

Assessment of Sexual Functions among Infertile Women

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ABSTRACT

Context: Sexual function plays a vital role in the quality of life and is determined by both biological and psychosocial factors. Infertile couples report poor sexual functions suggesting a causal relationship between infertility and sexual functions. Infertility caused sexual problems such as loss of sexual desire, decrease in the frequency of sexual intercourse, pain during sexual intercourse, and orgasmic difficulties in women and influencing their interpersonal and marital relationships and satisfaction.

Aim of the study: is to assess sexual functions among infertile women.

Methods: A descriptive research design selected to achieve the aim of this study. The study conducted at the infertility clinic of Ain Shams Maternity University Hospital on 135 women attending the previous settings. A Structured interviewing questionnaire sheet used to collect data concerning socio-demographic characteristics, female sexual history & infertility-related characteristics, and current condition of woman. The second tool was the Female Sexual Functions Index (FSFI) used to measure the sexual functions among infertile women.

Results: The study revealed an intermediate level of sexual function with a mean of 23.49 ± 7.82 , with the highest mean was for pain domain (4.09 ± 1.45), with the lowest mean is for desire (3.78 ± 1.51). In addition to near two-thirds of the infertile women displayed poor sexual function. The study also revealed a significant association between sexual functioning, and age, residence, duration of the marriage, educational level, husbands' age, husbands' educational level, husbands' occupation, household income, history of miscarriage, life stressors, coitus count and frequency of sexual intercourse.

Conclusion: The assessment of sexual function among infertile women revealed a pattern of intermediate function according to the female sexual function index. An association revealed between female sexual functioning as other socio-demographic characteristics, obstetric history, sexual history, and psychological status. The study recommended the establishment of sexuality disorder clinics and sexual counseling clinics in healthcare centers that involve a multidisciplinary team — further researches to study the issues of sexual function as part of prenatal care and reproductive health programs. Developments of practical strategies in order to provide cultural intervention to improve couples' awareness of their sexual relationship, as well as training in communication skills, are essential.

Keywords: Sexual function, infertile women

1. Introduction

Sexual health is a critical aspect of quality of life. It also influenced by medical conditions. Mainly occurs when gynecological disorders are involved, such as gynecological cancer or infertility (Candy, Jones, Vickerstaff, Tookman, & King 2016). Infertile couples have a lower sexual function in orgasm, arousal, and desire dimensions (Marci et al., 2012).

Sexual disorders can be a prior cause of infertility. Generally, infertile couples seek treatment for infertility instead of searching for a deeper problem in their sexual relationships. It was reported that many infertile women suffer from one of the different types of sexual dysfunction (Bianchini, Navarro, Peterson, & Salata, 2018).

Infertility affects between 3.5 and 16.7% of the couples in developed countries and between 6.9 and 9.3% of the couples in developing countries (Bianchini et al., 2018). Infertility, as an emotional shock, can even have an impact

on couples' communication and sexual skills. Overall, infertility, as a serious medical problem, can have destructive effects on the quality of life (Carter et al., 2011), through creating psychosocial stress, reduction of life satisfaction, an increase of marital conflicts, and decrease of sexual satisfaction and marital satisfaction (Dana et al., 2013).

Sexual and reproductive health is mentioned in the United Nations Sustainable Development Goals. They represent a target in the post-2015 agenda (United Nations General Assembly, 2015). It is a sign of increasing global awareness and initiative in moving forward on global sexual health issues, including education, care, and rights, health-care providers should accelerate and promote the progress of sexual health to be more inclusive and comprehensive (Khosla, Say, & Temmerman, 2015).

Female sexual dysfunction is a multifactorial condition likely to be associated with numerous anatomical, physiological, and psychological factors and likely to affect a woman's self-confidence, quality of life, and sexual

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relationships (Armirian, Golmakani, Mazlom, & Ahangar, 2016).

The biopsychosocial approach recognizes that biological includes hormone levels and hormonal changes that affect libido, or medical problems that affect genital sexual response. Psychological include self-esteem and body image, mood symptoms, like depression. Interpersonal includes general satisfaction in the woman's relationship with her husband, which is closely tied to overall sexual satisfaction, as well as the quality of communication in the relationship. Sociocultural factors include the woman's attitudes about menopause and aging, as well as religious, cultural, and other social values regarding sex. All these factors can affect female sexual function; all play a role in determining an individual's health concerning sexual functioning. These factors interact with each other in a dynamic system over time (Thomas, & Thurston, 2016).

Researchers and healthcare providers should consider all these factors when addressing female sexual functions of infertile women and improving coping skills to improve the communication between the couple and giving support to the management of any change that is needed in lifestyle and future programming (Esselstrom, 2014).

Obstetricians and gynecologists stress the fact that a creative and romantic dyadic relationship motivates couples to engage in sexual relations and correlates with sexual satisfaction (Pascoal, Narciso, & Pereira 2014). Ob-Gyn professionals should routinely assess female sexual problems. This routine assessment is to identify women who have sexual dysfunctions and providing sexual education and necessary information. The information provided should encompass the biological, psychological, and social aspects of sexual functions and the physiology of sexual response for promoting effective relations in sexual issues to improve women's sexual health. So Problems decrease gradual, unawareness is being changed to awareness (Lara, Scalco, Troncon, & Lopes 2017).

2. Significance of the study

Female sexual dysfunction (FSD) is a highly prevalent health issue among women. Sexual problems are common, estimated to affect 22–43% of women worldwide. In Egypt, a study conducted in Lower Egypt reported a prevalence of FSD of 46%. Infertility leading to social isolation, also, marital relations may be damaged by the diagnosis of infertility. Education and counseling on sexuality, sexual function, and sexual dysfunction are nursing interventions used to assist patients in resolving their sexual problems and enhance communication between couples and clinicians (Elnashar, El-Dien, El-Desoky, Ali, & El-Sayed, 2007).

Infertility makes an essential challenge to sexual life and can affect all aspects of the life of infertile women. It can cause many emotional and psychological disorders, such as sexual dysfunction, depression, hopelessness, feelings of worthlessness, and social stigmatization. So the assessment of these challenges that threaten infertile

women's sexual function, in order to plan appropriate intervention is of paramount importance. This study will provide in-depth knowledge for this phenomenon in a closed community.

3. Aim of the study

The current study emerged aiming to assess female sexual functions among infertile women.

3.1. Research questions

- What are the patterns of female sexual functions among infertile women?
- What are the factors affecting female sexual functions among infertile women?

4. Subjects and Methods

4.1. Research design

The descriptive correlational research design used to achieve the aim of this study.

4.2. Research Setting

The study conducted at the Infertility Clinic of Ain Shams Maternity University Hospital. It is a central hospital affiliated to Ain Shams University. The hospital provides maternity, gynecological, and newborn services to women from Cairo and other Egyptian Governorates. It had a bed capacity of 373 beds, 6 ICU beds, 21 operating rooms, 31 incubators. It received about 30,000 women in the ER and about 27,000 women in its clinics annually plus receiving about 23,000 admissions annually.

4.3. Subjects

Sample Type: It was a purposive sample.

Sample size: Sample size calculated based on the data of the previous year's Census report of Ain shams university maternity hospital. The flow rate of infertile women at the Infertility clinic at Ain shams University maternity hospital was (2700 infertile women) in the previous years. According to this equation, the sample size of (135) women was included in the study.

$$n = \frac{N \times p(1-p)}{\left[\frac{N-1}{N} \times (d^2 + z^2) \right] + p(1-p)}$$

$N \times p(1-p)$	$= (2700 * (0.103 * (1-0.103)))$
$N-1$	$= (2700-1) *$
d^2/z^2	$= 0.0025 / 3.8416 +$
$p(1-p)$	$= 0.103 * (1-0.103)$
n	$= 135$

Inclusion Criteria

- Age ranges from 21-45 years.
- They can read and write (For proper and efficient communication).
- A diagnosis of infertility or history of unsuccessfully trying to conceive for twelve months or more.
- Primary or secondary infertility (the existence of no more than one previous child if a participant had secondary infertility).
- Male factor/female factor infertility (or both), and unexplained infertility.

- Having continuous intercourse (sexually active over the prior four weeks.)

Exclusion criteria:

- Suffering from infections as STDs.
- Suffering from mental or psychiatric disease
- Having a history of cancers.
- Those in second marriage in either of the couples.

4.4. Tools of data collection

Data collected through the utilization of the following tools:

4.4.1. A Structured interviewing Arabic questionnaire

It developed by the researcher to assess women's socio-demographic characteristics and health history. It includes five parts. The first part is concerned with socio-demographic characteristics of women under study (such as age, educational level, occupation, duration of the marriage, residence, housing type). The second part includes the personal characteristics of the husband (such as age, educational level, occupation, household income, and lifestyle habits).

Gynecological and obstetric history included in the third part (such as previous children for women, pregnancy complications, labour complications, gynaecological disorders, and obstetric surgical operation). Psychosocial problems (such as emotional, psychological, and life stressors) are assessed in the fourth part. The fifth part included female sexual history & infertility-related characteristics (i.e., sexual complaint during sexual intercourse, male sexual dysfunctions, coitus count and frequency, fertility treatments, treatment effort, duration of infertility, and use of lubricants).

4.4.2. Female Sexual Function Index (FSFI) scale

FSFI is a 19-item questionnaire adopted from *Rosen et al., (2000)*, which is a self-report instrument for assessing different domains of female sexual functions. That is divided into six domains supported by factor analysis: desire (two items); arousal (four items); lubrication (four items); orgasm (three items); satisfaction (three items); and pain (three items) based on the five-point Likert scale ranging from "Almost always" (5) to "Almost never" (1). The total and subtotal score was calculated. The total score is obtained by adding scores of all domains; scores are obtained by adding the scores of the individual questions that comprise the domain and then multiplying the sum by the domain factor provided in the FSFI for each domain. Responses classified as good if FSFI=30 or more, intermediate if FSFI= 23-29, and poor if FSFI was <23.

4.5. Procedures

An official written approval letter containing the title and clarifying the purpose of the study was obtained from the dean of the Faculty of Nursing, Ain Shams University, directed to the director of Ain Shams Maternity University Hospital. Data were collected in the period from March 2017 till August 2017 on a sample of 135 infertile women fulfilling inclusion criteria at the previously mentioned setting.

At first, the researcher attended the previously mentioned setting then reviewed the registration record of the infertility unit; then all attended women fulfilling criteria were included in the study. The researcher explained the questionnaire to the studied women before participating in the study; the researcher interviewed each participant individually in a private room.

At the beginning of the interview, the studied woman filled out the demographic information questionnaire. The researcher assessed dimensions of sexual function in the woman by applied the female sexual functioning index scale (FSFI).

The tools for data collection were reviewed for the appropriateness of items and measuring the concepts through a jury of 3 experts in the field of maternity and gynecological nursing at Faculty of Nursing; Ain shams university to assure content validity of questionnaire then accordingly some questions were modified.

A pilot study conducted on 10% of the study sample (12 women) attended at infertility unit. It was conducted to evaluate simplicity, clarity, completeness, applicability, and feasibility of the research process to find the possible obstacles and problems that might be faced during data collection, then accordingly necessary modification of data collection plan and tools were done. Those women included in the pilot study were excluded from the mainstream study sample.

The ethical research considerations in this study include the following: The research approval was obtained from the Scientific Research Ethical Committee in the Faculty of Nursing at Ain Shams University before starting the study. The researcher obtained consent from the director of Ain Shams Maternity University Hospital and the head nurses for data collection.

The researcher clarified the aim of the study to the women included in the study to gain confidence and trust; written consent obtained. The tools of this study did not touch women's shyness. The researcher ensured that the study does not cause any harm during data collection. The researcher assured maintaining anonymity and confidentiality of the subject data. Each woman told that she could withdraw at any time from the study.

4.7. Data analysis

Recorded data were analyzed using the statistical package for social sciences, version 20.0 (SPSS Inc., Chicago, Illinois, USA). Quantitative data expressed as mean \pm standard deviation (SD). Qualitative data were expressed as frequency and percentage. Chi-square (χ^2) test of significance was used in order to compare proportions between qualitative parameters. The confidence interval was set to 95%, and the margin of error accepted was set to 5%. So, the p-value was considered significant as the following:

- Probability (P-value)
- P-value <0.05 was considered significant.
- P-value <0.001 was considered highly significant.
- P-value >0.05 was considered insignificant

5. Results

Table 1 shows that 42.2 of the studied women were between 21-29 years of age, with the mean age of 32.33±6.14. Regarding educational level, 25.9% of them had secondary education, regarding occupation 77.8% of them were housewives, regarding the duration of marriage 45.2% of them were between 5-10 years, regarding residence, 53.3% of them were living in rural areas, and 54.1% of them their housing type were a tenant.

Table 2 presents that the mean age of husbands was 38.32±7.28, and 37% of them at the age group between 30-38. Regarding husband educational level 26.7% had primary education, regarding husband occupation 44.4% was governmental employee, 58.5% of them their household income was sufficient, 56.3% of them ate healthy & balanced diet and 53.3% of them practice physical activities.

Table 3 reveals that 52.6% of them had primary infertility; regarding pregnancy complications, 23% of them had a miscarriage. Concerning labor complications, 29.6% of them had a cesarean section, and regarding gynecological disorders, 20.7% had tubal occlusion and vaginal infections. Regarding obstetric surgical operation, 29.6% of them do a hysteroscopy.

Table 4 presents that the emotional and psychological problems, 41.5% of them had anger and mood change, and regarding life stressors 33.3% of them had Financial, or job problems, and 60.7% had distress due to medical treatment.

Table 5 presents that 33.3% of them had vaginal dryness, 27.4% had dyspareunia, regarding male sexual dysfunction, 26.7% of them their husband had premature ejaculation, 52.6% of them their coitus count and frequency of sexual intercourse from 3-4 times a week. Regarding fertility treatments, 83.7% of them take fertility drugs. For their treatment effort, 45.9% of them try several times, regarding the duration of infertility, 69.6% of them suffering from infertility from more than three years, and 88.1% of them use lubricants.

Table 6 reveals domains mean scores of female sexual functions that are desire, arousal, lubrication, orgasm, satisfaction, and pain 3.78, 3.86, 3.90, 3.92, 3.93, and 4.09 respectively — the score range for each domain from 1-5, with a total mean score of 23.49±7.82.

Table 7 reveals that numbers and percentage distribution of studied women according to scores of sexual functions index; the total score reveals that poor, intermediate, and good were 63.7%, 13.3%, and 23%, respectively.

Table 8 shows that there were statistically significant relations between the studied women's female sexual functions and their age, place of residence, duration of the marriage, education level, and housing type ($p<0.05$).

Table 9 shows that highly statistically significant relations between the studied women female sexual functions and their husbands' age, educational level, occupation, household income, and practice of physical activities ($p<0.001$).

Table 10 represents significant statistical relations between the studied female sexual functions and the absence of complications during pregnancy, miscarriage, gestational hypertension, and cesarean section ($p<0.05$).

Table 11 shows significant statistical relations between the studied women's female sexual functions, the death of a close relative, social isolation, and pressure from the family, spouse, or relatives ($p<0.05$).

Table 12 reveals highly statistical significant relations between the studied women's female sexual functions and coitus count and frequency of sexual intercourse ($p<0.001$).

Table (1): Frequency and percent distribution of studied women according to their socio-demographic characteristics (N=135).

Socio-demographic characteristics of women	No.	%
Age (years)		
21-29 years	57	42.2
30-38 years	48	35.6
39- 45 years	30	22.2
Mean ± SD	32.33±6.14	
Education level		
Read and write	20	14.8
Primary education	26	19.3
Preparatory education	28	20.7
Secondary education	35	25.9
Technical or middle education	13	9.6
College education	13	9.6
Occupation		
Employee	30	22.2
Housewife	105	77.8
Duration of marriage (years)		
<5 years	32	23.7
5–10 years	61	45.2
>10 years	42	31.1
Mean ± SD	8.37±1.59	
Residence		
Urban	63	46.7
Rural	72	53.3
Housing type		
Owner	34	25.2
Tenant or leased	73	54.1
Living with relatives	28	20.7

Table (1): Frequency and percent distribution of women husbands' socio-demographic characteristics (N=135).

Socio-demographic characteristics of a husband	No.	%
Husband Age (years)		
21–29 years	16	11.9
30–38 years	50	37.0
39–45 years	44	32.6
> 45 years	25	18.5
Mean±SD		38.32±7.28
Husband educational level		
Illiterate	23	17.0
Primary education	36	26.7
Preparatory education	35	25.9
Secondary education	28	20.7
Technical or middle education	10	7.4
College education	3	2.2
Husband occupation		
Governmental employee	60	44.4
Private sector employee	36	26.7
Other	39	28.9
Household income		
Sufficient	79	58.5
Not enough	56	41.5
Husband life habits		
<i>Smokes Cigarette</i>		
Yes	26	19.3
No	109	80.7
<i>Drinks Coffee</i>		
Yes	49	36.3
No	86	63.7
<i>Alcohol abuse and recreational drugs</i>		
Yes	4	3.0
No	131	97.0
<i>Eats a healthy & balanced diet</i>		
Yes	76	56.3
No	59	43.7
<i>Practice physical activities</i>		
Yes	72	53.3
No	63	46.7

6. Discussion

Sexual functioning is a complex bio-psycho-social process coordinated by the neurological, vascular, and endocrine systems. In addition to biological factors, psychosocial factors like societal and religious beliefs, health status, personal experience, socio-demographic conditions, and psychological status of the couple play an essential role in adequate sexual functioning of a person. A breakdown in any of these areas may lead to sexual dysfunction (Ajit, Sandeep, & Sathyanarayana, 2017). The counseling approach leads to increased sexual satisfaction by decreasing patients' negative affect (Taravati et al., 2018).

Multiple studies have shown a strong positive association between sexual functions and health-related quality of life. A biopsychosocial approach that simultaneously considers physical, psychological, sociocultural and interpersonal factors is necessary to guide research and clinical care regarding women's sexual function (Taravati et al., 2018). These interventions should be based on sound assessment from health care practitioners. Infertility is a significant medical problem

that most stressful event in the life of the infertile couples. Sexual worries and marital problems are often related to infertility. Literature suggests that infertility is more psychologically stressful for women than for men. On the other hand, most of the therapeutic procedures are performed on females causing more anxiety and depression (Hasanpoor-Azghdy, Simbar, & Vedahir, 2014).

Sexual dysfunction is highly prevalent among midlife women and is associated with lower quality of life, and sexual function declines over time for many women. Researches Regarding theoretical models of female sexual response reveal that psychosocial factors, such as relationship satisfaction and sex, are keys to women's sexual function at midlife. Researchers and healthcare providers can benefit from a biopsychosocial approach to women's sexual function. By addressing all aspects of women's sexual function, and improve this vital component of midlife women's well-being (Thomas & Rebecca, 2016).

Therefore, this study conducted to assess sexual functions among infertile women. The results of the present study revealed that near half of the women were 21-29 years old.

Table (3): Frequency and percent distribution of studied women according to their obstetric and gynecological history (N=135).

Obstetric and Gynecological history	No.	%
Previous children of wife		
One child (secondary infertility)	64	47.4
None (primary infertility)	71	52.6
Pregnancy complications		
None	89	65.9
Gestational Diabetes	4	3.0
Miscarriage	31	23.0
Ectopic pregnancy	24	17.8
Gestational Hypertension	1	0.7
Stillbirths	13	9.6
Labor complication		
Other	20	14.8
Cesarean section	40	29.6
Obstructed labor	4	3.0
Gynecological disorders		
Tubal occlusion	28	20.7
Vaginal Infections	28	20.7
Intrauterine defects	10	7.4
Endometriosis	1	0.7
Pelvic adhesions	9	6.7
Polycystic ovarian syndrome	49	36.3
Obstetric surgical operation		
Laparoscopy	31	23.0
Hysteroscopy	40	29.6
Dilation and curettage(D&C)	2	1.5
None	78	57.8

Table (4): Frequency and percent distribution of studied women according to their psychosocial status (N=135).

Psychosocial status of woman	No.	%
Emotional and psychological problems		
None	48	35.6
Anger and mood change	56	41.5
Hopelessness feeling	34	25.2
Low self-esteem	33	24.4
Emotional Stress	13	9.6
Life stressors		
None	36	26.7
Death of close relatives during the past months	8	5.9
Financial, or job problems	45	33.3
The distress of medical treatment.	82	60.7
Social isolation	15	11.1
Pressure from the family, spouse or relatives	16	11.9

The other half is between 30 to 45 years. A quarter of them had secondary education. More than three-quarters of the women were housewives, more than half of them living in rural areas, less than half of them had a duration of marriage 5–10 years, and more than half of them their housing type were a tenant. Also, more than a third of them, their husbands' age was 30–38 years. More than a quarter of their husbands had primary education, less than half of them their husband occupations were governmental employees, and more than half of their household incomes were sufficient.

The current study also revealed that more than half of the infertile studied women had primary infertility. This

finding is more than the rate reported by *Eldib and Tashani, (2018)* when they conduct a systematic review with meta-analysis of prevalence survey in the Middle East and North Africa. They reported an estimation of the overall total infertility rate from four demographic surveys on Egypt, Morocco, Jordan, and Yemen as 38.5% (95% CI = 28.8–49.2, effect size = -2.11, $P = 0.035$). This difference may be referred to as different sample sizes and sampling techniques.

Concerning the women's psychological status, the present study indicated that about two-fifths of the studied infertile women had anger and mood changes, one-third of them had financial or job problems, and about two-thirds had distress due to medical treatment.

Table (5): Frequency and percent distribution of studied women according to their female sexual history and infertility related characteristics (N=135).

Female sexual history & infertility-related characteristics	No.	%
Sexual complaint during sexual intercourse		
None	63	46.7
Others	12	8.9
Vaginal dryness, use lubricants for intercourse	45	33.3
Dyspareunia	37	27.4
Male sexual dysfunction		
None	78	57.8
Prostate disorders	4	3.0
Hormone problems(testosterone)	12	8.9
Erectile dysfunction or impotence	16	11.9
Premature ejaculation	36	26.7
Coitus count and Frequency of sexual intercourse		
1-2 times a week	8	5.9
3-4 times a week	71	52.6
>4 times a week	29	21.5
1-2 times a month	27	20.0
Fertility treatments		
None	19	14.1
Intrauterine insemination (IUI)	12	8.9
Assisted reproductive technology (ART)	14	10.4
Fertility drugs	113	83.7
Treatment effort		
First time	73	54.1
Several times	62	45.9
Duration of infertility (Y)		
>1 years	10	7.4
2-3 years	31	23.0
>3 years	94	69.6
Mean±SD		3.09±0.59
Use of lubricants		
Yes	119	88.1
No	16	11.9

Table (6): Studied women's sexual functions domains' mean scores (N=135).

Female Sexual Function Index (FSFI)	Mean±SD
Desire (1-5)	3.78±1.51
Arousal (1-5)	3.86±1.47
Lubrication (1-5)	3.90±1.42
Orgasm (1-5)	3.92±1.25
Satisfaction (1-5)	3.93±1.68
Pain (1-5)	4.09±1.45
Total (6-30)	23.49±7.82

Table (7): Frequency and percentage distribution of the studied women according to the score of their sexual functions (N=135).

Female Sexual Functions Index (FSFI)	Poor		Intermediate		Good	
	No.	%	No.	%	No.	%
Desire	72	53.3	39	28.9	24	17.8
Arousal	88	65.2	26	19.3	21	15.6
Lubrication	79	58.5	25	18.5	31	23.0
Orgasm	81	60.0	26	19.3	28	20.7
Satisfaction	89	65.9	21	15.6	25	18.5
Pain	27	20.0	25	18.5	83	61.5
Total	86	63.7	18	13.3	31	23.0

Table (8): Relation between women's female sexual functions and their socio-demographic characteristics (n=135).

Socio demographic characteristics	Female Sexual Functions						χ^2	p-value
	Poor (n=86)		Intermediate (n=18)		Good (n=31)			
	No.	%	No.	%	No.	%		
Age (years)								
21-29 years	33	38.4	4	22.2	20	64.5	16.612	0.002
30-38 years	28	32.6	12	66.7	8	25.8		
39- 45 years	25	29.1	2	11.1	3	9.7		
Residence								
Urban	53	61.6	9	50.0	10	32.3	7.990	0.018
Rural	33	38.4	9	50.0	21	67.7		
Occupation								
Employee	20	23.3	5	27.8	5	16.1	1.040	0.594
Housewife	66	76.7	13	72.2	26	83.9		
Duration of marriage (years)								
<5 years	19	22.1	5	27.8	8	25.8	12.067	0.017
5-10 years	37	43.0	4	22.2	20	64.5		
>10 years	30	34.9	9	50.0	3	9.7		
Education level								
Read and write	18	20.9	2	11.1	0	0.0	27.507	0.002
Primary education	19	22.1	5	27.8	2	6.5		
Preparatory education	17	19.8	2	11.1	9	29.0		
Secondary education	17	19.8	4	22.2	14	45.2		
Technical or middle education	9	10.5	0	0.0	4	12.9		
College education	6	7.0	5	27.8	2	6.5		
The housing type								
Owner	14	16.3	7	38.9	13	41.9	12.672	0.013
Tenant or Leased	49	57.0	8	44.4	16	51.6		
Living with relatives	23	26.7	3	16.7	2	6.5		

These findings are also evidenced by Lykeridou, Gourounti, Deltsidou, Loutradis, and Vaslamatzis, (2009), who conducted a study on 404 women undergoing fertility treatment in a public clinic in Athens. They reported high scores of state and trait anxiety than the published normative scores. Also, Iris, Aydogan, and Eftal (2013) reported the damage to self-esteem, which is not easily repaired. The current study results confirm this that more than four-fifths of infertile women take fertility drugs, about half of them try it for several times.

The current study displayed that one-third of the studied women suffering vaginal dryness, less than one third had dyspareunia, and their husband had sexual dysfunction such as premature, and most of them use lubricants. Besides, the desire had scored the lowest mean score of sexual functions. One notable finding was about two-thirds of the studied women reported poor overall sexual functions.

These results matched a study that evaluates the relationship between infertility and libido, found that infertility caused the decreased desire in infertile women (Direkvand-Moghadam, Delpisheh, and Direkvand-Moghadam, 2015). Another Iranian study evaluated the risk factors of female sexual dysfunction among 604 infertile women. The results showed that infertile women experience changes in their sexual function (Pakpour, Yekaninejad, Zeidi, & Burri 2012). A Turkey study

evaluated the impact of the type of infertility on female sexual function. The study investigated 122 primary infertile women and 51 secondary infertile women; the results showed that women with secondary infertility have a higher prevalence of sexual dysfunction, including sexual desire, orgasm, and satisfaction compared with primary infertile women (Keskin et al., 2011).

Furthermore, Jamali, Zarei, and Rasekh (2014) reported significant decreased sexual function and sexual satisfaction in infertile women. In another study, sexual satisfaction and sexual function were examined in infertile women. The results of the study showed that infertile women have a significant decrease in all domains of their function and sexual satisfaction (Mendes de Leon et al., 2001). Contradicting to the current study findings, Zare et al. (2016) compared sexual dysfunction in fertile and infertile women. They reported no significant difference in the total score of sexual problems and other dimensions of a sexual problem except in frequency.

Findings demonstrated a significant relationship between sexual function scores and age of the studied women and decrease in age was associated with an increase in the sexual function. Similarly, this finding was similar to the study of Eftekhari et al. (2016), which showed that the prevalence of sexual dysfunction in older women is higher than young.

Table (9): Relation between women female sexual functions and their husbands' socio demographic characteristics (n=135).

Socio demographic characteristics of husband	Female Sexual Functions						χ^2	p-value
	Poor (n=86)		Intermediate (n=18)		Good (n=31)			
	No.	%	No.	%	No.	%		
Husband Age (years)								
21–29 years	5	5.8	2	11.1	9	29.0	27.565	<0.001
30–38 years	24	27.9	10	55.6	16	51.6		
39–45 years	36	41.9	3	16.7	5	16.1		
> 45 years	21	24.4	3	16.7	1	3.2		
Husband educational level							29.717	<0.001
Illiterate	16	18.6	6	33.3	1	3.2		
Primary education	26	30.2	3	16.7	7	22.6		
Preparatory education	27	31.4	4	22.2	4	12.9		
Secondary education	11	12.8	2	11.1	15	48.4		
Technical or middle education	4	4.7	2	11.1	4	12.9		
College education	2	2.3	1	5.6	0	0.0		
Husband occupation							21.227	<0.001
Governmental Employee	35	40.7	2	11.1	23	74.2		
Private sector employee	22	25.6	9	50.0	5	16.1		
Other	29	33.7	7	38.9	3	9.7		
Household income							16.030	<0.001
Not enough	40	46.5	12	66.7	4	12.9		
Sufficient	46	53.5	6	33.3	27	87.1		
Husband life habits								
Smokes Cigarette							1.647	0.439
Yes	16	18.6	2	11.1	8	25.8		
No	70	81.4	16	88.9	23	74.2		
Drinks Coffee							2.060	0.357
Yes	28	32.6	9	50.0	12	38.7		
No	58	67.4	9	50.0	19	61.3		
Alcohol abuse and recreational drugs							1.450	0.484
Yes	3	3.5	1	5.6	0	0.0		
No	83	96.5	17	94.4	31	100.0		
Eats healthy & balanced diet							3.876	0.144
Yes	48	55.8	7	38.9	21	67.7		
No	38	44.2	11	61.1	10	32.3		
Practice of physical activities							29.346	<0.001
Yes	39	45.3	4	22.2	29	93.5		
No	47	54.7	14	77.8	2	6.5		

Table (10): Relation between studied women female sexual functions and their obstetric and gynecological history (n=135).

Obstetric and Gynecological history	Level of Female Sexual Functions						χ^2	p-value
	Poor (n=86)		Intermediate (n=18)		Good (n=31)			
	No.	%	No.	%	No.	%		
Previous children of wife							1.756	0.416
One child	40	46.5	11	61.1	13	41.9		
None	46	53.5	7	38.9	18	58.1		
Pregnancy complications							6.128	0.047
None	51	59.3	12	66.7	26	83.9		
Gestational Diabetes	2	2.3	1	5.6	1	3.2		
Miscarriage	24	27.9	5	27.8	2	6.5		
Ectopic pregnancy	19	22.1	2	11.1	3	9.7		
Gestational Hypertension	0	0.0	1	5.6	0	0.0		
Stillbirths	10	11.6	2	11.1	1	3.2	1.901	0.387
Labor complication							0.687	0.709
Other	10	11.6	1	5.6	4	12.9		
Cesarean section	19	22.1	8	44.4	3	9.7		
Obstructed labor	4	4.7	0	0.0	0	0.0	3.400	0.419

Table (11): Relation between studied women female sexual functions and their psychosocial status (n=135).

Psychosocial status	Female Sexual Functions						χ^2	p-value
	Poor (n=86)		Intermediate (n=18)		Good (n=31)			
	No.	%	No.	%	No.	%		
Emotional and psychological problems								
None	33	38.4	5	27.8	10	32.3	0.920	0.631
Anger and mood change	36	41.9	8	44.4	12	38.7	0.168	0.919
Hopelessness feeling	20	23.3	8	44.4	6	19.4	4.273	0.118
Low self-esteem	17	19.8	7	38.9	9	29.0	3.405	0.182
Emotional Stress	10	11.6	2	11.1	1	3.2	1.901	0.387
Life stressors								
None	28	32.6	2	11.1	6	19.4	4.601	0.100
Death of close relatives during the past months	4	4.7	4	22.2	0	0.0	10.778	0.005
Financial and job problems	26	30.2	6	33.3	13	41.9	1.404	0.496
The distress of medical treatment.	48	55.8	14	77.8	20	64.5	3.252	0.197
Social isolation	8	9.3	5	27.8	2	6.5	6.029	0.049
Pressure from the family, spouse or relatives	8	9.3	6	33.3	2	6.5	9.351	0.009

Table (12): Relation between studied women female sexual functions and their sexual history and infertility related characteristics (n=135).

Female sexual history & infertility-related characteristics	Female Sexual Functions						χ^2	p-value
	Poor (n=86)		Intermediate (n=18)		Good (n=31)			
	No.	%	No.	%	No.	%		
Sexual complaint during sexual intercourse								
None	38	44.2	12	66.7	13	41.9	3.384	0.184
Others	9	10.5	1	5.6	2	6.5	0.738	0.691
Vaginal dryness, use lubricants for intercourse	33	38.4	5	27.8	7	22.6	2.845	0.241
Dyspareunia (difficult intercourse)	27	31.4	1	5.6	9	29.0	5.049	0.080
Coitus count and Frequency of sexual intercourse								
1-2 times a week	2	2.3	6	33.3	0	0.0	47.616	<0.001
3-4 times in a week	41	47.7	5	27.8	25	80.6		
>4 times a week	17	19.8	6	33.3	6	19.4		
1-2 times a month	26	30.2	1	5.6	0	0.0		

The present study findings also demonstrated statistically significant relationships with the place of residence, duration of the marriage, women's educational level, and housing type. These findings were in line with the results of other studies, which indicated that sexual functions were associated with some factors such as the length of the marriage, age of couples, and level of education (Rahmani, Alahgholi & Khuee, 2009). This finding contradicts Hendrickx, Gijis and Enzlin, (2015), who found that although sexual difficulties and sexual dysfunctions increase with age, sexual distress was more common in younger women. Also, Ziaee et al. (2014) showed that there was no statistically significant association between sexual relations and some related factors such as age, length of the marriage, and the number of children.

This finding is in line with a study conducted by Abbasi, Dehghani and Mzaheri (2012) to assess the changes in marital satisfaction. They found that sexual satisfaction was at its peak in the early years of marriage and also in the menopause period. Another study demonstrated an inverse relationship between sexual impact and an advanced maternal age because increasing age is associated with higher rates of infertility and worse outcomes for assisted reproductive technology. More likely, younger women could feel a different type of emotional response associated with infertility because it is less common in this age group. Therefore, this emotional stress

likely has an even more profound sexual impact than for older women (Winkelman, Katz, Smith, & Rowen, 2016). From the researchers' point of view, these disagreements between the previous studies seem to indicate that the age has different effects on a sexual function.

Based on the current study findings, an increased level of education was associated with an increase in the rate of sexual satisfaction. It is similar to Ji and Norling. (2004). They found a positive correlation between education and sexual satisfaction. Also, they argued that education could affect economic stability. When couples are educated, they have a greater chance of achieving economic stability, and thus higher marital and sexual satisfaction than couples with less formal education (Ji & Norling, 2004).

It may also result from the fact that they are bolder to discuss sexual matters openly. In short, it has been documented that the higher the level of female education, the higher the probability that they can discuss reproductive health issues with men (Fajewonyomi, Orji & Adeyemo, 2007). The results showed that the level of education was a significant contributing factor to sexual function. It is well established that individuals with high education levels are healthier and have fewer sexual problems. Therefore, it seems that the well-educated women were more likely to seek help for sexual dysfunction (Schomerus et al., 2013); this is consistent with Nassimi and Mahdavi (2008), they showed that there was a significant positive relationship

between education and sexual satisfaction. Also, *Taavoni and Haghani (2010), Ziaee et al., (2014)* found that sexual functions had a positive correlation with the level of education of couples among housewives.

The study demonstrated a significant difference between the duration of the marriage and sexual function scores. In other words, sexual functions decrease with increased marriage duration and the less the length of the marriage. This result is consistent with the findings of *Zare, Golmakani, Shareh, Shakeri, and Ghaebi, (2014)*. Many studies have confirmed the finding of this study, which confirmed that longer duration of marriage was associated with sexual dysfunction (*Pauleta, Pereira & Graça, 2010*) and *Abouzari-Gazafrودي, Najafi, Kazemnejad, & Rahnama, Montazeri, (2015)*.

The finding of this study contradicts those of *Jalili's* study; he believes that couples gradually learn lovemaking, and this can lead to increase marital satisfaction (*Jalili, 1996; Shakerian, 2010*). This finding is not supported by *Shahsiah, Bahrami and Mohebi, (2009)*. They explained that at the beginning of married life, sexual motivations hide marital concerns, like blaming each other, economic problems, and raising children. However, as time passes, problems have accumulated to the point where marriage starts falling apart. From the researchers' point of view, these disagreements between the previous studies seem to indicate that the duration of marriage has different effects on sexual satisfaction.

The study demonstrated highly statistically significant relations between the studied women's female sexual functions index and their husband's age, educational level, occupation, and household income ($p < 0.001$). Few studies have been conducted to assess the influence of socioeconomic factors on sexual function. In one study by *Rainer and Smith, (2012)* revealed that household income was unrelated to sexual satisfaction. In another study, income was negatively related to sexual satisfaction (*Del Mar Sanchez-Fuentes, Salinas & Sierra, 2016*). However, higher socioeconomic status is also associated with better mental and physical health, which is correlated with higher sexual function (*Lee, Nazroo, O'Connor, Blake, & Pendleton, 2016*).

The result of the study indicated a significant relationship between the studied women's sexual function scores and pregnancy complications and labor complications ($p < 0.05$). This result was similar to the results of *Lemack and Zimmern's (2000)* study, which showed that women with gynecological problems demonstrated a significant reduction in sexual activity. Also, this in line with finding that the presence of illness is significantly at increased risk of sexual dysfunction. Guilt-feelings connected with previous abortion seem to torture infertile women, and also she exposed to various pressures from relatives (*Fajewonyomi et al., 2007*).

The study has reported that there was a significant relationship between the studied women's sexual function scores and Life stressors ($p < 0.05$). According to *Ayub and Iqbal (2012), Shirjang et al., (2012)* found that family pressure over a wife who has no children, especially the

husbands' family, may cause marital dissatisfaction. Furthermore, stresses and tension between spouses affect sexual satisfaction (*Thomas, Hess & Thurston, 2015*). Additionally, this is in line with a study, pointed out to emotionally-unstable individuals are significantly at increased risk of sexual dysfunction (*Adigeb & Mbu, 2015; Fajewonyomi et al., 2007*).

The study showed a significant relationship between the sexual function scores and coitus count and frequency of sexual intercourse as more than eighty percent of good sexual function was among women with a frequency of three to four times a week. Previous studies reported the association between decreases in number and quality of courses, overall sexual activity, self-esteem, and sexual relation. Women also can develop negative thoughts about intercourse and might avoid sexual activity, which can negatively affect personal relationships. Besides, sexual dysfunctions are associated with reduced frequency of sexual intercourse, reduction of sexual desire and arousal, and less orgasmic experiences (*Pluchino et al., 2016; King, Holt & Nazareth, 2007*).

The results indicated that the sexual desire and frequency of coitus in infertile women had reduced significantly after an infertility diagnosis. This finding matched with *Ramezanzadeh, Aghssa and Zayeri, (2006)*, who concluded that the sexual desire and frequency of coitus has reduced in infertile couples after an infertility diagnosis.

7. Conclusion

Based on the results of the present study, the following can be concluded:

The assessment of sexual function among infertile women revealed a pattern of intermediate function according to the female sexual function index. In addition to near two-thirds of the infertile women displayed poor sexual function.

Many factors found to be associated with female sexual functioning as age, residence, duration of the marriage, educational level, husbands' age, husbands' educational level, husbands' occupation, household income, history of miscarriage, life stressors, coitus count and frequency of sexual intercourse.

8. Recommendations

In light of study flinging, the following recommendation can be given:

- Sexuality disorder clinics, sexual counseling clinics must be established in healthcare centers. It should be a multi-disciplinary clinic, incorporating sex therapists, psychologists, gynecologists, urologists, trained nursing personnel psychiatrists, and social workers.
- Further researches and future studies suggest studying the issues on sexual function as part of prenatal care and reproductive health programs for every woman. Sex education of couples before marriage seems to be of importance, in addition to paying more attention to women's sexual problems and conducting studies after the education of couples to evaluate the relationship between sexual satisfaction and divorce rate.
- Marital counseling is essential for the quality of family life and the stability of families.

- Developments of practical strategies in order to provide cultural intervention to improve couples' awareness of their sexual relationship, as well as training in communication skills, are essential since sexual dissatisfaction was revealed to be an underlying problem leading to a divorce.

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