Effect of Nursing Guidelines on Coping of Infertile Couples Undergoing In Vitro Fertilization

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ABSTRACT

Context: Infertility is defined as not being able to conceive after one year of unprotected sex. In vitro fertilization (IVF) is a process of fertilization where an ovum is combined with sperm outside the body, in vitro. In vitro fertilization (IVF) is psychologically and emotionally stressful. Coping strategies are needed to master, tolerate, reduce, or minimize stressful events.

Aim: This study aimed to evaluate the effect of nursing guidelines on coping of infertile couples' undergoing In Vitro Fertilization.

Methods: A quasi-experimental research design was utilized to achieve the aim of this study. This study conducted at the assisted reproductive technology unit of Ain shams Maternity University Hospital on a convenient sample of 98 couples undergoing fertility treatments. Two tools were used for data collection; the first tool was a structured interviewing questionnaire to assess the couple's socio-demographic data, obstetric history, the couple's knowledge regarding in vitro fertilization. The second tool was ways of coping scale (WQS) to assess coping strategies among the infertile couple.

Results: There is no statistically significant difference between couples in both groups according to their knowledge and their coping strategies to IVF before the implementation of nursing guidelines ($p > 0.05$). In contrast, there is a highly statistically significant improvement in knowledge and coping strategies of couples on the study group compared to control group couples after implementation of nursing guidelines($p<0.001$).

Conclusion: The finding of the current study supported the hypothesis, which stated that the infertile couples who will expose to the nursing guidelines, will exhibit improved coping strategies to IVF compared to the controls. The study recommended the application of nursing guidelines at the IVF unit of Ain Shams Maternity University Hospital and other settings for IVF treatment as routine care to improve infertile couples' coping strategies.

Keywords: Nursing Guidelines, Infertile Couples, Coping Strategies, In-vitro Fertilization.

1. Introduction

Infertility is defined as not being able to get pregnant (conceive) after one year (or longer) of unprotected sex. The infertility prevalence is approximately 14%, with the range from 7-28% depending on the age of the woman *(Xella et al., 2016).* In-vitro fertilization is one of assisted reproductive technology (ART) commonly used for the treatment of infertile couples. The prevalence of In Vitro Fertilization is 35.0% *(Zegers-Hochschild et al., 2013).*

In vitro fertilization (IVF) is a process of fertilization where an ovum is combined with sperm outside the body, in vitro ("in glass"). The process involves monitoring and stimulating a woman's ovulatory process, removing an ovum or ova from the woman's ovaries and letting sperm fertilize them in a liquid in a laboratory. After the fertilized ovum (zygote) undergoes embryo culture for 2–6 days, it is implanted in a woman's uterus, to establish a successful pregnancy *(Pandey et al., 2012).*

In vitro fertilization (IVF) is psychologically and emotionally stressful. Stress before, during, and after the IVF treatment is multidimensional. There is a chronic source of stress caused by the threat of permanent infertility and loss of hope. Another source of stress is the threat of the treatment itself and the risk of spontaneous abortion *(Andreotti et al., 2013).*

Therefore, a couple's undergoing IVF treatment requires help to cope better with all these emotions and to avoid being overwhelmed by them. The idea is to help the couple fully comprehend the implications of IVF treatment, to provide information, and emotional support during the treatments, besides, to enable the couple to cope with the results of the treatment become a significant issue *(Chen et al., 2017).*

Since IVF treatment considers stressful for the infertile couple, therefore, the couple needs to learn how to cope effectively with stress during this period. Coping strategies

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is the process of attempting to manage the demands created by stressful events that are appraised as challenging or exceeding a person's resources *(Zare et al., 2014).*

Coping strategies refer to the specific efforts, both behavioral and psychological, that people employ to master, tolerate, reduce, or minimize stressful events. Coping strategies of infertile couples are essential to help them to identify areas of stressors in their life and how to cope with stressors. Couple's coping methods, level of support, level of hope are essential factors influencing the infertility stress. Thus, coping strategies are a way of controlling and regulating stress *(Hashemi et al., 2015).*

A nursing guideline is referred to as scientifically developed statements of recommended best evidence-based nursing practice in a specific clinical area, designed to reduce the variation in nursing care *(Verkujilen et al., 2016)*. Moreover, nursing guidelines are one of the essential tools used to improve the value (quality and cost) of health care *(Hoesing, 2016)*.

The role of the nurse in assisted conception as treatment program coordinator and as such, the nurse plays a vital role within a multidisciplinary team. The intense and stressful nature of treatment requires the nurse to provide emotional support to the couples undergoing treatment. Good communication is essential to ensure that information is appropriately and effectively given and received *(Yazdani et al., 2016).*

2. Significance of the study

According to The World Health Organization (WHO), infertility in Egypt affects 15 percent of Egyptian couples, of these women, 9.2 percent suffer from secondary infertility, and 5.8 percent suffer from primary infertility, which means about 3 million women are infertile *(Deyhoul et al., 2018).*

In Egypt, infertility affects an estimated 10-15% of couples of reproductive age. Patients undergoing in vitro fertilization (IVF) experience high levels of stress, depression, and anxiety. Infertility treatment has a known psychological impact on women and their partners. Since assisted reproductive technologies are often the last resort to achieve pregnancy, treatment is stressful for most couples *(Moura-Ramos et al., 2016).* Based on this vital issue researcher suggested this study for improving coping strategies among couples undergoing In Vitro Fertilization (IVF).

3. Aim of the study

This study aimed to evaluate the effect of nursing guidelines on coping of infertile couples' undergoing In Vitro Fertilization.

3.1. Research hypotheses

- The infertile couples who will expose to the nursing guidelines will exhibit improved knowledge regarding IVF compared to the controls.
- The infertile couples who will expose to the nursing guidelines will exhibit improved coping strategies to IVF compared to the controls.

4. Subjects and Methods

4.1. Research design

A quasi-experimental (study/control group) research design was used in this study. A quasi-experimental is an empirical study used to estimate the causal impact of an intervention on its target population *(Hart et al., 2013).*

4.2. Research setting

The study was conducted at the assisted reproductive technology unit of Ain Shams Maternity University Hospital affiliated to Ain Shams university hospital.

4.3. Subjects

A convenient sample technique was used to recruit 98 couples undergoing fertility treatments that represent 15% of total infertile couples attending the previously mentioned setting in the 2018 year. The sample included 98 couples undergoing fertility treatment were divided into two equal groups. Group 1 consisted of 49 couples were selected as a control group, and group 2 consisted of 49 couples chosen as a study group. Couples were selected based on the following criteria

- A couple who has women age less than 42 years.
- Couple undergoing their first or second IVF cycle.

4.4. Tools of the study

Two tools of data collection were used as follow:

4.4.1. Arabic Structured Interviewing Questionnaire

The researcher designed an after reviewing the relevant literature *(Aleed, 2016).*

It consisted of (18) questions that divided into three parts as follow;

The first part used to assess the couple's socio-demographic data, including; couple's age, residence, couple's educational level, couple's occupational status, and family income. The second part consisted of obstetric history that including the menstrual cycle, the period of menstruation, menstruation problems, and previous pregnancies.

The third part used to assess the couple's knowledge regarding in vitro fertilization. It consisted of 9 items including the concept of artificial insemination (1 open-end question), the indication of IVF, factors affecting on IVF success (3, MCQs), steps (2, open-end question), knowledge before, during, and after the procedure (3 MCQs), complications after IVF, required medications for IVF (3 MCQs)

Scoring system for knowledge

The response to the items ranged from 2= correct, 1=incorrect. Each correct answer was given two marks, and the incorrect answer was given one. The total scores were 18 graded as < 75 % was unsatisfactory, and ≥ 75 was satisfactory.

4.4.2. Ways of Coping Scale (WCS)

It was adopted from *Folkman et al. (1986).* It composes 33 questions to assess coping strategies among the infertile couple. This scale is divided into three subscales; social coping subscale (7 items) such as "I talked to some people in order to find out more information about my problem." Cognitive coping subscale (12 items) such as "I developed different solutions to the problem." Psychological coping subscale (14 items) such as "I tried to adapt to the current situation."

Scoring system

Items of the coping strategy scale were based on three points Likert scale (used all the time scored as 3 - used sometimes scored as 2 and does not used scored as 1). The total score was 99 grades. This score converted into two categories:

- Positive coping if the total score was ≥ 60%.
- Negative coping if the total score was < 60%.

4.5. Procedures

Tools were reviewed by a panel of three experts in the obstetric and gynecological nursing field to test the face and content validity. Each of the experts was asked to examine tools for content coverage, clarity, wording, length, format, and overall appearance. Cronbach alpha test used to assess tools' reliability. The reliability of Arabic Structured Interview Questionnaire was 0.892, and for Ways of Coping Scale 0.894.

An official written approval letter clarifying the purpose of the study was obtained from the dean of the faculty of nursing Ain Shams University and directed to the director of Ain Shams Maternity University Hospital as approval for data collection.

Ethical consideration: The approval was obtained from the Scientific Research Ethical Committee in the Faculty of Nursing at Ain Shams University before starting the study. Then official permission was granted from the director of Ain Shams maternity university hospital. Written informed consent was obtained from a participant after explaining the purpose of the study; in addition, there is no harm occurred to the participant. Each participant told the right to withdraw from the study at any time. Human rights were considered. Data was confidential, and it was used only for the research. The researcher clarified the objective and aim of the study to couples that included in the study.

Fieldwork: The study was carried out over ten months, starting from the beginning of April 2018 to the end of January 2019. The average time consumed to fill in the tools was 10 minutes for an Arabic structured interviewing questionnaire and 25 minutes for Ways of Coping Scale (WCS). The previously mentioned settings were visited by the researchers two days/week from 9.00 a.m. to 2.00 p.m.

Nursing guideline phases. The nursing guideline conducted on four consecutive phases, assessment, development, implementation, and evaluation.

Assessment phase: The researcher attended the previously mentioned setting, then the researcher interviewed each couple, and participation approval was obtained orally after explaining the purpose of the study. The selecting couple who was undergoing IVF were divided into two groups; the control group (49) and the study group (49). The researcher started data collection by couples of the control group. The researcher obtained each couples' phone number in order to conduct a second meeting to fill the tools of data collection. After the completion of couples in the control group, the researcher started data collection from couples in the study group.

Development and implementation phase: Nursing guidelines were developed by the researcher based on real couples' need assessment about coping with IVF. Implementation of the nursing guideline was done through 4 sessions (2 sessions for knowledge regarding IVF, two sessions for coping strategies).

- The first session was related to orientation with the nursing guideline, the Second session concerned with knowledge about IVF (definition, an indication of IVF, procedure, the side effect of IVF, a precaution that follows before, during, and after IVF).
- The third session related to the introduction of coping and coping strategies used to improve couples coping with IVF treatment.
- The fourth session related to demonstrating cognitive, spiritual coping strategies and wrapping up all steps.

Couples in the study group were divided into small groups. Each group consisted of 2-3 couples approximately. Each session started with a summary of what was given through the previous sessions and the objectives of the new topic, taking into consideration the use of simple language to suit the level of couples' qualifications. As well, the session ended with a summary of its content and feedback gained from others. The researcher used educational media of conveying information as PowerPoint presentations and posters. A guideline handout was developed and offered for couples as a reference to be used after guideline implementation. The researcher followed couples with a phone to help them in solving any problem that may face them in this phase.

The evaluation phase is done after implementing guidelines by one month to evaluate the effect of nursing guidelines on coping with infertile couples undergoing IVF. The same pretest format was used to collect the couples' information and ways of coping.

4.6. Data analysis

Data were tabulated and organized, categorized, and analyzed all statistical calculations were done using computer session SPSS (statistical package for the social science, SPSS version 20). Data were presented in the form of mean±SD for continuous variables or frequencies and percentages for qualitative variables. Chi-square (x^2) test was used to study the association between two qualitative variables. A P-value of less than 0.05 will be considered statistically significant.

5. Results

Table 1 shows that the mean age of the husbands in the control group is (35.97± 5.47) compared to (34.17± 4.20) of the husbands in the study group. The mean age of the wives in the control group is (29.72±4.14) compared to (29.10±3.43) of wives in the study group. Regarding residence (61.2%) of couples in the control group live in the rural area while (73.5%) of couples in the study group live in the urban area. Concerning the level of education of husband (59.2.0%) of the study and control group have a university education, while, (46.9%) of wives in the control group versus (55.1%) of wives in the study group have a university education.

As regard income 63.3% in the study and control group, their income was not enough to cover the treatment cost. There is no statistically significant difference between control and study groups related to socio-demographic data but related to residence and income. There was a highly statistically significant difference between control and study groups.

Table 2 shows that there are no statistically significant differences in control and studied wives according to the menstrual cycle and period of menstruation. Concerning menstruation problems and Number of pregnancies, there are highly statistically significant differences in the control and the studied wives.

Figure 1 shows that 61.2% of couples in the control group have past trying of IVF, while 63.3% of couples in the study group have past trying of IVF.

Table 3 reveals that there are no statistically significant differences between control and studied wives according to their knowledge about IVF knowledge level except (steps of IVF and instructions followed before performing the procedure) before the implementation of nursing guidelines. There are highly statistically significant differences between the control and the studied wives according to their knowledge about IVF. However, related to required medications for IVF and factors that affect the success of the process, there are no statistically significant differences at the control and studied wives after implementation of nursing guidelines.

Table 4 indicates that there are no statistically significant differences between the control and the studied husbands according to their knowledge about IVF before the implementation of nursing guidelines. There are highly statistically significant differences at the control and the studied husbands according to their knowledge about IVF after the implementation of nursing guidelines.

Table 5 indicates that there is no statistically significant difference between couples' knowledge (wives and husbands) about IVF on control and study groups before the implementation of nursing guidelines. 61.2% and 65.3% of wives and husbands had an unsatisfactory level of knowledge before guidelines implementation in the control group compared to 67.3% and 71.4% for the wives and husbands in the study group, respectively. At the same time, there is a highly statistically significant difference between couples (wives and husbands) of control and study groups according to their total knowledge about IVF after implementation of nursing guidelines.

Table 6 indicates that there are no statistically significant differences between the studied wives regarding their total coping scale on the study and control group before the implementation of nursing guidelines. However, there are highly statistically significant differences between the studied wives regarding their total coping scale on the study and control group after implementation of nursing guidelines.

Table 7 indicates that there are no statistically significant differences between the studied husbands' total coping on the study and control group before the implementation of nursing guidelines. However, there are highly statistically significant differences between the studied husbands' coping scale on the study and control group after implementation of nursing guidelines.

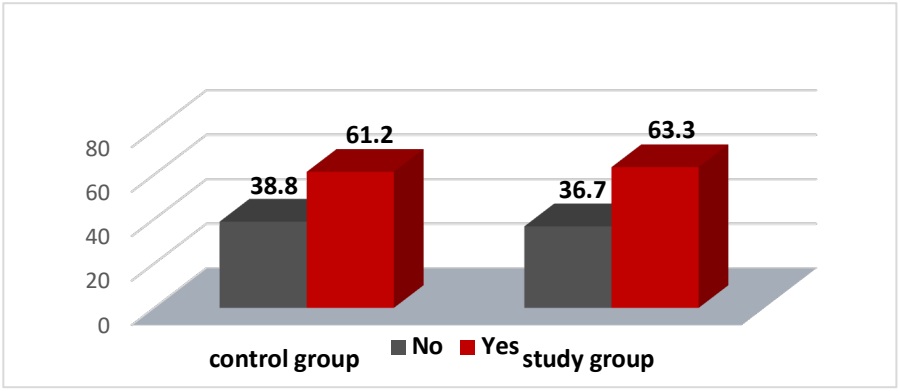
Table 8 points out that there is no statistically significant difference between couples (wives and husbands) on control and study groups according to their total coping with IVF before the implementation of the nursing guidelines while there is a highly statistically significant difference between couples (wives and husbands) on control and study groups according to their total coping with IVF after implementation of nursing guidelines.

Table (1): Comparison of study and control group regarding their socio-demographic characteristics (N=98).

Socio-Demographic Data	Control group (n=49)		Study group (n=49)		Chi-square	p-value
	No.	%	No.	%	$\chi 2$	
Husband's age (years)						
25-<30 year	7	14.3	10	20.4		
30-<35 year	16	32.7	21	42.9		
35-<40 year	14	28.6	17	34.7	10.803	>0.05
40+ year	12	24.5	1	2.0		
Mean ± SD	35.97 ± 5.47		34.17 ± 4.20			
Wives' age (years)						
25-<30 year	29	59.2	31	63.3		
30-<35 year	12	24.5	16	32.7		
35-<40 year	8	16.3	2	4.1	4.238	>0.05
40 + year	0	0.0	0	0.0		
Mean ± SD	29.72± 4.14		29.10± 3.43			
Residence						
Rural	30	61.2	13	26.5	11.975	<0.001
Urban	19	38.8	36	73.5		
husband's education						
Cannot read and write	3	6.1	11	22.4		
Primary education	7	14.3	5	10.2	7.476	>0.05
Secondary education	10	20.4	4	8.2		
University education	29	59.2	29	59.2		
Wives' education						
Cannot read and write	13	26.5	14	28.6		
Primary education	3	6.1	2	4.1	1.557	>0.05
Secondary education	10	20.4	6	12.2		
University education	23	46.9	27	55.1		
Husband's Job						
Not work	0	0.00	0	0.00	1.012	>0.05
Work	49	100.0	49	100.0		
Wives' Job						
Not work	26	53.1	19	38.8	2.013	>0.05
Work	23	46.9	30	61.2		
Family income						
Enough	12	24.5	18	36.7		
Not enough	31	63.3	31	63.3	7.200	<0.05
Enough and more	6	12.2	0	0.0		

Table (1): Comparison of study and control group wives regarding their obstetric history (N=98).

Obstetric history	Control group (n=49)		Study group (n=49)		Chi-square	p-value
	No.	%	No.	%	χ^2	
Menstrual cycle						
Regular	35	71.4	34	69.4	0.049	>0.05
Irregular	14	28.6	15	30.6		
Period of menstruation						
2-3 days	12	24.5	23	46.9		
4-6 days	28	57.1	21	42.9	5.600	>0.05
>6 days	9	18.4	5	10.2		
Mean ± SD	4.6939±0.23905		4.3061±0.23905			
Menstruation problems						
Bleeding	19	38.7	15	30.6	9.067	<0.05
Severe pain	30	61.3	34	69.4		
Number of pregnancies						
No	8	16.3	0	0.0		
One	24	49.0	27	55.1	11.501	<0.05
Two	15	30.6	22	44.9		
More than two	2	4.1	0	0.0		



(1): Percentage distribution of couples according to their past trying for IVF on the control and study groups (N=98).

Table (3): Comparison of study and control group wives' knowledge before and after guidelines implementation (N=98).

Wives' knowledge	Pre-implementation of nursing guidelines									Post-implementation of nursing guidelines								
	Control group (n = 49)				Study group (n = 49)				χ^2 P-value	Control group (n = 49)				Study group (n = 49)				χ^2 P-value
	Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory			Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory		
	No	%	No	%	No	%	No	%		N	%	N	%	N	%	N	%	
Concept of artificial insemination	24	49.0	25	51.0	31	63.3	18	36.7	1.159 >0.05	29	59.2	20	40.8	44	89.8	5	10.2	12.083 <0.05
Indication for IVF	13	26.5	36	73.5	24	49.0	25	51.0	0.783 >0.05	24	49.0	25	51.0	45	91.8	4	8.2	21.598 <0.001
Factors that increase the chances of IVF success	6	12.2	43	87.8	19	38.8	30	61.2	0.363 >0.05	24	49.0	25	51.0	43	87.8	6	12.2	17.033 <0.001
Steps of IVF	9	18.4	40	81.6	22	44.9	27	55.1	5.078 <0.05	24	49.0	25	51.0	45	91.8	4	8.2	21.598 <0.001
The wives need complete bed rest	11	22.4	38	77.6	17	34.7	32	65.3	1.508 >0.05	22	44.9	27	55.1	35	71.4	14	28.6	7.087 <0.05
Required medications for IVF	13	26.5	36	73.5	14	28.6	35	71.4	0.327 >0.05	37	75.5	12	24.5	41	83.7	8	16.3	1.005 >0.05
Factors that affect the success of the process	26	53.1	23	46.9	17	34.7	32	65.3	0.347 >0.05	16	32.7	33	67.3	25	51.0	24	49.0	3.397 >0.05
Instructions followed before performing the procedure	19	38.8	30	61.2	16	32.7	33	67.3	5.633 <0.05	38	77.6	11	22.4	46	93.9	3	6.1	5.333 <0.05
Instructions followed during the procedure	30	61.2	19	38.8	13	26.5	36	73.5	1.612 >0.05	31	63.3	18	36.7	43	87.8	6	12.2	7.946 <0.05
Instructions followed after the procedure	20	40.8	29	59.2	6	12.2	43	87.8	1.891 >0.05	32	65.3	17	34.7	46	93.9	3	6.1	12.313 <0.001
Complications of IVF	15	30.6	34	69.4	9	18.4	40	81.6	3.229 >0.05	35	71.4	14	28.6	44	89.8	5	10.2	5.288 <0.05

Table (4): Comparison of study and control group husband's knowledge before and after guidelines implementation (N=98).

Husband' knowledge	Pre-implementation of nursing guidelines									Post-implementation of nursing guidelines								
	Control group (n = 49)				Study group (n = 49)				χ^2	*Control group (n = 49)*				*Study group (n = 49)*				χ^2
	Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory		P	*Satisfactory*		*Unsatisfactory*		*Satisfactory*		*Unsatisfactory*		P-
	N	%	N	%	N	%	N	%	value	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*	value
Concept of artificial insemination	27	55.1	22	44.9	11	22.4	38	77.6	1.781 >0.05	27	55.1	22	44.9	32	65.3	17	34.7	31. 947 <0.001
Indication for IVF	21	42.9	28	57.1	27	55.1	22	44.9	1.987 >0.05	16	32.7	33	67.3	31	63.3	18	36.7	13.795 <0.001
Factors that increase the chances of IVF success	25	51.0	24	49.0	20	40.8	29	59.2	0.214 >0.05	26	53.1	23	46.9	39	79.6	10	20.4	14.203 <0.001
Steps of IVF	19	38.8	30	61.2	15	30.6	34	69.4	3.133 >0.05	22	44.9	27	55.1	36	73.5	13	26.5	14.418 <0.001
The woman needs complete rest	16	32.7	33	67.3	17	34.7	32	65.3	2.457 >0.05	25	51.0	24	49.0	34	69.4	15	30.6	22.518 <0.001
Required medications for IVF	17	34.7	32	65.3	20	40.8	29	59.2	3.494 >0.05	23	46.9	26	53.1	35	71.4	14	28.6	17.338 <0.001
Factors that affect the success of the process	24	49.0	25	51.0	15	30.6	34	69.4	1.051 >0.05	21	42.9	28	57.1	32	65.3	17	34.7	19.523 <0.001
Instructions followed before performing the procedure	13	26.5	36	73.5	14	28.6	35	71.4	2.680 >0.05	19	38.8	30	61.2	38	77.6	11	22.4	8.983 <0.05
Instructions followed during the procedure	6	12.2	43	87.8	17	34.7	32	65.3	3.085 >0.05	18	36.7	31	63.3	39	79.6	10	20.4	7.295 <0.05
Instructions followed after the procedure	19	38.8	30	61.2	20	40.8	29	59.2	1.793 >0.05	24	49.0	25	51.0	37	75.5	12	24.5	15.256 <0.001
Complications of IVF	21	42.9	28	57.1	16	32.7	33	67.3	0.495 >0.05	16	32.7	33	67.3	34	69.4	15	30.6	7.352 <0.05

Table (5): Comparison of couples (wives and husbands) regarding their total knowledge about IVF in both the control and study group before and after the implementation of the nursing guidelines.

Total knowledge	Control group (n= 49)		Study group (n= 49)		χ^2	P-value
	Satisfactory	Unsatisfactory	Satisfactory	Unsatisfactory		
Before Implementation of Nursing Guideline						
Wives	38.8	61.2	32.7	67.3	1.261	**>0.05**
Husband	34.7	65.3	28.6	71.4	3.191	**>0.05**
After Implementation of Nursing Guideline						
Wives	42.9	57.1	93.9	6.1	14.601	**<0.001**
Husband	55.1	44.9	81.6	18.4	11.892	**<0.001**

***Highly statistically significant No statistically significant at > 0.0*

Table (6): Comparison of the studied wives' total coping between control and study group before and after guidelines.

Total coping	Pre-implementation of nursing guideline									Post-implementation of nursing guidelines								
	Total scale coping in the control group (n=49)				Total scale coping in the study group(n=49)				χ^2 P-Value	Total scale coping in the control group (n=49)				Total scale coping in the study group(n=49)				χ^2 P-Value
	Positive		Negative		Positive		Negative			Positive		Negative		positive		Negative		
	N	%	N	%	N	%	N	%		N	%	N	%	N	%	N	%	
Social coping	14	28.6	35	71.4	12	24.5	37	75.5	3.044 >0.05	17	34.7	32	65.3	43	87.8	6	12.2	10.960 <0.001
Cognitive coping	20	40.8	29	59.2	18	36.7	31	63.3	3.819 >0.05	22	44.9	27	55.1	45	91.8	4	8.2	11.236 <0.001
Psychological coping	10	20.4	39	79.6	13	26.5	36	73.5	0.781 >0.05	12	24.5	37	75.5	46	93.9	3	6.1	12.982 <0.001
Spiritual coping	35	71.4	14	28.6	39	79.6	10	20.4	3.514 >0.05	35	71.4	14	28.6	42	85.7	7	14.3	9.502 <0.001

Table (7): Comparison of the studied husbands' total coping between control and study groups before and after guidelines.

Total coping	Pre-implementation of nursing guideline									Post-implementation of nursing guidelines								
	Total scale coping in the control group (n=49)				Total scale coping in the study group(n=49)				χ^2 P-Value	Total scale coping in the control group (n=49)				Total scale coping in the study group(n=49)				χ^2 P-Value
	Positive		Negative		Positive		Negative			Positive		Negative		Positive		Negative		
	No	%	No	%	No	%	No	%		No	%	No	%	No	%	No	%	
Social scale	21	42.9	28	57.1	18	36.7	31	63.3	1.873 >0.05	22	44.9	27	55.1	40	81.6	9	18.4	11.222 <0.001
Cognitive scale	16	32.7	33	67.3	21	42.9	28	57.1	1.307 >0.05	17	34.7	32	65.3	42	85.7	7	14.3	10.890 <0.001
Psychological scale	14	28.6	35	71.4	13	26.5	36	73.5	1.508 >0.05	19	38.8	30	61.2	43	87.8	6	12.2	12.512 <0.001
Spiritual scale	37	75.5	12	24.5	42	85.7	7	14.3	2.902 >0.05	39	79.6	10	20.4	44	89.8	5	10.2	9.782 <0.001

Table (8): Comparison of couples' (wives and husband) coping with IVF treatment in both the control and study group before and after implementation of the nursing guidelines.

Total coping	Control group (n=49)		Study group (n=49)		χ^2	p-value
	Positive	Negative	Positive	Negative		
Before Implementation of Nursing Guidelines						
Wives	24.5	75.5	30.6	69.4	1.868	>0.05
Husband	53.1	46.9	59.2	40.8	3.091	>0.05
After Implementation of Nursing Guidelines						
Wives	32.7	67.3	89.8	10.2	10.321	<0.001
Husband	57.1	42.9	77.6	22.4	8.512	<0.001

***Highly statistically significant No statistically significant at > 0.05*

6. Discussion

Coping with the stress of infertility is a topic that has received considerable attention from researchers for decades. To adequately respond to couples' stress, use coping strategies, behavioral or emotional efforts to manage change and regain control of their lives *(Okwelogu et al., 2013).* The present study was conducted to evaluate the effect of nursing guidelines on coping of infertile couples undergoing IVF.

Regarding infertile couples' age, the result of the present study indicates that more than half of wives in the control and study group their age ranged between (25-30) years. This finding was in respect to *Cassidy and McLaughlin (2016)*, who carried out a study about "the effect of couple age on fertility and outcome of IVF" and reported that women age between (20-30) years.

Concerning infertile couples' residence, the current study results revealed that more than two-thirds of the study group were from urban areas compared to more than one-quarter of the control. This finding could be due to that the infertile couples in an urban area can utilize many IVF centers. This finding coincided with *Anderson et al. (2013)* in their study about "residence factor in people seeking infertility treatment." It stated that three-quarters of the studied group were living in urban areas. Also, this finding was in the same line with *Manna et al. (2014),* who carried out "A community-based study on infertility and associated socio-demographic factors." It showed that the majority of the studied sample was from an urban area (84%), and the minority was from a rural area (16%) in India.

The infertile couples' level of education in the present study showed that around half of the studied sample in both study and control groups have a university education. This finding supported by *Mahalingaiah et al. (2012),* who conducted a study about "couples educational and influence on in vitro fertilization outcomes" and reported that the majority of the sample was approximately 92% of them were highly educated couples.

As regards the obstetric history of wives, the result of the current study indicated that more than two-thirds of wives in both the control and study group had a regular menstrual cycle. This finding disagreed with *Hammarberg et al. (2014)*, who conducted a study about "women's experience of IVF." It clarified that more than one-third of them had irregular menstrual cycles, and almost two-thirds of them were suffering from obstetric problems.

Concerning knowledge of wives regarding IVF, the current study indicates that knowledge scores among the study participants were unsatisfactory pre guidelines (among around two-thirds of the participants). There is no statistically significant difference between the two groups as regards their knowledge about IVF before implementing nursing guidelines except (steps of IVF and instructions followed before performing the procedure). This finding could be justified by more than half of infertile couples on both groups had previous experience with IVF and might have many misconceptions. This finding was in harmony with *Dattijo et al. (2016),* who conducted a study about "knowledge of infertility among infertile women in Nigeria" and revealed that unsatisfactory knowledge of women had a negative impact on the outcome of IVF.

Relate to the knowledge of husband regarding IVF, the current study indicates a no statistically significant difference between the two groups as regards their knowledge about IVF before implementing nursing guidelines. Around two-thirds of the participants in both groups had an unsatisfactory level of knowledge before the implementation of the nursing guidelines. This finding was in agreement with *Matthiesen, et al. (2011),* who conducted a study about "knowledge and attitudes of infertile couples about assisted reproductive technology" and reported that knowledge about IVF is inadequate in many parts of the world. There were several misconceptions regarding IVF all over the world and recommended increased knowledge to achieve a better understanding of the level of awareness and misconceptions of IVF.

Besides, the current study revealed that there is a highly statistically significant improvement in the total level of knowledge regarding IVF after implementing nursing guidelines except (required medications for IVF & factors that affect the success of the process) among the studied wives. This finding is reflecting the positive effect of the nursing guidelines in improving the couples' knowledge regarding the IVF. These findings were in the same line with *Malini and Pooley (2017),* who conducted a study about "The effect of female education on infertility." They stated that there was a significant improvement in the women's knowledge, practices, and attitude regarding IVF after the educational intervention compared with that before. These findings are supporting the first research hypothesis.

Concerning wives coping strategies before and after implementation of the nursing guideline, the findings of the current study revealed that there is no statistically significant difference between studied wives regarding their coping strategies on the study and control group before implementing the nursing guideline. However, there was a highly statistically significant improvement in wives' positive coping after implementing nursing guidelines. This finding might be referred to the effect of improved knowledge and exposure to coping strategies. These findings were in the same line with *Vanden Broeck et al. (2011),* who conducted a study about "counseling in infertility: individual, couple, and group interventions." They reported that there was a highly statistically significant positive improvement in wives' coping strategies at the intervention group.

Concerning husband coping strategies, the findings of the current study revealed that there was no statistically significant difference between husband on both groups regarding coping before implementing nursing guidelines. However, there was a highly statistically significant positive improvement in coping strategies after the program. This finding was similar with the study conducted by *Bayley et al. (2012),* who studied "the relationships between attachment, appraisal, coping and adjustment in men and women experiencing infertility concerns," and indicate that there no significant difference regarding using coping style before the program and highly significant difference after the intervention. This finding means that group therapy increases the cognitive-oriented approach that may be induced by group therapy and meaningful response to stressful events. Also, this finding was agreed with the study of *Chan et al. (2012)*

about "Incorporating spirituality in a psychosocial group intervention for a couple undergoing in vitro fertilization," and clarified that there no significant difference regarding coping strategies with IVF before the intervention and highly statistically significant difference after the program. These findings are supporting the second research hypothesis.

As regard infertile couples' coping strategies (wives and husbands), the present study finding points out that there is no statistically significant difference between couples (wives and husbands) on control and study groups according to their total coping with IVF before the implementation of the nursing guidelines. At the same time, there is a highly statistically significant difference between couples (wives and husbands) on control and study groups according to their total coping with IVF after implementation of nursing guidelines.

This finding disagreed with the study conducted by *Arpin et al. (2019)* about "testing a new group intervention for couples seeking fertility treatment." They reported that women reported more frequent use of almost all coping strategies than men, and also women proportionately engaged in a higher degree of confronted coping strategies, accepting responsibility, seeking social support.

7. Conclusion

The finding of the current study supported the research hypotheses that the implementation of nursing guidelines improves infertile couples' knowledge and coping strategies to IVF compared to the controls.

8. Recommendations

The following recommendation was suggested, based on the finding of the current study,

- The application of coping strategies for all couples suffer from infertility and undergoing IVF.
- Further researches needed to apply the educational program for improving coping strategy for couples undergoing IVF at all government and non-government settings.

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