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Evaluation of the Female Sexual Dysfunction in a Sample of Iranian Infertile Women

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Authors' contributions

This work was performed in collaboration between all authors. Authors ZB, HP and MF conducted the design of the study, and this process was supported by the other contributors. Analysis was completed by authors HP and ZB performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: Female sexual dysfunction (FSD) is recognized as a widespread health problem. Infertility may result in increased sexual dysfunction. The aim of this study was to evaluate the prevalence of FSD and some demographic characteristic with female sexual function; detect predictors factors of female sexual domains on sexual dysfunction a

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sample of Iranian infertile women.
Methodology: The cross-sectional study was carried out between August 2013 and January 2014 on 208 women referring to Fatemeh Zahra Infertility & Reproductive Center, Babol, Iran. Each survey contains demographic information and one validated questionnaire, the Female Sexual Function Index (FSFI). A score≤ 26.55 is considered ‘‘at risk’’ for sexual dysfunction. Statistical analyses were performed using Independent sample *t* test, linear and logistic regression with *P*<.05 indicating statistical significance. All statistical analyses were performed using SPSS software (Version 17).
Results: The percentage of sexual dysfunction was 46.6. The mean score of total sexual function was 26.18±4.14. The lowest mean of FSFI domains was related to desire and then arousal in infertile women. There was a significant association between all of the domains of sexual function with sexual function. All of the female sexual domains had the positive significant predictors of sexual function in infertile women. Standardized beta values showed that orgasm contributed to the greatest amount of unique variance to the model for infertile women sexual function, and followed by sexual satisfaction, sexual arousal, lubricant, sexual desire, and sexual pain (*P*<.001). There was a significant correlation between the domains of sexual function except pain and desire. The strongest correlation value was between the domains of sexual satisfaction and orgasm, and then arousal with orgasm. There was a significant association between sexual dysfunction and educational level, husband’s educational level, and infertility cause.
Conclusions: With considering to the high prevalence of sexual dysfunction in selected infertile women, therefore, early screening is needed for detecting predictor's factors o sexual dysfunction.

Keywords: Female sexual function index (FSFI); sexual dysfunction; infertility; risk factors.

1. INTRODUCTION

Sexuality is an important and complex part of health, and sexual dysfunction negatively affects quality of life and can be responsible for psychopathological problems [1]. A normal sexual response cycle includes desire, arousal, or orgasm [2]. Sexual dysfunction, a difficulty experience by a person during normal sexual response conclude low desire, arousal disorder, anorgasmia, dyspareunia, and vaginismus [3]. Sexual dysfunction according to classification system of the American Psychiatric Association's Diagnosis and Statistical Manual of Mental Disorders (DSM-IV) includes four subgroups: sexual desire disorders (Hypoactive Sexual Desire Disorder, Sexual Aversion Disorder); arousal disorders (Male Erectile Disorder, Female Sexual Arousal Disorder); orgasm disorders (Female Orgasmic Disorder, Male Orgasmic Disorder, Premature Ejaculation); and pain disorders (Dyspareunia, Vaginismus [4]. DSM-IV contains all currently recognized mental health disorders including Female Sexual Dysfunction (FSD). It is a manual published by the American Psychiatric Association [5]. Sexual dysfunction is unexpectedly common. In one study, prevalence of ‘‘sexual problems’’ was found to be 43.1% in females [6]. The incidence of FSD varies according to racial, cultural and health variables [1]. Studies showed that sexual problems were more prevalent in women than in men. Nusbaum et al. [7] reported that approximately 95% of women had one or more sexual concerns. Also, sexual concerns were more common in infertile women [8,9]. Women seeking infertility care had a number of stressors and increased risk for sexual dysfunction [10]. Other studies supported that infertile women were at higher risk for sexual dysfunction, poor marital adjustment, and lower quality of life than fertile women [11,12]. A Study in the literature has shown that the prevalence of

female sexual dysfunction was 70.65% in infertile women [13]. Principally, infertility is a common health problem and it is associated with significant psychosocial impact. Therefore, it may be one stressor factor in women life's and sexuality function. Another Study showed that sexual dysfunction can lead to infertility as a result of decreased intercourse frequency, and also the direct impact of infertility on female sexual functions [14]. Infertility and sexual dysfunction are interrelated with each other. Some authors consider sexual problems as infertility but others, with more supporters, believe infertility as the result of sexual dysfunction. According to this thesis, the experience of infertility affects the infertile couple with deep emotional tensions which is source of sexual dysfunction. Sexual functioning depends on changing hormonal phases, aging, lifestyle, psychosocial and physical factors [15]. Many biological and psychological factors may contribute to adequate sexual functioning [3]. Sexual dysfunction is associated with diminished quality of life; therefore, recognizing special risk factors may provide earlier diagnosis and treatment of sexual dysfunction which increase quality of life [13,16]. Although female sexual dysfunctions are more common in infertile women, there is limited scientific research on this topic. The aims of this research were to:

1) Evaluate the prevalence of sexual dysfunction.
2) Examine the relationship between some demographic characteristic with female sexual function.
3) Detect predictor's factors of female sexual domains on sexual dysfunction a sample of Iranian infertile women.

2. METHODOLOGY

2.1 Patients

The cross-sectional study was carried out between August 2013 and January 2014 on a sample of women referring to Fatemeh Zahra Infertility & Reproductive Center. A total of 208 infertile women were eligible to participate in this study. The study was approved by the Ethics Committee of the Babol University of Medical Sciences. Informed consent was obtained from each woman before enrolling in the study. The study protocol was explained to the participants. Then the infertile women completed the questionnaire by themselves. Investigators were available if additional information about the questions was requested. Inclusion criteria were: ability of reading and writing, infertility for more than a year, availability of the husband, having sexual activity lasting at least four weeks, no remarrying of couples, no history of sterility, no foster child, lack of severe and critical conflicts. If any of the infertile women suffered from a chronic medical condition (e.g. diabetes mellitus, cardiovascular diseases, hypertension, hypothyroidism, epilepsy and hepatic dysfunction), physical problems (spinal cord injury, amputation, and limb deformities), psychiatric problems, experiencing a stressful event in the past three months (death or serious illness in the family, a major change in living conditions), they were excluded from this study.

2.2 Questionnaires

Demographic and personal characteristics including age, age of husband, educational level, economic status, job condition, residency, duration of marriage, duration of infertility, type of infertility and etc. were obtained using a self-constructed questionnaire. Classification of economic status from low, moderate, to good was according to their household income description.

2.2.1 FSFI index

The Female Sexual Dysfunction Inventory (FSFI) was used to assess sexual dysfunction among infertile women. The 19-item questionnaire (self-report measure) evaluated sexual problems on six different domains, including sexual desire (two items), arousal (four items), lubrication (four items), orgasm (three items), satisfaction (three items), and pain (three items) [16]. Response options to each question are on a 5-Liker type scale ranging from 1 to 5 for items 1 and 2 (desire) and from 0 to 5 with the supplementary option ''no sexual activity'' for all other items (3–19). A score ≤26.55 is considered ''at risk'' for sexual dysfunction [17]. A higher FSFI score indicates better sexual function. Domain scoring is presented in (Table 1). Sexual dysfunction was evaluated with the culturally adapted Iranian version (IV-FSFI) of the Female Sexual Function Index (FSFI) developed by Rosen *et al*. [16]. The FSFI has been translated into Persian language and validated for use in Iranian women. The reliability tool to screen Iranian women via Cronbach alpha ranging from α=.72 to α=.90 was acceptable, as well as excellent construct validity [1,18]. In this study, the Cronbach alpha measurement of reliability for the instrument was ≥.80.

Table 1. Domain scoring

Domain	Item number	Score range	Factor	Minimum score	Maximum score
Desire	1, 2	1-5	0.6	1.2	6
Arousal	3, 4,5,6	0-5	0.3	0	6
Lubrication	7, 8,9,10	0-5	0.3	0	6
Orgasm	11,12,13	0-5	0.4	0	6
Satisfaction	14,15,16	(0 or 1)–5*	0.4	0.8	6
Pain	17,18,19	0–5	0.4	0	6
	Total			2	36

**Range for item 14=0–5; range for items 15 and 16=1–5*

2.3 Statistical Analysis

All reported *P*-values were two-sided, and *P*<.05 was considered statistically significant. Statistical analyses were performed using independent sample *t* test or χ^2 test. Also linear and logistic regressions were applied to detect the association of FSFI with demographic and personal characteristics in infertile women. All statistical analyses were performed using SPSS software (Version 17).

3. RESULTS

The number of infertile women who participated in the study was 208 (96.3%) and 8 infertile women did not agree or refused to give their consent (.7%). Lack of desire to answer to the sexual questions was the main cause for sampling loss.

The mean difference of age between men and infertile women was less than their husband. Most infertile women were housekeeper. The economic status in most infertile women was described as moderate level. The most frequent educational level was high school diploma in infertile women and also in their husbands. There was a statistically significant difference between the educational level in infertile women and their husbands. A college educational level was higher in infertile women than their husbands (*P*<.05). The most cause of infertility

in infertile women was described male factor. Almost two-thirds of women suffered from primary infertility. A small percentage of infertile women were tobacco users. The most of infertile women had treatment effort for the first time in the center. The demographic and personal characteristics of the infertile women are shown in (Table 2).

Table 2. Demographic features of the infertile women

Parameter	Values (Mean±SD)
Age (y)	27.85 ±5.73
Husband r age (y)	31.75±5.49
Mean age difference between men and women	3.90±4.4
	N (%)
Job description	
Housekeeper	174(83.7%)
Employed	34(16.3%)
Husband occupation	
Unemployed	7(3.4%)
Worker	62(29.8%)
Employee	36(17.3%)
Self-employed	101(48.6%)
Other	2(1%)
Educational level	
Illiterate and low literate	26(12.6%)
High school	42(20.3%)
Diploma	84(40.6%)
University	55(26.6%)
Husband educational level	
Illiterate and low literate	28(13.5%)
High school	66(31.7%)
Diploma	69(33.2%)
University	45(21.6%)
Economic status	
Low	52(25%)
Moderate	135(64.9%)
High	21(10.1%)
Tobacco user	
Yes	11(5.3%)
No	197(94.7%)
Treatment effort	
First time	131(63.6%)
Several times	75(36.4%)
Infertility type	
Primary	154(74%)
Secondary	54(26%)
Infertility cause	
Female	35(16.9%)
Male	74(35.7%)
Female and male	34(16.4%)
Unknown	64(30.9%)
Coitus count	
1-2 times in month	14(6.8%)
1-2 times in week	103(49.8%)
3-4 times in week	75(36.2%)
>4 times in week	15(7.2%)

Note: Values are mean±SD or number (percentage)

The prevalence of sexual dysfunction was 46.6% in infertile women. The mean score of total sexual function was 26.18±4.14 and in sexual function domains include: Desire (3.72±0.73), Arousal (3.77±0.94), Lubrication (4.54±0.86), Orgasm (4.58±1.05), Satisfaction (4.75±1.11), and Pain (4.83±1.07) (Table 3).

The lowest mean of FSFI domains were related to desire and then arousal in infertile women.

Table 3. Mean of FSFI and FSFI domains scores in infertile women

Domains	Mean±SD
Desire	3.72±0.73
Arousal	3.77±0.94
Lubrication	4.54±0.86
Orgasm	4.58±1.05
Satisfaction	4.75±1.11
Pain	4.83±1.07
Total FSFI	26.18±4.14

The coital frequency in most infertile women was 1-2 times in week (49.8%). The mean sexual function score was lower in the infertile women with the monthly coitus than the weekly coitus. On the other hand, the infertile women with monthly coitus was reported with the worse sexual function than the weekly coitus (20.64vs26.58, *P*<.009).

There was not a significant linear association between sexual function and age, husband's age, age difference between men and women, duration of marriage, duration of infertility (Table 4). The results showed that the demographic characteristics explained 1.5% of the variance in sexual function for infertile women.

There were a significant association between sexual dysfunction and educational level (*P*<.007), husband educational level (*P*<.041), and infertility cause (*P*<.023). The women with low education level were more likely to have higher FSFI scores. Sexual dysfunction in infertile women whose husbands had high educational level was more than those with low level of education. Also, when the cause of infertility is related to both women and men, the risk of sexual dysfunction was significantly higher than other cause of infertility. There was not a significant association between sexual dysfunction and housing type, tobacco user, and treatment effort (Table 5).

There was a significant association between all the domains of sexual function with sexual function (Table 6). All of female sexual domains revealed to be positive significant predictors of sexual function in infertile women. Standardized beta values showed that orgasm contributed to the greatest amount of unique variance to the model for infertile women's sexual function, and followed by sexual satisfaction, sexual arousal, lubricant, sexual desire, and sexual pain (*P*<.001) (Table 6). Orgasm factor explained 70.3% of variance in FSFI scores for infertile women. Sexual satisfaction factor explained 64.1% of variance in FSFI scores for infertile women. Sexual arousal factor explained 63.5% of variance in FSFI scores for infertile women. Lubricant factor explained 41.4% of variance in FSFI scores for infertile women. Sexual desire factor explained 39.7% of variance in FSFI scores for infertile women. Sexual pain factor explained 27.7% of variance in FSFI scores for infertile women (Table 6).

Table 4. Correlation of sexual function (expressed by FSFI scores) with the demographic characteristics of infertile women

Factors	Simple linear regression					Multiple linear regression			
	B standardized	R^2	*P*-value	95% CI		B standardized	*P*-value	95% CI	
				Low	Up			Low	Up
Age	-.06	0.004	.38	-0.06	0.14	Constant	.000	22.87	30.72
Husband's age	-.03	0.001	.68	-.13	0.08	.02	.83	-0.17	0.13
Age difference between men and women	-.11	0.013	.10	-.02	0.02	-.11	.14	-0.24	0.04
Duration of marriage	.02	0.001	.73	-0.12	0.17	.04	.75	-0.24	0.33
Duration of infertility	.02	0.001	.75	-.13	0.19	.004	.97	-0.28	0.29

Table 5. Correlation of sexual dysfunction with the demographic characteristics of infertile women

Factors	Binary logistic regression				Multiple logistic regression			
	OR	*P*-value	95% CI		OR	*P*-value	95% CI	
			Low	up			Low	Up
Housing type								
Owner								
Tenant	0.77	.39	0.43	1.40	.83	.56	.44	1.57
tobacco user								
No								
Yes	2.08	.25	0.59	7.35	3.30	.08	.85	12.80
Treatment effort								
First time								
Several times	1.62	.09	0.92	2.88	1.65	.11	.89	3.08
Educational level								
<diploma								
≥diploma	2.33	.007	1.27	4.28	2.57	.007	1.29	5.12
Husband education								
<diploma								
≥diploma	1.79	.041	1.03	3.13	1.31	.39	.70	2.46
Coitus								
Weekly								
Monthly	2.17	.17	0.70	6.72	.36	.10	.11	1.22
Infertility cause								
Alone factor								
Both female and male factor	2.43	.023	1.13	5.22	2.93	.012	1.27	6.75
Constant					0.04	.06		

There was a significant correlation between the domains of sexual function except pain and desire. The strongest correlation value was found between the domains of sexual satisfaction and orgasm (r=0.724), and then arousal with orgasm (r=0.633) (Table 7).

Table 6. Correlation of sexual function domains with sexual function of infertile women

FSFI / Predictor variable	B standardized	P-value	95% CI		R^2
			Low	Up	
Desire	.630	.001	2.981	4.203	0.397
Arousal	.797	.001	3.144	3.879	0.635
Lubrication	.644	.001	2.580	3.594	0.414
Orgasm	.838	.001	2.999	3.591	0.703
Satisfaction	.801	.001	2.679	3.296	0.641
Pain	.529	.001	1.588	2.500	0.277

Table 7. FSFI domain Inter-correlations (Pearson *r*: range= –1.00 – +1.00)

	Desire	Arousal	Lubrication	Orgasm	Satisfaction	Pain
Desire	1					
Arousal	0.584**	1				
Lubrication	0.307**	0.422**	1			
Orgasm	0.435**	0.633**	0.457**	1		
Satisfaction	0.463**	0.608**	0.317**	0.724**	1	
Pain	0.070	0.219**	0.292**	0.291**	0.263**	1

*Correlation is significant at the 0.01 level (2-tailed)**Correlation is significant at the 0.05 level (2-tailed)**

4. DISCUSSION

The result of the present study found that the prevalence of sexual dysfunction was high in this selected sample. 46.6% of the healthy women had any kind of sexual dysfunction according to cut off 26.55 for the FSFI. Monga et al. [12] showed that fertility was an important aspect in the life of most couples. The conception and raising of a child were the expected outcomes of sexual relationship for most women. Sexual problems were common among women, particularly among women seeking infertility treatment [2]. Sexual dysfunction was a common form of disorder, with prevalence up to 46% [4]. Several studies have shown that the prevalence of sexual dysfunction was higher in infertile women than in fertile women [14,19]. Tarlatzis et al. [20] had reported that the prevalence of female sexual dysfunction was 50% in infertile women. Abbey et al. [21] found that infertility reduces sexual satisfaction, but other studies did not find any change in sexual function of infertile individual than normal population [22-26].

The finding of this study indicated that the lowest mean of sexual function domains was desire and then arousal phase. The results of this study are consistent with Millheiser et al. [14] who found significantly lower scores of desire and arousal in the infertile group than the fertile group. These findings also agree with Abby et al. [10]. They also found that mean FSFI domains like e desire, arousal, lubrication, orgasm, satisfaction, pain were 3.6, 4.8, 5.4, 5.2, 5.2, and 6, respectively in infertile women. The lowest mean of FSFI domains were

related to desire and then arousal in infertile women [10]. Hurwitz et al. [27] reported loss of libido as the main cause of sexual dysfunction.

The result of this study showed that the mean of coitus also was statistically different in the two groups, with lower frequency (monthly coitus) in the FSD group compared to the Non-FSD group (weekly coitus). Jahanfar et al. [28] has found that coital frequency should be given attention in the management of infertility. Millheiser et al. [14] suggested that sexual problems may indirectly cause infertility by decrease of the frequency of sexual intercourse, however, it is equally likely that infertility influences directly on women's sexual function. A study in the literature showed that the frequency of sexual activity was significantly lower in the FSAD group than in the control group [16]. Also, the association of moderate and severe FSD with irregular weekly intercourse was strong (OR 3.7 and 2.64) but this was not so with mild FSD (OR 1.0) than the women with no FSD [1]. In our study, women with the lowest coitus count had a 2.17 higher risk for FSD compared to women who had several times coitus weekly. When the coitus count was more than 4 times in a week, the prevalence of FSD increased. Perlis et al. [29] reported that the median monthly coital frequency was seven for infertile women. Most infertile couple had ≥4 times per month intercourse. In addition, patients with better sexual function had 1.12 times higher odds of more frequent coitus. Less frequent coitus could have had an effect on fertility. Also, the studies showed that the women with more sexual experience had less sexual dysfunction [30]. The psychological pressure to become pregnant due to ''sex-on-demand'' can conclude reduced intercourse satisfaction [12].

The gathered data showed that there was not a significant linear association between sexual function and age, husband age, age difference between men and women, duration of marriage, and duration of infertility. Also there was not a significant association between sexual dysfunction with job, husband's job, residency, economic status, previous using ART, treatment effort, tobacco use, and infertility type. Asghari Roodsari et al. [31] showed that there was not an association between subgroups of sexual dysfunction with population factors. Sargolzaee et al. [32] indicated a lack of significant correlation between some variables of demographic features such as duration of infertility, duration of marriage, and others with sexual dysfunction. No significant differences were found between the women with FSD and women without FSD for any of the demographic characteristics [18]. Pakpour et al. [33] suggested that this result can be used in the clinical estimation of sexual function and the role population characteristics and psychological factors in the sexuality of infertile women.

The result of this study indicated that women with educational level of ≥diploma had a 2.6-fold higher risk of FSD than women with educational level lower than diploma after adjusting the confounding factors. Women with low educational level were more likely to have higher FSFI scores. Women, who had diploma and college education level, had a 2.6-fold higher risk for sexual dysfunction compared to women with lower grade diploma. Also, sexual dysfunction in infertile women whose husband had high educational level was more than those with low level of education (1.79-fold). The level of education demonstrated a statistically significant difference among the infertile females and males. There was a statistically significant difference between infertile men and women in educational level, with a greater proportion of college level in the infertile women than men (26.6%vs21.6%). The other studies showed that education level had an important role in sexual dysfunction [34,35]. Mohammadi et al. [36] showed that more than half of the infertile women with sexual dysfunction had college degree level. Study in the literature showed that the women whose husbands had a higher educational level had lower FSFI total score. Higher educational

level of partner put women at risk for female sexual dysfunction [33]. Akavantagavi et al. [37] found that some of the sexual dysfunctions such as vaginismus had a high prevalence among the educated women. Some studies indicated that the prevalence of dyspareunia was high (39.5%) in educated women [38], and the infertile women with a college degree had a 29.73-fold higher risk for sexual dysfunction than infertile women with primary school after controlling for potential confounding [13]. Less educated women reported higher rates of frequency of intercourse [39].

In our study, there was a significant association between sexual dysfunction and infertility cause. Sexual dysfunction was 2.93-fold higher when the cause of infertility was related to both women and men than the other causes of infertility. Studies in the literature showed sexual dysfunction can be worse with management, treatments or aetiology of infertility [40]. Some studies indicated that outcome of an infertility diagnosis might cause the progression of personal and marital distress, and poor sexual relationship [41,42]. It seems that one of the challenging factors in infertile women is the fear of unsuccessful treatment of infertility. This problem is felt more when the cause of infertility is related to both females and males.

The results of this study indicated a significant association between all domains of sexual function with sexual function. All of the female sexual domains resulted to be positive significant predictors of sexual function in infertile women. Orgasm contributed to the greatest amount of unique variance to the model for infertile women's sexual function, and followed by sexual satisfaction, sexual arousal, lubricant, sexual desire, and sexual pain. The weakest association was between the pain domain and sexual function (total scale score). Orgasm explained 70.3% of variance in FSFI scores for infertile women. One study indicated that orgasm concluded sexual satisfaction. The authors found statistically significant differences in all the domains and also the total scale score, a moderately high correlation was presented between marital satisfaction and the FSFI domain of global sexual satisfaction [16]. The weakest correlation was between the domains of pain and total score, which were consistent with our results [18]. Data in the literature showed that this clinical finding would provide more skills to evaluate treatment specificity [16].

The present study showed significant correlation between the domains of sexual function except pain and desire. The strongest correlation value was between the domains of sexual satisfaction and orgasm (r=0.72), and then arousal with orgasm (r=0.63). Studies showed that sexual response include the coordination of several phases [43]. Each of the domains such as desire, arousal, pain, and orgasm has correlation with other sexual function domains [16]. Therefore, the problems affecting one phase may interact with other disorders [44,45]. Masters and Johnson [43] indicated a considerable relationship between the dimensions of satisfaction and orgasm in women. Rosen et al. [16] reported that the domains inter-correlations were generally high. There were not statistically significant correlations between pain and desire (r=0.15) for the FSAD group. Mohammadi et al. [36] suggested that the highest correlation was between the domains of arousal and orgasm. Principally, sexual excitement is the stimulation of sexual desire [13]. If sexual satisfaction occurs and sexual stimulation continues, sexual arousal may peak into orgasm and also happening orgasm conclude sexual satisfaction [16].

Despite the importance of the present result, this research has some limitations. Our data were collected for a sample of Iranian infertile women; therefore it may not generalize well all Iranian infertile women. Researchers suggested that future research will cover Iran wholly. The strengths of this study include the use of a validated sexual function survey questionnaire (FSFI). Our infertile women come from a population that entirely consists of

Muslim women. Therefore, the cultural and religious differences on the result should be considered**.** We hope that this research can provide the assessment of infertile women's sexual function as a potential risk factor because if the risk factors are known, preventing strategies can be developed.

5. CONCLUSION

It is concluded that there was a higher percentage of sexual dysfunction in selected infertile women. Therefore, early screening is needed for detecting predictors factors of sexual dysfunction.

CONSENT

Informed consent was obtained from each woman before enrolling in the study.

ETHICAL ISSUE

This study was approved by the Ethics Committee of the Babol University of Medical Sciences.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Safarinejad MR. Female sexual dysfunction in a population-based study in Iran: prevalence and associated risk factors. International. Journal of Impotence Research. 2006;18:382–95.
2. Basson R. Women's sexual dysfunction: Revised and expanded definitions. CMAJ. 2005;172(10):1327–33. doi:10.1503/cmaj.1020174.
3. Heiman JR. Evaluating Sexual Dysfunction in Women. Clinical Obstetrics and Gynecology. 1997;40(3):616-29.
4. Simons JS, Carey MP. Prevalence of sexual dysfunctions: Results from a decade of research. Archives of Sexual Behavior. 2001;30:177–219. doi:10.1023/A:1002729318254.
5. American Psychiatric Association. DSM-IV-TR: Diagnostic and statistical manual of mental disorders. 4th edition. Text revision. Washington, DC: American Psychiatric Association; 2000.
6. Shifren J, Monz B, Russo P, Segreti A, Johannes C. Sexual problems distress in United States women. Obstet Gynecol. 2008;112:970–8.

7. Nusbaum MRH, Gamble G, Skinner B, Heiman J. The high prevalence of sexual concerns among women seeking routine gynecological care. J Fam Pract. 2000;49(3):229–32.
8. Smith JS. Couples undergoing infertility treatment: Implications for counselors. Fam J. 2003;11:383–7.
9. Meldrum DR. Infertility. In: Hacker NF, Moore JG, editors. Essentials of obstetrics and gynecology. Philadelphia: WB Saunders. 1998:610–20.
10. Abby P. Furukawa, Phillip E. Patton, Paula Amato, Hong Li, Catherine M. Leclair. Dyspareunia and sexual dysfunction in women seeking fertility treatment. Fertility and Sterility. 2012;98(6):1544-48.
    Available: http://dx.doi.org/10.1016/j.fertnstert.2012.08.011.
11. Freeman E. Psychological evaluation and support in a program of in vitro fertilization and embryo transfer. Fertil Steril. 1985;43:48–53.
12. Monga M, Alexandrescu B, Katz S, Stein M, Ganiats T. Impact of Infertility on quality of life, marital adjustment, and sexual function. Urology. 2004;63(1):126-130. doi:10.1016/j.urology.2003.09.015.
13. Ugur Keskin, Hakan Coksuer,Sadettin Gungor, Cihangir Mutlu Ercan, Kazim Emre Karasahin, Iskender Baser. Differences in prevalence of sexual dysfunction between primary and secondary infertile women. Fertility and Sterility. 2011;96(5):1213-17. doi:10.1016/j.fertnstert. 2011.08.007 .
14. Millheiser LS, Helmer AE, Quintero RB, Westphal LM, Milki AA, Lathi RB. Is infertility a risk factor for female sexual dysfunction? A case-control study. Fertility and Sterility. 2010;94(6):2022-25. doi:10.1016/j.fertnstert.2010.01.037.
15. Safarinejad MR, Hosseini SY, Ali Asgari M, Dadkhah, Taghva A. A randomized, double-blind, placebo-controlled study of the efficacy and safety of bupropion for treating hypoactive sexual desire disorder in ovulating women. Journal Complication. 2010;832–39. doi:10.1111/j.1464-410X.2010.09208.x.
16. Rosen R, Brown C, Heiman J, Leiblum S, Meston C, Shabsigh R, et al. The Female Sexual Function Index (FSFI): A multidimensional self-report instrument for the assessment of female sexual function. J Sex Marital Ther. 2000;26(2):191–208.
17. Wiegel M, Meston C, Rosen R. The Female Sexual Function Index (FSFI): Cross validation and development of clinical cutoff scores. J Sex Marital Ther. 2005;31:1–20.
18. Fakhri A, Pakpour AH, Burri A, Morshedi H, Zeidi IM. The Female Sexual Function Index: Translation and validation of an Iranian version. J Sexual Med. 2012;9(2):514–23.
19. Audu BM. Sexual dysfunction among infertile Nigerian women. J Obstet Gynaecol. 2002;22:655–7.
20. Tarlatzis I, Tarlatzis BC, Diakogiannis I, Bontis J, Lagos S, Gavriilidou D, Mantalenakis S. Psychosocial impacts of infertility on Greek couples. Hum Reprod. 1993;8(3):396-401. PMID:8473455.
21. Abbey A, Andrews FM, Halman LJ. Provision and receipt of social support and disregard: what is their impact on the marital life quality of infertile and fertile couples? J Personality Soc Psychol. 1995;68:455–69.
22. Daniluk JC. Infertility: intrapersonal and interpersonal impact. Fertil Steril. 1988;49: 982–90.
23. Wright J, Duchesne C, Sabourin S. Psychosocial distress and infertility: Men and women respond differently. Fertil Steril. 1991;55:100–108.

24. Mazure CM, Greenfeld DA. Psychological studies of in vitro fertilization/embryo transfer participants. J In Vitro Fertiliz Embryo Transfer. 1989;6:242–56.
25. Leiblum SR, Kemmann E, Lane MK. Psychological concomitants of in vitro fertilization. J Psychosom Obstet Gynecol. 1987;6:165–71.
26. Fagan RJ, Schmidt CW, Rock JA, et al. Sexual functioning and psychological evaluation of in vitro fertilization couples. Fertil Steril. 1986;46:668–72.
27. Hurwitz MB. Sexual dysfunction associated with infertility: A comparison of sexual function during the fertile and the non-fertile phase of the menstrual cycle. S Afr Med J. 1989;76(2):58–61.
28. Jahanfar SH, Mollaiynezhad M, Jaferpour M, Jamshidi R. Infertility related stress and marital life in Iranian infertile women who referred to Isfahan Infertility Treatment Clinic. Reprod Inferti J. 2000;2(5):26-34.
29. Perlis N, Lo KC, Grober ED, Spencer L, Jarvi K. Coital frequency and infertility: which male factors predict less frequent coitus among infertile couples? Fertil Steril. 2013;100(2):511-515. doi: 10.1016/j.fertnstert. 2013.04.020. Epub 2013 May 10.
30. Gahanfar S. In dietetics of sexual dysfunction, 1st Edition, Salemi: Tehran, 2002 [In Persian].
31. Asghari Roodsari A, Khademi A, Akbari Hamed E, Tabatabaiifar SL, Alleyassin A. Female sexual dysfunction in married medical students. McGill Journal of Medicine (MJM). 2005;8(2):104-8.
32. Sargolzaee R, Moharreri F, Arshadi HR, Javidi K, Karimi SH, Fayyazi Bordbar MR. Psychosexual and depression disorders in infertile female referring to Mashhad Infertility Treatment Center. Journal Reproduction & Infertility. Fall. 2001:46-51[In Persian].
33. Amir H. Pakpour, Mir Saeed Yekaninejad, Isa Mohammadi Zeidi, Andrea Burri. Prevalence and risk factors of the female sexual dysfunction. In a sample of infertile Iranian women. Arch Gynecol Obstet. 2012;286:1589–96. doi :10.1007/s00404-012-2489-x.
34. Sako T, Inove M, Watanabe T, I˙shii A, Yokoyama T, Kumon H. Impact of overactive bladder and lower urinary tract symptoms on sexual health in Japanese women. Int Urogynecol. 2011;22(2):165–69. doi:10.1007/s00192-010-1250-x.
35. Lin ZS, Qion LX, Ximg P. New progress on diagnosis and treatment of female sexual dysfunction. Zhonghua Nan ke Xue. 2003;9(6):457–61.
36. Mohammadi KH, Heydari M, Faghihzadeh S. The Female Sexual Function Index (FSFI): validation of the Iranian version. Payesh Journal. 2008;7(3):269-78[In Persian].
37. Akavantagavi MH, Froutan K. Sexual health in Iran to investigate the role of families. 2012. Available: http://www.razmilawyer.ir/index.php?ToDo=ShowArticles&AID=5087.
38. Valadares A, Pinto-Neto A, Conde D, Sousa M, Osis M, Costa-Paiva L. A population-based study of dyspareunia in a cohort of middle-aged Brazilian women. Menopause. 2008;15:1184–90.
39. Furukawa T. Assessment of mood: Guides for clinicians. J Psychom Res. 2010;68:581–9.
40. Joelle Darwish. Sexuality, Guidelines for Concelling in infertility. Eshre. 2002:73-7.
41. Mahlstedt P. The psychological component of infertility. Fertil Steril. 1985;43:335–46.
42. Boivin J, Takefman JE, Tulandi T, Brender W, et al. Reactions to infertility based on extent of treatment failure. Fertil Steril. 1995;63:801–7.

43. Masters WH, Johnson VE. Human sexual response. Boston: Little Brown; 1966.
44. Laumann EO, Paik A, Rosen RC. Sexual dysfunction in the United States. JAMA. 1999;281:537–44.
45. Rosen RC, Taylor JF, Leiblum SR, Bachmann GA. Prevalence of sexual dysfunction in women: results of a survey of 329 women in an outpatient gynecological clinic. Journal of Sex & Marital Therapy. 1993;19:171–88.

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