated questionnaire that assesses female sexual response in the following domains – sexual desire, sexual arousal, vaginal lubrication, orgasm, sexual satisfaction, and pain. There are nineteen questions that assess sexual function in the last four weeks and give scores in each component [11]. At the end, a total score is presented. Values lower than or equal to 26 indicate a higher risk for female sexual dysfunction.

Control group

As a control group, healthy women, age-matched with the study group, who did not have chronic diseases were included. The same exclusion criteria applied to the study group were used. For this group, only the sociodemographic questionnaire and the FSFI were applied.

Statistical analysis

The Kolmogorov-Smirnov and Shapiro-Wilk tests were applied to assess the normal distribution of quantitative data using the GraphPad Prism 3.0 software. Continuous variables were expressed as median [interquartile range] and compared using the non-parametric Mann-Whitney and Kruskal-Wallis tests. Categorical variables were expressed as percentages and compared using the chi-square test or Fisher's exact test, as appropriate using SPSS 17.0 software. Data were also evaluated by logistic regression analysis using the STATA v.9.2 program (StataCorp, USA). The covariables age, education, marital status, treatment, and comorbidity were included in the logistic regression model when the univariate analysis showed $p \leq 0.2$. Correlations were evaluated using Spearman's correlation coefficient (r) with the aid of GraphPad Prism 3.0 software. The p -values less than 0.05 were considered statistically significant.

Results

The survey was answered by 179 patients diagnosed with infertility and by 200 women in the control group, totaling 379 women. From the group of patients with infertility, 22 were excluded for not answering the questionnaire properly.

Thus, the final sample consisted of 157 female participants in the infertility group, who were compared with the control group ($n=200$). Sociodemographic data were distributed as shown in **Table 1**. The mean age was 36 years old in the group of infertile patients and 37 years old in the control group ($p=0.978$).

Table 1. Sociodemographic profile.			
Features	Patient N=157	Control N=200	p-value
Median age (years) [IQR]	36 [33 - 40]	37 [32 - 40]	0.978
Civil Status n (%)			
Married	141 (89.8)	183 (91.5)	0.859
Single	14 (8.9)	15 (7.5)	
Divorced	2 (1.3)	2 (1.0)	
Good physical health (SF-12 \geq 51) n (%)	117 (74.5)		
Good mental health (SF-12 \geq 43) n (%)	76 (48.4)		
Comorbidities			
Depression n (%)	20 (12.7)		
Endometriosis n (%)	3 (1.9)		
Other comorbidities n (%)	2 (1.3)		
Treatment n (%)			
In vitro fertilization	100 (63.7)		
Ovulation induction	43 (27.4)		
Artificial insemination	20 (12.7)		
Attempts n (%)			
1 st time	44 (28.0)		
1-2 times	66 (42.0)		
3 or more	47 (29.9)		
IQR: Interquartile Range			

Based on the scores obtained in the SF-12, 74% (117/157) of patients with infertility are in good physical health (scores above 50), according to the standardization of the questionnaire. Among the patients studied, 48% (76/157) had good mental health (scores above 43). The depression rate was 12.7% (n=20). All women participating in the group of infertile

patients were undergoing assisted reproduction treatment, IVF (63.7%) being the most common type of treatment.

Table 2 provides data on the FSFI results. The prevalence of sexual dysfunction was higher in the group of patients with infertility (62/157; 39.5%) than in the control group (64/200;

Table 2. FSFI Result.			
	Median Patient [IIQ]	Median Control [IQR]	p-value*
Total FSFI	28.2 [23.2 – 30.6]	29.3 [24.9 – 31.8]	0.036
Desire	3.6 [2.4 – 4.2]	3.6 [2.4 – 4.2]	0.3486
Arousal	4.5 [3.4 – 5.1]	4.9 [3.6 – 5.4]	0.003
Lubrication	4.8 [3.7 – 5.7]	5.4 [4.8 – 6.0]	<0.0001
Orgasm	4.8 [3.6 – 5.6]	5.2 [4.0 – 6.0]	0.153
Satisfaction	4.8 [3.6 – 5.6]	5.2 [4.4 – 6.0]	0.1309
Pain	5.6 [4.6 – 6.0]	6.0 [4.8 – 6.0]	0.192
Sexual Dysfunction (FSFI \leq26.5) n (%)	62 (39.5)	64 (32.0)	0.148
IQR: Interquartile Range, p-value adjusted by logistic regression.			

Table 3. Relationship between FSFI results and sample characteristics.

FSFI			
	No median [IQR]	Yes median [IQR]	p- value*
Depression	28.6 [24.3 – 30.8]	22.7 [19.3 – 24.6]	0.009
Endometriosis	28.1 [23.2 – 30.6]	31.1 [28.9 – 31.1]	0.142
Some treatment**	27.9 [23.3 – 30.0]	28.4 [23.2 – 30.6]	0.611
In vitro fertilization	28.0 [23.9 – 30.3]	28.4 [23.3 – 30.6]	0.809
Ovulation induction	28.1 [23.2 – 30.6]	28.5 [24.3 – 30.8]	0.683
Artificial insemination	28.2 [23.3 – 30.6]	27.6 [23.3 – 32.1]	0.921
	<35 years old	≥35 years old	
	1st time	1-2 times	3 or more
Attempts	28.1 [24.2 – 31.0]	28.4 [23 – 30.4]	27.9 [23.2 – 30.6]
Age	28.3 [24.8 – 30.7]	28 [22 – 30.6]	0.417

IQR: Interquartile Range.
 *p-value adjusted by logistic regression.
 ** Use of medication for depression or endometriosis.

32%), but without significant difference ($p=0.148$). However, it was observed that the scores found in the group with infertility were significantly lower ($p=0.036$), mainly in the arousal and lubrication domains. All medians of the FSFI domains of patients in the infertility group are lower when compared to controls.

Among the comorbidities studied, only depression had a negative influence on the rate of sexual dysfunction ($p=0.009$). Patients who have depression have a worse FSFI score than those who do not, as shown in **Table 3**. On the other hand, the type of treatment used, age or number of attempts did not influence the FSFI medians.

Regarding the results of the SF-12 questionnaire, there was a correlation between worse mental health in the SF-12 and a higher risk for sexual dysfunction (Spearman's $r=0.35$).

Discussion

Sexuality and the sexual function itself are greatly influenced by culture and lifestyle of each country. In Brazilian women undergoing infertility treatment, we found that FSFI scores were significantly lower than in the control group, mainly in the arousal and lubrication domains. A systematic review showed similar results for the lubrication domain, but the second most prevalent domain was desire [12]. Additionally, it was found that the worse the mental health (attested by the SF-12), the greater the possibility of sexual dysfunction in this group. These data show the importance of prioritizing sexual complaints during consultation with the assisted reproduction specialist. That is, a multidisciplinary team is needed, including

a gynecologist, andrologist, sexologist, and psychologist, which allows addressing infertility and subsequent sexuality as a whole, and not as dichotomized issues [13].

In the present study, the mean age was 36 years old in the group of infertile patients and 37 years old in the control group, and age had no influence on the FSFI scores. This data goes against what is shown in the literature, which suggests that the occurrence of sexual dysfunctions increases directly with age for men and women [14]. What could explain this divergence is that, in terms of age, infertile women seek assisted reproduction services, often at an older age compared to the age of fertile women [15]. Additionally, some authors have reported that although the frequency of symptoms increases with age, personal distress about these symptoms seems to decrease as patients age [14].

The prevalence of depression among patients in the infertility group was 12.7%, a value similar to that described in the literature. Peterson et al., found a prevalence of 11.6% of depression in women with infertility in the United States [16]. Depression, anxiety, marital maladjustment, sexual dysfunction, and worse quality of life are more common in women with infertility, with depression being the most common illness in people with primary infertility [17]. Having a diagnosis of infertility and being subjected to the stress of treatment can put women at risk of experiencing depressive symptoms, especially if treatment fails [16]. On the other hand, Ozturk et al. described that infertile women have a higher frequency of depressive symptoms than fertile women; however, this difference was not significant [18]. Among eight studies selected in a systematic review, three assessed

depression among participants and all concluded that the process of assisted reproduction treatment leads to emotional damage for the patient or the couple [7].

The FSFI questionnaire is a very common tool for assessing sexual dysfunction and an excellent method for comparing studies homogeneously to determine if there are any differences between them [12]. From eight studies evaluated in a systematic review, five used the FSFI – three studies showed results similar to the present study. In two others, there was no difference between the control group and the group of infertile patients [7].

Regarding the results of the SF-12 questionnaire, most patients in the infertile group reported good physical health and almost half were categorized as having good mental health. These data are similar to those observed by Shoji et al. in the Japanese population, in which the authors reported that sexual satisfaction decreases with therapeutic interventions and affected mental health, influencing more than physical factors [19]. In our study, worse mental health was significantly correlated with higher risk of sexual dysfunction. Additionally, these findings corroborate those patients with depression had a worse FSFI score, in line with studies carried out in other countries [17,20].

In our study, the type of treatment and the number of attempts had no significant influence on the frequency of SD. Other authors have described that regardless of the stage of infertility treatment, the sex life of couples may already be impaired [21]. Interventions such as programmed intercourse and assisted reproductive technology were considered emotionally stressful for infertile couples, with lower sexual satisfaction in this group than in couples who achieved pregnancy spontaneously [19]. On the other hand, Mendonça et al., also found no significant difference between fertile and infertile women in a study conducted with women from Goiás (Brazil) [15], as well as Furukawa et al. [22].

Limitations

This study is limited by its cross-sectional design and absence of male participation. As an online survey, it must rely in patients' information about the presence of comorbidities, treatment and others. On the other hand, questionnaires about sexuality should have more reliable answers when carried out anonymously and online than if they were applied in person.

Conclusion

In conclusion, in our sample of women undergoing infertility treatment, we found that the FSFI scores were significantly lower compared to the control group, mainly in the arousal and lubrication domains. Additionally, it was found that the

worse the mental health, the greater the possibility of sexual dysfunction in this group.

What Does This Study Add to the Clinical Work?

Emphasis on the psychological care of patients who undergo assisted reproduction treatment during the process of trying to conceive.

Declarations

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Conflict of interest

The authors have no relevant financial or non-financial interests to disclose. All authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript. The authors have no financial or proprietary interests in any material discussed in this article.

Ethics approval

This study was approved by the Ethics Committee (EC) of Universidade Positivo, on September 2nd, 2020 (protocol number 4,261,000).

Consent to participate

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

Consent for publication

The authors approved the version to be published and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Availability of data and materials

Data are available from the authors upon reasonable request and with permission from the correspondence author.

Code availability

Not applicable.

Authors' contributions

ACS: project development, manuscript writing, data collection; AHM: manuscript writing; AGS: manuscript writing; RN: project development, manuscript writing, DMTM: project development, manuscript writing.

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