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EFFECT OF EDUCATIONAL PROGRAM ABOUT OVARIAN HYPER STIMULATION SYNDROME AMONG WOMEN UNDERGOING INFERTILITY TREATMENT

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Abstract

Background: *Ovarian hyper stimulation syndrome (OHSS), is an atypical reaction that women may experience in response to excessive hormones and often occurs during fertility treatments. So improving of women' knowledge about this subject is most important aspect.* ***The aim of*** *this study was evaluate the effect of educational Program about Ovarian Hyper Stimulation Syndrome among Women Undergoing infertility treatment.* ***Design:*** *Quasi Experimental study design was used.* ***Sitting:*** *Study was conducted at In vitro fertilization department with its outpatient clinic at Ahmed Maher teaching hospital.* ***Sample****: convenient sample included 162 women.* ***Tools*** *two tools were used to data collection. The first tool structured interviewing questionnaire sheet was used to assess women`s general characteristics and infertility data - the second tool, women `s knowledge assessment sheet. It used to assess studied women knowledge regarding ovarian hyper stimulation syndrome, The main* ***Results:*** *only 13.2% of the studied women of study group had good knowledge regarding Ovarian Hyper Stimulation before implementing of educational program which improved to 73.5% and 74.7% good knowledge immediately and after three months of implementing of educational program respectively as p-value <0.01 for all variables.as regarding to control group where (98.6%) had poor knowledge in base line assessment, still (96.2%), (95.1) after routine care and end of three months of follow up had poor knowledge respectively with no statistical significant different compared to its level before.* ***Conclusion*** *The present study showed that, the knowledge of infertile women about ovarian hyper stimulation syndrome improved for women who received the educational program more than the control group who received routine care only.* ***Recommendations:*** *in the light of the finding of the study, the following recommendation is suggested increase women knowledge about ovarian hyper stimulation syndrome through health education and awareness become as a part of protocol infertility treatment.*

Keywords*: Educational Program, Ovarian Hyper Stimulation Syndrome, Infertile Women.*

INTRODUCTION

The number of assisted fertility cycles increases worldwide; it is likely that there will be increasing cases of ovarian hyper stimulation syndrome (OHSS) unless preventative measures are successful. Healthcare professionals at fertility centers should consider women's information needs at this difficult time so that they are informed about both the initial signs and symptoms of OHSS, and signs

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of escalating severity, and the actions they need to take if their condition deteriorates **(*Lumley, et al.,* 2023).**

Symptoms of ovarian hyper stimulation syndrome often begin within a week after using injectable medications of HCG to stimulate ovulation, though sometimes it can take two weeks or longer for symptoms to appear, OHSS may worsen as body begins producing its own HCG in response to the pregnancy **(Mayoclinic, 2021).**

The signs and symptoms of OHSS vary depending on the severity of the condition. Symptoms of mild to moderate OHSS include: Abdominal discomfort/pain, Bloating, Slight weight gain, Nausea. Severe cases of OHSS occur rarely and can lead to hospitalization due to serious symptoms and complications including: Excessive weight gain, Severe nausea and vomiting, Severe abdominal swelling, Difficulty breathing, Blood clots, Decreased urination, Kidney failure (**Mayoclinic, 2021**).

Physicians have identified certain risk factors for OHSS, as well as preventative measures that can be taken in order to avoid OHSS in higher risk groups. A woman has a low body weight, or is younger than thirty-five years old.

Additionally, a woman is more likely to develop OHSS if she either has high levels of estrogen before hCG injection, or has polycystic ovarian syndrome, a relatively common reproductive condition that results in irregular periods, excessive hair growth, and enlarged polycystic ovaries.

Women who exhibit any of those risk factors may require scientists to take extra precautions during fertility treatment, Although some women with no risk factors can develop OHSS, a woman is more likely to develop OHSS if she has had it before (**Alison Lane., 2020**)

The patient education play important role in influencing infertility care decisions, the burden of care, and the potential for adverse outcomes with certain treatments so it is important for patients to understand the full spectrum of treatment, its risks as ovarian hyper stimulation syndrome related to Misuse of medication without monitoring and out of control ***(Michigan department of health human services, (2019).***

This study provides a unique insight into the experiences of women` knowledge about ovarian hyper stimulation syndrome who undergoing infertility treatment and highlights the her needed for information about the condition

Significance of the study:

Despite careful monitoring, up to 20% to 33% of IVF treatments have been reported to be associated with mild forms of OHSS. Severe OHSS has been reported in 3%-8% of IVF cycles. ***(Xiuzhen Shen et al., 2021)***

So the researcher look for educate the women about the serious complication association which (OHSS)

Aim of this study

The present study was aimed to evaluate the effect of educational program about ovarian hyper stimulation syndrome (OHSS) among women undergoing infertility treatment

Research Hypotheses

The knowledge of infertile women about ovarian hyper stimulation syndrome who received the educational program Improved rather than the group who received routine care only.

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SUBJECT AND METHODS

I. Technical Design:

1-Study design: - Quasi Experimental study

2- Setting: - The study conducted at in vitro fertilization (IVF) department in Ahmed Maher teaching hospital as it is teaching hospital and has a large special IVF department so the researcher expected to meet large number of women for fertility problems treatment.

3- Sampling: - *Type*: - convenient sample of women undergoing infertility treatment with random assignment, divided into 2 groups (control and study)

Sample size

All cases whose attended at the previous mention sitting for one year (2020), the sample was 162 women undergone infertility treatment, randomly-selected all odd number as study group were included 83 women and all even number as control group were included 79 women

Tools of data collection:

This study conducted using two tools as the following:-

Tool I: Structured interviewing questionnaire sheet:

That was developed by the researcher after reviewing the relevant literature and was written in simple Arabic language. It was divided into two parts:

First part: - It was designed to assess personal characteristic of women including '' age, place of residence, level of education..etc. ''

Second part: It was designed to assess previous and current infertility data such as '' type and causes of infertility, plan and duration of treatment …….etc”

Tool II: Women`s knowledge assessment sheet It was adapted from (***Noha&Noura 2021)*** and modified by researcher to assess studied women knowledge regarding ovarian hyper stimulation syndrome, it included the 15 questions as definition, classification, manifestation of OHSS ……etc. This tool used as Pretest for both groups, as posttest for the study group after the educational program about ovarian hyper stimulation syndrome, the control group after routine car and after three months for both groups.

Scoring system for knowledge:

The scoring system for assess the level of knowledge regarding ovarian hyper stimulation syndrome ranging from (1-3) in which score (1) denotes incorrect answer, score (2) denotes incomplete correct answer, (3) denotes complete correct answer, The total score ranged from 15-45, it was categorized into three categories: Total knowledge was considered good if the total scores was > 34 (> 75%) while average level was considered if the total scores was = 27 - 34 (60% - 75%) and poor level if the total scores was < 27 (<60%).

Field work

Achieved through five phases: Assessment, planning, implementation, evaluation and follow up

Assessment phase:

The researcher attended the previous mentioned sitting in IVF department 5 days per week daily from 9 am to 1 pm, The researcher met every participant woman individually, introduced herself, explain the aim

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in the study to ensures their cooperation, then oral consent of women was obtained, interview conducted in special room in department to keep the confidentiality of data,.

The researcher used **two tools** to collect initial data (structured interviewing questionnaire sheet, women `s knowledge assessment sheet, as pretest tools before intervention for both group. It was filled by researcher in a time ranged between 45- 60 minutes.

Planning phase:

Based on the analysis of the data obtained from the assessment phase, the researcher obtained participant woman visiting schedule and plan orientation process (implementation of educational program about ovarian hyper stimulation syndrome, evaluation and follow up for studied women

Implementation phase:

It was conducted in two sessions in special room at the study sitting.

The first session

The researcher start to explain the educational program and its aim for studied woman in study group only (Arabic booklet), that explain meaning of ovarian stimulation, definition & causes of ovarian hyper stimulation syndrome, its classifications, signs & symptoms, investigation and diagnosis, risk factors of OHSS.

The second session

The researcher instructs him for every type or classification to early detection and avoids the development of OHSS if occurred, the duration take up 45- 60 minutes.

Evaluation:

Immediately evaluation women knowledge after implementation of educational program by posttest, the duration takes-up 30- 45minutes, while the women of control group were filled post test sheet for knowledge after routine care; the duration takes-up 15- 20 minutes

Follow up phase

The studied women followed after three months to insure the fixation of knowledge about ovarian hyper stimulation syndrome, used the same women knowledge assessment which used before, after intervention.

II. Operational Design

The operational design include elaboration of the phases of the study, namely preparatory phase, content of validity, reliability, ethical consideration, pilot study and field work.

a) Preparatory phase

The researcher reviewed the literature using text books scientific journals and internet with aim of developing the data collection and for acquiring in depth knowledge about the subject.

b) Validity & reliability

During construction of data collection tools, face and content validity of the study tools was assessed by a jury group of three experts in maternal and neonatal nursing and medicine field to judge the tool for its comprehensiveness, clarity relevance, understanding and applicability. The tools were rephrased based on jury opinion, recommendations, additions, and modification of items was done.

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The Reliability tools was tested by using **Structured Interviewing questionnaire sheet (**0.870)

Women `s knowledge assessment sheet (0.870)

Pilot study:

Pilot study was carried out in the period from 1/10/to 6/11/2019 on 10% of women were included (12 cases) who were excluded from the sample and chosen randomly from the previous mentioned setting, it was conducted to test the research study to find the possible obstecles and problems that might be faced during data collection.

Ethical considerations:

In all phases of the study all ethical concern were taken into consideration: The approval was obtained from the scientific research Ethical Committee in Faculty of Nursing at Ain Shams University before starting the study. There was no harm occurred for the women.

The questionnaire didn`t include any immoral statements that touch woman` beliefs, dignity, culture, tradition and religious issues. Informed oral consent was taken from women to apply this study on them. Each woman has the right for withdrawal from study sample at any time.

III. Administrative Design

An official letter requesting permission to conduct study from the Dean of the Faculty of Nursing, Ain Shams University to manager of Ahmed Maher teaching hospital this letter included the aim of the study and hard copy from data collection tools in order to get the permission and help for collection of data.

IV. Statistical Design

Data entry and data analysis were done using statistical package for the social science (SPSS) version 26. Data were presented as number, percentage means and standard deviation. Cochrane test used to show difference between variables before, after intervention and follow up.

Mc Nemar test was used to show difference between variables before and after intervention. Pearson test was used to show correlation between variables. Result was presented in table, figures, and charts.

P-value considered

(*) Statistical significant when at $p < 0.05$

(**) highly statistical significant when at $p < 0.01$

No significant difference when at $p > 0.05$

Strength of study

The first research to improve the knowledge of women regarding medical issue

Limitation of study

The sample was smaller than expected due to the COVID-19 pandemic.

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RESULTS

Table (1): Percentage distribution of the studied women according to their general characteristics of the study and control group (N=162):

General characteristics	Study group		Control group		X^2	P-value
	N (83)	%	N(79)	%		
Age/ year						
18 < 25 years old	25	30.1	19	24.1	3.462	**0.484**
25 <35 years old	39	**47**	36	**45.5**		
35< 45 years old	19	22.9	24	30.4		
Age (mean±SD)	**32.2±8.4**		**31.3±6.9**			
Occupation:						
works	16	19.3	15	19	0.002	**0.963**
house wife	67	**80.7**	64	**81**		
Income level:						
Not enough	20	24.1	22	27.8		
Hardly enough	47	**56.6**	46	**58.3**	0.934	**0.627**
Enough	16	19.3	11	13.9		
Type of family:						
Nuclear	78	**94**	77	**97.5**	1.194	**0.274**
Extended	5	6	2	2.5		
Place of resident:						
Urban	72	**86.7**	67	**84.8**	0.125	**0.724**
Rural	11	13.3	12	15.2		

Table (1) shows that 47.0% and 45.5% of studied women in the study and control group their age varied between 25 > 35 years, with mean age 32.2±8.4 and 31.3±6.9 years respectively. Concerning occupation, 80.7% and 81.0% of studied women in the study and control group were house wife. Regarding income level 56.6% and 58.3% studied women in the study and control group had a moderate income, about 94.0% and 97.5% of them in the study and control group had nuclear family. Related place of residence 86.7% in the study group and 84.8% in the control group were lived at urban areas; with no statistical significant difference between study and control group as p-value >0.05 for all previous variables.

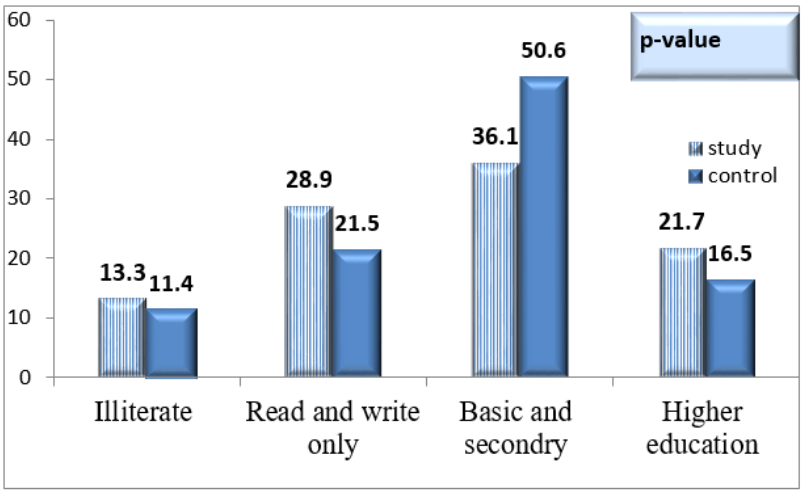

Figure (1): Percentage distribution of study and control group regarding their level of education (N=162):

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Figure (1): illustrates that 36.1% of the women in study group and 50.6% of control group had a basic and secondary level of education, where no statistical significant difference between study and control group as p-value >0.05.

Table (2): Distribution of the studied women according to their current infertility data in the study and control group (N=162):

Current infertility data	Study group		Control group		X^2	P-value
	N (83)	%	N(79)	%		
Type of infertility:						
Primary infertility	51	**61.4**	59	**74.7**	**4.931**	**0.085**
Secondary infertility	32	38.6	20	25.4		
Causes of the current infertility:						
Ovarian dysfunction	34	**41**	33	**41.8**	**1.949**	**0.745**
Blockage of the fallopian tubes	10	12	10	12.6		
Male factor	24	28.9	23	29.1		
Other	15	18.1	13	16.5		
Current treatment plan:						
Ovarian stimulation	24	28.9	14	17.7	**3.972**	**0.137**
Assistant reproductive technology**(ART)**	59	**71.1**	65	**82.3**		
Duration of infertility treatment:						
< 1year	21	25.3	13	16.4	**4.254**	**0.235**
1year < 5 years	46	**55.4**	42	**53.2**		
5 years < 10 years	10	12	18	22.8		
10 years <	6	7.2	6	7.6		

Table: (2): displays current infertility data, and reported that regarding type of infertility, 61.4% in the study group and 74.7% in the control group had primary infertility, 41.0% of the study group and 41.8% in the control group had ovarian dysfunction as a cause of the current infertility. Regarding current treatment plan, 71.1% and 82.3% of the studied women in the study group and control group had ART as a current treatment respectively. Concerning duration of infertility treatment, 55.4% of the study group and 53.2% of the control group had duration of treatment varied from 1-5 years; with no statistical significant difference between study and control group as p-value >0.05 for all previous variable

Table (3): Percentage distribution of the studied women according to their knowledge about OHSS in the study group before, after and follow up intervention (N=83):

Items		Knowledge about OHSS in study group						X^2	P-value
		Before		After		Follow up			
		N	%	N	%	N	%		
Meaning of ovarian stimulation	complete Correct answer	16	19.3	63	75.9	71	85.5	**139.3**	**0.001****
	incomplete Correct answer	39	47	13	15.7	12	14.5		
	incorrect answer	28	33.7	7	8.4	0	0		
Definition of OHSS	complete Correct answer	12	14.5	56	67.5	56	67.5	**143.5**	**0.001****
	incomplete Correct answer	10	12	20	24.1	22	26.5		
	incorrect answer	61	73.5	7	8.4	5	6		
Causes of OHSS	complete Correct answer	8	9.6	47	56.6	50	60.2	**107.2**	**0.001****
	incomplete Correct answer	23	27.7	27	32.6	26	31.4		
	incorrect answer	52	62.7	9	10.8	7	8.4		
Onset of Symptoms appearance	complete Correct answer	9	10.8	68	81.9	67	80.7	**193.3**	**0.001****
	incomplete Correct answer	9	10.8	13	15.7	13	15.7		
	incorrect answer	65	78.4	2	2.4	3	3.6		
Classification of symptoms	complete Correct answer	11	13.3	68	81.9	66	79.5	**179.1**	**0.001****
	incomplete Correct answer	9	10.8	13	15.7	13	15.7		
	incorrect answer	63	75.9	2	2.4	4	4.8		

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Mild Symptoms forms of OHSS?	complete Correct answer	15	18.1	51	61.5	51	61.5	**153.3**	**0.001****
	incomplete Correct answer	9	10.8	29	34.9	28	33.7		
	incorrect answer	59	71.1	3	3.6	4	4.8		
Moderate Symptoms forms of OHSS?	complete Correct answer	10	12	24	28.9	22	26.5	**101.5**	**0.001****
	incomplete Correct answer	15	18.1	49	59.1	50	60.2		
	incorrect answer	58	69.9	10	12	11	13.3		
Severe Symptoms forms of OHSS?	complete Correct answer	9	10.8	22	26.5	23	27.7	**113.6**	**0.001****
	incomplete Correct answer	12	14.5	51	61.5	48	57.8		
	incorrect answer	62	74.7	10	12	12	14.5		
Critical Symptoms forms of OHSS?	complete Correct answer	10	12	44	53	49	59	**137.3**	**0.001****
	incomplete Correct answer	17	20.5	34	41	30	36.2		
	incorrect answer	56	67.5	5	6	4	4.8		
Laboratory investigation required for women to detect OHSS	complete Correct answer	7	8.4	33	39.8	31	37.3	**161.9**	**0.001****
	incomplete Correct answer	11	13.3	45	54.2	46	55.5		
	incorrect answer	65	78.3	5	6	6	7.2		
The rays required for women to detect OHSS	complete Correct answer	5	6	34	41	19	22.9	**138.5**	**0.001****
	incomplete Correct answer	11	13.3	42	50.6	48	57.8		
	incorrect answer	67	80.7	7	8.4	16	19.3		
The risk factors of OHSS	complete Correct answer	5	6	16	19.2	20	24.1	**149.5**	**0.001****
	incomplete Correct answer	9	10.8	53	63.9	57	68.7		
	incorrect answer	69	83.2	14	16.9	6	7.2		
Instructions followed for mild OHSS	complete Correct answer	5	6	55	66.3	59	71.1	**203.1**	**0.001****
	incomplete Correct answer	7	8.5	24	28.9	20	24.1		
	incorrect answer	71	85.5	4	4.8	4	4.8		
Instructions followed for moderate OHSS	complete Correct answer	3	3.6	60	72.3	58	69.9	**209.3**	**0.001****
	incomplete Correct answer	8	9.7	20	24.1	20	24.1		
	incorrect answer	72	86.7	3	3.6	5	6		
Instructions followed for Severe OHSS	complete Correct answer	1	1.2	61	73.5	43	51.8	**167**	**0.001****
	incomplete Correct answer	12	14.5	19	22.9	22	26.5		
	incorrect answer	70	84.3	3	3.6	18	21.7		

Table (3) reveals the studied women's knowledge about OHSS in the study group before, after intervention and follow up, and reported a significant improvement in their knowledge between before, after and follow up, with highly statistical significant difference between before, after intervention and follow up at p-value <0.01 for all variables.

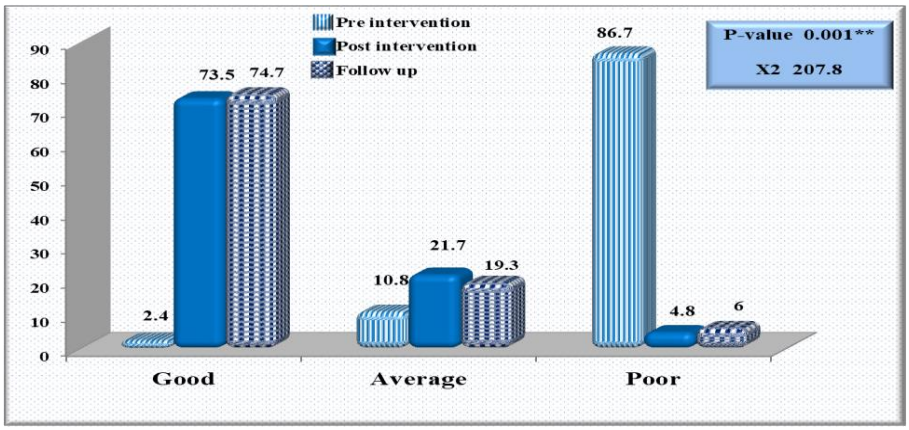

Figure (2): The studied women's total knowledge percentage about OHSS in the study group before, after and follow up intervention (N=83)

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Figure (2): illustrates that 2.4% of the studied women in the study group had a good level of knowledge that was improved to be 73.5% after intervention and 74.7% in follow up, with highly statistical significant difference between before, after and follow up at p-value <0.01.

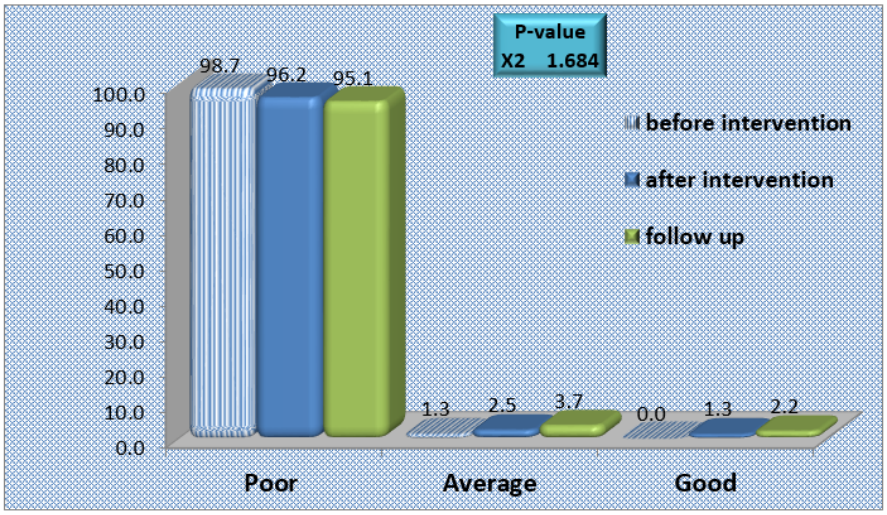

Figure (3) Distribution of the studied women's total knowledge percentage about OHSS in the control group before, after and follow up of intervention (N=79)

Figure (3): this figure clarifies that 98.7% of the studied women in the control group had poor knowledge before routine care, 96.2%, 95.1 after routine care and end of three months of follow up had poor knowledge respectively with no statistical significant difference between before, after and follow up, at p-value >0.05.

Table (4): correlation between the studied women's general data in the study group and total knowledge level regarding OHSS before, after intervention and follow up (N=83):

General characteristics	Total knowledge level regarding OHSS			
		Before intervention	After intervention	Follow up
Age/ years	Pearson Correlation	-.026-	**.346****	.175
	Sig. (2-tailed)	.813	.001	.113
The level of education:	Pearson Correlation	-.029-	**.509****	**.556****
	Sig. (2-tailed)	.793	.000	.000
Occupation:	Pearson Correlation	-.045-	**-.343-****	**-.305-****
	Sig. (2-tailed)	.686	.002	.005
Income level:	Pearson Correlation	.142	**.437****	**.437****
	Sig. (2-tailed)	.202	.000	.000
The duration of current marriage:	Pearson Correlation	-.011-	**-.246-***	-.198-
	Sig. (2-tailed)	.919	.025	.072
Type of family:	Pearson Correlation	.103	**-.334-****	**-.270-***
	Sig. (2-tailed)	.353	.002	.014
Resident:	Pearson Correlation	-.002-	**-.230-***	-.164-
	Sig. (2-tailed)	.985	.037	.137

Table: (4) shows correlation between the studied women's general characteristics in the study group and total knowledge level about OHSS before, after intervention and follow up, and found that before intervention there were no correlation between total knowledge level and all variables. While after

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intervention there were positive correlation between total knowledge level and all variables. And in follow up there were positive correlation between total knowledge level and the level of education, occupation, income level and type of family, and there were no correlation between total knowledge level and age, duration of current marriage and resident.

Table (5): correlation between the studied women's current infertility data in the study group and total knowledge level regarding OHSS before, after intervention and follow up (N=83):

Current infertility data	Total knowledge level regarding OHSS			
		Before intervention	After intervention	Follow up
Type of infertility	Pearson Correlation	.073	-.028-	.036
	Sig. (2-tailed)	.512	.799	.745
Causes of the current infertility:	Pearson Correlation	.063	**-.327-****	**-.285-****
	Sig. (2-tailed)	.578	.003	.010
Current treatment plan:	Pearson Correlation	.017	.019	-.095-
	Sig. (2-tailed)	.878	.868	.391
Duration of infertility treatment:	Pearson Correlation	-.095-	-.089-	-.045-
	Sig. (2-tailed)	.393	.424	.684

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

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

Table (5) shows correlation between the studied women's current infertility data and total knowledge level regarding OHSS in the study group and found that there were no correlations between total knowledge level and all variables of infertility data before, after intervention and in follow up except the correlation between total knowledge level and causes of current infertility that there was positive correlation after intervention and in follow up in the study group

DISCUSSION

One of the major causes of infertility is ovulatory failure so many women undergo induction of ovulation to stimulate their ovaries to produce ova as part of their fertility treatment. Ovarian hyper stimulation syndrome (OHSS) is a complication of fertility treatment, which uses pharmacological ovarian stimulation to increase the number of oocytes and therefore embryos available during assisted reproductive technology (ART).OHSS is associated with significant physical and psychosocial morbidity and has been associated with maternal death **(Elsayed et al.,2021)**

The key principles of OHSS management therefore are early recognition and the prompt assessment and treatment of women with moderate or severe OHSS **(Grynberg et al., 2022).** So this study aimed to evaluate the effect of educational Program about Ovarian Hyper Stimulation Syndrome among Women Undergoing Infertility Treatment.

Regarding to general characteristics of the studied women; In relation to age of the studied women the current study result showed that approximately half of studied women in the study and control group their age varied between 25< 35 years old, with mean age 32.2±8.4and 31.3±6.9 years respectively. This result was supported by **Selter et al., (2019)** who applied study In New York among 11,562 women to evaluate risk factors for life-threatening complications for patients with severe ovarian hyper stimulation syndrome in a United States nationwide sample and found that most of the studied sample aged from 25–39 years old, this similarity may be due to those women came to ART in the reproductive around this age.

Concerning occupation, the present study result revealed that most of studied women in the study and control group were house wife. This result in the same line with **Hassan &Farag, (2019)** who

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applied study in Egypt among 300 women to assess phenotypic characteristics of women with PCOS, found that highly percentage of the studied women were house wife.

Regarding income level, the present study result revealed that more than half of studied women in the study and control group had a hardly enough income, the majority of them in the study and control group had a nuclear family. This result was contradicted with **Braam et al., (2020)** who conducted study in Australia among e 120 women to explore the perspective of women with an increased risk of OHSS regarding the safety and burden of IVF: a discrete choice experiment and showed that less than half of the studied women had highly household income. This result may be due to different economic status between countries of studied samples due to difference in the study sitting.

Related to place of residence, the current study result showed that most of the study and control group were from urban areas; with no statistical significant difference between study and control group as p-value >0.05 for all previous variables. This result was supported with **Selter et al.,(2019)** who showed that the majority of the studied women lived at urban areas In New York, this similarity may return to the place of sample collection

Regarding level of education, the current study result revealed that more than one third of the women in study group and half of them in control group had a basic and secondary level of education, where no statistical significant difference between study and control group at p-value >0.05 .This result was contradicted with **Braam et al., (2020)** who conducted study in Australia among 120 women to explore the perspective of women with an increased risk of OHSS regarding that the safety and burden of IVF: a discrete choice experiment and showed that more than two fifths of the studied women had high level of education, from my side of view this difference may be due to Australia is consider one of the best educational system in the world.

Regarding to present infertility data of the studied woman, According to their current infertility data of the studied women, the present study result reported that regarding type of infertility, less than two thirds and less than three quarters in the study and control group respectively had primary infertility, while slightly less than half of the study and control group had ovarian dysfunction as a cause of the current infertility in my prospective this may was the cause of ovarian stimulation, more over regarding current treatment plan, less than three quarters and most of the studied women in the study group and control group respectively had Assisting Reproductive Technology trial as a current treatment. Concerning duration of infertility treatment, more than half of them in the study group and control group had duration of treatment varied from 1-5 years this may be due to more than half of them their age of marriage were less than 5 years; with no statistical significant difference between study and control group at p-value >0.05 for all previous variable

These findings were supported with **Xiuzhen Shen 2021** who conduct study on 205 women high ovarian responders who were to undergo in vitro fertilization to assess Clinical Pregnancy and Incidence of Ovarian Hyper stimulation Syndrome in High Ovarian Responders Receiving Different Doses of hCG Supplementation in a GnRH-Agonist Trigger Protocol, he found No significant difference was noted in the mean age, infertility duration, infertility causes

These findings were supported with **Sun et al., (2021)** who conducted study in China to examined the risk Factors Associated with Ovarian Hyper stimulation Syndrome (OHSS) Severity in Women With Polycystic Ovary Syndrome Undergoing IVF/ICSI and found that less than three quarters of the studied women had primary infertility, while more than one tenth of them had intra cytoplasmic sperm injection (ICSI) as a treatment. and in accordance with **Hassan &Farag, (2019)** who reported that less than two thirds of the studied women had primary infertility. While this result was contrasted with **Ko et al.,(2021)** who applied study in China to compare the number of oocytes obtained after ovarian stimulation between Chinese and Caucasian women undergoing IVF using a standardized stimulation

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regimen and found that two fifths of the studied women their causes of infertility unexplained, minority of them had duration of treatment varied from 3-6 years

Concern women' knowledge score about ovarian hyper stimulation syndrome in the study group and control group before intervention the present study displayed that the majority both group had poor knowledge about ovarian hyper stimulation syndrome, especially the instruction knowledge followed by moderate or severe ovarian hyper stimulation syndrome when occurred at a baseline assessment before intervention that no statistical significant difference between study and control group before intervention at p-value >0.05 for all variables. I think this result may return to decrease public medical awareness in Egypt.

This result was agreed with **Ahmed et al., (2022)** who applied study in Egypt to evaluate the effect of Instructional guidelines on in vitro fertilization nurses' knowledge and preventive measures regarding ovarian hyper stimulation syndrome and found that there is highly statistical significance difference between pre & posttest regarding total knowledge level of preventive measures about OHSS. While this result was disagreed with **Lumley et al., (2023**) who found that the studied women had insufficient knowledge about ovarian hyper stimulation syndrome

As regard to total knowledge score OHSS in the study group before, after and follow up intervention, the current study result illustrated that minority of the studied women in the study group had a good level of knowledge that was improved to be less than three quarters of them after intervention and in follow up respectively especially the knowledge about meaning of ovarian stimulation, onset of appearance symptoms and classification of ovarian hyper stimulation syndrome, with highly statistical significant difference between before, after and follow up at p-value <0.01. This result may be due to decrease their knowledge before intervention and effect of educational program for women under infertility treatment to enhance women knowledge about OHSS.

This result was the same line with **Hasab Allah. M.,et al 2019** whose carried out at all infertility treatment centers in Minia city (El Nile, Jannah, Minia center, and Egypt center) conduct study on 60 nurses to evaluate Effect of Supportive Guidelines on Nurses' Knowledge and Practices regarding Ovarian Hyper stimulation Syndrome, she founded that the three quarter of the participants nurse had poor knowledge about OHSS in pretest reduced to less than one tenth in posttest with highly statistically significant differences where at p-value < 0.01.

While regarding to the total level of knowledge of studied women at control group, before, immediately, after and three months this study show that the majority of the studied women in the control group had poor knowledge in base line assessment before, still had poor knowledge after routine care and end of three months of follow up respectively with no statistical significant difference between before and after and follow up of routine care at p-value >0.05.this result explain that women don`t receive sufficient knowledge about ovarian hyper stimulation syndrome with routine care

This result was supported with **Elsayed et al.,(2021)** who found that highly percentage of the studied sample had poor knowledge in pretest which declined to more than one tenth of them at immediately post and after one month of interventions respectively.

As regard to correlation between the studied women's personal data in the study group and knowledge level about OHSS before, after intervention and follow up, the current study result found that before intervention there were no correlation between total knowledge level and age, the level of education, occupation, income level, the duration of current marriage, type of family and resident. While after intervention there were positive correlation between total knowledge level and age, the level of education, occupation, income level, the duration of current marriage, type of family and resident. And in follow up there were positive significant correlation between total knowledge level

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and the level of education, occupation, income level and type of family, and there were no correlation between total knowledge level and age, duration of current marriage and resident. This result may be due to level of education is an essential factor in the consolidation of person' knowledge.

This result was agree with **Ahmed et al.,(2022)** who clarified that there is no statistically significant relation between total knowledge level in pretest& age group. And similar with **Devi and Upashe, (2019)** who applied Effectiveness of Structured Teaching Program to assess Staff Nurses Knowledge Regarding Ovarian Hyper stimulation Syndrome and reported that there is no association with variables likes age, professional qualification, total years of clinical experience and clinical experience in maternity ward with knowledge regarding Ovarian Hyper stimulation Syndrome

CONCLUSION

The present study showed that, the knowledge of infertile women about ovarian hyper stimulation syndrome improved for women who received the educational program more than the control group who received routine care only

Recommendation

In the light of the finding of the study, the following recommendation is suggested increase women knowledge about ovarian hyper stimulation syndrome through health education and awareness to become as a part of protocol infertility treatment,

Further research

Effect of nursing guidelines about ovarian hyper stimulation syndrome on women quality of life and satisfaction

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