

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

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Abstract

Background: Infertility failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse. Aim of research: investigate the Effect of educational program based on Levine's conservation model on the quality of life of infertile women. Research design: A Quasi- experimental study (study and control group) was employed to complete the objective of the investigation. Research setting: An obstetrics and gynecological outpatient clinic affiliated with Benha University hospital. Research sample: A purposive sample of 90 women with infertility was used which divided equally into two groups (each 45 women). Tools of data collection: Four tools were employed tool(I) A Structured interviewing questionnaire, tool (II)Evaluation infertile women's knowledge concerning infertility, tool (III)Visual Analogue Scale for Fatigue to assess infertile women fatigue, Tool (IV) Fertility life quality questionnaire to assess life quality of infertile women. Results: A significantly significant difference was noted between study and control groups regarding knowledge, fatigue, energy, and quality of life pertaining to infertility following the application of Levine's conservation model ($p < 0.001$) and there was greatly statistically significant positive connection 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 impact on life quality of infertile women as well as knowledge, energy and fatigue. Recommendations: Designing health educational program for infertile women to improve and update the most current knowledge, practices and life quality.

Keywords: Infertile women, Levine's conservation model, Quality of life

1. Introduction

Infertility is a global health issue during the reproductive age, Infertility characterized as not being able to conceive following a year of regular, unprotected intercourse. Infertility is the major health problems that affect people around the world. Worldwide 48 million couples and 163 individual suffer from infertility. Despite the fact that calculating the infertility rate is straightforward due to the coexistence of male and female variables [Ramadan & Said, 2023]. Female factors account for at least 64% of all fertility problems and underlying medical conditions such as damage to the fallopian tubes that disrupts ovulation, pelvic inflammatory disease, polycystic ovaries, endometriosis, prematurity, and male factors contribute to a minimum of 36% of all reproductive issues. Diverse ethnic and racial groups do not differ substantially in the prevalence of infertility. 8–12% of couples worldwide are generally afflicted with infertility. [Jarnagin et al 2023] A diagnosis of infertility is a significant setback for both males and females. The treatment process places significant physical, physiological, social, and financial strain on couples subsequent to the diagnosis. The level of stress experienced during the therapy procedure significantly impacts both the trajectory and efficacy of the treatment. This challenge encountered during infertility therapy has an impact on both males and females. The burden of treatment operations that falls on women, lead to physical and mental tired, sleepless, stress, and depression for women [Arugu, 2023].

Social concern has grown over the issue of infertility, which can result in significant psychological issues, psychological imbalances

between partners, and even divorce [Jarnagin et al., 2023]. One could characterize infertility as a life-threatening condition, an identity dilemma, or a chronic ailment. Life satisfaction is lower for infertile couples compared to their non-fertile counterparts. More so in communities that promote the practice of conceiving children quickly following matrimony, infertility significantly affects the quality of life for couples [Li, 2023].

The health, welfare, physical, mental, and social aspects of individuals comprise life quality. According to WHO, life quality concerning an individual's viewpoint of their own status in life, which is significant within the cultural framework and values of their place of residence and is associated with their aspirations, expectations, criteria, and concerns. Quality of life is influenced by a variety of elements, including physical health, mental state, social relationships, personal views, and environmental connection [Machado et al., 2023].

Women undergoing infertility treatment who are experiencing significant challenges require comprehensive nursing care. A nursing theory or model ought to guide the delivery of comprehensive care. In recent years, the amount of theory and model-based studies examining infertile therapy for women and couples has increased [Shahbazi et al., 2021]. Levine's Conservation Model is one of several nursing models that may be applied to women care undergoing infertility therapy [Nezhad et al., 2022].

This paradigm emphasizes adjustments that enable women to preserve their personal integrity in accordance with conservation ideals. Four fundamental concepts comprise this model: energy

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conservation, personal and social integrity, in addition to structural integrity. Levine's concept posits that the objective is to assist women in attaining wholeness and maintaining their health [Nezhad et al., 2022].

The Conservation Model of Levine comprises three primary components. Conservation, integrity, and adaptation are the three. Adaptation entails attaining a state of equilibrium with one's internal and external surroundings through the mitigation of challenges that have an adverse impact on one's welfare. Integrity is observed when there is a harmonious equilibrium between the dynamic requirements of an individual and the challenges presented by a constantly evolving environment. Conservation ensures the preservation of authenticity, comprehensiveness, and flexibility [Levine, 1996].

Four conservation principles were formulated by Levine within the context of comprehensive patient care. The purpose of these principles is to promote energy conservation, social integrity, personal integrity, and structural integrity. Considering the very stressful nature of the infertility treatment experience for women, it is imperative that their structural, personal, social, and energy integrity be preserved in order to assist them in managing this ordeal. It was determined that Levine's conservation model was quite beneficial when applied to the care of preterm newborns, the elderly, cancer patients, postpartum women, and the improvement of postpartum sexual functioning [Alkhatiba & Alkhateeb, 2023].

The educational programme teaches women how to conduct themselves in a way that is advantageous for the advancement, preservation, or reestablishment of medical well-being. Environmental, mental, spiritual, social, emotional, and intellectual health are all addressed in educational curricula [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].

In these clinical domains, nurses can play a crucial role in identifying the symptoms and comprehending the ramifications of this diagnosis on the daily lives and interpersonal connections of women. As infertility can have physical, psychological, mental, and social repercussions on women, it is crucial to help them with a caring and comprehensive approach to care as they struggle to manage this disease [Akalewold et al., 2023].

2. Significance of research:

Infertility has significant negative out come and impact on physical, social, emotional, psychological on Infertile couples live, infertile women experience violence, divorce, social stigma, low self-esteem, isolation, spend most of the time at home and away from social environment, also

Infertility lead to more destruction of the relationship between couples. Prevalence of the primary and secondary infertility was 2.5 and 7.9% in the world [Sahakian et al., 2023].

The prevalence of infertility differs geographically, with an estimated eight to twelve percent of couples globally being affected. It was discovered that one in every four couples in emerging nations had infertility. As an indication of the prevalence of infertility among Egyptian women, 12% of Egyptian couples were afflicted. Approximately 17.5% of the adult population, or 1 in 6 individuals globally, is affected by infertility. Among the male population in Egypt, 4.3% experience primary infertility and 7.7% secondary infertility. Given that the population of Egyptian women aged 15 to 49 surpasses 25 million, at least 3 million of this age group are infertile [WHO, 2023].

Levine argues that conservation is a pivotal notion that warrants careful examination in order to sustain human life and enhance infertile women adaptation to the environment. Pertaining to evaluating the effect of an educational program based on Levine's conservation model on the quality of life of Infertile women, the present study was undertaken

3. Aim of research:

Study effect of educational program based on Levine's conservation model on the quality of life of infertile women

was accomplished by use of the subsequent:

- Assessing life quality and knowledge of infertile women concerning infertility.
- Developing, planning, and executing an educational program for infertile women concerning infertility based on Levine's conservation model.
- Assessing the impact of an educational program grounded in Levine's conservation model on the knowledge and life quality of infertile women with respect to infertility.

4. Research Hypotheses:

H1: Infertile women who received an educational program based on Levine's conservation model concerning infertility demonstrated greater knowledge and better life quality compared than those who did not receive.

H2: Infertile women who received educational program based on Levine's conservation model concerning infertility would improve energy, personal, social, structure integrity and decrease fatigue compared than those who did not receive.

5. Subjects and Method

5.1. Research design

A Quasi- experimental study [study and control group]. was employed to accomplish the objective of the investigation

5.2. Research setting:

obstetrics and gynaecological outpatient clinic affiliated with Benha University hospital in Benha city was utilized to conduct the research.

5.3. Research sampling:

A purposive sample was used to fulfill the aim of the study. The sample included all women suffer from

primary or secondary infertility who attended to the prior setting for A duration of six months and met inclusion criteria of this study (The total number was 90 infertile women) the study sample classified into two group (study group and control group).

Inclusion criteria:

- Infertile women in reproductive age 20- more than 40 years
- 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.
- Free from any medical or phycological problems affect quality of life.

5.4. Tools of data collection:

The following five tools were utilized in this research:

5.4.1.Tool(I): A structured interviewing questionnaire sheet :- Tool I: A Structured interviewing questionnaire sheet

It was adopted from [Afroughi & Pouzesh, 2021]. [Sflia & Snchoi., 2021] ; and translated into Arabic Language, it comprised the subsequent five components:

Part (1) Assessment of personal characteristics of infertile women such as: (Occupation, residence, age, and education level)

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

part (3)Assessment menstrual history of infertile women such as : (Menarche age, menstrual cycle interval, regularity, length, and duration of menses, amount of menstrual blood, natural of menstrual blood, pain associated with menstrual cycle and severity of pain).

part (4) Assessment medical and surgical history to assess Infertile women such as : (suffering from chronic disease, type of chronic disease , previous surgery and post-operative complications).

part (5)Assessment infertility history of infertile women such as [marriage duration, continuous presence of husband, frequency of intercourse per week, using of moisturizing cream during intercourse, vaginal rinsing before and after intercourse, type of vsginal wash used , timing of infertility diagnosis , 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 used to facilitate pregnancy

5.4.2.Tool (II)Tool II: Assessment of Infertile women's knowledge regarding infertility the researcher designed it following an examination of the advanced literature review [Sahiner & Boz ., 2022]: it included (11) MCQ questions such as (meaning of infertility, risk factors of infertility for women, reasons why women cannot conceive, husbands' risk factors for infertility, husband's infertility reasons, 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

For each item, a score of two was assigned for a complete correct response and a score of one for an incompletely correct or unknown response. After being translated to a percentage, the overall knowledge score was assigned the following grade:

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

- 1- Good knowledge level >75% of total knowledge score (>16 degree).
- 2- Average knowledge level 60-75 %of total knowledge score (13-16 degree).
- 3- Poor knowledge level < 60% of total knowledge score (< 13 degree).

5.4.3.Tool [III]: Partograph: - The Visual Analogue Scale for Fatigue (VAS-F) to assess fatigue of Infertile women:

it was adopted from *Castillo & Allendes., [2022]* to measure fatigue in infertile women. The scale comprises (2) subscales with (18) items :- to assess conservation of energy

- Fatigue measurement(13) items.
- Energy measurement (5)items.

Scoring system:-

- Every item on the scale is graded along a horizontal line of 10 cm, with positive and negative expressions at either end. According to their emotional states, the women each marked a point on the line. A measurement and score between 0 and 10 were then applied to the specified point. Two subscales are also included in the instrument: energy[items 6–10] and weariness items 1–5 and 11–18

5.4.5.Tool(IV)Tool IV : Fertility quality of life (Ferti Qol sheet) questionnaire to assess quality of life of Infertile women:

it was adopted from *Ozcan, & Kirca, [2023]* to evaluate the infertile women's life quality. The first self-report questionnaire to receive international validation is called FertiQoL, and it can be used to evaluate an infertile person's quality of life. The 36-item survey is broken down into two primary sections: the core module and the treatment module.

Module(1) core module includes: The overall satisfaction with physical health and quality of life is measured by 24 items divided into 4 subscales and 2 additional items. The 26 items are as follows:

- **Emotional (6 items)** Feeling able to cope with your fertility problems , Feeling of jealousy and resentment because of the fertility problems, Experienced grief and feeling of loss about not being able to have a child or more children, Fluctuate between hope and despire because of fertility problems, Feeling of sad and depressed about your fertility problems, Feeling of angry because of fertility problems
- **Mind-Body (6 items)** impaired attention and concentration by thought of infertility, thinking of can't moving a head with other life goals and plans because of fertility problems, feeling drained or worn out because of fertility problems, interfering with day

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to day work or obligations of fertility problems , bothering by fatigue because of fertility problems, feeling of pain and physical discomfort because of the fertility problems

- **Relational (6 items)** Satisfying with sexual relationship even though fertility problems, Affectioning with each other(your partner)even though you have fertility problems, Strengthening your commitment to your partner even though fertility problems, Haveing a negative impact on your relationship with your partner because of fertility problems, Find it difficult to talk to your partner about your feelings related to infertility, Feeling of pain and physical discomfort because of fertility problems.

- **Social (6 items)** Satisfying with the support you receive from friends with regards to your fertility problems, Socially isolation because of fertility problems, Feeling of uncomfortable in attending social situation like holiday and celebration because of fertility problems, Understanding by the family what you are going through, Feeling of inferior to people with children because of fertility problems, Feeling of social pressure on you to have or have more children.

- **Overall health and QOL satisfaction(2 items)** as level of health give? , you satisfy with life's quality?

module [2] treatment module consist of 10 items:

6 items for treatment environment, Fertility medical services available to you, feeling of the fertility staff understand what you going through, Bothering by the physical side effects of fertility medication or treatment., Rate the surgery and/or medical treatment you have received, Rate the quality of information you received about medication , surgery and /or medical treatment, Satisfying with your interactions with infertility medical staff,

4-items for treatment tolerability: Infertility treatment negatively affecting on your mood, Dealing with complicated of the procedure and /or administration of medication for your infertility treatments, Bothering by the effect of treatment on your daily or work related activities, Bothering by the physical side effects of fertility medication or treatment.

Scoring system :

Each item of (FertiQol) questionnaire was assigned a score according to a 5 -point of likert scale ranged from (0-4) .

Total score of fertility quality of Life:

The total score of Ferti Qolis 144 degree classified as following :

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

6.Tools validity:

Three panels with expertise in obstetrics and gynaecological nursing at Benha University's faculty of Nursing evaluated the data collection instruments in order to assess their content validity and assess their clarity, relevance, comprehensiveness, and

applicability. All feedback pertaining to the structure and order of the questions was considered, and the appropriate adjustments were made.

7.Tools reliability:

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

8.Ethical considerations:

- Before beginning the study, permission was granted by the Benha University Faculty of Nursing's Scientific Research Ethical Committee.

- The study's objective was made clear to each infertile woman in order to earn their trust and confidence.

- Before taking part in the trial, each infertile woman gave her oral consent.

- The study's instruments guaranteed that no subject would suffer injury during data collection or have their dignity, culture, customs, or religion violated. did not violate human rights and did not contain any unethical sentiments.

- After statistical analysis, all data collection instruments were destroyed to protect study confidentiality.

- Every woman who took part in the study was able to leave at any time.

9. Pilot study:

A pilot research was performed on 10% of the overall data collection time [3 weeks] and involved 9 infertile women in order to assess the usefulness and clarity of the data collection instruments as well as the amount of time required to complete the questionnaire. No changes were made in accordance with the findings of the pilot research. Women who were infertile during the pilot trial were thus a part of the main study population.

10.Operational design:

The study was conducted through three phases [preparatory, implementation and evaluation phase].

10.1. Preparatory phase

The researcher taught and trained on the four-phases teaching method and read many literature reviews about this method. Also, the researcher reviewed the national and international advanced literature to design tools of data collection.

10.2. Educational guidelines:

Under the supervision of the supervisors, the researcher created it after studying pertinent national and international literature, and it contained the following: an introduction, a definition, incidence, risk factors , causes , type, diagnosis , treatment of infertility , diet that increase or decrease fertility for women , prevention of infertility, principle of Levine's conservation model (energy conservation, structure integrity, personal integrity and social integrity) it was written in straightforward Arabic and was backed up by numbers.

10.3. Field work:

- Beginning in March 2023 and ending in August 2023, the study was conducted over a six-month period. Three days a week (Saturday, Sunday,

and Monday) from 9 a.m. to 12 p.m., the researcher visited the previously prementioned setting

- In order to protect the study's privacy and confidentiality, the researcher gave the infertile women a suitable, private space during the interview.

- To earn the women's confidence and trust, the researcher presented herself to them, described the goal of the study, and gave them all the details about how it was being conducted.

- Then the researcher obtained oral consent from all the participants in the research. Infertile women were reassured that the obtained data was confidential and infertile women possess the freedom to leave the study at any moment and without explanation.

- The researcher interviewed 2-3 infertile women per day and started by distributing a structured interview questionnaire sheet (tool I) to determine personal characteristics of participated infertile women, the average amount of time needed to finish this tool was around 5-10 minutes.

- Then the researcher utilized the second tool to determine infertile women knowledge concerning infertility. The average time needed to finish using this tool 10-15 minutes.

- The researcher used the third tool of Visual analogue scale for fatigue to determine the Infertile women fatigue and the average time needed to finish using this tool 5-10 minutes

- The researcher used the final tool (Fertiqol questionnaire) to determine the life quality of infertile women. The average time required to complete this tool is 10 to 15 minutes.

- The total time required to filling tools of data collection ranged from 30-50 minute

10.4. For study group:

- The researcher applied educational program using Levine's conservation model through interactive four sessions, each session had a duration of [(10-15 minutes] The researcher followed methods of teaching Like that: lecture, group discussion.

- General objective of educational program was stated as “ infertile women will have the capacity to gain knowledge, improve energy and better life quality regarding infertility” to fulfil the verified requirements of the sample under investigation.

- The program contents were introduced to infertile women, and each woman was duly notified of the time of the subsequent session. Emphasis was placed on employing a basic Arabic language that is appropriate for the educational level of the infertile women. The next session commenced with input of preceding session and the aims of upcoming session.

- **First session:** incorporated general information about infertility such as, introduction about infertility, definition, risk factor of disease, causes, types, investigation, prevention and possible treatment.

- **Second session:** included providing infertile women with information about Energy conservation is the practice of maintaining a balance between energy input and output in order to prevent

exhaustion. Conservation of energy included adequate rest, nutrition, 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 concerning the preservation of personal integrity, including the pursuit of self-awareness, self-determination, respect, and recognition. 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, a nation, a religious group, an ethnic group, and a political system. To illustrate, promoting social support and encouraging women to share their experiences in a group setting can alleviate feelings of loneliness and assist them in maintaining their standing within their families, communities, and societies.

- Active engagement was increased through the use of reinforcement and motivation during sessions; each infertile woman was granted the opportunity to articulate the feelings and pose inquiries.

10.5.For control group: Infertile women in control group acquired 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.

10.6.Evaluation phase:

This phase was conducted immediately following educational program employing the identical structure of evaluation tools to assess the applied educational program's impact, and the results were then compared to those of the control group.

10.7.Follow up:-

Two-month follow-up is conducted to check that the information is retained and that the quality of life has improved

10.8.Administrative design:

In order to commence the study, the director of Benha University Hospital was presented with an official letter endorsed by the dean of the faculty of nursing at Benha University, requesting permission to conduct the research. Additionally, each woman provided oral consent prior to data collection

10.9. Statistical analysis:

Before being entered automatically, the data underwent verification. Analysis and tabulation of data were performed utilizing SPSS version 22. (Statistical Package for Social Sciences[Utilization of descriptive statistics) e.g., mean, standard deviations, frequencies, and percentages). The following tests were utilized: Pearson correlation coefficients, independent t-tests, Fisher Exact Test, and Chi-squared Test.

11.Results:

Table (1) exhibits that, 48.9 % of the studied women' age ranged from 30- < 40 years for study group with Mean \pm SD] 31.73 \pm 5.24]while 51.1 %

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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 research 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 variation between study and control group concerning knowledge about infertility at pre intervention phase (P= > 0.05) While there was greatly statistical variation between study & control groups at post intervention & follow up with relation to every aspect of knowledge about infertility.

Table (2) according to conservation of energy demonstrates that improvement in overall fatigue and total energy was significantly different between the control group and the study group during the post-intervention and follow-up phases as opposed to the pre-intervention period (P= ≤ 0.001)

Table (3) indicate that, at the post-intervention and follow-up intervention phases of Levine's conservation model, there was a statistically significant variation [p < 0.001] in the mean scores of all items comprising the emotional dimension of life quality with regard to personal integrity between the control and study groups. However, no such difference was found between the two groups during the pre-intervention phase (p>0.05)

Table (4) indicate that there was a statistically significant variation [p < 0.001] in the mean scores of all items comprising the mind-body dimension of quality of life with respect to personal integrity be the control and study groups during the post-intervention and follow-up intervention phases of Levine's conservation model. However, no significant difference was observed between the two groups during the pre-intervention phase (p>0.05)

Table (5) indicate a statistically significant distinction (p < 0.001) between the control and study groups regarding the mean scores of all items comprising the relational dimension of life quality as it relates to social integrity during the post-

intervention and follow-up phases of Levine's conservation model. There was never a statistically significant difference between the two groups during the pre-intervention phase (p>0.05)

Table (6) indicate that at the post-intervention and follow-up intervention phases of Levine's conservation model, there was a highly significant variation in the mean scores of all items comprising the social dimension of quality of life with regard to social integrity between the control and study groups (p < 0.001) However, no significant variation was noted between the two groups during the pre-intervention phase (p>0.05)

Table (7) indicate that at the post-intervention and follow-up intervention phases of Levine's conservation model, there was a highly significant difference in the mean scores of all items comprising the treatment environmental dimension of life quality with regard to structure integrity between the control and study groups (p < 0.001) However, no significant difference was noted between the two groups during the pre-intervention phase (p>0.05)

Table (8) It is evident that a substantial and statistically significant disparity existed between the control and study groups in terms of the mean scores for all items comprising the treatment reliability dimension of life quality with regard to structure integrity during the post-intervention and follow-up phases of Levine's conservation model (p < 0.001) Prior to the intervention, there were no statistically significant variations between the two groups at any time (p>0.05)

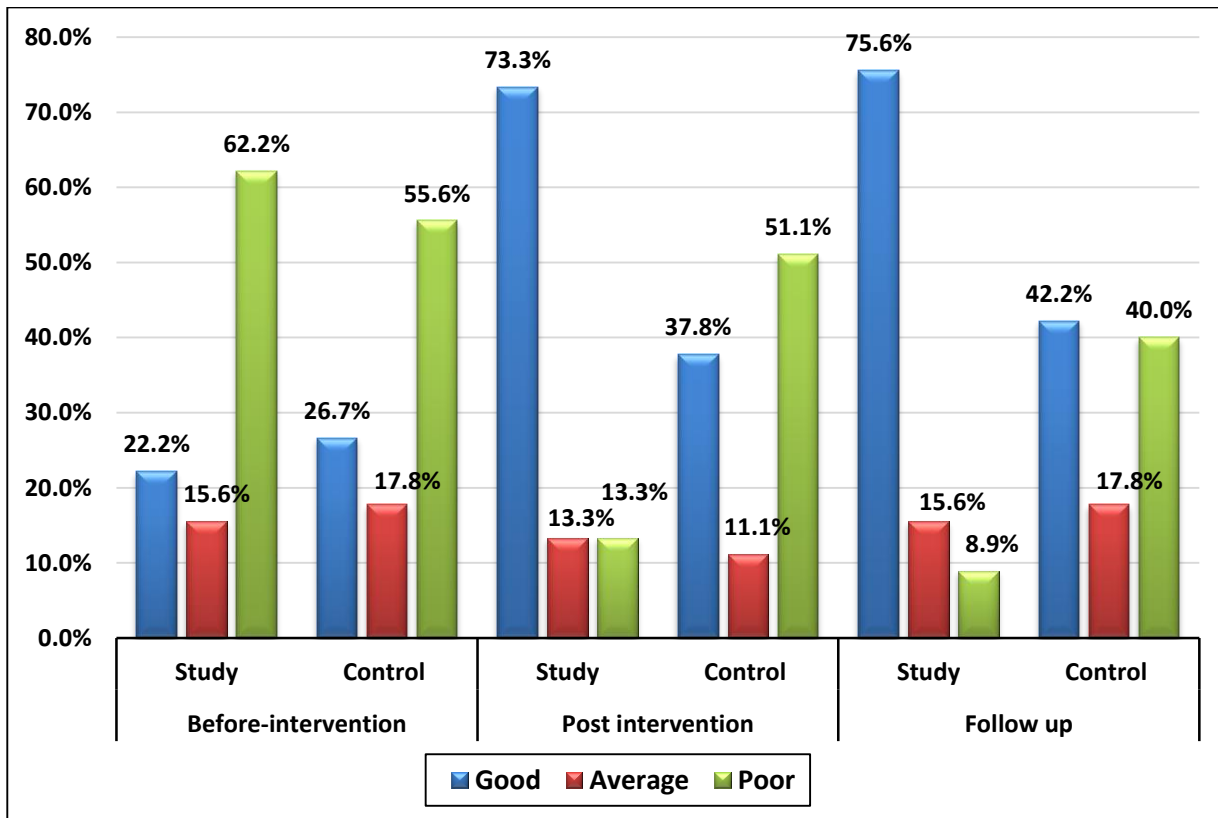
Figure (2): indicates that, compared to pre-intervention, there was a greatly significant variation in all aspects of quality of life between the study and control groups at post-intervention and follow-up P = < 0.001

Table (9) demonstrates that, in the pre, post, and follow-up intervention phases, there was a high statistically significant positive connection (p < 0.001) between the study and control groups' overall quality of life, total knowledge score, total fatigue, and total energy.

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	5.06	0.13 ^{ns}
Primary education	2	4.4	7	15.6		
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(2): 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 (2) :Frequency distribution of studied sample of both group regarding 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	Control group n=45	t-test	P value
		Mean ±SD	Mean ±SD		
Total Fatigue (13 items)					
Pre -intervention	0-130	84.48±17.96	86.28±16.39	0.497	0.621 ^{ns}
Post intervention		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	0-50	19.93±5.07	20.71±5.91	0.670	0.505 ^{ns}
Post intervention		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**

**A high statistical significant difference (P ≤ 0.001)

Table (3): Frequency distribution of studied sample of both group regarding mean scores of personal integrity [emotional][at pre intervention, post intervention and follow up phases of Levine’s conservation model (n=90

Emotional Dimension	Range of Possible Scores	Study group n=45	Control group n=45	t-test	P value
		Mean ±SD	Mean ±SD		
Feeling able to cope with your fertility problems					
Before-intervention	0-4	2.64±0.93	2.75±0.90	0.57	0.56 ^{ns}
Post intervention		3.20±0.69	2.02±0.94	6.75	0.000**
Follow up		3.37±0.64	2.48±0.86	5.49	0.000**
Feeling of jealousy and resentment because of the fertility problems					
Before-intervention	0-4	2.75±0.88	2.64±0.80	0.62	0.53 ^{ns}
Post intervention		3.37±0.57	2.62±0.88	4.79	0.000**
Follow up		3.57±0.58	2.68±0.84	5.79	0.000**
Experienced grief and feeling of loss about not being able to have a child or more children					
Before-intervention	0-4	2.86±0.81	2.77±0.82	0.51	0.60 ^{ns}
Post intervention		3.37±0.71	2.44±1.07	4.83	0.000**
Follow up		3.57±0.49	2.73±0.75	6.28	0.000**
Fluctuate between hope and despair because of fertility problems					
Before-intervention	0-4	2.75±0.74	2.84±0.73	0.57	0.57 ^{ns}
Post intervention		3.64±0.48	2.86±1.07	4.41	0.000**
Follow up		3.64±0.51	2.91±0.82	5.16	0.000**
Feeling of sad and depressed about your fertility problems					
Before-intervention	0-4	2.88±0.85	2.97±0.81	0.50	0.61 ^{ns}
Post intervention		3.73±0.49	3.08±0.97	3.96	0.000**
Follow up		3.68±0.46	3.00±0.60	6.05	0.000**
Feeling of angry because of fertility problems					
Before-intervention	0-4	2.66±0.97	2.64±1.13	0.10	0.92 ^{ns}
Post intervention		3.82±0.49	3.00±1.12	4.48	0.000**
Follow up		3.48±0.69	2.97±0.86	3.08	0.003*
Overall score					
Before-intervention	0-24	16.60±2.17	16.62±2.18	0.04	0.96 ^{ns}
Post intervention		19.97±0.69	16.28±2.12	11.06	0.000**
Follow up		20.20±0.69	16.44±2.67	9.11	0.000**

**A high statistical significant difference [P ≤ 0.001]

Table (4)Frequency distribution of studied sample regarding mean scores of personal integrity (mind body) at pre intervention, post intervention and follow up phases of Levine’s conservation model (n=90)

Mind-body Dimension	Range of Possible Scores	Study group n=45	Control group n=45	t-test	P value
		Mean ±SD	Mean ±SD		
impaired attention and concentration by thought of infertility					
Before-intervention	0-4	2.00±1.06	2.17±0.93	0.84	0.40 ^{ns}
Post intervention		3.26±0.78	2.26±1.05	5.11	0.000**
Follow up		3.42±0.75	2.33±1.12	5.38	0.000**
thinking of can't moving a head with other life goals and plans because of fertility problems					
Before-intervention	0-4	2.37±1.11	2.24±1.26	0.53	0.59 ^{ns}
Post intervention		3.55±0.62	2.37±1.38	5.19	0.000**

Follow up		3.68±0.59	2.42±1.42	5.51	0.000**
feeling drained or worn out because of fertility problems					
Before-intervention		2.20±1.19	2.33±1.08	0.55	0.58 ^{ns}
Post intervention	0-4	3.44±0.65	2.42±1.17	5.08	0.000**
Follow up		3.55±0.65	2.48±1.23	5.10	0.000**
interfering with day to day work or obligations of fertility problems					
Before-intervention		2.04±1.02	2.17±0.98	0.63	0.53 ^{ns}
Post intervention	0-4	3.40±0.71	2.31±1.12	5.47	0.000**
Follow up		3.42±0.78	2.40±1.21	4.64	0.000**
bothering by fatigue because of fertility problems					
Before-intervention		2.57±1.09	2.71±0.99	0.60	0.54 ^{ns}
Post intervention	0-4	3.71±0.54	2.84±1.08	4.77	0.000**
Follow up		3.73±0.44	2.86±1.09	5.07	0.000**
feeling of pain and physical discomfort because of the fertility problems					
Before-intervention		2.37±1.15	2.28±1.21	0.35	0.72 ^{ns}
Post intervention	0-4	3.22±1.08	2.28±1.25	3.83	0.000**
Follow up		3.60±0.57	2.46±1.37	5.09	0.000**
Overall score					
Before-intervention		13.57±6.42	13.93±6.08	0.27	0.78 ^{ns}
Post intervention	0-24	20.60±2.11	14.51±6.56	5.92	0.000**
Follow up		21.40±2.37	14.98±7.05	5.80	0.000**

**A high statistical significant difference [P ≤ 0.001]

Table (5)Frequency distribution of studied sample regarding mean scores of social integrity (relational) at pre intervention, post intervention and follow up phases of Levine’s conservation model (n=90)

Relational Dimension	Range of Possible Scores	Study group n=45	Control group n=45	t-test	P value
		Mean ±SD	Mean ±SD		
Satisfying with sexual relationship even though fertility problems					
Before-intervention		1.93±1.09	2.17±0.93	1.13	0.25 ^{ns}
Post intervention	0-4	3.20±0.75	2.26±1.05	4.82	0.000**
Follow up		3.51±0.62	2.33±1.12	6.12	0.000**
Affectioning with each other(your partner)even though you have fertility problems					
Before-intervention		2.28±1.17	2.20±1.32	0.33	0.73 ^{ns}
Post intervention	0-4	3.46±0.62	2.46±1.30	4.62	0.000**
Follow up		3.71±0.50	2.47±1.42	5.72	0.000**
Strengthening your commitment to your partner even though fertility problems					
Before-intervention		2.13±1.19	2.26±1.13	0.54	0.58 ^{ns}
Post intervention	0-4	3.33±0.63	2.35±1.22	4.73	0.000**
Follow up		3.55±0.58	2.57±1.27	4.68	0.000**
Haveing a negative impact on your relationship with your partner because of fertilyproblems					
Before-intervention		1.95±1.04	2.11±1.04	0.70	0.48 ^{ns}
Post intervention	0-4	3.28±0.84	2.26±1.11	4.90	0.000**
Follow up		3.44±0.69	2.53±1.27	4.22	0.000**
Find it difficult to talk to your partner about your feelings related to infertility					
Before-intervention		2.42±1.13	2.57±1.13	0.64	0.51 ^{ns}
Post intervention	0-4	3.57±0.69	2.82±1.07	3.97	0.000**
Follow up		3.73±0.44	2.91±1.12	4.55	0.000**
Feeling of pain and physical discomfort because of fertility problems					
Before-intervention		2.28±1.17	2.17±1.31	0.42	0.67 ^{ns}
Post intervention	0-4	3.11±1.04	2.40±1.13	3.08	0.000**
Follow up		3.77±0.47	2.53±1.42	5.56	0.000**
Overall score					
Before-intervention		13.02±6.51	13.51±6.39	0.35	0.72 ^{ns}
Post intervention	0-24	19.97±2.59	14.57±6.46	5.19	0.000**
Follow up		21.73±1.99	15.31±7.14	5.80	0.000**

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**A high statistical significant difference [P ≤ 0.001]

Table[6): Frequency distribution of studied sample of both groups regarding mean scores of social integrity social dimation[at pre intervention, post intervention and follow up phases of Levine’s conservation model (n=90)

Social Dimension	Range of Possible Scores	Study group n=45	Control group n=45	t-test	P value
		Mean ±SD	Mean ±SD		
Satisfying with the support you receive from friends with regards to your fertility problems					
Before-intervention	0-4	2.64±0.93	2.75±0.90	0.57	0.56 ^{ns}
Post intervention		3.20±0.69	2.02±0.94	6.75	0.000**
Follow up		3.37±0.64	2.48±0.86	5.49	0.000**
Socially isolation because of fertility problems					
Before-intervention	0-4	2.00±1.06	2.17±0.93	0.84	0.40 ^{ns}
Post intervention		3.26±0.78	2.26±1.05	5.11	0.000**
Follow up		3.42±0.75	2.33±1.12	5.38	0.000**
Feeling of uncomfortable in attending social situation like holiday and celebration because of fertility problems?					
Before-intervention	0-4	1.93±1.09	2.17±0.93	1.13	0.25 ^{ns}
Post intervention		3.20±0.75	2.26±1.05	4.82	0.000**
Follow up		3.51±0.62	2.33±1.12	6.12	0.000**
Understanding by the family what you are going through					
Before-intervention	0-4	2.75±0.88	2.64±0.80	0.62	0.53 ^{ns}
Post intervention		3.37±0.57	2.62±0.88	4.79	0.000**
Follow up		3.57±0.58	2.68±0.84	5.79	0.000**
Feeling of inferior to people with children because of fertility problems					
Before-intervention	0-4	2.37±1.11	2.24±1.26	0.53	0.59 ^{ns}
Post intervention		3.55±0.62	2.37±1.38	5.19	0.000**
Follow up		3.68±0.59	2.42±1.42	5.51	0.000**
Feeling of social pressure on you to have or have more children					
Before-intervention	0-4	2.28±1.17	2.20±1.32	0.33	0.73 ^{ns}
Post intervention		3.46±0.62	2.46±1.30	4.62	0.000**
Follow up		3.71±0.50	2.47±1.42	5.72	0.000**
Overall score					
Before-intervention	0-24	14.00±4.24	14.20±4.14	0.22	0.82 ^{ns}
Post intervention		20.06±2.57	14.02±3.96	8.56	0.000**
Follow up		21.28±2.26	14.68±5.86	7.03	0.000**

**A high statistical significant difference (P ≤ 0.001)

Table (7) Frequency distribution of studied sample of both groups regarding mean scores of structure integrity (Treatment environment dimension) at pre intervention, post intervention and follow up phases of Levine’s conservation model (n=90)

Treatment environment Dimension	Range of Possible Scores	Study group n=45	Control group n=45	t-test	P value
		Mean ±SD	Mean ±SD		
Fertility medical services available to you					
Before-intervention	0-4	2.86±0.81	2.77±0.82	0.51	0.60 ^{ns}
Post intervention		3.37±0.71	2.44±1.07	4.83	0.000**
Follow up		3.57±0.49	2.73±0.75	6.28	0.000**
feeling of the fertility staff understand what you going through					
Before-intervention	0-4	2.75±0.74	2.84±0.73	0.57	0.57 ^{ns}
Post intervention		3.64±0.48	2.86±1.07	4.41	0.000**
Follow up		3.64±0.51	2.91±0.82	5.16	0.000**
Bothering by the physical side effects of fertility medication or treatment					

Before-intervention	0-4	2.20±1.19	2.33±1.08	0.55	0.58 ^{ns}
Post intervention		3.44±0.65	2.42±1.17	5.08	0.000**
Follow up		3.55±0.65	2.48±1.23	5.10	0.000**
Rate the surgery and/or medical treatment you have received					
Before-intervention	0-4	2.04±1.02	2.17±0.98	0.63	0.53 ^{ns}
Post intervention		3.40±0.71	2.31±1.12	5.47	0.000**
Follow up		3.42±0.78	2.40±1.21	4.64	0.000**
Rate the quality of information you received about medication , surgery and /or medical treatment?,					
Before-intervention	0-4	2.13±1.19	2.26±1.13	0.54	0.58 ^{ns}
Post intervention		3.33±0.63	2.35±1.22	4.73	0.000**
Follow up		3.55±0.58	2.57±1.27	4.68	0.000**
Satisfying with your interactions with infertility medical staff					
Before-intervention	0-4	1.95±1.04	2.11±1.04	0.70	0.48 ^{ns}
Post intervention		3.28±0.84	2.26±1.11	4.90	0.000**
Follow up		3.44±0.69	2.53±1.27	4.22	0.000**
Overall score					
Before-intervention	0-24	13.95±3.91	14.51±3.96	0.66	0.50 ^{ns}
Post intervention		20.48±2.36	14.66±3.76	8.78	0.000**
Follow up		21.17±2.47	15.64±5.68	5.99	0.000**

**A high statistical significant difference [P ≤ 0.001]

Table (8): Frequency distribution of studied sample of both groups regarding mean scores of structure integrity (treatment tolerability dimension) at pre intervention, post intervention and follow up phases of Levine’s conservation model (n=90)

Treatment tolerability Dimension	Range of Possible Scores	Study group n=45	Control group n=45	t-test	P value
		Mean ±SD	Mean ±SD		
Infertility treatment negatively affecting on your mood					
Before-intervention	0-4	2.66±0.97	2.64±1.13	0.10	0.92 ^{ns}
Post intervention		3.82±0.49	3.00±1.12	4.48	0.000**
Follow up		3.48±0.69	2.97±0.86	3.08	0.000**
Dealing with complicated of the procedure and /or administration of medication for your infertility treatments					
Before-intervention	0-4	2.37±1.15	2.28±1.21	0.35	0.72 ^{ns}
Post intervention		3.22±1.08	2.28±1.25	3.83	0.000**
Follow up		3.60±0.57	2.46±1.37	5.09	0.000**
Bothering by the effect of treatment on your daily or work related activities					
Before-intervention	0-4	2.28±1.17	2.17±1.31	0.42	0.67 ^{ns}
Post intervention		3.11±1.04	2.40±1.13	3.08	0.000**
Follow up		3.77±0.47	2.53±1.42	5.56	0.000**
Bothering by the physical side effects of fertility medication or treatment					
Before-intervention	0-4	2.28±1.17	2.20±1.32	0.33	0.73 ^{ns}
Post intervention		3.46±0.62	2.46±1.30	4.62	0.000**
Follow up		3.71±0.50	2.47±1.42	5.72	0.000**
Overall score					
Before-intervention	0-16	9.62±3.12	9.31±3.52	0.44	0.65 ^{ns}
Post intervention		13.61±2.42	10.15±3.24	5.73	0.000**
Follow up		14.57±1.48	10.40±4.49	5.91	0.000**

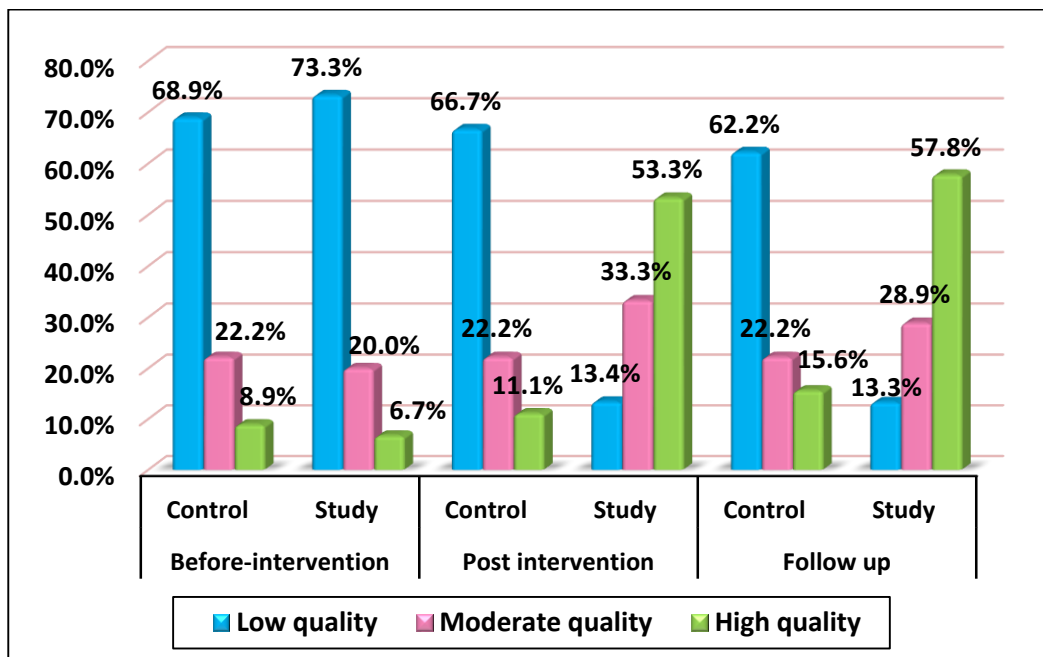
**A high statistical significant difference (P ≤ 0.001)

Table (9): 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	
	R	P value	R	P value	R	P value	R	P value	r	P value	R	P value
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 $p \leq 0.0$

Figure (2) 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)



12.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 life quality. [Madziyire et al., 2021] Perception of one's place in life in regard to objectives, expectations, standards, and worries, in conjunction with the culture and value systems in which infertile women live, can have an impact on life quality (QoL) of infertile women [Chaudhary et al., 2022]

Levine's conservation model was utilized to evaluate the effectiveness of an educational

programme for the aim of this research. On life quality of infertile women. Study hypothesis has been proved through study results which will be discussed as following sequence:

According to the personal characteristics of the women in the study and control groups, the current study found that the mean age of the study group's women ranged from 30 to less than 40 years, with a SD of 31.73 ± 5.24 , while the mean age of the control group's women varying between 20 and under 30 years, with a SD of 30.53 ± 5.25 . The research and control groups included fewer than half of those with secondary education. Additionally, whereas the majority of control group consisted of housewives, the majority of the study group consisted of workers. Notably, over two thirds of control group and over three fifths of the study group were from rural areas.

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 outcome aligned with *Abd El-Kader et al., [2022]* who performed a study under the name "Risk factors for endometriosis among Egyptian infertile women with different illness stages" and discovered that the mean age of the women was 30.4 ± 6.1 . This outcome was also comparable to *Hassan et al., [2023]* who disclosed the results of a study on the "Effect of nursing counselling based on BETTER model on sexuality and marital satisfaction among infertile women" conducted at the outpatient clinic of the obstetrics and gynaecology department at Benha University Hospital in Egypt. The study's mean age for the study and control groups was 30.61 ± 3.22 and 31.77 ± 3.38 years, respectively. In terms of housing, over half of the study and control groups, respectively, dwell in cities.

Additionally, this result concurred with *Hamed et al., [2021]* who performed research in Egypt on "the role of diagnostic laparoscopy in the unexplained infertility cases" and discovered that almost two-fifths of the women in the study had only completed secondary school.

The study's conclusions were not in line with *Alkor & Abbassi., [2022]* who conducted a comparison research using hysterosalpingography and laparoscopy to examine the effects of unilateral and bilateral tubal blockage in female infertility, 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.

However, this outcome was not corresponding to *Ibrahim et al., [2023]* who carried out a study named "Effectiveness of Lifestyle Modification on Health-

Related Quality of Life among Women with Polycystic Ovary Syndrome" and found that somewhat less than two fifths of the research group were employed, while more than half of the control group were housewives. Additionally, the research disclosed that a majority of the women had successfully completed their secondary education.

Furthermore, the outcome did not align with *Shehata et al., [2023]* who performed a study entitled "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 greater than half of the women in the research were highly educated, and married also less than three fifths of them were working.

There was disagreement with this outcome. *Alasser et al., [2022]* According to a recent study titled "Effect of instructional supportive guidelines on quality of life among women with endometriosis," slightly less than two fifths of the study's women were employed, more than one-third of the women were between the ages of thirty and forty, and less than one-quarter lived in an urban area.

Concerning 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 research 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 research group , while over one-third of them exhibited sound understanding level about infertility of control group at post intervention, Also over three-quarters had solid understanding. level about infertility of study group, while more than two fifth had good knowledge level about infertility of control group at follow up. This outcome showed that the infertile women's understanding of infertility was greatly improved by Levin's conservation model.

From the perspective of the researcher, 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.

The obtained outcome aligned with *Mohammed et al., [2019]* who demonstrated that there were substantial statistical variations in total knowledge between the pre- and post-tests.

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Additionally, the current study's findings concurred with *Mohammed et al., [2022]* who looked at the "Effect of Guided Instructions Using Bundle of Care on Knowledge and Compliance with Treatment among infertile Women" found that among infertile women, the total knowledge score increased significantly after the intervention compared to before. Additionally, the results demonstrated that, prior to the intervention, more than two thirds of the infertile women in the intervention group had inadequate knowledge about infertility; however, following the intervention, their increase in knowledge level, with less than two thirds having good knowledge. One explanation for the higher percentage of women living in rural areas could be poor or inadequate information.

This result was not in line with *Ofosu-Budu & Hanninen ., [2021]* who performed research in Eastern Finland on "means of decreasing the stigma of infertility: Views of infertile women and their herbalists" and found that less than half of the participant ladies knew anything about infertility.

These results also contraindicated with *Baiomy et al., [2023]* and illustrated that; about three fifths among the females examined 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 females under study in both groups the current study shows that, when comparing the pre-intervention to the post- and follow-up intervention phases, there was a highly statistically significant improvement in total weariness and total energy among the study and control group. The researcher ascribes this improvement to the program's beneficial impact on infertile women's quality of life, which is based on Levin's conservation models.

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 revealed that, with a statistically significant difference between the groups, the experimental group was less fatigued than the control group. It was also discovered that following the practise, there was a statistically significant difference between the experimental and control groups in terms of energy and perceived social support.

Regarding to mean score of emotional dimension regarding personal integrity of Levine's Conservation Model among the women under study at different phases of intervention, according to the current study, there was no significant variation between the two groups at the pre-intervention phase ($p > 0.05$), but there was a highly statistically significant variation

between the study and control groups' mean scores of all items of the emotional dimension of life quality

at the post- and follow-up intervention phases of Levine's conservation model at [$p < 0.001$]. This outcome was approved by [*Gençtürk et al ., 2023*] who carried out the research about the "R relationship between infertility and sleep quality in women" , who found in his study about efficacy of Levin's conservation models on personal integrity following program execution at the post-implementation and follow-up stages of intervention

However, this conclusion was not accepted by [*Visser et al., 2019*] who found that their investigation on the efficacy of psychosocial group intervention for lowering anxiety in women undergoing in vitro fertilisation resulted in a substantial decline in the emotional state of the women under study [($p < 0.05$]. Also, these findings weren't approved by [*Rashidi B. et al., 2020*], We found that young women between the ages of 21 and 30 who were contemplating IVF in particular had psychological and emotional issues compared to women in the same age group in the general population. Moreover, these findings weren't incoherence with [*Domar et al ., 2020*] who study "Impact of group psychological intervention on pregnancy rates in infertile women" who stated that in addition to having profound consequences on a woman's psychological well-being and her connection with her partner, IVF can have positive effects on women.

Regarding mean score of mind-body regarding personal integrity of levine's conservation model among studied women demonstrated that there was an extremely significant statistical difference between the mean scores of all items of mind-body dimension of personal integrity among the study and control groups at post and follow-up intervention phases of Levine's conservation model at [$p < 0.001$] in contrast to pre-intervention phase at [$p > 0.05$]

This result was corroborated by [*Evcili et al., 2020*] Whose research focused on the "Effectiveness of postpartum sexual health education program structured according to Levine's conservation model" and showed that the program's implementation had a highly significant impact on the women in the study. This findings was not supported by [*Kahyaoglu & Balkanli, 2019*] who conducted the study about "factors associated with quality of life among infertile women undergoing IVF" and revealed that the mean score of mind-body was no significant differences at all phases of intervention .

Regarding mean score of social integrity of levine's conservation model relational dimension of among studied women at different phases of intervention, revealed that, significant statistical differences were detected between the mean scores of all items of relational dimension of life quality among the study and control groups at post and follow-up

intervention phases of Levine's conservation model at [$p < 0.001$] whenever, there was no significant variation between both groups at pre-intervention phase at ($p > 0.05$). These findings might be due to misconceptions about infertility and poor social status before implementing the program.

These findings are in accordance with [Kus C, 2019] who conducted about "Determination quality of life and perceived social support of women in Infertile case" revealed that prior to beginning his program regarding social support for women undergoing in vitro fertilization, the women in the study group had substantially greater levels of social, marital, and personal discomfort. This may be seen as wives bearing more of the burden of childrearing, especially in cases where males were the primary cause of the issue.

On the other hand, [Karlıdere et al., 2019] added that Overall care outcomes will be improved by addressing the social support networks of women diagnosed with infertility, assisting them in making the most of the support provided by their families and other social support networks, and implementing interventions to fortify the social support networks of those who lack adequate support. These results did not generally concur with [Moghadam M. H., 2021] who conducted a study titled as "Communication, evaluation between general health and infertile women" found that at different stages of intervention, young women intending IVF in particular had higher social issues than women in the general population in the same age group.

Additionally, the mean physical health score of the women under study at various intervention stages. This investigation revealed the following: at the post-intervention and follow-up intervention phases of Levine's conservation model, there was a highly statistically significant variation ($p < 0.001$) between the study and control groups' mean scores of all items related to overall physical health and quality of life satisfaction, whereas there was no significant difference [$p > 0.05$] between the two groups at the pre-intervention phase.

These results were in line with [Evcili et al., 2020] who conducted research on the "Effectiveness of postpartum sexual health education program structured according to Levine's conservation model" and showed that the program's execution had a highly significant impact on the women in question in terms of structural integrity.

In terms of the mean score of the environmental status related to structural integrity among the women under study at various intervention phases, the current study found that, at post-intervention and follow-up intervention phases of Levine's conservation model, there was a greatly statistically significant difference between the mean scores of all treatment environmental dimension items of life quality between the study and control groups at [$p < 0.001$] whenever,

there was no significant variation between the two groups at [$p > 0.05$]

However, these results were not endorsed by [Sedek et al., 2022] who showed that there were no significant differences between the two groups at the pre-, post-, and follow-up phases of the intervention in their study on the "comparison of quality of life, sexual satisfaction, and marital satisfaction between infertile couples."

Regarding the mean structure integrity score associated with tolerability among the women under study at various intervention phases, the current study found that, at post-intervention and follow-up intervention phases of Levine's conservation model, there was a highly statistically significant difference between the mean scores of all treatment reliability dimension items of quality of life between the study and control groups at [$p < 0.001$] whenever, there was no significant difference between the two groups at [$p > 0.05$].

In terms of the overall quality of life of the women under research, the current study showed that a minority of the study group had a good quality of life prior to the intervention phase, while fewer than 10% of the control group had a high quality of life. More than one tenth of the control group and more than half of the study group had good quality of life at the post-intervention phase, respectively. Less than one fifth of the control group and less than three fifths of the study group had good quality of life at the follow-up phase. This outcome was in line with [Baïomy et al., 2023] who investigated life quality among infertile women in Benha city and demonstrated that, one tenth of control group, had good life quality while minority of study group had had good life quality at pre intervention, one fifth had average quality of life of control group, while two thirds of study group had good life quality at post intervention, while about more than one fifth had good quality of life of control group at follow up, while greater than half of study group had good life quality at follow up.

Furthermore, the obtained outcome aligned 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 life quality, while one fifth of study group had good life quality at pre intervention, while greater than quarter of control group had good life quality and half of research group had good life quality at post intervention while majority had good life quality at follow up

Disagreement was expressed regarding this outcome [Wdowiak et al. 2021] who carried out a study in Poland titled "Assessment of quality of life in infertility treated women in Poland" and found that the majority of women had excellent pre-intervention quality of life.

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The findings of the current investigation demonstrated a strong statistically significant positive correlation between the study and control groups' total life quality, total knowledge score, total fatigue, and total energy during the pre-, post-, and follow-up intervention phases, with respect to the correlation between the studied women, these variables, and their respective levels of fatigue and energy. From the perspective of the researcher, 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 outcome corresponded to *Baiomy et al., [2023]* who demonstrated that the overall quality of life, total knowledge, and energy scores of the investigated women showed a very statistically significant positive correlation.

This result was strongly agreed with *Ahmed, [2023]* who showed that once the continuous care model was implemented, there was a highly substantial positive association between the intervention group's overall quality of life and their entire knowledge about infertility [$p \leq 0.001$].

This outcome was not corresponding to *Mohamed et al., [2019]* who investigated the "Impact of nutritional education on infertile women's knowledge during the preconception period" and found no statistically significant positive link between the women's overall life quality, overall knowledge, and overall energy.

Conclusion:

Based on the results of the current research, it could be concluded that:-

The quality of life for infertile women improved with the implementation of an educational program based on Levine's conservation model. The knowledge and energy levels of infertile women significantly improved, and their degree of fatigue decreased. The researcher also came to the conclusion that infertile women's quality of life, knowledge, energy, and fatigue were positively correlated.

So, the present study results supported study hypotheses and purpose.

Recommendations:

- Designing health educational program for infertile women to enhance and refresh the most recent understanding, practices and quality of life.
- 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 life quality of infertile women.

Recommendations for further studies:

- In service training programs for health professionals to use Levine's conservation model to improve life quality of infertile women.
- All infertile women should have access to a thorough and easily comprehensible handbook about infertility in all healthcare facilities.
- Premarital counseling should be provided emphasizing on the importance of good sexual relations and its effect on infertility.
- To enable results to be generalized, the research should be replicated with a bigger sample size and in a different setting.

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