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Effect of an Educational Intervention for Infertile Women Regarding Natural Fertility Methods and Sexual Skills for Improving Sexual Function

Soad A. Ramadan, Amira R. Said*

Obstetrics & Women's Health Nursing, Faculty of Nursing, Benha University, Egypt
*Corresponding author: amira.refaat@yahoo.com

Abstract **Background:** Nowadays, infertility is considered as a social concern which can lead to the couples' psychological imbalance, relationship disturbance and divorce. Sexual satisfaction is mainly affected by the consequences of infertility, such as decrease of self-esteem, depression, anxiety, and sexual relationship with failure in reproduction. **Aim:** was to evaluate the effect of an educational intervention on infertile women' knowledge, practices and attitude regarding natural fertility methods and it is effect on female sexual function. **Research design:** A quasi experimental design was used. **Setting:** The study was carried out in the Gynecology clinic at Benha University Hospital. Purposive **sample** was used to recruit 100 infertile women attending to the Gynecology clinic at Benha University Hospital during seven months. Three **tools** were used for data collections: A Structured interviewing questionnaire, women's attitude toward adaptation of infertility and female sexual function index was conducted to assess sexual function in infertile women. **Results:** Revealed that 49.0% of women had poor knowledge before intervention. However, 73.0% of them had good knowledge after one month of intervention respectively. Moreover, there was a highly statistically significant correlation ($P < 0.01$) between the infertile women' sexual function scores pre and post one month of intervention. As well as, only 4.0 % of the studied women had positive attitude toward adaptation of infertility before intervention. Meanwhile, after one month of intervention the positive attitude changed to 92.0% respectively. **Conclusion:** the implementation of an educational intervention was effective and significantly improved women's knowledge, practice and attitude towards natural fertility methods and sexual skills. The study **recommended** that adequately planned in-service training programs related to sexual function and satisfaction must be established to develop women's knowledge, practices and attitude in order to fit newly developed concepts for adaptation.

Keywords: *Infertility, fertility methods, female sexual function*

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1. Introduction

Prevalence of infertility in Egypt according to a study conducted by the Egyptian Fertility Care Society and sponsored by the World Health Organization, infertility in Egypt affects 12 percent of Egyptian couples. Of these women, 4.3 percent suffer from primary infertility (have never been pregnant) and 7.7 percent suffer from secondary infertility (have been pregnant before, even if the pregnancy ended in a miscarriage or an ectopic pregnancy). The number of women aged 15 to 49 years exceeds 25 million, which means that at least 3 million women are infertile in Egypt [20].

Numerous studies have demonstrated that infertile couples have significantly higher rates of sexual dysfunction and marital dissatisfaction. And also it has shown infertility has a significantly greater effect on female's sense of sexual identity than do other stressors. The causal factors of infertility, including desire, arousal, orgasm, and pain disorders, can lead to limited or avoided sexual activity, especially around the ovulation time, so the association between infertility and sexuality is complex and bidirectional: infertility can be considered either as a cause or a consequence of sexual dysfunction [9].

Sexual health is considered of fundamental importance to the longevity of affective relationships and it is seen as one of the factors that help the occurrence, recovery & maintenance of well-being and overall good health of the woman. Initially human sexual response was defined as a four-phasic phenomenon, consisting of: desire, arousal, orgasm and resolution, therefore, a sexual dysfunction involves a change in one or more phases of the sexual response cycle or the presence of pain associated with the intercourse, which manifests itself in a persistent or recurrent way [1].

Sexual function is an important component of health and quality of life. Although sexual problems are related to both partners, sexual problems are highly prevalent

in women: approximately 95% of women have one and more sexual concerns [16]. Female sexual function is multifactorial in nature, comprising psychosocial, neurologic, and hormonal processes. Female sexual dysfunction is a continuum of psychosexual disorders centered on sexual desire with interrelated problems of arousal, orgasm, and sexual pain that interrupts quality of life for many women [6].

The nurse plays a crucial role to prevent acquired female infertility through identified interventions for maintaining a healthy lifestyle through provides monitoring and counseling for continued support such as eating a well-balanced healthy nutritious diet, with plenty of fresh fruits, vegetables, and maintaining a normal weight to reduce the incidence of metabolic syndrome by making every woman who already have metabolic syndrome can prevent many of the serious health problems [17].

More over the nurse must advice the infertile women with Physical activity is usually a safe and beneficial treatment for women with metabolic syndrome and its consequences, atherosclerotic cardiovascular disease and type 2 diabetes. Both aerobic and resistance exercise are effective therapies. For most women, the recommendation is to do moderately intense activity for 30 minutes per day. Aerobic activity should be performed in episodes of at least 10 minutes, preferably spread throughout the week [13]. When women come to doctors, clinics, and hospitals for any reason, healthcare providers should be aware of those who might have metabolic syndrome. So, some clinicians suggest that measure waist size, blood pressure, blood lipid and blood glucose levels [30].

1.1. Significance of the Study

Infertility varies across regions of the world and is estimated to affect eight to twelve percent of couples worldwide. One in every four couples in developing countries had been found to be affected by infertility [21]. **Prevalence of infertility in Egypt,** 12 percent of Egyptian couples was affected. Of these women, 4.3 percent suffer from primary infertility and 7.7 percent suffer from secondary infertility [20]. In addition, from the researchers' clinical experience, they found that there was poor knowledge and negative attitude regarding natural fertility methods and sexual function among infertile women. Hence, it is imperative to raise women's knowledge about recent issues of sexual function and satisfaction. This study was conducted to improve women's knowledge, practices and attitude regarding natural fertility methods and sexual skills by applying an educational intervention.

1.2. Aim of the Study

This study aimed to evaluate the effect of an educational intervention on infertile women's knowledge, practices and attitude regarding natural fertility methods and sexual skills.

This aim was achieved through the following objectives:

1- Assessment knowledge, practice and attitude of infertile women regarding natural fertility methods and sexual skills.

2- Designing and implementing an educational intervention regarding natural fertility methods and sexual skills.

3-Evaluate the outcome of an educational program on infertile women's knowledge, practices and attitude regarding natural fertility methods and sexual skills.

1.3. Research Hypothesis

Infertile women who received an educational intervention would have improved knowledge, practices and positive attitude toward natural fertility methods and sexual skills than before intervention.

2. Subjects and Method

2.1. Research Design

A quasi experimental design (pre and post intervention) was utilized to achieve the aim of the present study.

2.2. Setting

This study was conducted at the Gynecology clinic at obstetrics & gynecology department in Benha University Hospital located in Benha city at Qalioubia governorate. This particular setting was chosen because it is main hospital providing care for women with different social backgrounds and it's also the referral center infertility and high risk women also its clinical training setting for nursing students in Faculty of Nursing. This hospital started to provide care since its opening in 1981; it provides free and economical service to all patients.

2.3. Subjects

2.3.1. Sample Type

Purposive sample was used as it included all infertile women attending Gynecology clinic in Benha University Hospital.

2.3.2. Sample size

The study was conducted over a period of (7) months, The total study sample through this period was attended to the Gynecology clinic in Benha University hospital (108) infertile women were recruited into the study but (8) of them did not complete the questionnaires, so the study was conducted on (100) infertile women.

2.3.3. The Inclusion Criteria

The inclusion criteria of the study were being infertile women having no children or step children after one year of regular, unprotected intercourse. Besides, all the participants were sexually active, defined as having engaged in sexual intercourse with a partner in the past 4 weeks, the husband already exists with her wife and not travelling.

2.3.4. The Exclusion Criteria

The exclusion criteria of the study were having family disputes during the recent week, having physical problems of spinal cord injury, mutilation, paralysis, and limb deformity, having psychological problems, having medical diseases, such as cardiovascular and pulmonary disorders, hyperthyroidism, hypothyroidism, epilepsy, and diabetes,

having experienced stressful events, such as death or acute disease of close relatives and major changes in life during the past three months, being drug abusers, and using drugs for increasing the sexual desire.

2.4. Tools of Data Collection

Three main tools were used for data collection

I- A Structured Interviewing Questionnaire

It was designed by the researchers after reviewing related literature it was written in an Arabic language in the form of close and open-ended questions. It encompassed three major parts:

First part: Included socio demographic data and obstetric characteristics such as (age, educational level, employment status, type of family, place of residence, menarche age, duration of infertility, outcome of the previous pregnancy for infertile women with secondary infertility, and frequency of sexual activity.

Second part: Included anthropometric measurements to calculate of BMI (weight in kg and height in meters. Using a portable stadiometer, the researcher measured the women's height and weight without shoes and with light clothing. Then, the subjects' BMI was calculated as weight/height^2 (kg/m^2) [29].

Third part: Included general women's knowledge regarding natural methods to increase fertility& chances of conception, it consisted of (10) items (definition of fertility, natural methods to increase fertility, factors affecting ability of women on fertility, effect of sexual health on fertility, effect of obesity on fertility, definition of infertility& types of it, risks of infertility, diagnostic studied for infertility, and treatment of infertility).

Scoring system

Each item was assigned a score of (2) given when the answer was completely correct, a score (1) was given when the answer was incompletely correct and a score (0) was given when the answer was incorrect or unknown. The mean and standard deviation was calculated. In addition, women's total knowledge score was converted into total percent and graded as the following; poor when total score was (less than 60%), average when total score was (60% to less than 75%) and good when score total was (75% to 100%).

II- Female sexual function index questionnaire was **adapted from** [19] & [27] to assess sexual function of the studied infertile women. This questionnaire consists of 19 questions, investigating the subjects in 6 domains, namely; sexual desire, sexual arousal, lubrication, orgasm, sexual satisfaction, and pain during intercourse.

Scoring System: The questions are scored ranging from 0 to 5 and Scores obtained for each item are then summed up within each domain and then multiplied by a constant factor to yield individual domain scores. It should be mentioned that sexual desire is covered by questions 1 and 2, excitement by the sum of questions 2, 4, 5, and 6, lubrication by adding questions 7, 8, 9, and 10, orgasm by the sum of questions 11, 12, and 13, sexual satisfaction by adding questions 14, 15, and 16, and pain by summing up questions 17, 18, and 19 [26]. Accordingly, the total FSFI score is the sum of scores obtained for each domain, and ranges from 2 to 36, with a higher score associated with a lesser degree of sexual dysfunction. Sexual activity was classified as good if FSFI=30 or more, intermediate if FSFI= 23-29 and poor if FSFI was <23.

III Women's Attitude towards Adaptation of Infertility

This tool was developed by the researchers after reviewing related literatures to assess women's attitude pertaining adaptation of infertility and consisted of (13) items such as (maintaining a suitable weight because it has a negative effect on infertility and sexual function, losing enjoyment of sex because of fertility problem, feeling with failed of sexual relation because of infertility, feeling of frustrating when thinking about sexual life, feeling of talking to other partner about sexual matters, infertility have a negative impact on the sexual relationship, satisfing with the frequancy of sexual activity .....etc.,).

Scoring system

The items were judged according to a three point Likert scale continuum from agree (3), neutral (2), and disagree (1). Summing up the scores of the items then the overall score gave total attitude score. Women's total attitude score was graded as the following; negative when total score was (less than 60 %), neutral when total score was (60% to 75%) and positive when total score was (75% to 100%).

2.5. Method

2.5.1. Preparatory Phase

The preparatory phase was the first phase of the study, the researcher carried out through review of local and international related literature about the various aspects of the research problem. This helped the researcher to be acquainted with magnitude and seriousness of the problems, and guided the researcher to prepare the required data collection tools.

2.5.2. Approval

An official approval to conduct the study was obtained by submission an official letter issued from the Dean of Faculty of Nursing at Benha University to the director of Benha University Hospital. The title and purpose of the study were illustrated as well as the main data item to be covered.

2.5.3. Legal Aspects for Ethical Consideration

Approvals of women were obtained before data collection and after explaining the purpose of the study to the women.

- Anonymity was assured as the filled questionnaire sheets were given a code number (not by names).
- The women were ensured that questionnaire sheet will be used only for the purpose of the study and will be discarded at the end of the study.
- The women who participated in the study were informed about having the right to withdraw at any time without giving any reason.
- Each participant woman in the study was informed that her rights would be

- Secured, informed about the nature, process, and expected outcomes of the study.

2.5.4. Tools Validity and Reliability

The tools for data collection were developed after reviewing of current and past national and international literature related to title of the study by using available local and international books, magazines, periodicals and computer search to develop study tools then this tool was ascertained by a jury consisting of five experts related to field one professor of obstetrics and gynaecology medicine, two professors obstetrical and gynaecological nursing, one professor of psychiatric medicine and one professor of psychiatric nursing, They were requested to express their opinions and comments on the developed tools and provide any suggestions for any additional or omission of items. Changes were done according to experts opinions, some items were added to questionnaire sheet. This phase was carried out in a period of one month.

2.5.5. Pilot Study

A pilot study was carried out on 10% (6 days) of total duration of collected data, included (12) women fulfilling the previously mentioned criteria, it was conducted to evaluate the simplicity, clarity, validity and reliability of the tools also to find the possible problems that might face the researcher and interfere with data collection and to estimate the time needed to fill in the sheets. According to the results of the pilot study, simple modifications were done as rephrasing some questions and removing two questions. The pilot study sample excluded from study sample.

The main purpose of pilot study

- Evaluate the applicability and clarity of tools.
- Assess the feasibility of field work.
- Determine the time needed to finish sheet.
- Identify a suitable place for interviewing women.
- Detect any possible obstacles that might face the researcher and interfere with data collection.

Results of the Pilot Study

After conducting the pilot study, it was found that the sentences of the tool were clear, relevant and applicable but,

- Few words have been modified.
- Tools were relevant and valid.
- No problem that interferes with the process of data collection was detected.
- The tools were reconstructed and made ready for use

2.6. Procedures

The following phases were adopted to fulfil the aim of the current study; assessment, planning, implementation, and evaluation phases. These phases were carried out from the beginning of November 2016 to end of May 2017 covering Seven Months.

2.6.1. Assessment Phase

This phase encompassed interviewing the women to collect baseline data, at the beginning of interview the researchers greeted each woman, explained the purpose, duration, and activities of the study. Pre-test was done to assess women's' knowledge, practice and attitude regarding natural fertility methods, sexual skills and also weight maintenance and it is effect on sexual dysfunction. The data obtained during this phase constituted the base line for further comparison to evaluate the effect of an educational intervention. Average time for the completion of each women interview was around (20-30 minutes).

2.6.2. Planning Phase

Based on baseline data obtained from pre-test assessment and relevant review of literature, the educational intervention was developed by the researchers in a form of printed Arabic booklet to satisfy the studied women's' deficit knowledge sexual dysfunction and natural fertility methods.

General objective of the educational intervention was to improve women's knowledge, practices and attitude about natural fertility methods and sexual function.

Specific objectives of the educational intervention: after completion of the educational intervention, each woman should be able to:

- Define fertility and infertility.
- Identify obesity & body mass index and it is effect on infertility and sexual function.
- Discuss sexual health and sexual dysfunction.
- Recognize natural fertility methods.
- Enumerate types of food which increase fertility.
- Determine risks for infertility.
- Identify diagnostic studies for infertility.
- Discuss line of treatment of infertility.
- Identify how to modify her lifestyle for the best to improve sexual function.
- List types of exercises for maintenance of weight.

2.6.3. Implementation Phase

The researchers visited the previous mentioned setting two days/week from 9 am to 1 pm. The educational intervention involved (4) scheduled sessions. These sessions were repeated to each subgroup of (3-5) women. The duration of each session lasted from half an hour to one hour including periods of discussion according to their achievement, progress and feedback, two session per day to each group which incorporated by ten minute as break to take coffee break for each infertile woman . Also At the beginning of the first session an orientation to the educational intervention and its aims took place; Arabic language was used to suit the women's level of understanding. Feedback was given in the beginning of each session about the previous one. Different methods of teaching were used such as modified lecture, group discussion and brainstorming. Suitable teaching media were included an educational booklet that distributed to all women in the first day of the educational intervention as well as audio-visual aids. After one month from completion of educational intervention the third day /week for follow up but the first and second day for new infertile women in each week for each group.

2.6.4. Evaluation Phase

During this phase, the educational program was evaluated by using the same format of tools which used

before the program implementation. Follow up were scheduled one month after the program implementation, to evaluate infertile women's' knowledge, practices and attitude in order to test infertile women's retention of knowledge , improving of practice and attitude regarding natural fertility methods and it is effect on female sexual function. The researcher used tools; A Structured interviewing questionnaire, women's attitude towards adaptation of infertility, Female sexual function index questionnaire. At almost time the researcher followed infertile women via telephone.

2.6.5. Limitation of the Study

There was some limitation when data were collected as:

- The time of infertile women was one of the obstacles to fill sheet especially after the exit from gynecological clinic.
- Some women didn't want to speak about sexuality.
- Some women needed to follow up with physiotherapist to attain ideal weight.

2.6.6. Strengths of the Study

One of the strong points of this study was using FSFI questionnaire which contains the key dimensions of sexual function, has a high reliability as well as validity, and has been less used in Egyptian studies.

3. Statistical Design

After completion of data collection, the data were organized and tabulated, statistically analyzed using Data entry was done using Epi-Info 6.04 computer software package, while the study data were statistically analyzed using the SPSS software (Statistical Package for the Social Sciences, version 20, SPSS Inc, and Chicago, III, USA). Descriptive statistics, frequency, percent, mean, standard deviation, maximum, and minimum were used in this study. Student's T-test was used to compare the FSFI domains between primary and secondary infertility. In addition, one-way ANOVA and post-hoc tests were used to determine the relationship between FSFI and BMI scores. Besides, P-value<0.05 was considered as statistically significant.

3.1. Statistical Methods

Data are summarized using:

- **Arithmetic mean:** as average describing the central tendency of observations.
- **Descriptive statistics:** in the form of frequencies, percentage means and The Standard Deviation.
- **Number of observations:** for each the percentage (for qualitative variables
- **Student's t-test:** is a test used to study the association between two quantitative variables.
- **Chi square test:** statistical significance of the result was considered as follows:

- Non Significance difference obtained at p-value (> 0.05)
- Significance difference obtained at p-value (≤ 0.05)
- A highly significant difference obtained at p-value (≤ 0.001)

4. Results

Table 1 describes the socio-demographic characteristics of the infertile women. It illustrated that, the mean age of infertile women was (27.89) with standard deviation (±8.06) years, the majority of infertile women were in the age group 25 to 30 years old (38.0%) the most of infertile women are housewife (84.0%) with the Secondary school (37.0%). The most of infertile women' family type is nuclear (79.0%). Also, most of them (61.0%) live in rural area.

Table 2 describes the obstetric characteristics of the infertile women. It illustrated that the majority infertile women age of menarche was (66.0%) from 13 to 15 years, the majority infertility duration of infertile women was (62.0%) from five year to nine years, while the minority infertility duration of the infertile women (9.0%) was from 10 years to 14 years, nearly above of them, sexual activity frequency (54.0%) was from 2 to 4 times per week. Also (18.0%) of them was birthed from the previous pregnancy outcome of infertile women with secondary infertility.

Figure 1 displays that approximately three quarter of the sample of infertile women with primary infertility was (75%) and only one quarter of them with secondary infertility was (25%).

Figure 2 shows that nearly more than half of the samples of infertile women (57%) were overweight and obesity from class I.

Table 3 Represents that there was statistically and highly statistically significant difference before and after one month of implementing educational intervention regarding to women's' knowledge of fertility and infertility.

Figure 3 portrays that 49.0% of women had poor knowledge before intervention. However, 73.0% of them had good knowledge after one month of intervention respectively.

Table 4 illustrates that there was a highly statistical difference between infertile women's sexual function index domains pre and post one month intervention.

Table 5 shows that negative correlation between body mass index and items of female sexual function index pre and post intervention except in pain with body mass index had positive correlation pre intervention.

Table 6 explains that there was a highly statistical difference regarding to their attitude toward adaptation of infertility pre &post one month of intervention among infertile women.

Figure 4 illustrates that only 4.0 % of the studied women had positive attitude toward adaptation of infertility before intervention. Meanwhile, after one month of intervention the positive attitude changed to 92.0%.

Table 7 reveals that, there was no statistically significant correlation between knowledge and attitude before intervention. On the other hand, there was statistically significant correlation between knowledge and attitude after one month of intervention.

Table 1. Distribution of the studied infertile women according to their socio demographic characteristics (N=100)

Socio-demographic characteristics	No	%
Age/year		
< 25 years	30	30.0
25 - 30 years	38	38.0
31 - 35 years	18	18.0
36 - 40 years	11	11.0
> 40 years	3	3.0
Mean ± SD	27.89 ± 8.06	
Educational qualifications		
Illiterate	22	22.0
Primary or preparatory school	30	30.0
Secondary school	37	37.0
University	11	11.0
Employment		
Employed	16	16.0
Housewife	84	84.0
Family type		
Nuclear	79	79.0
Extended	21	21.0
Residence		
Rural	61	61.0
Urban	39	39.0

Table 2. Distribution of the studied infertile women according to obstetric characteristics (N=100)

Obstetric characteristics	No	%
Menarche's age/ year		
< 10 years	3	3.0
10 - 12 years	20	20.0
13 - 15 years	66	66.0
16 - 18 years	11	11.0
Infertility duration / year		
1 - 4 years	29	29.0
5 - 9 years	62	62.0
10 - 14 years	9	9.0
Frequency of sexual activity		
Once per month	1	1.0
2-4 per month	31	31.0
2-4 per week	54	54.0
>4 per week	14	14.0
Outcome of previous pregnancy for infertile women with secondary infertility	(N=25)	
Abortion	5	5.0
Ectopic pregnancy	2	2.0
Birth	18	18.0

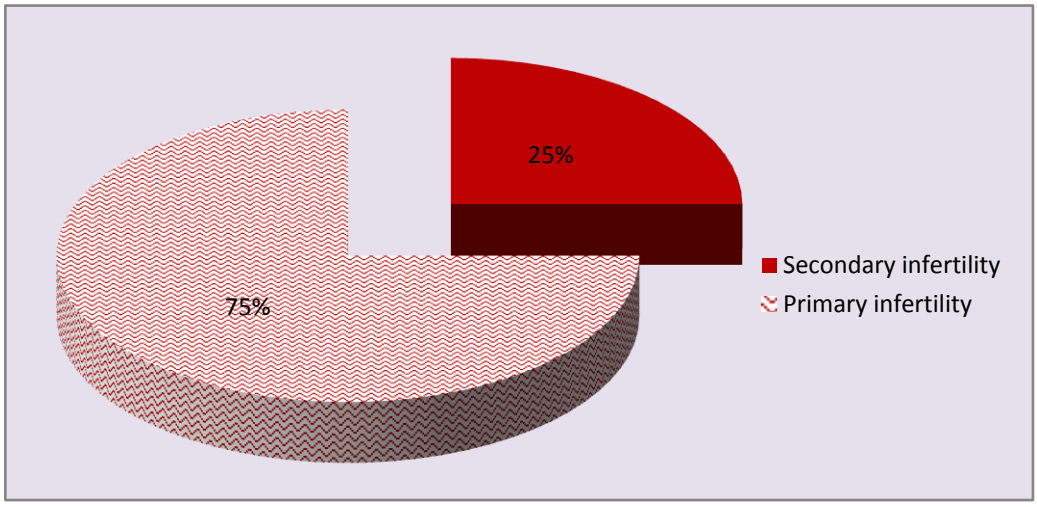

Figure 1. Percentage distribution of infertile women according to types of infertility (n=100)

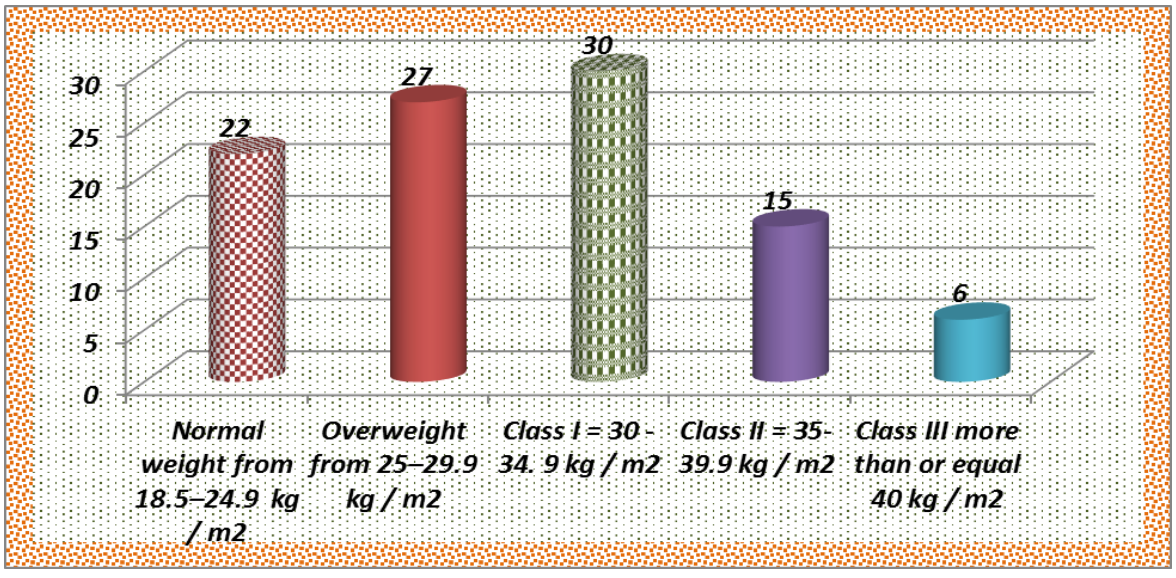

Figure 2. Percentage distribution of infertile women regarding body mass index and obesity degree (n=100).

Table 3. Distribution of the studied sample according to their knowledge regarding fertility and infertility pre & post one month of intervention (n=100)

	Pre intervention				Post intervention				Chi square test	P value
	Inadequate		Adequate		Inadequate		Adequate			
	No	%	No	%	No	%	No	%		
Definition of infertility	51	51.0%	49	49.0%	24	24.0%	76	76.0%	15.55	<0.001**
Natural methods increase fertility	45	45.0%	55	55.0%	27	27.0%	73	73.0%	7.03	<0.05*
Factors affecting ability of women on fertility	57	57.0%	43	43.0%	28	28.0%	72	72.0%	17.20	<0.001**
Effect of sexual health on fertility	46	46.0%	54	54.0%	21	21.0%	79	79.0%	14.02	<0.001**
Effect of obesity on fertility	47	47.0%	53	53.0%	19	19.0%	81	81.0%	17.73	<0.001**
Types of food which increase fertility	49	49.0%	51	51.0%	20	20.0%	80	80.0%	18.60	<0.001**
Sexual health & sexual dysfunction and its effect on fertility.	62	62.0%	38	38.0%	20	20.0%	80	80.0%	36.46	<0.001**
Risks of infertility	47	47.0%	53	53.0%	27	27.0%	73	73.0%	8.58	<0.001**
Diagnostic studies for infertility	47	47.0%	53	53.0%	21	21.0%	79	79.0%	15.06	<0.001**
Treatment of infertility	41	41.0%	59	59.0%	21	21.0%	79	79.0%	9.35	<0.05*

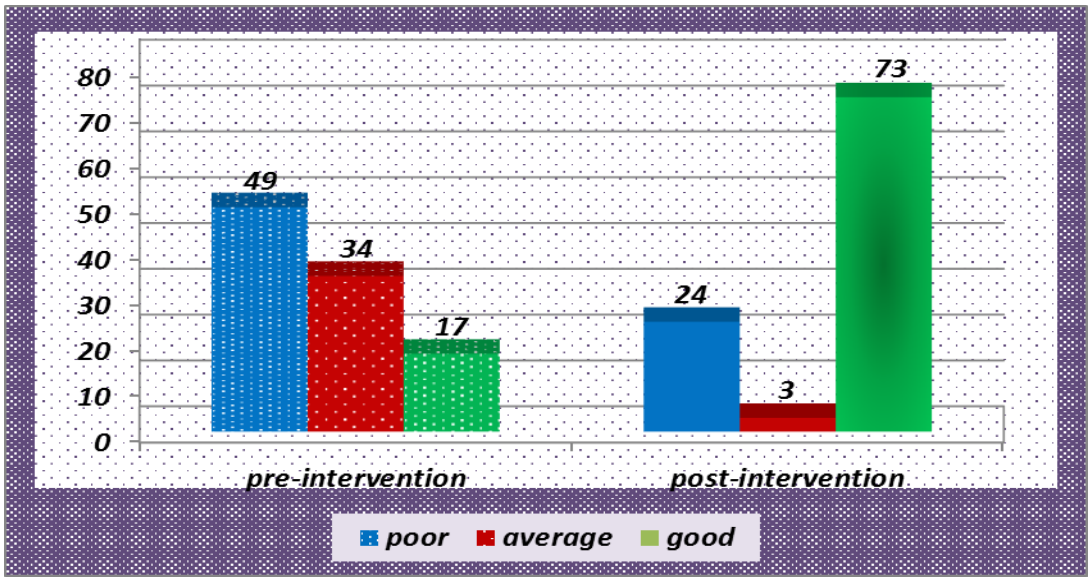

Figure 3. Distribution of the studied sample according to their total knowledge scores pre& post one month intervention (n=100)

Table 4. Mean and standard deviation of infertile women regarding FSFI questionnaire scores pre & post one month of intervention (n= 100)

Sexual function	Pre intervention	Post intervention	Paired t test	P value
	Mean ±SD	Mean ±SD		
Desire				
Desire: frequency	2.69±1.00	1.30±.461	14.436	.000
Desire: level	2.98±.75	2.19±.394	10.639	.000
Arousal				
Arousal: frequency	3.81±1.02	2.16±.368	16.356	.000
Arousal: level	3.98±.96	2.19±.394	19.365	.000
Arousal: confidence	3.80±1.06	2.16±.368	15.214	.000
Arousal: satisfaction	3.64±1.05	2.19±.394	14.822	.000
Lubrication				
Lubrication: frequency	3.68±.196	5.17±.377	-12.575	.000
Lubrication: difficulty	4.86±1.23	2.11±.314	20.581	.000
Lubrication: frequency of maintaining	3.75±1.31	5.54±.520	-11.296	.000
Lubrication: difficulty in maintaining	4.68±1.31	2.32±.468	16.901	.000
Orgasm				
Orgasm: frequency	3.76±1.11	5.64±.502	-13.921	.000
Orgasm: difficulty	4.94±1.26	2.32±.468	18.362	.000
Orgasm: satisfaction	3.28±1.23	2.11±.314	9.317	.000
Satisfaction				
Satisfaction: with amount of closeness with partner	3.04±1.10	1.18±.386	16.485	.000
Satisfaction: with a sexual relationship	2.03±.858	1.15±.358	10.424	.000
Satisfaction: with overall sex life	2.07±.85	5.50±.627	-30.585	.000
Pain				
Pain: frequency during vaginal penetration	3.81±1.26	5.60±.512	-15.021	.000
Pain: frequency following vaginal penetration	3.89±1.34	5.58±.551	-11.908	.000
Pain: level during or following vaginal penetration	3.94±1.17	5.58±.551	-14.711	.000

Table 5. Correlation between FSFI scores according to body mass index in infertile women pre and post one month of intervention

Domain items	Body mass index			
	Pre-intervention		Post-intervention	
	R	p-value	r	p-value
Desire	-.196	.051	-.042	.679
Arousal	-.242*	.015	-.020	.844
Lubrication	-.201*	.044	-.007	.946
Orgasm	-.120	.236	-.063	.535
Satisfaction	-.087	.390	-.045	.658
Pain	.005	.959	-.132	.192

Table 6. Distribution of the studied sample according to their attitude toward adaptation of infertility pre &post one month of intervention (n = 100)

Items	Pre-intervention						Post-intervention						Chi square test	P value
	Disagree		Uncertain		Agree		Disagree		Uncertain		Agree			
	No	%	No	%	No	%	No	%	No	%	No	%		
1. Maintaining a suitable weight because it has a negative effect on infertility and sexual function	41	41.0	45	45.0	14	14.0	7	7.0	26	26.0	67	67.0	63.84	<0.001**
2. I find I've lost my enjoyment of sex because of fertility problem.	32	32.0	46	46.0	22	22.0	6	6.0	27	27.0	67	67.0	45.48	<0.001**
3. I feel just as attractive to my partner as before fertility problem.	37	37.0	51	51.0	12	12.0	3	3.0	31	31.0	66	66.0	17.16	<0.001**
4. I don't feel any different from other members of my sex because of fertility problem.	26	26.0	55	55.0	19	19.0	1	1.0	28	28.0	71	71.0	61.97	<0.001**
5. I feel that I've failed at sex because I can't get pregnant.	37	37.0	48	48.0	15	15.0	0	0.0	25	25.0	75	75.0	84.24	<0.001**
6. During sex, I can think in the children.	33	33.0	47	47.0	20	20.0	1	1.0	32	32.0	67	67.0	58.35	<0.001**
7. I feel frustrated When .I think about my sex life	42	42.0	50	50.0	8	8.0	0	0.0	20	20.0	80	80.0	113.76	<0.001**
8. sexual life ,it is an enjoyable part of my overall life.	44	44.0	53	53.0	3	3.0	0	0.0	20	20.0	80	80.0	130.35	<0.001**
9. Does infertility have a negative impact on the sexual relationship	39	39.0	56	56.0	5	5.0	0	0.0	28	28.0	72	72.0	106.63	<0.001**
10. I have lost confidence in my self as a sexual partner.	38	38.0	54	54.0	8	8.0	1	1.0	21	21.0	78	78.0	106.59	<0.001**
11. I satisfied with the frequency of sexual activity.	43	43.0	46	46.0	11	11.0	3	3.0	25	25.0	72	72.0	85.82	<0.001**
12. I feel good about my self	28	28.0	60	60.0	12	12.0	3	3.0	25	25.0	72	72.0	77.43	<0.001**
13. I feel that I can talk to my partner about sexual matters.	41	41.0	57	57.0	2	2.0	4	4.0	18	18.0	78	78.0	122.90	<0.001**

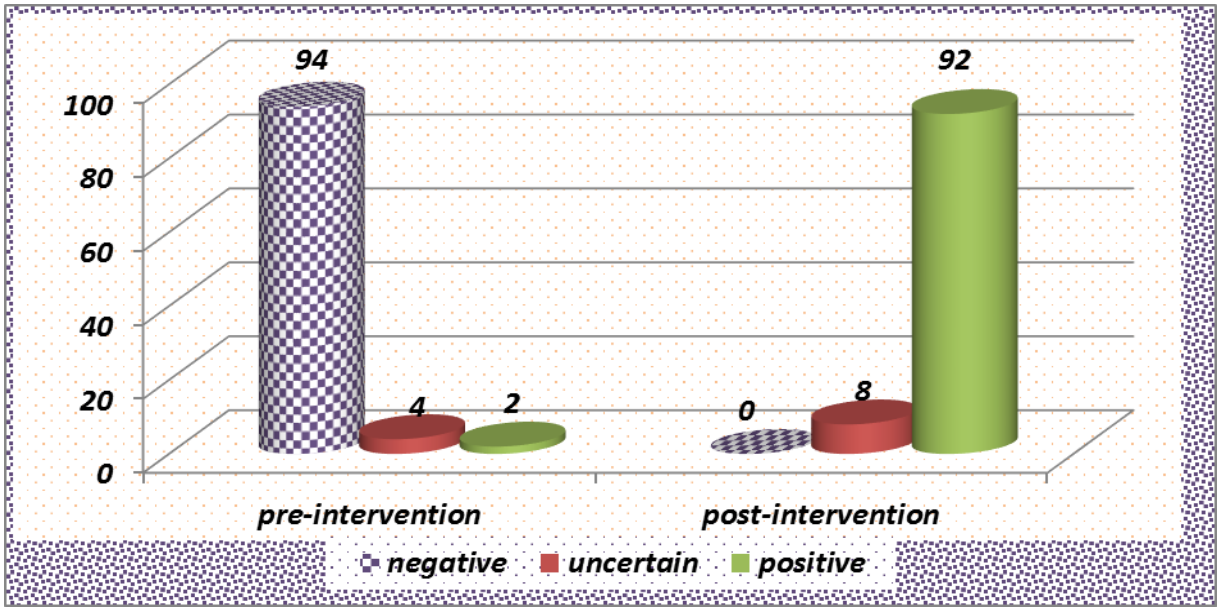

Figure 4. Distribution of the studied sample according to their total attitude pre & post one month of intervention n= 100

Table 7. Correlation coefficient between total scores of women's Knowledge and attitude before / after one month intervention

Items	Knowledge (pre.)		Knowledge (post.one month)	
	r	P value	r	P value
Attitude (pre.)	.024	.809		
Attitude (post)			.108	.287

5. Discussion

The present study was to evaluate the effect of an educational intervention on infertile women's knowledge, practices and attitude regarding natural fertility methods and sexual skills. This aim was highly significantly achieved through the present study findings within the frame of hypothesis which was infertile women who received an educational intervention would have improved knowledge, practices and positive attitude toward natural fertility methods and sexual skills than before intervention.

The current study findings were revealed that most of infertile women from age of 25 to 30 years old, the mean age of infertile women was (27.89) with standard deviation (±8.06) years, the most of them were housewife with the secondary school and live in rural area. Also family type of infertile women' was nuclear. As well as regarding the obstetrics characteristics of infertile women. It illustrated that the majority infertile women age of menarche from 13 to 15 years and the infertility duration of infertile women from five year to nine years, nearly above half of them, sexual activity frequency was from 2 to 4 times per week. Also one quarter of them was birthed from the previous pregnancy outcome of infertile women with secondary infertility.

The present study showed that approximately three quarter of the sample of infertile women with primary infertility and only one quarter of them with secondary infertility. This finding dis agrees with [11] who reported that, 45.2% and 54.8% had primary and secondary infertility among the infertile women, respectively. This could be explained by the infertile women with primary and secondary infertility might not have been ready to disclose their sexual problems to other people because sexuality is still considered a taboo subject to discuss openly in Egyptian culture.

Also, this study stated that approximately half of the sample of infertile women's body mass index was overweight obesity. This result in the same line with [25] , who reported that women with increased body mass index (BMI) are more likely to be infertile than those of normal weight. Statistics suggest that 70% women suffering from infertility also suffer from obesity. Obesity not only alters physical appearance, but also disrupt the balance of hormones and enzymes in the body. This could be explained by approximately 80 % of infertile women were overweight and obese related to lack of a more specific medical diagnosis of BMI with measurable characteristics.

Additionally [14], concluded that women who are overweight or obese are less likely to respond to fertility drugs. This occurs because the excessive weight obstructs the proper absorption of the fertility drugs used during treatments. Some IVF clinics refuse to treat obese women unless they reduce their BMI because fertility can be negatively affected by obesity; also the adverse effects of obesity on fertility and pregnancy outcomes are overwhelming and indisputable.

Concerning women's knowledge toward fertility and infertility, after implementing the educational intervention, there was a highly statistically significant improvement for subtotal and total knowledge scores in relation to definition of fertility, natural methods which increase fertility, factors affecting ability of women fertilization, effect of sexual health & obesity on fertility, definition, types, risks of infertility and diagnostic studied for infertility ($P<0.01$). While, there was a statistically significant improvement for knowledge toward ttreatment of infertility ($P< 0.05$). These results are consistent with [8], who indicates that acquired female infertility may prevent through identified interventions maintaining a healthy lifestyle and maintaining a normal weight through eating a well-balanced, healthy nutritious diet, with plenty of fresh fruits, vegetables, decreased consumption of caffeine& smoking and practicing exercises.

Also [5], reported that diagnosis of infertility begins with a medical history and physical exam. The healthcare provider may request tests, including laboratory tests such as hormone testing, measure of FSH and estrogen in the day 2 or 3from the menstruation, measurements of thyroid function, measurement of progesterone in the second half of the cycle. Examination and imaging such as an endometrial biopsy, laparoscopy, fertiloscopy, Pap smear, pelvic exam, a post coital test, Hystero-salpingo-graphy and Sono-hystero-graphy. There are genetic testing techniques under development to detect any mutation in genes associated with female infertility.

And also [28], *said that* ,the health care provider plays an important role for maintaining a specific educational program in managing metabolic syndrome that include setting reasonable goals, raising awareness, identifying barriers to change, managing stress, preventing relapse, and providing on-going support. Overweight women should be advised to maintain a healthy weight. The best way to lose weight is to eat fewer calories. Women usually have the most success losing weight when they are part of a formal program that provides monitoring and counseling for continued support.

Moreover [17], added that general education programs can reduce the incidence of metabolic syndrome by making everyone aware of the benefits of staying slim and exercising. Women who already have metabolic syndrome can prevent many of the serious health problems by losing weight, eating a balanced, healthy diet, and exercising more.

Regarding FSFI questionnaire scores there was improvement of some domains for these infertile women after intervention of the program. These findings were supported by [10], who concluded that sexual activity is one of the most important parts of women's life. In addition, various factors, including physiological factors, psychological factors, medications, infertility, lifestyle, and relationships, are effective in the occurrence and progress of sexual disorders in infertile women

In addition to [22], stated that female's sexual desire was not affected by organic factors; but, it was influenced by self-confidence, previous sexual experiences, strong emotional relationships, hormones, and psychological diseases. And also, agree with [12], who was evaluated 200 Indian infertile women and showed that decreased

frequency of intercourse and an - orgasmic were the most common problems. This could be explained by infertile women with sexual dysfunction did not seek any help or advice for their sexual problems. When a physician asked about the reason for not consulting linked it to embarrassment.

However, this finding was in contrary to [11], who mentioned that the prevalence of sexual dysfunction was 94.9% and 100% in primary and secondary infertile women, respectively and the difference was not statistically significant. This could be explained by which might be due to the lack of knowledge about marital issues and lack of training in the society. *Also*, [23] who reported that counseling, books, and health educational program help couples communicate better about their sexual needs & differences, understand the causes of their difficulties, and provide treatment suggestions. Increasing novelty often sparks sexual desire and enhances sexual response.

Concerning correlation between body mass index and items of female sexual function index had been found good levels of sexual function among normal body mass index. This finding was in the same line with [7], who conducted a study of the female sexual function index (FSFI) questionnaire was used to determine the prevalence of sexual dysfunction in obese women , concluded that the excess weight had damaged their sexual life, in all domains of sexual function (sexual desire, sexual arousal, vaginal lubrication, orgasm, sexual satisfaction, and pain) and showed sever impaired in sexual function.

This finding was disagree with [2], who reported that the correlation index of sexual function among overweight and obese women had been found good levels of sexual function among these women. This could be explained by most overweight and obese women consider themselves to be less attractive, less sexually interesting and incapable of developing a satisfying romantic relationship, compared to women with normal weight. Therefore, they have a higher risk of developing sexual dysfunction, compared to women with normal weight.

Additionally, was agree with [4], who demonstrated that a strong negative association between body mass index and scores of the Female Sexual Functioning Index (FSFI) for women diagnosed with female sexual Femalenction; however, for women without diagnosed sexual dysfunction, there was no association between BMI and FSFI. Furthermore [18], was in agreement, who indicated that the obese women, with high BMI, were at a greater risk of sexual dysfunction. High BMI plays a key role as a predictor of poor sexual function. Excess weight increases the risk of reproductive problems. *And also* [24], was in agreement, who mentioned that higher BMI was associated with lower sexual function in infertile women and revealed that there is an association between sexual dysfunction and grade of obesity among Turkish women

Concerning women's attitude towards adaptation of infertility, the findings of the current study revealed that, there was a highly statistical significant women's positive attitude after intervention. This could be due to the fact that, receiving information from educational intervention adherence with educational sessions and their active participation improving their knowledge and lead to positive attitude. These findings are in the same line with [28], reported that general education programs are considered a part of a formal program that provides monitoring and counseling for continued support of overweight women are the keys to long-term success in managing metabolic syndrome through healthy lifestyle change strategies. And also was agree with [3], who concluded that management should focus on support, education, addressing psychological factors and strongly emphasizing healthy lifestyle with targeted medical therapy as required. Monitoring and management of long-term metabolic complications is also an important part of routine clinical care. Comprehensive evidence-based guidelines are needed to aid early diagnosis, appropriate investigation, regular screening and treatment of this common condition.

Accordingly, [15] demonstrated that, higher levels of depression, psychological and psychosexual morbidity and an increased response to stress in infertile women compared with controls. Low self-esteem, decreased social activity and less romantic contentment were reported in women with sexual dysfunction before applying educational program.

6. Conclusion

In the light of present study it can be concluded the, there was a significant improvement in the women's knowledge, practices and attitude regarding natural fertility methods and sexual skills after the educational intervention compared with that before it. There was positive correlation between women's knowledge and their attitude before and after intervention. There was a highly statistical difference between infertile women's sexual function index domains pre and post one month of intervention.

7. Recommendation

In view of the research findings, the following recommendations are proposed

1. The findings of the present study should be used for developing various consultations and supportive programs for such couples.
2. The BMI and FSFI should be calculated and used as an assessment tool to determine sexual function & BMI for infertile women and follow up progress or deterioration.
3. Arrange teaching sessions about health promotion focused on improving the impaired sexual function of overweight and obese women.

Further Researches

1. In-service training programs related to sexual function and satisfaction must established to develop women's knowledge, practices and attitude in order to fit newly developed concepts for adaptation.
2. Investigate the relationship between BMI and sexual function for fertile and infertile women to determine the effects of BMI on infertility in Egyptian population.

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