

Sexual Dysfunction in Women Undergoing Fertility Treatment in Iran: Prevalence and Associated Risk Factors

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Abstract

Background: Sexual dysfunctions are one of the most fundamental difficulties for infertile women, which can be as the cause of infertility. This study investigated the prevalence of this disorder and associated factors in order to improve infertility treatment process and the quality of life of women referring to infertility center.

Methods: A cross sectional study was performed on 236 women who referred to Fatima Zahra infertility center of Babol, Iran. Data collection tool was a questionnaire contained two parts; demographic characteristics and infertility information. Also, data for sexual dysfunction was obtained through diagnostic interview based on the international classification DSM-IV. For data analysis, logistic and linear regression analysis were used. The $p < 0.05$ was considered significant.

Results: Most of women (84.9%) suffered from primary infertility and the mean duration of infertility was 60.2 ± 8.4 months. The prevalence of sexual dysfunction was 55.5% (n=131); including dyspareunia in 28% (n=66), impaired sexual desire and lack of orgasm in 26.3% (n=62 patients), vaginismus in 15.2% (n=36) and lack of sexual stimulation in 13.6% (n=32). Binary logistic regression analysis showed that age, sexual satisfaction and history of mental illness had a significant effect on the probability of experiencing the sexual dysfunction.

Conclusion: There is a high prevalence of sexual dysfunction among infertile women. Considering the interaction between sexual dysfunction and infertility, professional health care centers should be sensitive to this effect. Also, more attention must be paid on marital relationships, economic and social situation and infertility characteristics in order to prevent sexual dysfunction development through early screening and psychological interference.

Keywords: Infertility, Sexual dysfunction, Women.

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Introduction

Infertility has always been important and an issue of concern in human population. Sexual problems are more common among infertile couples and are reported to be between 5 and 55 percent (1). Sexual dysfunctions can be the cause of infertility or the result of it. There are different types of sexual dysfunctions causing infertility including problems in intercourse, number of sexual intercours [due to decreased sexu-

al desire (11%)], erection or ejaculation disorders (premature ejaculation is the most common type (66%)) and lack of ejaculation (8%) in men and also vaginismus or dyspareunia (58%) and decreased sexual desire (28%) in women. On the one hand, inadequate sexual excitement in women causes lack of vagina lubrication resulting in reduction of sperm migration (2). On the other hand, the response to inability of conceiving lead

to emotions such as anger, anxiety, hopelessness and sadness in most people that, in and of itself, may disturb the sexual activities. Stress due to infertility and its treatment may be a source of sexual problems (3). Therefore, infertility with several mechanisms can bring up sexual dysfunctions as stated below.

First, what is obvious is that sexual activity is different from sexual pleasure. The need for compulsory intercourse (like postcoital test or repeated intercourse in order to conceive, as man must have orgasm whereas woman may not experience it) causes men to suffer from temporary listlessness and women to be disappointed to reach orgasm in the pursue of continual intercourse. In such circumstance, both partners may experience reduction in sexual desire. These stresses contribute to sexual dissatisfaction among couples (3). Second, feelings of being guilty, blame and anger hurt the sense of being male or female and cause disorder in sexual desire. If the cause of infertility is woman, she will feel guilty and therefore, she restricts her sexual demand (4).

Third, depression resulting from not being attractive reduces sexual desire and causes sexual disturbance. A study in Belgium showed that women with anxiety before sperm insemination had either delay in conception or failed in getting pregnant compared to those who were not anxious before insemination (5). In a study conducted in Australia, only 13% of women with depression became pregnant during IVF cycles versus 29% of women who were not depressed (6). The role of depression and stress on reducing pregnancy rate in women is also reinforced by other studies (7, 8). Infertility interventions ruin couples' normal life, recreation, and planning since the time of ovulation induction, sperm insemination or sexual contact is undefined. This leads to the intensification of anxiety and stress. The financial pressures because of the cost of infertility treatment and the uncertainty of the outcome of such treatment are so stressful that can influence the sexual relationship (8-10).

A research by Jindal in 2002, conducted on 200 infertile Indian women demonstrated that more than 50% of women complained about one or more sexual problems. Decreased sexual desire and lack of orgasm were the most common complaints (11). Also Sigg et al. (2005) showed that sterility treatment brought up sexual dysfunctions in 35% of couples (2). Jain et al. studied (2005) the relationship between the psychosexual disor-

ders and infertility in India on 175 infertile women and they found out that the most frequent disorders were dyspareunia (58%), decreased sexual desire (28%) and lack of orgasm (14%) (12). The results of another study in India (2013) indicated high prevalence of sexual dysfunction (63.7%) in comparison with the control group (46.4 %), in which sexual desire and orgasm disorder (40%) were the most common complications (13).

Unfortunately, despite numerous articles in the field of sexual dysfunction in various female groups in Iran (including the general population, pregnancy, lactation, menopause, divorce groups, etc.), there is so limited information on this issue in infertile women. On the other hand, the tools used to collect data have been either made by researchers themselves, which their validity and reliability is unknown in most studies, or the use of FSFI questionnaire (Female Sexual Function Index) which is completed through patients' self-reports. For example, Ramzani Tehrani et al. studied (2012) the prevalence of sexual dysfunction in women in four provinces of Iran. They showed the most common disorders were sexual desire (35.6%), sexual excitement (39.9%), lubrication of vagina (18.9%), orgasm (27.3%), satisfaction from the sexual relationship (15.2%) and also, dyspareunia (56.1%) (14). The findings of Hoseini et al. (2012) in Sari, Mazandaran province, also demonstrated that 45.2% of women referring to the health centers suffered from sexual dysfunction (15). Also, Foroutan and Meidani's (1387) research about the prevalence of sexual dysfunction in couples demanding divorce showed that 68.4% of women had no sexual consent (16).

Another study made in Yazd IVF Center on infertile women revealed that the most common sexual dysfunction was orgasm disorder (83.76%) and the rates of sexual desire disorder, dyspareunia and vaginismus were 80.7%, 67.7% and 76.7%, respectively. More than 50% of cases had decreased frequency of coitus after diagnosis of infertility. Vaginismus and dyspareunia were more common in the age group of 20-24 years (17).

Tanha et al. (2013) observed sexual dysfunction is high in infertile women, and women with secondary infertility suffer more from impaired sexual function compared with those with primary infertility. They also found significant negative correlation between total FSFI score and age, partner age and marriage duration (18).

Therefore, given the importance of this issue and the lack of available data in Iran, performing a

study seemed to be beneficial for improving the infertility treatment and the life quality in infertile couples.

Methods

The cross-sectional study (descriptive-analytical method) was performed on 236 women referring to Fatima Zahra infertility center (Table 1). Fatima Zahra infertility and reproductive health research center is affiliated with Babol university of medical sciences. This center has been working on the subjects with infertility since 1992. It is known as a major referral center dealing with patients in the north of Iran.

Non-probability sampling was conducted. All women with a history of infertility for at least one year and continuous sexual activity during the past year were enrolled. After having explained the objectives and methods of the study, informed consent was received from all samples. Data collection tool was a questionnaire completed through interviews in private meetings by the researcher. The questionnaire was composed of two parts: demographic characteristics and information about sexual relationship (such as frequency of sexual contacts per week, satisfaction with sexual and non-sexual relationships). Sexual dysfunction measurement were done by gynecologists/sexologists in infertility center on the basis of a diagnostic interview according to the International Classification DSM-IV in four parts including sexual desire disorder, sexual excitement disorder, orgasmic disorder and sexual pain (vaginismus and dyspareunia) over the course of at least three months before the initiation of the study (19). DSM questionnaire for sexual dysfunction is a standard questionnaire that is completed mainly through interviews with the subjects.

To describe the data, descriptive statistics and to assess the effect of study variables on sexual dysfunctions, logistic and linear regression analysis were used by means of SPSS, version 20. The p-value of less than 5% was considered significant.

Results

The mean age of the women participated in this study was 26.1±5.3. 45.8% of them had high school education and 82.8% of them were housewives. Most women (84.9%) suffered from primary infertility and the mean duration of infertility was 60.2±8.4 months. The mean±SD of family size and number of sexual contacts per week were

2.5±1.4 (between two and ten people) and 2.4±1 (from zero to seven times a week), respectively. More than 90% of the women were satisfied about their sexual and non-sexual relations with their spouses. 11% were addicted to narcotics or tobacco consumption. Demographic characteristics of the samples are shown in table 1.

The prevalence of sexual dysfunction in this study was 55.5% (n=131) in which 50% of the subjects complained about more than one problem. Types of sexual dysfunction with respect to prevalence were dyspareunia 28% (n=66), impaired sexual desire and lack of orgasm 26.3% (n=62 patients), vaginismus 15.2% (n=36) and lack of sexual stimulation 13.6% (n=32). 41.6% of the females reported a change in number of sexual intercourse; more than 50% cited experiencing anxiety during sexual intercourse after starting the infertility treatment process.

Table 1. Demographic profile of the women undergoing fertility treatment

Variables	N (%)
Age groups	
≤25	113 (47.9)
26-30	75 (31.8)
31-35	38 (16.1)
≥36	10 (4.2)
Education	
Illiterate	4 (1.7)
Primary/Middle	95 (40.2)
Diploma	109 (46.2)
College education	28 (11.9)
Living place	
Urban	88 (37.3)
Rural	148 (62.7)
Housing type	
Owner	139 (58.9)
Tenant	73 (30.9)
Living with relatives	24 (10.1)
Infertility cause	
Male factor	89 (37.7)
Female factor	40 (16.9)
Both of them	28 (11.9)
Idiopathic	79 (33.5)
Physical illness history *	
Yes	30 (12.7)
No	206 (87.3)
Mental illness history **	
Yes	65 (27.5)
No	171 (72.5)

*History of physical illness including diseases of the urinary-reproductive tract (n=15), diabetes (N=8), heart disease (N=3) and thyroid disease (N=4); **Mental illness history including depression (N=30), anxiety (N=28) and obsession (N=7)

Table 2. Frequency of sexual dysfunction according to the starting time, type and cause of infertility in the women undergoing fertility treatment

Sexual dysfunction	Starting time		Infertility type		Infertility cause			
	Lifelong *	Acquired *	Primary	Secondary	Female	Male	Both	Idiopathic
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Sexual desire **	17 (27.4)	45 (72.6)***	49 (79)	13 (21)***	10 (16.1)	22 (35.5)	6 (9.7)	24 (38.7)
Sexual excitement	15 (46.8)	17 (53.2)	24 (75)	8 (25)***	6 (18.8)	8 (25)	3 (9.4)	15 (46.9)****
Orgasm	34 (54.8)	28 (45.2)	54 (87.1)	8 (12.9)	10 (16.1)	22 (35.5)	5 (8.1)	25 (40.3)***
Dyspareunia	25 (37.9)	41 (62.1)****	59 (89.4)****	7 (10.6)	9 (13.6)	24 (36.4)	3 (4.5)	30 (45.5)***
Vaginismus	5 (14.2)	31 (85.7)***	31 (86.1)	5 (13.9)	7 (19.4)	11 (30.6)	2 (5.6)	16 (44.4)***

*From the beginning of the first intercourse/Some time after the first intercourse; **Sexual desire disorder including decreased sexual desire (N=45) and sexual aversion (N=17); ***P<0.001; ****P<0.01; Data analysis by χ^2 test

The most of women (80.7%) believed that sexual behavior consultation helped them to adapt themselves to the problem of infertility. Distribution frequency of sexual dysfunction types in terms of duration, type and cause of infertility is shown in table 2.

Assessment of interactive effect of the variables on the sexual dysfunction in the linear and the multiple logistic regression is shown in table 3, 4. According to this table, infertility cause (OR=2.46), sexual satisfaction (OR=4.94), and a history

of mental illness (OR=3.54) were proved to be suitable independent predictive variables for sexual desire disorder in the subjects.

Moreover, age, satisfaction of sexual relationships and history of mental illness showed to be good independent predictor variables for lack of experiencing sexual excitement in the women. OR for experiencing this disorder in the subjects aged more than 36 compared to less than 25 was 2.34 times, sexual and non-sexual dissatisfaction compared to sexual satisfaction and non-sexual was

Table 3. The correlation between sexual dysfunction and other variables using multiple logistic regression analysis in the women undergoing infertility treatment

Variables	Sexual desire OR (CI)	sexual excitement OR (CI)	Orgasm OR (CI)	Dyspareunia OR (CI)	Vaginismus OR (CI)
Age					
≤25	1.0 (Ref)	1.0 (Ref)	1.0 (Ref)	1.0 (Ref)	1.0 (Ref)
26-30	1.38 (0.76-1.86)	1.56 (0.84-2.25)	1.28 (0.77-2.32)	1.18 (0.48-1.93)	1.38 (1.32-2.54)
31-35	1.26 (0.86-2.62)	1.15 (0.48-2.36)	1.36 (0.86-2.80)	1.20 (0.77-2.69)	1.78 (0.89-2.89)
≥36	1.26 (0.65-2.38)	2.34 (1.16-3.91) **	3.04 (2.46-5.28) ***	2.61 (1.75-3.42) **	1.86 (0.87-4.90)
Education					
Illiterate	1.0 (Ref)	1.0 (Ref)	1.0 (Ref)	1.0 (Ref)	1.0 (Ref)
Diploma	1.25 (0.61-1.98)	0.86 (0.38-1.94)	0.66 (0.22-1.99)	0.39 (0.18-1.87)	0.75 (.28-1.41)
Academic education	1.01 (0.45-2.26)	0.75 (0.25-1.87)	0.84 (0.25-2.40)	1.01(0.85-1.97)	2.30 (1.18-3.44) ***
Infertility cause					
Idiopathic	1.0 (Ref)	1.0 (Ref)	1.0 (Ref)	1.0 (Ref)	1.0 (Ref)
Female factor	1.74 (0.08-2.36)	1.32 (0.35-4.93)	2.64 (1.53-3.89) **	1.74 (1.19-2.87) *	1.12 (0.79-1.65)
Male factor	0.79 (0.19-1.25)	1.24 (0.78-2.67)	1.38 (0.40-1.98)	1.62 (0.89-2.51)	1.08 (0.49-2.69)
Both of them	2.46 (1.29-3.64) **	1.14 (0.51-1.78)	1.19 (0.82-1.80)	1.31 (0.49-2.45)	1.21 (0.89-2.56)
Non-sexual satisfaction					
Yes	1.0 (Ref)	1.0 (Ref)	1.0 (Ref)	1.0 (Ref)	1.0 (Ref)
No	1.82 (0.27-2.14)	3.25 (1.08-4.28) **	3.68 (1.64-5.18) ***	1.45 (0.71-2.95)	1.15 (0.62-2.35)
Sexual satisfaction					
Yes	1.0 (Ref)	1.0 (Ref)	1.0 (Ref)	1.0 (Ref)	1.0 (Ref)
No	4.94 (2.88-6.61) ***	5.38 (2.87-7.32) ***	4.86 (3.78-6.95) ***	1.30 (0.78-2.83)	1.40 (1.12-2.89)
Mental illness history ***					
Yes	1.0 (Ref)	1.0 (Ref)	1.0 (Ref)	1.0 (Ref)	1.0 (Ref)
No	3.54 (1.13-4.83) ***	1.54 (1.01-2.32) **	1.68 (1.25-2.92) **	0.67 (0.20-1.48)	1.23 (0.30-2.52) **

*P< 0.05; **P< 0.01; ***P< 0.001

Table 4. Linear regression analysis results on the effects of the variables on sexual dysfunction in women undergoing infertility treatment

Variables	Desire	Excitement	Orgasm	Dyspareunia	Vaginismus
	B standardized (CI)				
Infertility duration	0.29 (0.69-1.56)	0.28 (0.69-1.31)	0.72 (0.25-2.13) *	0.85 (0.40-1.26) *	0.32 (0.19-1.01)
Intercourse No./w	0.32 (0.74-1.80)	0.20 (0.87-2.65)	0.38 (0.68-1.02)	0.40 (0.77-1.63) *	0.87 (0.28-1.47)

*P<0.01

5.38 and 3.25 times, respectively. In addition, in those with no history of mental illness, the odd ratio for lack of sexual excitement was 1.54 times less than odd ratio for women in the reference group.

The results on lack of experiencing orgasm showed that at age over 36, infertility due to female factor, satisfaction of sexual relationships, and a history of mental illness were significant predictors on the probability of occurrence of this disorder (ORs were 3.04, 2.64, 3.68, 4.86 and 1.62, respectively). Moreover, increasing infertility duration can have a 72 percent predictive effect on orgasmic dysfunction (p<0.001).

Regarding the experience of sexual pain one could say that increasing age (OR=2.61), infertility due to female factor (OR=1.74) as well as duration of infertility and the frequency of intercourses per week were effective on the occurrence of dyspareunia (%85 and %42, respectively). Similarly, academic education (compared to elementary and secondary education), and a history of mental illness were predictors of the occurrence of vaginismus (OR=2.30, 1.23).

Discussion

Based on our finding, the prevalence of sexual dysfunction was 55.5%. The most common types of sexual dysfunction in more than 25% of women were dyspareunia, sexual desire and orgasm, respectively. This amount was found different in other epidemiologic studies examined sexual dysfunction in infertile women. A study in the United States reported a lower incidence of sexual problem 40% (20) whereas, Keskin et al. (2011) observed a higher incidence of sexual dysfunction in Turkey; 76.5% in women with secondary infertility compared to 64.8% in women with primary infertility (21). In Iran, also, a high degree of prevalence of this disorder (56-80.2%) in infertile women has been reported (22-25). On the contrary, the study of Furukawa et al. (2012) and Iris et al. (2013) found no significant difference in the

rate of sexual dysfunction in infertile women in comparison with the control group (26-27). However, there is a possibility that women with different ethnic and cultural backgrounds have different knowledge and perceptions about their own bodies and sexual performance (28).

Sexual function is, in essence, an important component of health and quality of life. Sexual problems can be the consequence of the disturbance in non-sexual relationships and reduction of intimacy between couples indirectly leading to infertility by reducing the frequency of intercourse. On the other hand, the process of diagnosis and treatment of infertility itself can directly have an impact on women's sexual functioning.

Given the impact of infertility on women's physical and mental health, a higher incidence of sexual dysfunction in this group of women is plausible compared to those in population (29). For instance, in a study in four provinces of Iran, the prevalence of sexual dysfunction in women was reported 27.3% (14) and in another study on 2626 women, 31.5% (29) which are much less than what was found in this study 55.5%. In Malaysia, the prevalence of female sexual dysfunction was reported 29.6% and in Australia 27% (30-31). Though it seems the prevalence of sexual dysfunction is more common in infertile women, an accurate estimation of the prevalence of the disorder is not possible. This is because of various self-reports of sexual performance and considerable differences in sample size.

In the present study, the most common sexual problems were dyspareunia, sexual desire disorder and lack of orgasm, whereas Tayebi et al. (2007) assessed 300 infertile women referred to IVF center of Yazd and showed the most common problems were the lack of orgasm and decreased sexual desire (23). Similar results were found by Audu (2002) on 97 infertile Nigerian women showing dyspareunia and reduced sexual desire as the most common complications (32). Jain et al. (2000) also found that the most common sexual dysfunctions

in infertile women were dyspareunia, decreased sexual desire and lack of orgasm (12).

In the present study, higher age was found to be the main risk factor for sexual dysfunction. The relation between the two (*i.e.* increasing age and sexual dysfunction) is often due to the reduction of sexual function resulting from physiological changes and the number of sexual relationships that occurs in women with more than 40 years of age (33).

In addition to age parameter, psychological problems were found to be a strong predictor of sexual dysfunction. Diagnosis of infertility can stimulate the mental disorders such as depression and anxiety in women. Moreover, failure in infertility treatment as infertility diagnosis is a potential source of psychological problems (20). The study of Pakpour et al. (2012) demonstrated that infertile women show depression signs twice more than those with children (25). The relation between infertility and depression is not really clear; however, factors such as treatment failure, low economic status, lack of support of the spouse as well as the history of depression may act as the predisposing factors (1). Non-sexual relationship is also confirmed through this study to be a risk factor for sexual dysfunction (libido and orgasm dysfunction) which is in agreement with the results of other researches in the literature.

As a matter of fact, women enjoying happiness and joyous relationships with their spouses experience sexual dysfunction less than those who are not content in non-sexual relationship with their spouses. Our findings also indicated that medical factors of infertility in both women and men enhanced the risk of sexual dysfunction in women. Similarly, Pakpour et al. (2012) found that sexual dysfunction risk is significantly high in women with well-known somatic causes of infertility (25).

Sexual satisfaction was also an important factor in emerging sexual dysfunction (libido, sexual excitement and orgasm). Infertility and sexual dysfunctions are symbiotic. That means, infertility may alter the manifestation of a woman's sexual feelings and can lead to or aggravate sexual dysfunctions. To the same amount, sexual dysfunctions can cause infertility. In women, sexual stimulations don't lead to sexual excitement alone because psychological factors can play a deterrent role (6). Studies have shown that infertility is a major source of stress affecting women's sexual feelings. For instance, focusing on sexual rela-

tionship in order to get pregnant and not for sexual pleasures, scheduled intercourse, losing marital intimacy followed by diagnosis of infertility and unsuccessful treatment attempts are all known as sexual risk factors for the evolution of sexual dysfunctions in both men and women (13).

In this study, some demographic factors have been identified as the risk factors of disorders in sexual cycle like increasing age and duration of infertility with lack of orgasm and dyspareunia and university education with vaginismus. Infertility type was not related to the sexual dysfunctions. Increasing age and consequently natural changes in hormones, blood circulatory and nervous systems may affect sexual pleasure in women.

On the other hand, psychological factors like anxiety may contribute to orgasm disorder or dyspareunia in women. This situation especially occurs in infertile women with long term infertility.

In a study made by Rohina et al. (2013), duration of infertility was significantly related to the sexual dysfunction whereas no significant correlation was found with the type of infertility (13). Their results revealed that illiteracy is an independent risk factor for sexual dysfunctions.

In a population-based study about sexual dysfunction, it was shown that education and job variables were associated with lack of sexual desire and orgasm (29). Fahami et al. (2007) in their study about sexual dysfunctions on postmenopausal women showed that women with lower education level experienced more sexual dysfunctions (34). They concluded that low education level in women could result in psychological changes, which in turn could be the basis for sexual dysfunction. However, our study showed that higher education level is a risk factor for vaginismus. Though no obvious reason was found to justify this relationship, the role of cultural and psychological factors must be considered.

Conclusion

Infertility can have adverse effects on the sexual life of women. Therefore, professional staff working in health care centers should be sensitive to this very pressing issue. They must consider all factors affecting sexual relationship and more attention must be paid to socioeconomic status, marital relationships and fertility and sterility characteristics. That helps prevent the evolution of sexual dysfunction through early screening and psychological interventions.

Conflict of Interest

The Research Deputy of Babol University of Medical sciences financially supported this study. The research was carried out in Fatima Zahra Infertility and Reproductive Health Research Center, Babol University of Medical Sciences, Iran. The authors have no conflicts of interest.

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