Effect of educational program based on Levine's conservation model on the quality of life of infetile women

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Abstract

Background: Infertility is a common global problem and one of the major challenges encountered by individuals of reproductive age**. Aim:**The study aimed to evaluate the effect of educational program based on Levine's conservation model on the quality of life of infertile women. **Study design:** Quasi- experimental study (intervention & control group, pre and post test) was utilized to fulfill the aim of the study . **Setting:** The study was conducted at Obstetrics and Gynecology out -patient clinic at Benha University hospital. **Sampling:** A purposive sample of 90 women with infertility was used . **Tools of data collection:** Four tools were used tool (I) A Structured interviewing questionnaire, tool (II) Participated women's knowledge regarding infertility, tool (III) Visual Analogue Scale for Fatigue (VAS-F), Tool (V) Fertility quality of life questionnaire. **Results:** There was a marked improvement in knowledge, fatigue, energy and quality of life of studied sample regarding infertility after implementation of Levine's conservation model with highly statistically significant difference between study and control group (p<0.001) and there was highly statistically significant positive correlation between total quality of life, total knowledge , total fatigue and total energy in both study and control groups at pre , post and follow up intervention phases(p<0.001). **Conclusion:** Levine's conservation model had a positive effect on quality of life of infertile women as well as knowledge, energy and fatigue. **Recommendations:** Designing and implementing counseling programs for infertile couples to imorove sexual and psychological status**.**

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Keywords: Infertility, Levine's conservation model , Quality of life

Introduction

Infertility is a global health issue during the reproductive age, Infertility defined as not being able to get pregnant after 12 months of unprotected regular sex. Although the infertility rate is difficult to determine due to the presence of both male and female factors, the infertility prevalence is not significantly different among various ethnic and racial groups. In general, infertility affects 8%–12% of couples globally *(Jarnagin et* Being diagnosed with infertility is big adversity for both women and men. After the diagnosis, the treatment process also puts lots of physical, physiological, social, and financial stress on couples. This stress in the treatment process is a substantial factor that affects the course and success of treatment. This adversity faced in the infertility treatment process affects both women and men. The burden of treatment operations that falls on women, lead to physical and mental tired, sleepless, stress, and depression for women *(Arugu, 2023).*

The problem of infertility has become a social concern that can lead to severe psychological problems and psychological imbalance between couples and even divorce *(Jarnagin et al., 2023).* Infertility can be considered a crisis in life, identity problem, and a chronic illness. Infertile couples have less satisfaction with life than other counterparts. Particularly, in those societies that bringing children immediately after marriage is encouraged, infertility has a greater impact on couples' quality of life *(Li, 2023).*

Although infertility is not a life-threatening condition, it decreases the quality of life of people. The quality of life is a multi-dimensional concept

that is influenced by physical, psychological, emotional, and social factors *(Bagis, 2023)*. Therefore, the need to assess the underlying social and psychological factors affecting the quality of life of infertile couples is important . Furthermore, more attention should be given to the factors affecting couples' relationships and marital adjustment *(Molgora, 2021)*.

Quality of life includes health, welfare, physical, mental and social dimensions of people. The World Health Organization (WHO) defines the quality of life as understanding of the person own position in life, which is meaningful within culture and value of the place of residing and relates to person's aims, expectations, criteria, and concerns. There are many factors as physical health, mental status, social relations, personal beliefs and person's connection with environment which affect quality of life (*Machado et al., 2023*).

Women having serious difficulties during infertility treatment need holistic nursing care. A nursing model/theory should be used to provide holistic care. Recently, there is an increasing number of theory and model-based studies on women/couples receiving infertility treatment *(Shahbazi et al., 2021)*. One of these nursing models that can be used in caring for women receiving infertility treatment is Levine's Conservation Model (LCM) *(Nezhad et al., 2022)*.

One model of care applicable to infertile women is the Levine's Conservation Model (LCM). This model focuses on adaptations to enable women to maintain the personal integrity using the principles of conservation. This model contains four basic principles: conservation of energy, structural, personal and social integrity. Here, according to Levine's model, the goal is to help women achieve wholeness and stay healthy (*Nezhad et al., 2022*) .

LCM consists of three main components. These are adaptation, integrity, and conservation. Adaptation means living in harmony with internal and external environments by reducing problems that affecting the well-being. Integrity occurs in the presence of a balanced harmony between the ever-changing needs of the person and the problems in

ever-changing environment. Conservation is the assurance of integrity, completeness, and adaptation *(Levine, 1996)*. When conservation is achieved, the person is in harmony and adaptation has been achieved. LCM originated from the conservation concept and emphasized that all nursing practices should be based on conservation principles *(Alkhutaba & Alkhateeb, 2023)*.

Levine's developed four conservation principles in the framework of holistic patient care. These principles are aimed at conserving energy, structural integrity, personal integrity, and social integrity. Given that women receiving infertility treatment go through a very stressful process, energy, structural, personal, and social integrity should be conserved to help these women to cope with this process. LCM was used in caring for preterm infants, elders, cancer patients, postpartum women, and in improving postpartum sexual functions, and was found to be quite effective *(Alkhutaba & Alkhateeb, 2023)*.

Educational program is the profession of educating women about health. Areas within this profession encompass environmental health, physical health, social health, emotional health, intellectual health and spiritual health. Educational program is a process by which women learn to behave in a manner conducive to the promotion, maintenance or restoration of health (*Beydokhti, et al., 2021*).

Nurses should have a broad range of abilities and information that aid in conducting the appropriate assessment and identifying the requirements and problems of infertile women . The primary responsibility of nurses is to make sure that infertile couple have access to enough information on infertility, including diagnostic procedures, medications, treatment plans, and any necessary investigations *(Afroughi & Pouzesh, 2021)*.

The role of the infertility nurse is continually expanding and changing to meet the demands of couples undergoing assisted reproduction, responsibilities of infertility nurses have in ovulation induction programs in fertility clinics . A simple questionnaire was sent to all

fertility units listed in The Patients' IVF Clinics. nurses carry out various tasks within the fertility programe involved in initial consultation, transvaginal ultrasound scanning, intrauterine inseminations, administration of medication, sperm preparation and pregnancy tests *(Farren et al., 2022)*.

Nurses working within these clinical areas can be an instrument in recognizing the symptoms and understanding the impact of this diagnosis on women's activities of daily life and their relationships. Infertility can affect women on a physical, psychological, mental and social level, so a holistic and sensitive approach to care is important in supporting women to cope with this condition *(Akalewold et al., 2023).*

Significance of study

Infertility has major problem that affect on partner psychological status, it's also one of threatening factors that affect the stability of martial status . Infertility can have serious implications on physical such ad violence, social, economic for both spouses . Infertile women also tend to isolation from friends and family ,spend most of the time at home and away from social environment .*(Sahakian et al., 2023)* . Prevalence of the primary and secondary infertility was 2.5 and 7.9% , also, they added that, the overall prevalence of infertility is 10.4%. , infertility has a profound emotional, psychological and economic impact on affected couples and society. (*Otta et al., 2023*).

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. 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 *(WHO, 2023).*

According to Levine's, conservation is one of the most critical concepts that should be evaluated in maintaining a person's life and increase the adaptation of an individual to the situation. So, this study will be conducted to evaluate effect of educational program based on Levine's conservation model on the quality of life of infertile women

Aim of the Study:

The study aimed to evaluate the effect of educational program based on Levine's conservation model on the quality of life of infertile women. **This aim was achieved through the following:**

- Assessing infertile women's knowledge and quality of life regarding infertility.

- Planning, designing and implementing an educational program based on Levine's conservation model for infertile women's regarding infertility.

- Evaluating the effect of educational program based on Levine's conservation model on infertile women's knowledge and QOL regarding infertility.

Research Hypotheses:

H1: Infertile women who receive an educational program regarding infertility will demonstrate improved knowledge and QOL than who don't receive.

H2: Levine's conservation model will have positive effect in improving knowledge and QOL of infertile women.

Subjects & Methods
Research design:

A Quasi- experimental study (intervention & control group, pre and post test) was followed to fulfill the aim of the study.

Setting:

The study was conducted at Obstetrics and Gynecological out -patient clinic at Benha University hospital in Benha city.

Sampling:

The sample included all women suffer from primary or secondary infertility who attended to the previous setting for a period of six months and met inclusion criteria of this study (The total number was 90 infertile women).

Inclusion criteria:

- Infertile women in reproductive age (15: 49) years according to WHO.

- Women who have been diagnosed with of primary or secondary infertility.

- Women who can read and write

Exclusion Criteria:

- Women with mentally illness or unable to communicate .

Tools of data collection:

Four tools were used for data collection as following:

Tool I: A Structured interviewing questionnaire sheet(Appendix I)

It was adopted from *(Sflia &Snchoi., 2021)* ; (*Sahiner & Boz ., 2022)* and translated into Arabic Language , it included five parts as following :

Part (1) Personal characteristics of infertile women such as: (Age, residence, educational level and occupation).

part (2) Anthropometric measures of infertile women such as (weight, height & BMI).

part (3) Menstrual history of participated women such as : (Age of menarche, regularity of menstruation , duration of menstruation, interval of menstrual cycle, amount of menstrual blood, natural of menstrual blood, pain associated with menstrual cycle and severity of pain).

part (4) Medical and surgical history of participated women such as : (suffering from chronic disease, type of chronic disease , previous surgery and post-operative complications).

part (5) Infertility history of participated women such as (Years of marriage, continuous presence of husband, frequency of intercourse per week, use of moisturizing cream during intercourse, vaginal rinsing before and after intercourse, material used for vaginal rinsing, time of diagnosis of infertility, type of infertility, complications occurred during child birth, type of child birth, time of labor, number of abortions, Medications intake to treat infertility,

type of treatment, duration of infertility treatment and traditional practice .

Tool II: Participated women's knowledge regarding infertility (appendix II) : it included (11) MCQ questions such as (definition of infertility, risk factors of infertility for women,causes of infertility for women, risk factors of infertility for husband, causes of infertility for husband, types of infertility, meaning of primary infertility, meaning of secondary infertility, investigation of infertility for women, investigation of infertility for husband and possible treatment).

Scoring system

Each item was given a score (2) when the answer was correct and a score (1) when the answer was incorrect / don't know. The total knowledge score was converted into percentage and graded as the following:

The total score of fertility knowledge classified as the following: the total score is (2x 11) = 22 degree:

6- Good knowledge level >75% of total knowledge score (>16 degree).

7- Average knowledge level 60-75 %of total knowledge score (13-16 degree).

8- Poor knowledge level < 60% of total knowledge score (< 13 degree).

Tool III: The Visual Analogue Scale for Fatigue (VAS-F). (Appendix III): it was adapted from *A Castillo & Allendes.,(2022)* to measure fatigue in infertile women. The scale consists of (2) subscales with (18) items :-

➤ Fatigue measurement (13 items).

➤ Energy measurement (5 items).

- Each item of the scale is rated on a 10-cm horizontal line with positive expressions at one end and negative expressions at the other end. The women marked a point on the line corresponding to the level of their emotions. Then, the marked point was measured and scored from 0-10. The instrument also possesses two subscales: fatigue (items 1–5 and 11–18) and energy (items 6–10)

Tool IV : Fertility quality of life (Ferti Qol sheet) questionnaire (Appendix IV) : it was adapted from *Ozcan, & Kirca, (2023)* to assess the quality of life of infertile women. FertiQoL is the first internationally validated self report questionnaire that can be considered as a tool to assess the quality of life of an individual with infertility. FertiQoL, takes approximately 15-20 minutes to complete. The questionnaire includes 36 items and is divided into two main modules: the core module and treatment module.

Module(1) core module includes: 24 items in 4 subscales and two additional items measure overall satisfaction with physical health and quality of life) to be 26 items as following :

➕ **Emotional (6 items)**: as Do you feel able to cope with your fertility problems ?, Do you fertility problems cause feeling of jealousy and resentment?, Do you experienced grief and feeling of loss about not being able to have a child or more children ?, Do you fluctuate between hope and despire because of fertility problems?, Do you feel sad and depressed about your fertility problems ?, Do your fertility problems make you angry?

➕ **Mind-Body (6 items)** as Are your attention and concentration impaired by thought of infertility?, Do you think you can't move head with other life goals and plans because of fertility problems?, Do you feel drained or worn out because fertility problems?, Do you fertility problems interfere with day to day work or obligations?, Are you bothered by fatigue because of fertility problems ?, Do you feel pain and physical discomfort because of your fertility problems?

➕ **Relational (6 items)** as Are you satisfied with sexual relationship even though fertility problems ?, Are you and your partner affectionate with each other even though you have fertility problems ?, Have fertility problems strengthed your commitment to your partner?, Have fertility problems had a negative impact on your relationship with your partner ?, Do you find it difficult to talk to your partner about your feelings related to infertility ?, Do

you feel pain and physical discomfort because of your fertility problems?

➕ **Social (6 items)** as Are you satisfied with the support you receive from friends with regards to your fertility problems?, Are you socially isolated because of fertility problems?, Do you feel uncomfortable attending social situation like holiday and celebration because of fertility problems?, Do you fell your family understand what you are going through?, Do you fertility problems make you inferior to people with children ?, Do you feel social pressure on you to have or have more children?

1- **Overall health and QOL satisfaction (2 items).**: as   How would you rate your health ?, Are you satisfied with quality of life?

module (2) treatment module consist of 10 items:

6 items for treatment environment : as Are the fertility medical services you would like available to you?, Do you feel the fertility staff under stand what you going through?, Are you bothered by the physical side effects of fertility medication or treatment ?, How would you rate the surgery and/or medical treatment you have received ?, How would you rate the quality of information you received about medication , surgery and /or medical treatment?, Are you satisfied with your interactions with infertility medical staff ?.

4-items   for treatment tolerability : as Does infertility treatment negatively affect your mood?, How complicated is dealing with the procedure and /or administration of medication for your infertility treatments?, Are you bothered by the effect of treatment on your daily or work related activities?, Are you bothered by the physical side effects of fertility medication or treatment?

Scoring system :
Each item of (Fertiqol) questionneire was assigned a score based on a 5 -point of likert scale ranged from (0-4) .

Total score of fertility quality of Life:
the total score of (FertiQol) is 144 degree classified as following :

▪   High quality of life >75%(> 108 degree).

- Moderate quality of life 60-75% (86-108 degree).
- low quality of life < 60 %(<86 gedree).

Content validity:

Tools of data collection were reviewed by three panels expertise in the field of obstetrics and gynecology nursing at faculty of Nursing, Benha University to test content validity and to judge the clarity, relevance, comprehensive, and applicability of tools. All comments regarding format and sequence of questions were taken into consideration, and the necessary modifications were made.

Reliability of the tools:

Reliability was calculated by Cronbach's alpha coefficient test, and the internal consistency of women's knowledge regarding infertility (Too II) was α=0.84. Internal consistency of Visual analogue scale for fatigue VAS-F (Tool III) was α=0.94. Additionally Internal consistency of Fertility quality of life sheet FQOL (Tool IV) was α=0.91.

Ethical considerations:

- The study approval was obtained from Scientific Research Ethical Committee of faculty of nursing at Benha University before starting the study.

- The aim of the study was clarified to each infertile women to gain their confidence and trust.

- Oral consent was obtained from each infertile women before participate in the study.

- The study tools were ensuring that the study didn't touch participant's dignity, culture, traditional and religious aspects and didn't cause any harm for any participant during data collection. Also didn't include any immoral statements and respect human rights.

- All tools of data collection were burned after statistically analysis to promote confidentiality of the study.

- All participated women had freedom to withdraw from the study at any time

Administrative approval:

Approvals to conduct the study was obtained by submission of an official letter issued from the Dean of faculty of Nursing / Benha University to the director of Benha University Hospital before starting the study. Also, oral consent was obtained from each women before data collection

Pilot study:

A pilot study was carried out on 10% of total time of data collection (3weeks) which included (nine infertile women) to evaluate clarity and applicability of tools of data collection and to estimate the time needed to fill questionnaire. According to results obtained from pilot study , no modifications were carried out. Thus, infertile women involved in the pilot study were included in the main study sample

Field work:

- The study was carried out through six months starting from the beginning of march 2023 to the end of August 2023. The researcher visited the previously mentioned setting three days/ week (Saturday, Sunday and Monday) from 9 A.m to 12P.m.

- The researcher provided appropriate separate place for the infertile women during the interview to maintain privacy and confidentiality of the study.

- The researcher introduced herself to the participated women and explained the purpose of the study and also, provided all information about the process of the study to gain confidence and trust participated women .

- Then the researcher obtained oral consent from all the participants in the study. Infertile women were reassured that the obtained data was confidential and infertile women have a right to withdraw from the study at any time without giving any reason.

- The researcher interviewed 1-2 infertile women per day and started by distributing a structured interview questionnaire sheet (tool I) to assess personal characteristics of

participated infertile women, the average time for completion of this tool was around 5-10 minutes.

- Then the researcher used the second tool to assess infertile women knowledge regarding infertility the average time for completion this tool 10-15 minutes.
- Then the researcher used the third tool of Visual analogue scale for fatigue and the average time for completion this tool 5-10 minutes
- The researcher used the final tool(Fertiqol questionnaire) , to assess quality of life of infertile women the average time for completion this tool 10-15 minutes.
- The total time required to filling tools of data collection ranged from 30-40 minute

For intervention group:

- The researcher applied educational program using Levine's conservation model through interactive four sessions for three days per week, the duration of each session was conducted for (10-15 minutes). The researcher followed methods of teaching such as: lecture, group discussion . the researcher applied the educational program through 4 session over four week . the session conducted for small group as following:

- General objective of educational program was stated as " infertile women will be able to acquire knowledge, improve energy and better quality of life regarding infertility" to satisfy the actual needs of studied sample .

- infertile women were oriented with the program contents , each women was informed about the time of the next session , take into consideration the use of Arabic language that suits the infertile women educational level . the subsequent session started by feedback about the previous session and objectives of the new session

- First session: included general information about infertility such as, introduction about infertility, definition, nature of disease, causes, types, diagnosis, prevention and possible treatment .

- Second session: included providing infertile women with information about Conservation of energy which refers to balancing energy input and output to avoid excessive fatigue. Conservation of energy included adequate rest, nutrition, and exercise and adequate sleep.

- **Third session**: included providing information about Conservation of structural integrity body's (preventing physical breakdown) such as exercise and preservation of personal hygiene.

- **Fourth session**: included providing infertile women with information about conservation of personal integrity such as strives for recognition, respect, self-awareness, selfhood, and self-determination. the fourth session also included providing infertile women with information about conservation of social Integrity as the integration of infertile women with her family, community, religious group, an ethnic group, a political system, and a nation. For Example: Helping the women to maintain her position in her family, community, and society which will include social support also encouraged sharing experiences in a group to make them feel better and to prevent social isolation.

- Motivation and reinforcement during sessions were used to enhance motivation for sharing in the study during session , the researcher gave chance to each infertile women to ask question and share information with each other

For control group:

Infertile women in the control group received only the routine hospital care for infertility or counseling regarding infertility after completion of the study, participated women in control group were given the educational guideline regarding infertility.

Evaluation Phase:

This phase was done after 1month of application by using the same format of tools to evaluate the effect of the applied educational program and then compared with control group.

Follow up :-

Follow up done after 2 months to ensure retention of information & improvement of quality of life .

Statistical analysis:

Prior to automated input, data were checked. Data tabulation and analysis were done using SPSS version 22 (Statistical Package for Social Sciences). Descriptive statistics was used (e.g., mean, standard deviations, frequencies, and percentages). Pearson correlation coefficients, independent t-tests, Fisher Exact Test and Chi-square tests were applied.

For all of the statistical tests done,

- p-value > 0.05 which indicated no statistically significant difference.

- p-value ≤ 0.05 indicated a statistically significant difference.

- p-value ≤ 0.001 indicated a highly statistically significant difference.

Results:

Table (1): shows that, 48.9 % of the studied women' age ranged from 30- < 40 years for study group with Mean ± SD (31.73±5.24) while 51.1 % ranged from 20- <30 years for control group with

mean age (30.53±5.25). Regarding to educational level, (48.9 % and 44.4%) of the study and control group had secondary education, respectively. Also, 57.8% of the study group were employee, while 51.1% of control group were housewife. Moreover, (62.2% and 68.9%) of the study and control group were from rural area, respectively

Figure (1): displays that, there was no significant difference between study and control group regarding knowledge about infertility at pre intervention phase (P= > 0.05). While there was highly statistical difference between study & control groups at post intervention & follow up regarding all items of knowledge about infertility.

Table (3): illustrates that, there were a highly statistical significant difference improvement in total fatigue and total energy among the study and control group at post and follow up intervention phase compared to pre intervention (P= ≤ 0.001).

Figure (2):shows that, there was highly statistical significant difference between study & control groups at post intervention &, follow up regarding all items of quality of life compared to pre intervention (P= ≤ 0.001)..

Table (4): shows that, there is a high statistically significant positive correlation between total women' , total quality of life, total knowledge score ,total fatigue and total energy in both study and control groups at pre, post and follow up intervention phases (p ≤ 0.001).

Table (1): Frequency distribution of the studied women in both study and control groups according to personal characteristics (n=90)

Groups / Variables	Study group n=45		Control group n=45		FET/X^2	P-value
	No	%	No	%		
Age (years)						
20-<30 years	21	46.7	23	**51.1**	0.32^ϵ	0.93 [ns]
30-<40 years	22	**48.9**	20	44.5		
≥ 40 years	2	4.4	2	4.4		
Mean ± SD	31.73±5.24		30.53±5.25		t=1.08	0.281 [ns]
Educational level						
Read and write	0	0.0	2	4.4		
Primary education	2	4.4	7	15.6	5.06	0.13 [ns]
Secondary education	22	**48.9**	20	**44.4**		
University education	21	46.7	16	35.6		
Occupation						
Housewife	19	42.2	23	**51.1**	0.71	0.39 [ns]
Employee	26	**57.8**	22	48.9		
Residence						
Rural	28	**62.2**	31	**68.9**	0.44	0.50 [ns]
Urban	17	37.8	14	31.1		

Figure (1): Frequency distribution of studied women' total knowledge score regarding infertility in both study and control groups at pre intervention , post intervention & follow up (n=90).
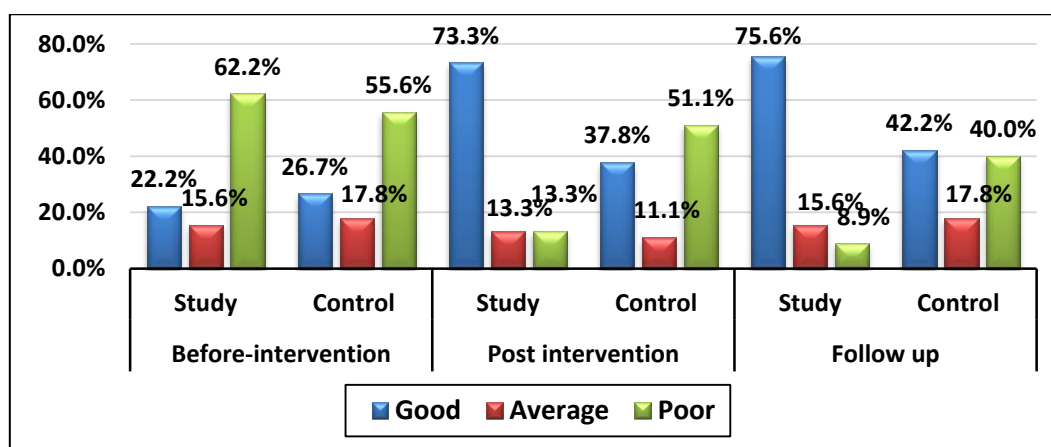
Table (3): Comparison of the mean scores of total fatigue and total energy among the studied sample in both groups at pre intervention, post intervention and follow up phases of Levine's conservation model (n=90).

Dimensions	Range of Possible Scores	Study group n=45 Mean ±SD	Control group n=45 Mean ±SD	t-test	P value
Total Fatigue (13 items)					
Pre -intervention		84.48±17.96	86.28±16.39	0.497	0.621 [ns]
Post intervention	0-130	43.57±16.89	81.35±16.50	10.72	0.000**
Follow up		41.97±17.17	79.73±17.95	10.19	0.000**
Total Energy (5 items)					
Before-intervention		19.93±5.07	20.71±5.91	0.670	0.505 [ns]
Post intervention	0-50	35.77±3.04	22.00±5.87	13.96	0.000**
Follow up		37.48±4.03	22.88±5.48	14.37	0.000**

Figure (2): Frequency distribution of studied women' total quality of life regarding infertility in both groups at pre intervention, post intervention and follow up phases (n=90).
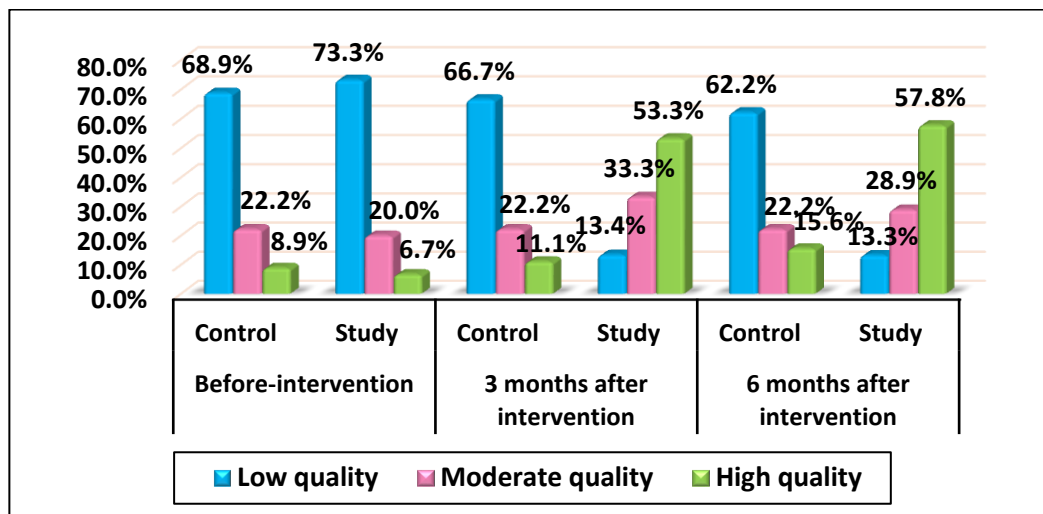

Table (4): Correlation between studied women', total quality of life, total knowledge score ,total fatigue and total energy in both study and control groups at pre intervention, post intervention and follow up phases (n=90) .

Variables	Total quality of life											
	Control group n= 45						Study group n= 45					
	Pre-intervention		Post-intervention		Follow-up		Pre-intervention		Post-intervention		Follow-up	
		lue		lue		lue		lue		lue		lue
Total knowledge	.446	.000**	0.471	.000**	.491	.000**	.432	.000**	.510	0.000**	.634	.000**
Total fatigue	-.409-	.000**	-.421-	.000**	-.452-	.000**	-.461-	.000**	-.554-	0.000**	-.573-	.000**
Total Energy	.489	.000**	.510	.000**	.543	.000**	.572	.000**	.549	.000**	.696	.000**

** Highly Statistically significant p ≤ 0.0

Discussion

Infertility can profoundly impact woman's quality of life, influencing psychological, emotional, and social well-being. Related to the complex challenges infertile women face, there's an increasing need for supportive interventions that address holistic needs. Levine's conservation model, initially conceptualized to guide nursing practice, emphasizes preserving the integrity, stability, and conservation of individual energy to promote health. By using this model, several educational programs have been designed for infertile women, which aim to improve quality of life. *(Madziyire et al., 2021).* Quality of life of infertile women (QoL) can be affected by perception of position in life in the context of the culture and value systems in which infertile women live and in relation to goals, expectations, standards, and concerns. *(Chaudhary et al., 2022).*

This study aimed to evaluate Effects of educational program based on Levine's conservation model on the quality of life of infertile women. Study hypothesis has been proved

through study results which will Discussed as following sequence:

Concerning demographic characteristics of the studied women in both study and control groups according to personal characteristics, the present study revealed that about half of the studied women' age ranged from 30- < 40 years for study group with Mean ± SD (31.73±5.24) while more than half of women in control group ranged from 20- <30 years with mean age (30.53±5.25). Regarding to educational level, less than half of the study and control group had secondary education. Also, more than half of the study group were employee, while more than half of control group were housewife. Moreover, more than three fifths of study group and more than two thirds of control group were from rural area .

On basis of these results, the researcher concluded that, due to the rural culture and young age of a large percentage of the participating women (20 : <30 years) and a not insignificant percentage of them being housewives, it's expected that their information will be limited in addition to the pressure on the issue of early pregnancy.

This result was congruent with *Abd El-Kader et al., (2022)* who conducted a study titled as "Risk factors for endometriosis among Egyptian infertile women with different disease stages" and showed that Mean ± SD of Women age was 30.4 ± 6.1. Also, this result was similar to *Hassan et al., (2023)* who revealed a study at outpatient clinic of Obstetrics and Gynaecology department in Benha University Hospital, Egypt about "Effect of nursing counselling based on BETTER model on sexuality and marital satisfaction among infertile women" and represents that mean age of study and control groups were 30.61±3.22 and 31.77±3.38 years respectively. Concerning residence, more than half of the study and control groups respectively live in urban places.

Furthermore, this finding agreed with *Hamed et al., (2021), who* studied " the role of diagnostic laparoscopy in the unexplained infertility cases" in Egypt, and found that, about two fifths of the studied women had secondary education.

These findings of this study were inconsistent with *Alkor & Abbassi., (2022),* who studied "unilateral and bilateral tubal obstruction in female infertility: Comparison study between hysterosalpingography and laparoscopy, in Damascus" and found that, the participants ages ranged between 17-41 years, and the average age of the participants was 29.67±6.78. This might be due to the most of infertility women attended to Obstetrics and Gynaecology Outpatient Clinic are in childbearing age.

On the other hand, this results was contraindicated with *Ibrahim et al., (2023)* who conducted a study titled as "Effectiveness of Lifestyle Modification on Health-Related Quality of Life among Women with Polycystic Ovary Syndrome" and indicated that more than half of the women had secondary education, Also, slightly less than two fifths of the study group were employee, while more than half of control group were housewife.

Also, this result was inconsistent with *Shehata et al., (2023)* who carried out a study titled as "Clinical Aspects and Quality of Life among Women with Endometriosis in Port Said City "and mentioned that a mean age of 29.1± 4.8 years and more than two third between the ages of 25 and 35. About more than half of the women in the study were highly educated, and married also less than three fifths of them were working.

This result was disagreed with *Alasser et al., (2022)* in their recent study titled "Effect of instructional supportive guidelines on quality of life among women with endometriosis" reported that more than one third of the women' age ranged from 30-40 year, less than one quarter of women residence in urban area, and slight less than two fifths of the study women were Working.

Regarding to knowledge of studied women about infertility, the present study displayed that, there was no significant difference between study and control group regarding knowledge about infertility at pre intervention phase While there was highly statistical difference between study & control groups at post intervention & follow up

phases regarding all items of knowledge about infertility **.**

From the researcher point of view, these results proven the effectiveness of applicable model and that the participants' understand of infertility-related topics.

This finding was congruent with ***Mohammed e t al ., (2019)*** who Revealed that there was highly statistically significant differences between pre and post-test regarding total knowledge in pre and post-test .

Regarding women' total knowledge of infertility in both study and control groups at the present study demonstrated that; less than one quarter of the studied women had good knowledge level about infertility of study group while more than one quarter of women had good knowledge level about infertility of control group at pre intervention phase , compared with post and follow up , less than three quarters had good knowledge level about infertility of study group , while more than one third had good knowledge level about infertility of control group at post intervention , Also more than three quarters had good knowledge level about infertility of study group, while more than two fifth had good knowledge level about infertility of control group at follow up . This result demonstrated that Levin's conservation model was very effective in improving the infertile women's knowledge level regarding infertility .

From the researcher point of view, improving women's knowledge of infertility often requires a multi-faceted approach which involve developing culturally sensitive educational materials, promoting open discussions about infertility, providing accessible healthcare services, and enhancing health literacy initiatives. Reducing stigma surrounding infertility and encouraging the dissemination of accurate information through healthcare providers and reliable sources are also crucial steps in enhancing women's knowledge in this area and provided women with a booklet related to infertility.

This finding was congruent with ***Mohammed e t al ., (2019)*** who Revealed that there was highly statistically significant differences between pre and post-test regarding total knowledge in pre and post-test .

Also, the results of current study agreed with ***Mohammed et al., (2022)*** who studied "Effect of Guided Instructions Using Bundle of Care on Knowledge and Compliance with Treatment among infertile Women " showed that there was a highly statistically significant increase in total knowledge score post intervention compared to pre intervention among infetile women. Also, showed that more than two thirds of the infertile women in the intervention group had poor knowledge regarding infertility pre intervention whereas post intervention knowledge level increased and became less than two thirds of them had good knowledge. Poor or inadequate knowledge might be attributed to the highest percentage of women lived in rural areas.

This finding was incongruent with ***Ofosu-Budu et al. (2021),*** who studied "ways of reducing the stigma of infertility: Views of infertile women and their herbalists" in Eastern Finland , and reported that, more than half of partcipant women had poor knowledge about infertility.

These results also contraindicated with ***Baiomy et al., (2023)*** and illustrated that; about three fifths of the studied women had average knowledge level about infertility, while less than third of them had poor knowledge level about infertility and only tenth of them had good knowledge level about infertility.

Considering dimensions of Levin's conservation models (total fatigue and total energy) among the studied women in both groups the present study illustrates that, there were a highly statistical significant difference improvement in total fatigue and total energy among the study and control group at post and follow up intervention phase compared to pre intervention. The researcher attributes this improvement to positive effect of the applied

program based on Levin's conservation models on the quality of life of infertile women .

This result was agreed with **_Özcan &Kirca,_** _(2023)_ who conducted a study in Turkey, about "The effects of nursing care based on Levine's conservation model on fatigue, depression, perceived social support, and sleep quality in infertile women: A randomized controlled trial" and showed that the experimental group had a lower fatigue level than the control group, with a statistically significant difference between the groups. It was also found that the experimental group had higher energy and perceived social support scores than the control group after the practice, with a statistically significant difference between the groups .

Regarding quality of life of infetile women , the present study showed that, there was highly statistically significant difference between study & control groups at post intervention & follow up regarding all items of quality of life compared to pre intervention **.** From the researcher point of view, these results may be related to highly successful in addressing the specific quality of life factors under consideration. This could include counselling, or lifestyle changes and applied program based Levin's conservation models

Concerning total quality of life of the studied women, the present study illustrated that less than one tenth had high quality of life of control group, while minority of study group had good quality of life at pre intervention phase. Also more than one tenth of control group had good quality of life, while more than half had good quality of life of study group at post intervention ,also less than one fifth had good quality of life of control group, while less than three fifth of study group at follow up phase .

This result was consistent with **_Baiomyet al.,_** _(2023)_ who studied Quality of life among infertile women in Benha city and demonstrated that, one tenth of control group, had good quality of life while minority of study group had had good quality of life at pre intervention, one fifth had average quality of life of control group, while two

thirds of study group had good quality of life at post intervention , while about more than one fifth had good quality of life of control group at follow up , while more than half of study group had good quality of life at follow up .

Also, this finding was in accordance with **_Fadaei et al., (2019)_** who studied "The Effect of Educating Based on Continuous Care Model on the Infertility Treatment related Quality of Life, Iran" Less than quarter of the control group had good quality of life , while one fifth of study group had good quality of life at pre intervention, while more than quarter of control group had good quality of life and half of study group had good quality of life at post intervention while majority had good quality of life at follow up

This finding was disagreed with **_Wdowiak et al. (2021)_** who conducted a study in Poland, about "Assessment of quality of life in infertility treated women in Poland" and they reported that, the most of women had very good quality of life at pre intervention .

Regarding correlation between studied women , total quality of life, total knowledge score, total fatigue and total energy in both study and control groups, the present study showed that, there was a high statistically significant positive correlation between total quality of life, total knowledge score, total fatigue and total energy in both study and control groups at pre, post and follow up intervention phases . From the researcher point of view, it may be related to several causes such as effective intervention, health empowerment, stress reduction, improve health care seeking behaviour, and life styles changes.

This result was consistent with **_Baiomy et al., (2023)_** who revealed that; there were highly statistically significant positive correlation between the studied women total quality of life score, total knowledge score and energy

This result was strongly agreed with **_Ahmed,_** (**_2023_**) who displayed that a highly significant positive correlation between total knowledge regarding infertility and total quality of life in

intervention group after implementation of the continuous care model (p ≤0.001).

This result was inconsistent with ***Mohamed et al., (2019)*** who studied "Effect of educational intervention about nutrition for infertile women on their knowledge in preconception period" and revealed that there is no statistically significant positive correlation between the studied women total quality of life score, total knowledge score and total energy.

Conclusion:

Based on the results of the current study, it could be included that:-

Application of educational program based on Levine's conservation model had a positive effect on quality of life of infertile women. There was marked improvement in knowledge level and energy of infertile women and decrease fatigue level. The researcher also concluded that there was positive correlation between quality of life, knowledge, energy and fatigue of infertile women.

So,the current study results supported study hypothese and aim.

Recommendations:
- Designing and implementing counseling programs for infertile couples to improve sexual and psychological status.
- In service training programs for health professionals to use Levine's conservation model to improve quality of life of infertile women.
- A simplified and comprehensive booklet regarding infertility should be available for all infertile women in all health facilities.
- Premarital counseling should be provided emphasizing on the importance of good sexual relations and it's effect on infertility.

Recommendations for further studies:
- Training programs for all women with infertility to raise their knowledge and improve their attitude about infertility.

- Replication of the study on large sample size in different setting for generalization of results.

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