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Assessment of knowledge, Sexual Dysfunction, Anxiety and Marital Satisfaction among Infertile Women

Amany Fikry Ali[1], Entesar Fatouh Abd El-Moneim[2], Shaimaa Hassan Mohamady[3]

(1) Assistant Lecturer of Maternal and Newborn Health Nursing - Faculty of Nursing – Al-Fayoum University, Egypt.
(2) Professor of Maternal and Newborn Health Nursing - Faculty of Nursing - Helwan University, Egypt.
(3) Professor of Maternal and Newborn Health Nursing - Faculty of Nursing - Helwan University, Egypt[3].
E-mail of corresponding author: afa04@fayoum.edu.eg

Abstract

Background: Infertility affects different areas of the couple's life. Many couples describe the period of diagnosis and treatment of infertility as the most stressful period of life. ***Aim of the study:*** aimed to assess knowledge, sexual dysfunction, anxiety, and marital satisfaction among infertile women. ***Design:*** A descriptive design was used in the current study. ***Setting:*** The study was conducted in the Gynecology clinic at Benha university hospital, Egypt. ***Sample:*** A purposive sample was utilized, which included 60 infertile women. ***Tools:*** Four tools were used in the current study: ***First tool:*** A structured interviewing questionnaire that consisted of ***First part:*** The general characteristics and the health history, ***Second part:***Assessment of knowledge about fertility and infertility. ***Second tool:*** Female sexual function index (FSFI). ***Third tool:*** Taylor anxiety scale. ***Fourth tool:*** ENRICH marital satisfaction scale. ***Results:*** Only less than one quarter of the studied women had satisfactory total knowledge scores about fertility and infertility. Also, the Mean of desire, arousal, lubrication, orgasm, satisfaction, and pain scores were low. Moreover, the minority of the studied women had mild to moderate anxiety regarding total scores of Taylor anxiety scale interpretation. Also, about half of the studied women had marital satisfaction regarding total scores of ENRICH scale interpretation. ***Conclusion:*** The majority of the studied women had unsatisfactory total knowledge scores about fertility and infertility. Also, the Mean sexual function indicator scores of the studied women were low. Moreover, the majority of the studied women had severe anxiety. Furthermore, more than half of the studied women hadn't marital satisfaction regarding total scores of ENRICH scale interpretation. ***Recommendations:*** Development of nursing instructions guided by coping model to improve knowledge and marital satisfaction and decrease sexual dysfunction and anxiety among infertile women.

Key words: *Anxiety, Knowledge, Marital satisfaction, Sexual dysfunction.*

1. Introduction

Infertility is the inability to get pregnant even after having frequent and unprotected sex for one year. Infertility is a medical condition that can cause psychological, physical, mental, spiritual and medical detriments to the patient. Infertility frequency in the world is 3%-7% and infertility results from female related factors in approximately 37% of all infertility cases. Infertility can affect both men and women and is usually self-diagnosable by an inability to get pregnant ***(Walker et al., 2022).*** Also, knowledge about infertility is limited in the population and a lot of misconceptions and myths are prevalent in worldwide. Good knowledge and perception of infertility is very crucial among couples as it may help to prepare their minds when couples are having difficulty in having children.

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Knowledge of infertility may also help society to understand and help infertile couples with a reduction in social and psychological burden ***(Ali et al., 2020).***

Though, sexual dysfunction is a problem in a person's sexual desire, arousal or orgasm. Sexual dysfunction is common and affects as many as 30% of men and 40% of women. Also, sexual dysfunction is even more common for couples dealing with infertility. Often, people ignore or downplay the sexual problems of infertile couples. Some sexual problems may go away when the pressures of infertility treatment end but, sexual difficulties often linger or get worse after treatment ends or a couple becomes parents. Even couples who never have major sexual problems often find that there are times of less sexual desire and satisfaction ***(Bergman et al., 2021).***

Furthermore, anxiety is a certain consequence to infertility that is a multidimensional stressor which requiring many emotional adjustments that can cause not only anxiety but also stress and depression. Anxiety and infertility treatments are related in a complex way. Also, women seeking infertility treatment have higher rates of anxiety and depressive symptoms. The psychological impact of infertility medication in particular clomifene citrate may be an important independent risk factor for the development of anxiety ***(Hussain et al., 2022).*** Nevertheless, marital satisfaction is a mental state that reflects the perceived benefits and costs of marriage to a couple. The more costs a marriage inflicts on a person, the less satisfied one generally is with the marriage and with the husband or the wife. Similarly, the greater the perceived benefits are, the more satisfied one is with the marriage and with the marriage couple. Accordingly, knowing the factors associated with marital satisfaction in the infertile couples can help the couples to keep on their treatment and increase their success chance ***(Yilmaz, et al., 2020).***

Significance of the Study:

Infertility frequency in the world is 3%-7% and the prevalence of infertility in Egypt according to a study conducted by the Egyptian Fertility Care Society affects 12 percent of Egyptian couples ***(Ramadan et al., 2018).*** The ability of reproduction is closely connected with sexual and marital satisfaction and psychological status. So, sexual intercourse may lose its spontaneity and erotic value because the main aim becomes conception leading to sexual dysfunction. Also, many couples describe the period of diagnosis and treatment of infertility as the most stressful period of their life so, anxiety and marital dissatisfaction are typical reactions to infertility ***(Starc et al., 2019).*** Therefore, this study was conducted to assess knowledge, sexual dysfunction, anxiety, and marital satisfaction among infertile women.

Aim of the Study

The aim of the present study was to assess knowledge, sexual dysfunction, anxiety and marital satisfaction among infertile women.

Research Question

What is the knowledge, sexual dysfunction, anxiety, and marital satisfaction among infertile women?

Research Design

A descriptive design was utilized in this study. A descriptive research design is a type of research methodology that aims to describe or document the characteristics, behaviors, attitudes, opinions or perceptions of a group or population being studied ***(Hassan., 2024).***

Setting

The study was conducted in the Gynecology clinic at Benha university hospital that is located at the center of Benha city in Egypt.

Sample

Type of sample: A purposive sample was used in the current study.

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Sample Size

The sample size was consisted of (60) infertile women through 6 months. The process of data collection was carried out in the period from the beginning of December 2022 and completed by the end of May 2023.

Inclusion Criteria

- Infertile women after one year of regular unprotected intercourse.
- All women who sexually active in the previous 4 weeks.

Exclusion Criteria

- The presence of family disagreements within the last weeks.
- The presence of physical problems such as spinal cord injury, malformation, paralysis and limb abnormality.
- Medical illnesses such as cardiovascular disease and pulmonary disorders.
- Facing stressful events such as death or acute illness.

Tools for Data Collection

Four main tools were used for data collection in the present study.

Tool I: A Structured Interviewing Questionnaire :

This tool was designed by the researcher after reviewing current and related literatures ***Ramadan et al., 2018*** and was written in an Arabic language in the form of close and open-ended questions. The tool encompassed three major parts:

Part 1: The general characteristics and the health history of the studied women that consisted of (13) questions and used to assess the personal data such as (age, place of residence, educational level and occupation) and the health history that was composed of menstrual cycle history such as (menarche age, menstrual cycle nature, menstrual cycle duration and bleeding amount), infertility treatment history such as (duration of marriage, duration of infertility, previous an external fertilization process and its results) and medical and surgical history such as (suffering from chronic diseases and previous surgeries).

Part 2: Assessment of the studied women knowledge about fertility and infertility. The part used to assess the general knowledge regarding the natural ways to improve fertility and conception chances and the diagnostic tests of infertility that consisted of (10) questions such as (definition of fertility, the natural ways to improve fertility, the factors that affect a woman's fertility, effect of sexual health on fertility, the effect of obesity on fertility, definition of infertility, types of infertility, the diagnostic tests for women and men infertility and infertility treatment).

Scoring System:

Scoring system for general knowledge of the studied women was calculated as the following: Each given answer about fertility and infertility was correct and women were asked to select from these answers. Correct answer was considered for the woman select and was scored as (2). Incorrect answer was considered for the answer that the woman does not select and was scored as (1). Total knowledge score was 20 and the higher scores represent higher levels of knowledge and was categorized as the following: Unsatisfactory < 60 % of total score knowledge. Satisfactory ≥ 60 % of total score knowledge.

Tool II: Female Sexual Function Index (FSFI):

The tool was adopted from ***Anis et al.,2011*** and was written in an Arabic language. The tool evaluated six sexual domains: sexual desire, arousal, lubrication, orgasm, satisfaction, and pain throughout the sexual intercourse. The tool had 19 questions to assess the degree of women's sexual function in the form of close ended questions.

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The first domain is (Desire): which evaluated through two questions (times and level of sexual desire). ***The second domain is (Arousal):*** which evaluated through four questions (times and level of arousal during a sexual intercourse, in addition to the confidence about becoming sexually aroused during a sexual intercourse and satisfaction about sexual desire). ***The third domain is (Lubrication):*** which evaluated through four questions (frequency and difficulty of lubrication, in addition to frequency and difficulty of lubrication maintenance). ***The fourth domain is (Orgasm):*** which evaluated through three questions (frequency and difficulty of orgasm, in addition to satisfaction with the orgasm- inducing capacity during sexual intercourse). ***The fifth domain is (Satisfaction):*** which evaluated through three questions (satisfaction about emotional closeness during sexual intercourse and about sexual relationship with the couple and overall sexual life). ***The sixth domain is (pain):*** which evaluated through three questions (frequency of pain or discomfort during and after vaginal penetration and the intensity of pain during or after vaginal penetration).

Scoring System

The questions were divided into six subscales: sexual desire (questions 1 and 2), arousal (questions 3, 4, 5 and 6), lubrication (questions 7, 8, 9, and 10), orgasm (questions 11, 12, and 13), satisfaction (questions 14, 15 and 16) and pain (questions 17, 18, and 19). The score range for questions 3 to 14 and 17 to 19 between 0–5; for questions 1, 2, 15 and 16 between 1–5. The full-scale score range was from 2 to 36, with the higher scores indicating better sexual function.

Tool Ⅲ: Taylor Anxiety Scale:

The tool was adapted from ***Taylor et al., 1953*** and modified by researcher. The tool was translated into the Arabic language. Also, the tool was composed of 50 items to determine anxiety levels through psychosomatic manifestations. The tool was divided to physical or somatic manifestations items such as (tired quickly, there are attacks of nausea, headaches, diarrhea, feeling hungry, constipation, warmth of hands and feet, degree of sweating, the heart pounding, shortness of breath and stomach troubles).

In addition, psychological manifestations items such as (degree of nervousness, working under tension, degree of concentration on one thing, worrying over money and business, degree of blushing, worrying about over possible misfortunes, the nightmares, sleeping disturbances, feeling embarrassed, sensitivity when dealing comparing with others, capability to be happy as others, degree of calm, crying easily, degree of happiness, feeling of nervous, restlessness, exciting and worrying toward things, feeling frightened of things or people, felling with self-consciousness and self-confidence).

Scoring System

The tool was composed of 50 items within the rank of two points Likert scale ranging like 1= Yes, 0 = No. The replies indicating anxiety were counted, giving a score from 0 to 50 with the higher scores representing a higher level of anxiety. Scoring was easily accomplished by summing scores for items. The total score ranged from 0–50. The following guidelines were recommended for the interpretation of scores: 0–9, normal or no anxiety; 10–18, mild to moderate anxiety; 19–29, moderate to severe anxiety and 30–50, severe anxiety.

Tool IV: ENRICH Marital Satisfaction Scale:

The tool was adapted from ***Blaine et al.,1993*** and modified by researcher. The tool was translated into the Arabic language. The tool was used to assess the marital satisfaction of the studied women and included two dimensions: the first dimension was marital satisfaction (MS) such as (Unsatisfaction with the communication and understanding between the couples, there are un meeting needs by the relationship, unsatisfaction with the way of handling the responsibilities as parents).

The second dimension was idealized distortion (ID) such as (understanding between couples, a pleasure with the husband' personality characteristics and personal habits, a pleasure with handling of role responsibilities in the

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marriage, completely understanding of mood changes of the woman by the husband, the success of the relationship, a pleasure with the way of making decisions and resolving conflicts, a pleasure with the financial position and the way of making financial decisions, a pleasure with managing the leisure activities and the time that the couples spend together, a pleasure with expressing affection and relating sexually and a satisfaction with practicing the religious beliefs and values) ***(Nunes et al., 2022).***

Scoring System

The tool was consisted of 15 items with total score 30 and the higher scores represent higher levels of marital satisfaction. The tool included three points Likert scale ranging like 2= Agree, 1= To Some Extent, 0= Not Agree. It was divided into two levels as the following: Unsatisfactory < 60 %. Satisfactory ≥ 60 %.

Tools Validity

Validity was done by panels of three expertise in the field of (Maternal and Newborn Health Nursing) who interviewed the four tools for content accuracy and internal validity. Also, professors were asked to judge the items for completeness and clarity.

Tools Reliability

Cronbach alpha reliability test was done through SPSS computer package. This test for tool II (Female sexual function index FSFI) was 0.923 ***(Anis et al.,2011).*** Also, this test for the third tool (ENRICH Marital Satisfaction Scale) was 0.871. and for the fourth tool (Taylor Anxiety Scale) was 0.845.

Ethical Consideration

An official permission to conduct the proposed study was obtained from the Scientific Research Ethics Committee, faculty of nursing – Helwan university. Participation in the study was voluntary and a woman was given complete full information about the study and their role before signing the informed consent. The ethical considerations were include explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the information where it was not be accessed by any other party without taking permission of the participants. Ethics, values, culture and beliefs was respected.

Pilot Study

A pilot study was conducted on a sample of 10 % of the total period of the sample collection that was 6 months and included (6) of infertile women collected within 2 days/week for two weeks and 2-3 women/week to test the feasibility of different tools and help in time planning. No modifications were carried out, so all infertile women were included in the study.

Field Work

The process of data collection was carried out in the period from the beginning of December 2022 and completed by the end of May 2023, consuming 6 months, after obtaining all official permissions. The researcher met the infertile women attending to the previous setting 2 days/week from 10 am – 2 pm until reaching the foreordained sample size. The researcher visited Ob/Gyn clinic to assess the place and the rate of infertile women. Also, the researcher explained the aim of the study to staff nurses to facilitate the conduction of the study. Also, the researcher introduced herself to gain the women's confidence and agreement as well as obtained the consent to participate in the study then, the researcher explained the aim of the study to each woman. Then, the researcher selected women who fulfilled the study criteria. The researcher interviewed 2 – 3 women in week.

Also, the researcher distributed the tools for each woman individually and helped women who couldn't read and write to fill the sheet. Then the researcher conducted the assessment process for each woman.

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So, the researcher used four tools in the current study; structured interviewing questionnaire (tool I) that consisted of the general characteristics and the health history sheet and anthropometrics sheet as well as assessment of knowledge about fertility and infertility sheet. Furthermore, the researcher used female sexual function index (FSFI) (tool II), Taylor anxiety scale (tool III) and ENRICH marital satisfaction scale (tool IV).

Statistical Analysis :

Data were collected, revised, coded and entered to the Statistical Package for Social Science (SPSS) version 23. The quantitative data were presented as mean, standard deviations and ranges. Also, qualitative variables were presented as number and percentages. Spearman correlation coefficients were used to assess the correlation between two quantitative parameters in the same group. 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: P>0.05: Non-significant (NS). P<0.05: Significant (S). P<0.01: Highly significant (HS).

2. Results :

Table (1) shows that, the mean age of the studied women was 25.97 ± 5.19 and more than two thirds of them (66.7 %) were from rural area. Moreover, more than half of the studied women (51.7%) had a secondary education. In addition, about two thirds of the studied women (60.0%) were house wives.

Table (2) illustrates that, more than half of the studied women had menarche before age of 11 years and the mean menarche age of the studied women was 11.45 ± 1.14. In addition, half of the studied women (50.0 %) had abundant bleeding amount. Furthermore, the menstrual cycle duration of more than two thirds of the studied women (66.7 %) lasted 3-7 days. While the menstrual cycle duration of more than one third of the studied women (33.3 %) lasted more than 7 days.

Table (3) points out that, the mean years of infertility of the studied women was 3.37 ± 2.09. Moreover, most of the studied women (93.3 %) had not an external fertilization process (IVF). In addition, more than two thirds of the studied women (73.3 %) had no chronic diseases. Also, less than one third of the studied women (28.3%) did not perform any surgeries.

Figure.1 shows that, the majority of the studied women (80.0%) had unsatisfactory total knowledge scores about fertility and infertility.

Table (4) reveals that, the mean sexual function indicator scores of the studied women was 19.15 ± 5.48.

Figure.2 shows that, the majority of the studied women (85.0 %) had severe anxiety.

Figure.3 shows that, more than half of the studied women (55.0 %) hadn't marital satisfaction regarding total scores of ENRICH scale interpretation.

Table (5) reveals that, there was a negative correlation between age and arousal, lubrication, orgasm and satisfaction scores as increasing of the studied women age reduce arousal, lubrication, orgasm and satisfaction scores. In addition, there was a strong positive correlation between age and psychological manifestations.

Table (6) shows that, there was a negative correlation between years of marriage and a weak negative correlation between years of infertility and the sexual function indicator Mean scores.

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Table (1): Distribution of the studied women according to the general characteristics (N= 60).

Demographic data	No.	%
Age (years)		
≤ 25 years	30	50.0
> 25 years	30	50.0
Mean±SD. **Range**	**25.97 ±5.19** **17 –37**	
Place of residence		
Rural	40	66.7
Urban	20	33.3
Educational level		
Can't read & write	4	6.7
Primary Education	8	13.3
Secondary Education	31	51.7
University Education	17	28.3
Occupation		
Working	24	40.0
Not Working (housewives)	36	60.0

Table (2): Distribution of the studied women according to their menstrual cycle history (N = 60).

Health history	NO.	%
Menstrual Cycle History		
Menarche age		
≤ 11 years	34	56.7
> 11 years	26	43.3
Mean±SD. Range	11.45 ± 1.14 10 – 1٤	
Menstrual Cycle Nature		
Regular	30	50.0
Irregular	30	50.0
Bleeding Amount		
Little	3	5.0
Moderate	27	45.0
Abundant	30	50.0
Menstrual Cycle Duration		
Less than 3 days.	0	0
3-7 days.	40	66.7
More than 7 days.	20	33.3

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Table (3): Distribution of the studied women according to their infertility treatment history & medical and surgical history (N = 60).

Health History	No.	%
Infertility Treatment History		
Years of marriage (years)		
≤ 7 years	35	58.3
> 7 years	25	41.7
Mean±SD. Range	6.44 ± 5.04 1 – 15	
Years of infertility (years)		
≤ 4 years	41	68.3
> 4 years	19	31.7
Mean±SD. Range	3.37 ± 2.09 1 – 9	
Previous an external fertilization process (IVF)		
Once	4	6.7
More than once	0	0
No	56	93.3
Medical and Surgical History		
Suffering from any chronic diseases		
Blood Pressure	12	20.0
No	44	73.3
Previous surgeries		
Appendectomy	9	15.0
Umbilical Hernia	8	13.3
Exploration (Endoscopic)	16	26.7
Abscess & cholecystectomy	10	16.7
No	17	28.3

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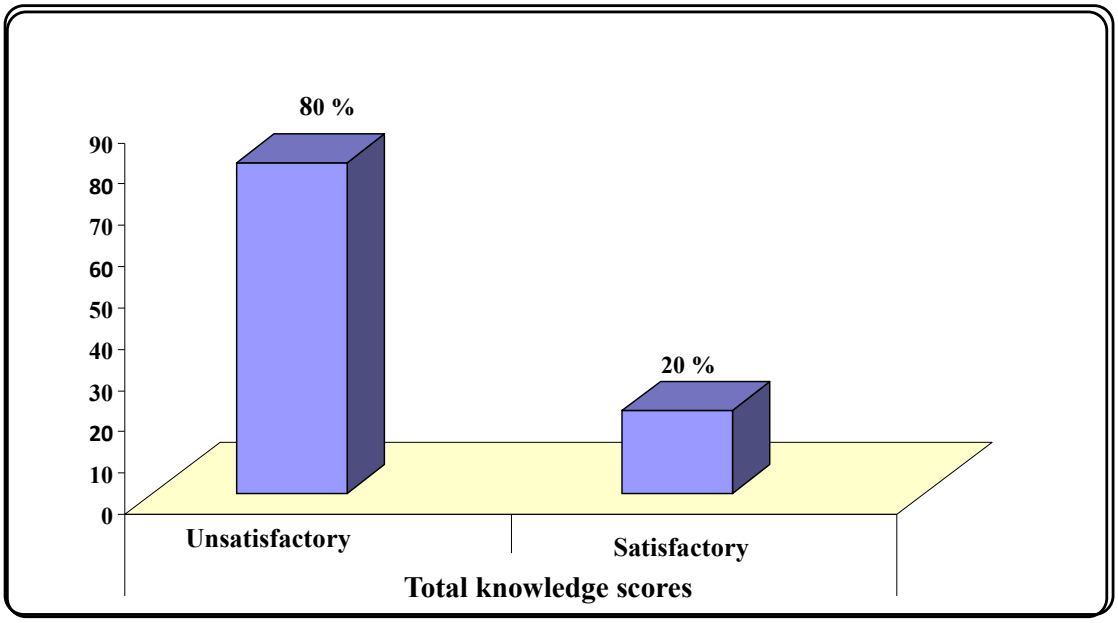

Fig.1 Distribution of the studied women according to their total knowledge scores (N = 60).

Table (4): Mean and standard deviation of total scores of the studied women female sexual function index (N = 60).

The Sexual Function Domains		No. = 60
Desire domain	Mean±SD Range	2.7 ± 0.84 1.2 - 4.8
Arousal domain	Mean±SD Range	2.66 ± 1.03 1.2 - 4.8
Lubrication domain	Mean±SD Range	3.56 ± 0.97 1.8 - 5.7
Orgasm domain	Mean±SD Range	3.59 ± 1.12 1.6 - 6
Satisfaction domain	Mean±SD Range	3.84 ± 1.16 1.2 - 6
Pain score	Mean±SD Range	2.8 ± 0.97 1.2 - 6
Total Mean sexual function index scores	Mean±SD Range	19.15 ± 5.48 10.6 - 32.9

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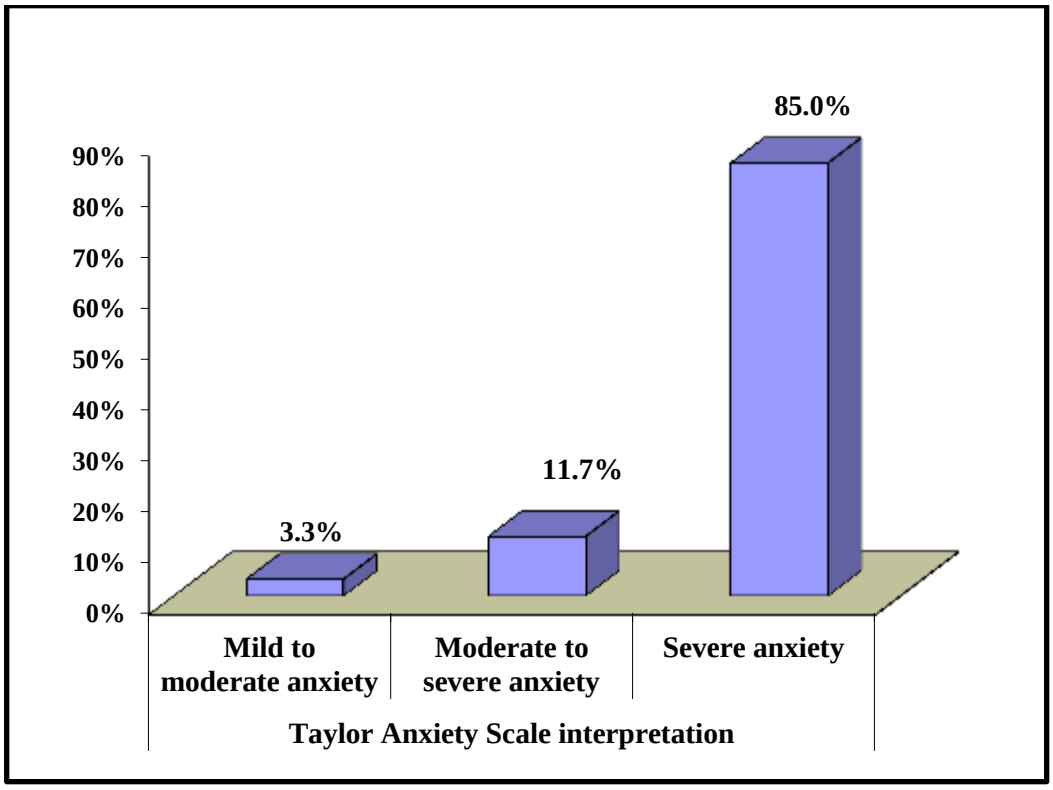

Fig.2 Total scores of Taylor anxiety scale interpretation.

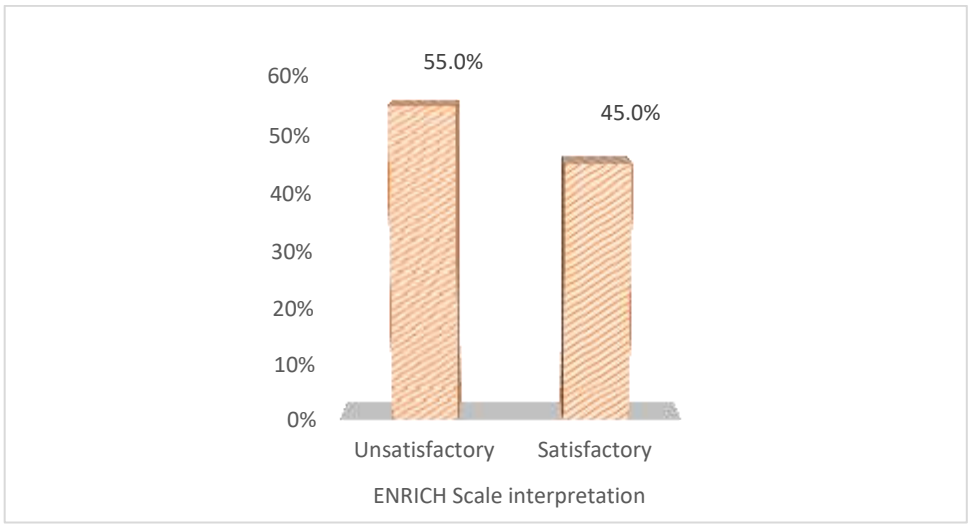

Fig.3 Total scores of ENRICH scale interpretation.

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Table (5): Correlation of age and age at the first menstruation with the calculated scores (N = 60).

Items	Age		Menarche age	
	r	p-value	r	p-value
• The sexual function index Mean scores	-0.253	0.051	0.176	0.180
• Desire score	-0.223	0.087	-0.069	0.599
• Arousal score	**-0.301***	**0.020**	-0.058	0.662
• Lubrication score	**-0.274***	**0.034**	**0.279***	**0.031**
• Orgasm score	**-0.292***	**0.023**	**0.365****	**0.004**
• Satisfaction score	**-0.300***	**0.020**	**0.322***	**0.012**
• Pain score	0.034	0.799	0.194	0.138
• Taylor anxiety Mean scores	**0.437****	**0.000**	-0.006	0.962
• Physical or somatic manifestations	0.170	0.195	0.145	0.268
• Psychological manifestations	**0.430****	**0.001**	-0.094	0.476
• ENRICH scale total scores	0.241	0.064	**0.261***	**0.044**

P>0.05: Non significant (NS); P <0.05: Significant (S); P <0.01: Highly significant (HS) Spearman correlation coefficients.

Table (6): Correlation between years of marriage and years of infertility with the calculated scores (N = 60).

Items	Years of marriage (years)		Years of infertility (years)	
	r	p-value	r	p-value
• The sexual function index Mean scores	**-0.302***	**0.019**	-0.236	0.069
• Desire score	-0.243	0.061	-0.202	0.122
• Arousal score	**-0.296***	**0.022**	**-0.293***	**0.023**
• Lubrication score	**-0.322***	**0.012**	-0.227	0.082
• Orgasm score	**-0.327***	**0.011**	-0.243	0.062
• Satisfaction score	**-0.347****	**0.007**	-0.248	0.056
• Pain score	-0.060	0.649	-0.003	0.980
• Taylor anxiety Mean scores	**0.417****	**0.001**	**0.383****	**0.002**
• Physical or somatic manifestations	**0.605****	**0.000**	**0.542****	**0.000**
• Psychological manifestations	**0.408****	**0.001**	**0.360****	**0.005**
• ENRICH scale total scores	0.160	0.222	**0.277***	**0.032**

P>0.05: Non significant (NS); P <0.05: Significant (S); P <0.01: Highly significant (HS) Spearman correlation coefficients.

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3.Discussion

Infertility was an important reproductive health problem that caused sexual, psychological and social disorders that had prevented afflicted couples from exercising control over the lives particularly in the realms of sexual dysfunction, anxiety and marital satisfaction. Therefore, the current study aimed to assess knowledge, sexual dysfunction, anxiety and marital satisfaction among infertile women. In relation to the general characteristics of the studied women, the current study findings illustrated that half of the studied women were aged ≤ 25 years and the other half were > 25 years with mean age 25.97 ±5.19. On the same line, ***Alirezaei et al., 2020*** in a study entitled "Evaluation of factors associated with sexual function in infertile women, Iran" reported that more than half of studied women were aged more than 25 years with mean age 36.7±7.8. While ***Li et al., 2020*** in a study entitled "Infertility-Related stress and life satisfaction among Chinese infertile women: a moderated mediation model of marital satisfaction and resilience, China" were opposing the current study findings as the stated that nearly two thirds of study sample were above 40 years.

Regarding residence the current study findings revealed that more than two thirds of studied women were from rural areas. On the same line ***Maroufizadeh et al., 2020*** in a study entitled "The relationship between marital satisfaction and depression in infertile couples, Iran" stated that more than half of studied subjects were resident in agricultural districts. In disagreement with the current study, ***Samadaee-Gelehkolaee et al., 2020*** in a study entitled "Factors associated with marital satisfaction in infertile couple: a comprehensive literature review, Iran" revealed that nearly half of studied subjects were lived in towns and urban areas.

Considering education, the current study findings revealed that more than half of the studied women had a secondary education. On the same line ***Dastaran et al., 2022*** in a study entitled "The Effect of BETTER-Based Sex Counselling on Sexual Quality of Life in Infertile Women, Iran" stated that more than half of studied women had secondary education. In disagreement with these results ***Li et al., 2020*** who reported that nearly two thirds of study sample had a basic education.

As regards to occupation, the current study findings demonstrates that about two thirds of the studied women were housewives, ***Riazi et al., 2020*** was in congruence in a study entitled "Evaluation of sexual function among infertile women and their sexual self-concept, Iran" as they reported that the majority of studied women are not working. On the other hand, ***Karakas et al., 2019*** in a study entitled "Sexual counselling in women with primary infertility and sexual dysfunction: Use of the BETTER model, Turkey" stated that more than half of studied women were working.

Concerning the studied women' health history, the current study findings revealed that regarding menstrual cycle history more than half of the studied women had menarche before age of 11 years with mean age 11.45 ± 1.14. Also, half of the studied women had regular menstrual cycle and half of the studied women had abundant amount. For instance, a study conducted by ***Mahadeen et al., 2020*** in a study entitled "Sexual satisfaction among infertile couples: demographics and psychosocial health factors, Jordan" found a similar prevalence of early menarche among women experiencing infertility and two thirds of the studied women had regular menstruation. On the other hand, ***El-Amiri et al., 2021*** in a study entitled "Sexual function and satisfaction in couples with infertility: a closer look at the role of personal and relational characteristics, Canada" diverged in its observations regarding menstrual regularity among women facing infertility as less than one third reported irregular menstrual cycle and more than half of women had moderate amount of bleeding.

In relation to infertility treatment history, the current study findings revealed that more than one third of the studied women had more than 7 years of marriage with mean 6.44 ± 5.04 years and more than two thirds of the studied women had less than four years of infertility with mean 3.37 ± 2.09 years. In agreement with the present findings, a study conducted by ***Iordachescu et al., 2021*** in a study entitled "Emotional disorders, marital adaptation and the moderating role of social support for couples under treatment for infertility, Romania" similarly reported an extended

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duration of marriage from 7-10 years with mean years 7.9 ± 4.30 among women experiencing infertility and the research highlighted that a significant proportion of participants had been married for several years, aligning with the notion that infertility often becomes a prominent concern for couples after an extended period of attempting to conceive. Also, ***El-Amiri et al., 2021*** presented similar observations regarding the duration of infertility. The findings indicated infertility duration 3-6 years with mean 4.8 ± 2.11 years of infertility among the study participants compared to the current study's results. Also, in contrast ***Marvi et al., 2019*** that conducted a study entitled "The Effect of Sexual Education based on Sexual Health Model on the Sexual Function of Women with Infertility, Iran" illustrated that the mean duration of marriage of nursing instructions and control groups were 8.52±4.65 and 8.77±4.76 years respectively. From the researchers' point of view such discrepancies highlighted the heterogeneity in infertility experiences among women and underscored the need for personalized approaches in fertility treatments and support. These differences might stem from variations in the studied women's regional factors, emphasizing the importance of considering diverse contexts in interpreting infertility-related research.

As regards previous an external fertilization processes, the current study findings indicated that most of the studied women did not undergo this process. Also, regarding suffering from any chronic diseases, more than two thirds did not suffer from any chronic diseases and relating to previous surgeries, less than one third did not perform any surgeries. In alignment with the current study, ***Iordachescu et al., 2021*** who similarly found a significant proportion of women not undergoing external fertilization processes, indicating that assisted reproductive technologies may not be universally pursued or accessible among women dealing with infertility. Regarding previous surgeries, ***Karakas et al., 2019*** agreed with the current study's observation that nearly one-third of participants did not undergo any surgical procedures. However, ***Yilmaz, et al.,2020*** in a study entitled "Relationship between marriage satisfaction and sexual functions in couples undergoing infertility treatment, Turkey" presented contrasting results regarding the prevalence of chronic diseases among women experiencing infertility. The findings suggested a higher incidence of chronic health conditions compared to the current study's observation. These discrepancies emphasize the importance of considering the health diversity within the population of women dealing with infertility. From the researchers' point of view, an external fertilization process or assisted reproductive technologies such as in vitro fertilization was the last choice of the women for infertility treatment, and this might be due to the high costs of these technologies. Also, there was no relationship between suffering from chronic diseases and performing previous surgeries and infertility.

As regards the studied women's knowledge about fertility, the current study results revealed that about more than one third of the studied women had correct answer about definition of fertility that was the natural ability to produce offspring. While most of the studied women had incorrect answer regarding ghee that was one of the factors that affect a woman's fertility. Similarly, ***Capotosto., 2021*** in a study entitled "An integrative review of fertility knowledge and fertility-awareness practices among women trying to conceive, USA" also stated that most of the study subjects believed that they should receive fertility-awareness education because of having poor knowledge regarding fertility. Concerning the studied women' knowledge about infertility, the current study results revealed that more than one third of the studied women had correct answer regarding secondary infertility that was of the types of infertility. While more than two thirds of the studied women had incorrect answer regarding examination of ovarian reserve that was one of the diagnostic tests for women infertility. For instance, ***Mahmoud et al., 2023*** who reported similar unsatisfactory outcomes about women's knowledge regarding infertility. In relation to total knowledge scores of the studied women, the current study results indicated that most of the studied women had unsatisfactory total knowledge scores about fertility and infertility.

Similarly, ***Dattijo et al., 2020*** in a study entitled "Knowledge of infertility among infertile women in Bauchi, Northern Nigeria" and ***Verulava et al., 2022*** in a study entitled "Fertility Awareness and Knowledge among Infertile Women in Georgia" reported analogous results, demonstrating that most of the studied women had unsatisfactory information about fertility and infertility. From the researcher's point of view, these unsatisfactory knowledge about fertility and infertility might be due to the shortage in using different educational methods as power point

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presentations, videos and printed materials such as booklet that facilitated the access to information and enhanced the women knowledge about fertility and infertility.

In relation to assessment of the studied women according to the sexual function scale, the current study findings revealed that, the mean desire domain of the studied women was 2.7 ± 0.84. Moreover, the mean pain domain of the studied women was 2.8 ± 0.97. Also, the total mean sexual function index scores were 19.15 ± 4.22. The current study agreed with, ***Dastaran et al., 2022*** who found that the mean scores for sexual function, sexual self-efficacy and marital satisfaction were improved among studied groups 4 and 8 weeks post nursing instructions than pre nursing instructions that were bad sexual scores. While, the result wasn't agreed with, ***Mohammadzadeh et al., 2021*** who mentioned that all domains of female sexual function index had a significant elevation. From researcher's point of view, infertile women had troubles regarding sexual confidence, self-respect and difficulty to precise their concerns or keep up autonomy in marital connections. The World Health Organization ***WHO., 2021*** reported that it was important to understand, help and educate couples about sexual problems so could be treated better. However, doctors and nurses often ignored sexual health.

Regarding assessment of the studied women according to the Taylor anxiety scale, the current study findings revealed that, the majority of the studied women (85.0 %) had severe anxiety. In agreement of the current study, ***Fawaz et al., 2019*** in a study entitled "Effect of preparation program on reducing anxiety level among women undergoing Assisted Reproductive Treatment Process, Egypt" who indicated that more than two thirds of the studied women had high levels of anxiety. On the contrary, a study conducted by ***Abdolahi et al., 2019*** that entitled "Effect of cognitive behavioural therapy on anxiety and depression of infertile women, Iran" illustrated that, two thirds of the infertile women had moderate level of anxiety. From the researcher's point of view, this controversy might be due to type of the sample, different personal characteristics as (age, occupation, income and education of the study sample) and different culture of the study sample.

Considering assessment of the studied women according to the ENRICH scale, the current result revealed that, more than half of the studied women (55.0 %) hadn't marital satisfaction regarding total scores of ENRICH scale interpretation. The results of ***Masoumi et al., 2020*** who conducted a study entitled "Effect of Marital Relationship Enrichment Program on Marital Satisfaction, Marital Intimacy and Sexual Satisfaction of Infertile Couples, Iran" agreed with the study findings as showed that, two thirds of the studied couples had marital dissatisfaction. On the contrary, ***Mohaddesi et al., 2022*** who conducted a study entitled "Correlation Between Marital Satisfaction and Mental Health in Infertile Couples referred to Kosar Infertility Clinic in Urmia: A Cross-Sectional Study, Iran." that reported that in one quarter of infertile couples, infertility had a positive effect on marital satisfaction and strengthens the relationship between the couples. From the researcher's point of view, infertility influenced on all sides of marital relationship as financial and sexual that had a bad effect on martial satisfaction. Also, the discrepancies might be due to the society differences.

Concerning the correlation between study parameters as regarding the correlation of age and age at the first menstruation with the calculated scores, the current study revealed that, there was a negative correlation between age and arousal, lubrication, orgasm and satisfaction scores as increasing of the studied women age reduce arousal, lubrication, orgasm and satisfaction scores. In a similar vein, ***Abdolahi et al., 2019*** observed a negative correlation between age and specific aspects of sexual function, aligning with the current study findings on arousal, lubrication, orgasm, and satisfaction. On disagreement, ***Fawaz et al., 2019*** reported nuanced findings with age showing a positive correlation with sexual satisfaction among studied women. In addition, there was a strong positive correlation between age and psychological manifestations. ***Abdolahi et al., 2019*** aligned with the current study results who reported a positive correlation between age and somatic and psychological manifestations. On the other side, ***Yoldemir et al., 2021*** who conducted a study entitled "Comparison of anxiety scores between unexplained primary

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and secondary infertile couples, Turkey" reported that there was no correlation between age and somatic manifestations neither before nor after nursing instructions.

Regarding the correlation of years of marriage and years of infertility with the calculated scores, the present study illustrated that, there was a negative correlation between years of marriage and a weak negative correlation between years of infertility and the sexual function indicator Mean scores. On the same line, ***Iordachescu et al., 2021*** supported the idea that the duration of marriage could influence badly on sexual experiences. While ***Dastaran et al., 2022*** disagreed with the present study results, reporting a positive correlation between years of marriage and sexual satisfaction. Their results suggested that, in some cases, longer marital durations were associated with higher sexual satisfaction.

4. Conclusion

Based on the study findings, it was concluded that infertility had a negative effect on sexual dysfunction, anxiety and marital satisfaction of infertile women. Also, the majority of the studied women had unsatisfactory total knowledge scores about fertility and infertility. In addition, the mean sexual function indicator scores of the studied women were low. Moreover, the majority of the studied women had severe anxiety. Furthermore, more than half of the studied women hadn't marital satisfaction regarding total scores of ENRICH scale interpretation and the results of the current study answered the research question and achieved the aim of the study.

5. Recommendations

Based on the main study findings, the following recommendations are suggested:

- Development of nursing instructions guided by coping model to improve knowledge and marital satisfaction and decrease sexual dysfunction and anxiety among infertile women.
- Enhancement of infertile women' awareness of their sexual relationship, anxiety, and marital satisfaction at early stage during frequent antenatal care.

Recommendations for further studies:

- Applying regular periodical training programs for nurses who are working in maternity clinics to provide proper counseling services for the infertile women regarding sexual dysfunction, anxiety and marital satisfaction.
- Replicating the current study by using larger samples of the population and include more than one hospital with different affiliations in different regions in Egypt in order to generalize the findings.

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