

Levin's Conservation Model Nursing Care: Impact on Fatigue and Sleep Quality among Postpartum Women

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Abstract

Background: The postpartum period is important for women and their families because it brings about physical, social, and emotional changes that increase fatigue and impact their sleep quality and quantity. The **aim** of the study was to examine the impact of Levin's Conservation Model nursing care on fatigue and sleep quality among postpartum women. **Design:** A quasi-experimental research design (a non-equivalent group design) was employed. **Sample:** A purposive sample of 128 postpartum women was chosen for the study. **Settings:** The research was conducted at postnatal obstetrics and gynecology departments associated with Menoufia University Hospital and Shebin El-Kom Teaching Hospital. **Instruments:** The study utilized a structured interview survey, the Visual Analogue Scale for fatigue, and the Pittsburgh Sleep Quality Index. **Results:** After the intervention, postpartum women in the study group showed a higher total knowledge score of 36.29 ± 3.98 on Levine's Conservation Model of Nursing Care compared to 8.37 ± 7.18 the control group. Also, after the intervention, the study group's score of fatigue dropped to 50.59 ± 7.46 , while the control group's levels remained at 82.70 ± 7.82 . Moreover, the intervention increased the total energy score of the study group to 27.25 ± 4.20 while the control group remained at 6.18 ± 3.13 . Additionally, the intervention led to good sleep quality for 77.00% of the study group, while only 10.0% of the control group experienced the same after 6 weeks. **Conclusion:** The nursing care conservation model by Levin led to a substantial rise in total knowledge and energy scores, as well as a reduction in postpartum fatigue levels. Additionally, there were enhancements in sleep quality following involvement in educational workshops. **Recommendations:** It is suggested to offer health education programs to postpartum women to enhance their knowledge of Levine's conservation model-based nursing care, leading to better sleep quality and patterns and decreased fatigue.

Keywords: Levin's conservation model-based nursing care, postpartum fatigue, quality of sleep.

Introduction

The postpartum phase goes from 1-hour post-childbirth to 42 days and is a crucial time for the mother's well-being, according to WHO (2022). Women go through different physical, mental, and emotional changes during this time that can disrupt their everyday schedules. Various issues have been documented in this timeframe, spanning physical, mental, and emotional struggles such as tiredness, worries about intimacy, hemorrhoids, bowel issues, difficulties with breastfeeding, nervousness, tension, sadness, difficulties sleeping, bleeding, urinary leakage, and stress disorder (Gmelig Meyling et al. 2023).

Postpartum fatigue (PPF) is described as a prolonged feeling of extreme tiredness and reduced ability to perform physical and mental tasks, including decreased energy and diminished cognitive functions, making it a common issue for women after giving birth, according to Badr et al. (2021). Between 37 and 64% of new mothers experienced fatigue at 5–6 weeks postpartum, while 25–67% reported fatigue at 12–24 weeks, and 18–66% at 1–2

years postpartum. A recent study found that factors such as youth, low socioeconomic status, decreased self-efficacy, hormonal fluctuations, and inadequate sleep quality all play a role in postpartum fatigue within 3 months after childbirth (Baattaiah et al., 2024).

Furthermore, Baattaiah et al. (2024) also pointed out that postpartum women often experience issues with their sleep quality, such as deprivation (lack of sleep) and fragmentation (frequent awakenings). Sleep is fundamental for our bodies, and not only does it provide physical restoration, but it also helps to replenish our energy levels. The main reasons for sleep disturbances in the postpartum period are the baby's crying, the need for frequent night feedings, physical pain after childbirth, and maternal anxiety. Sleep disruption in new mothers poses major difficulties, such as hindering daily activities for a few months following delivery (Witkowska-Zimny et al. 2024).

The conservation model is the primary idea, where achieving conservation leads to both adaptation and wholeness for individuals.

Levine's conservation model seeks to enhance adjustment, preserve wholeness, and enhance the individual's physical and emotional health by considering four conservation domains: energy, structure, personal integrity, and social integrity (Saini & Kalia, 2019). The study's theoretical foundation was derived from Levine's conservation model, created by Myra Oestrin Levine, which is a comprehensive model applicable to postpartum women, according to Peksoy et al. (2022).

Nurses greatly contribute to helping women adjust to the postnatal period by providing interventions that focus on energy conservation, structural integrity maintenance, personal integrity maintenance, and social integrity maintenance. Postpartum women face challenges from both internal and external factors, with changes in the body after giving birth being linked to internal factors, while different physical, social, and emotional stressors during the postpartum period led to changes in the external environment (Ozcan & Eryilmaz, 2021).

The goal is for postpartum women to feel confident in caring for themselves and their newborns, ready to return to their usual responsibilities at home and in their community. To accomplish this, the nurse assists new mothers in navigating the expected physical, emotional, and social changes that happen after giving birth and supports them in utilizing Levin's conservation model techniques. Additionally, the nurse plays a part in offering social support and promoting the bond between mother and fetus during the postpartum period to enhance adjustment in postpartum women (Sharifipour et al. 2022).

Significance of the study

The time after childbirth is a delicate and demanding period linked to tiredness, emotional fluctuations, and sleep problems. Sleep problems in mothers are a significant concern for maternal health, occurring during a critical period and leading to negative impacts on the emotional, behavioral, and sleeping patterns of their infants (Modak et al. 2023). Mothers must wake up during the night to care for their newborns after they give birth. This new behavior disrupts the regular sleep-wake cycle. In the seven weeks following childbirth, sleep issues have been reported in as many as 57.7% of individuals (Belete & Misgan, 2023).

More than 60% of mothers experience postpartum fatigue, making it the primary issue for women after giving birth. Tiredness results in diminished physical and mental capabilities. Issues such as tiredness and trouble sleeping can impact every aspect of one's health, according to Badr et al. (2021). Hence, there was a considerable requirement to enhance the sleep quality and reduce fatigue levels of postpartum women through the implementation of nursing care rooted in Levin's conservation model. Based on the literature review, there have been few studies examining the impact of Levin's conservation model-informed nursing care on fatigue and sleep quality in postpartum women. Therefore, this research was carried out to examine how Levin's conservation model-focused nursing care impacts the fatigue and sleep quality of postpartum women.

The aim of the study

To examine the impact of Levin's Conservation Model nursing care on fatigue and sleep quality among postpartum women.

Research hypotheses:

- H1: After attending the educational sessions, postpartum women are expected to exhibit an increased knowledge score about Levine's Conservation Model nursing care compared to those who did not attend.
- H2: After attending the educational sessions, postpartum women who receive nursing care based on Levin's conservation model are expected to experience a lower fatigue score compared to those who did not attend.
- H3: After attending the educational sessions, postpartum women who receive nursing care based on Levin's conservation model are expected to exhibit a greater energy score compared to those who did not attend.
- H4: After attending the educational sessions, postpartum women who receive nursing care based on Levin's conservation model are expected to experience higher sleep quality compared to those who did not attend.

Operational definition:

Levin's Conservation Model is a nursing model designed for postpartum women to assist them in enhancing adaptation, preserving wholeness, and enhancing quality of life by focusing on energy conservation, structural integrity, and personal integrity principles.

Method

Research Design: The current study utilized a quasi-experimental research design (a non-equivalent group design).

Research Settings: The research was conducted at postnatal obstetrics and gynecology departments associated with Menoufia University Hospital and Shebin El-Kom Teaching Hospital.

Sample Type:

A purposive sample of 128 postpartum women who met specific criteria was chosen.

Criteria for inclusion:

- First-time mothers after giving birth.
- Postpartum women who are medically healthy, and do not have any obstetrics issues that could impact their well-being.

Exclusion criteria:

- Being pregnant with more than one fetus.

Determination of Sample Size: The researchers used Yamane's formula to calculate the required sample size. $n = N / (1 + N(e)^2)$.

The components in this formula are as follows: n represents the sample size.

N represents the total number of individuals in the study.

e = the margin of error in the calculation = 5%

The sample size was determined to be 128 women, with 64 women in each group.

Sample procedure:

A deliberate selection of one hundred and twenty-eight women who had recently given birth were chosen (68 from University Hospital and 60 from Shebin El-Kom Teaching Hospital, in the postnatal departments of Obstetrics and Gynecology). All of them met the eligibility requirements and were included in the present research project. All 128 women chose a number on a piece of paper; those who picked number 1 were put in the study group, and those who picked number 2 were put in the control group. This method was employed to prevent sample contamination and bias.

Data Collection Instruments:

In the current research, data was gathered using these instruments:

Instrument 1: A structured interview survey: This instrument was created by researchers after studying existing literature (Elkheshen et al. 2023). The instrument was made up of two components:

Part I: Personal characteristics of the participants in the study included their age,

educational attainment, employment status, and location of residence.

Part II: An assessment of the postpartum women's level of knowledge of Levin's conservation model of nursing care. It included the postpartum period (4 items), proper nutrition (5 items), personal hygiene (4 items), and newborn care/breastfeeding (6 items). These questions were used to assess the women's level of knowledge about Levin's model before (pre-test) and 6 weeks after the intervention (post-test).

Scoring system of knowledge:

It was adopted from Elkheshen et al. (2023). Correct and complete answers were scored (2); correct and incomplete answers were scored (1); and incorrect or don't know answers were scored (0). The total knowledge score was calculated by summation of the scores for the 'known items'. The overall knowledge score was calculated by summing up scores for each item. Scores were converted to percentages, ranging from 0 to 38, with knowledge categorized as:

- Good: >75% overall knowledge level
- Fair: 50%–75% overall knowledge level
- Poor if <50% overall knowledge level

Instrument II: The Visual Analogue Scale for Fatigue (VAS-F):

It was adopted from Castillo & Allendes (2022). This tool assesses fatigue and energy levels in postpartum women through 18 items, with 13 items focusing on fatigue (1, 2, 3, 4, 5, 11, 12, 13, 14, 15, 16, 17, 18) and five items on energy (6, 7, 8, 9, 10). Positive sentiments are located at one extreme of the VAS F scale, while negative sentiments are found at the opposite end, with a 10 cm gap between them. Postpartum women were requested to indicate on a visual analogue line, ranging from (0) "not tired at all" to (10) "very tired," the number that best describes their current state. Obtaining higher scores on fatigue-related items and lower scores on energy-related items signifies a rise in fatigue severity levels.

Instrument (III): Pittsburg Sleep Quality Index (PSQI):

It was adopted from Buysse et al.'s (1989) study to evaluate the sleep patterns and quality of postpartum women's sleep in the postpartum period. It includes 19 self-evaluated questions and seven different areas of sleep problems determined by healthcare professionals, such as subjective sleep quality, time taken to fall asleep, length of sleep, how

well one sleeps, interruptions during sleep, use of sleep aids, and how sleep impacts daytime functioning. Points for each question vary between 0 and 3.

Scoring System: The total global PSQI score is calculated by adding the seven components scores, which can range from 0 to 21 points. Higher scores indicate more severe overall sleep problems. A PSQI score of 5 or higher globally reflects poor sleep quality.

Validity and reliability

Five qualified experts (three from the Maternal and Newborn Health Nursing Department and two from Obstetrics Medicine) confirmed the validity of the instrument through content and internal validity assessments. The researchers utilized test-retest reliability to assess the internal consistency of the instruments. It was accomplished by utilizing identical tools with identical individuals in comparable circumstances. Results from multiple tests were assessed to evaluate the reliability of the outcomes across different time periods. The reliability of all dimensions in the instruments was good, with Cronbach's α scores ranging from 0.75 to 0.90 for instrument I, 0.85 for instrument II, and 0.86 for instrument III. Internal reliability was a measure of the degree to which items on a scale were interconnected or consistent with each other.

Administrative Approvals: Permission was granted by the Committee of Research and Ethics, Faculty of Nursing, Menoufia University, on June 21, 2023. Letters from the Dean of the Faculty of Nursing at Menoufia University were obtained and sent to the managers of Menoufia University Hospital and Shebin El-Kom Teaching Hospital for the study to be conducted. The study received authorized consent from the directors of the mentioned establishments.

Ethical considerations: The researchers introduced themselves to the women participating and explained the study's goals and design to obtain their consent and cooperation. Ethical concerns were addressed by emphasizing confidentiality and informed consent. Privacy was ensured through secure documents, using numbers instead of names for the women. They were assured that their data would be confidential and used for statistical analysis only. The results were presented as aggregate data without individual details.

Women were informed of their voluntary participation option and the freedom to withdraw at any time. Female participants could enquire about any research aspect as well.

A pilot study: A small preliminary study was carried out on 10% of the entire sample (13 women who had recently given birth) based on the criteria for selection. The postpartum women who were studied were selected from the earlier obstetrics and gynecology postnatal ward. The purpose of the study was to assess the feasibility, applicability, clarity, and understandability of the instruments and identify the required time to respond to the questions. According to the findings of the initial study, the required adjustments were implemented as needed. Therefore, all female participants involved in the initial study were removed from the study sample to maintain the integrity of the results.

Study field work:

The study consists of four stages: a preparatory phase, an assessment phase, an implementation phase, and an evaluation phase. These stages were carried out over a span of 6 months, starting in March 2023 and concluding in September 2023, in the postnatal department of obstetrics and gynecology. It took place three days a week (Saturday, Sunday, and Thursday) from 9.30 AM to 1 PM. This procedure was followed until the necessary quantity was achieved.

The preparatory phase:

A thorough examination was carried out to establish the information base related to the research area, which included analyzing an online thesis as well as referencing available literature such as the work by Ozcan and Eryilmaz (2021). Instruments were prepared and tested for validity and reliability. A small-scale study was conducted, and the required adjustments were implemented.

Assessment phase:

At the first meeting, the researchers introduced themselves and clarified the research objectives. Every woman was interviewed separately in the postnatal department waiting area to gather personal information and assess their knowledge of Levine's conservation model of nursing using Instrument I. Evaluate their fatigue levels with Instrument II. Additionally, evaluate the sleep patterns and quality of sleep of postpartum women by utilizing Instrument

III. Each woman's interview lasted approximately 15–20 minutes. The women were approached by the researchers, who questioned them in Arabic and documented their responses on the provided tool. The phone numbers and addresses of the postpartum women being studied were collected to make communication easier.

The implementation phase: (for the study group only)

It began right after the assessment stage. The postpartum women were given guidance by the researchers on how to use Levin's conservation model of nursing care through teaching sessions to reduce fatigue and enhance their sleep patterns and quality. Two educational sessions were carried out for women who had recently given birth. One session discusses the postpartum period's impact on women, and the other focuses on Levin's conservation model of nursing care to help improve postpartum women's sleep patterns and quality.

Teaching sessions:

Duration: 30 to 45 minutes allotted.

Session 1: Summary of the postpartum period

Goals for the session:

The researchers presented details on the postpartum period, the number of visits needed, elements of care, and obstetrician appointment timing.

Intended Learning Outcomes (ILOS):

Knowledge and Understanding Skills:

- A1. Define the postpartum period.
- A2. State the number of postpartum visits.
- A3. Illustrate elements of postpartum care.
- A4. State the time to visit the obstetrician.

Intellectual Skills:

- B1. Differentiate between the elements and goals of postpartum care.

Professional and Practical Skills:

- C1. Develop care plan to address fatigue and improve sleep patterns and quality in postpartum women.

General and Transferable Skills:

- D1. Skillfully discuss nursing care steps with new mothers using Levin's conservation model to enhance fatigue and sleep quality.

Session Outlines:

- Definition of the postpartum period.
- Number of postpartum visits
- Aspects of postpartum care.

- Time to visit the obstetrician after delivery.

Methods of teaching:

- Individual discussion.

Educational tools:

- A PowerPoint presentation
- Visual images and instructional videos about the postnatal period.

Session (2): Levin's conservation model of nursing care to alleviate postpartum women's fatigue and enhance sleep quality in postpartum women.

Duration permitted: 30 to 45 minutes

Goals for the session:

The researchers provided basic information to postpartum women on Levin's conservation model nursing care steps to help reduce fatigue and enhance sleep quality.

Intended Learning Outcomes (ILOS):

A. Knowledge and Understanding Skills:

- A1. State Levin's model of conservation as a nursing care principle for alleviating fatigue in postpartum women and enhancing their sleep quality.

B. Intellectual Skills:

- B1. Distinguish between a proper and improper diet after giving birth.

C. Professional and Practical Skills:

- C1. Demonstrate how to perform breast care.
- C2. Demonstrate how to perform deep breathing exercises and Kegel exercises properly.

D. General and Transferable Skills:

- D1. Effectively communicate with postpartum women to implement Levin's conservation model of nursing care.
- D2. Recognize the significance of the instructional sessions on Levin's Conservation Model of Nursing Care for reducing fatigue and enhancing sleep quality in women.

Overview of the sessions:

- Levin's nursing care model to alleviate fatigue and enhance sleep quality in postpartum women.

Methods of instruction:

- Individual discussion.

Educational tools:

- A PowerPoint presentation.
- Visual aids and informative videos on the topic of the postpartum period.

First section: The researchers start with the first component of Levin's conservation model of nursing care (energy conservation) it includes

encouraging new mothers to develop healthy eating habits. Such as eating omega-3-rich foods, fruits, and vegetables; sticking to a balanced diet; staying hydrated; taking prenatal vitamins; consuming fenugreek with honey; and decreasing caffeine consumption. This section also aims to guarantee adequate periods of rest. Ensure to take at least a 30-minute break daily and prioritize napping whenever the baby is asleep, even during the day.

Second section: The researchers used Levin's conservation model of nursing care, emphasizing structural integrity. They encouraged postpartum women to partake in appropriate exercises such as walking, deep breathing, pelvic, and Pilates exercises to assist in the healing process. Moreover, it is crucial to encourage postpartum women to follow basic hygiene practices for their breasts, perineal area, and wounds to prevent infections, control pain, and promote the recovery process.

Third section: In order to fulfill the third aspect of Levin's nursing care conservation model, which focuses on personnel integrity, the process concentrated on upholding or rebuilding a patient's feelings of dignity, self-respect, humanity, individuality, and autonomy. Women were suggested to write in a diary about emotions and thoughts not expressed to others to help improve their well-being. Assistance was provided to women through phone calls.

Fourth section: The researchers implemented Levin's conservation model of nursing care's final aspect, focusing on social integrity, by motivating postpartum women to engage in social interactions to prevent sensory deprivation and encouraging the use of media such as newspapers, magazines, radio, phones, and TV. Additionally, they assisted in revamping the nearby outdoor surroundings to accommodate this new scenario by strategically placing necessary newborn care items in easily reachable spots. This will aid in adjusting to the external environment. In conclusion, the postpartum women were advised to talk about any challenges they faced. By the end of the sessions, the researchers recommended that postpartum women incorporate the sleep conservation model-based nursing care to alleviate fatigue and enhance their sleep quality. The researchers arranged for every woman to have a follow-up test after 6 weeks, either at the

obstetrics and outpatient clinics or through a phone call.

Control Group: The women in the control group were also interviewed and evaluated for their familiarity with Levine's conservation model of nursing care, the severity of postpartum fatigue, and their sleep habits and quality (pre-test). The researchers did not provide any intervention for them. The researchers arranged a follow-up assessment for each woman six weeks later, either at the outpatient clinics or over the phone.

1. The evaluation phase:

During this stage, assessment was carried out six weeks after the intervention (post-test). Both the study and control group postpartum women took the post-test to evaluate their understanding of Levine's conservation model of nursing care with Part II of Instrument I. They were also assessed for fatigue and energy level with Instrument II and sleep quality with Instrument III after six weeks. The researchers obtained the data by contacting participants via telephone to assess the intervention's effectiveness. Each woman spent approximately 15 minutes on the post-test.

An assessment was conducted by comparing the study and control groups at various stages of the intervention to assess the impact on the women's knowledge of Levin's conservation model of nursing care. This was measured using an interview questionnaire both before and after the intervention. Additionally, their postpartum fatigue levels, sleep patterns, and quality were evaluated after six weeks of the intervention.

Statistical analysis

Data was gathered, organized, and analyzed using an IBM PC with SPSS version 25 software. The analysis included various statistical methods.

- **Descriptive statistics** involve presenting quantitative data using the mean and standard deviation (SD) and qualitative data using numbers and percentages.
- **Analytical statistics** are utilized to determine the potential correlation between the variables being studied. The tests of importance encompass:
- **The Chi squared test (χ^2)** is a significance test used to compare two groups with qualitative variables.

- **Student t-test:** it is a statistical test used to compare quantitative variables between two groups to determine significance.

Results:

Table 1 displays the individual attributes of the postpartum women included in the research. It was revealed that 46.9% of the participants in the study group and 40.6% of those in the control group fell into the age range of 23 to 29 years old. Additionally, secondary education was reported by 62.5% of participants in the study group and 54.7% of those in the control group. During that time, 70.3% of the participants in the study group and 78.1% of those in the control group were homemakers. In conclusion, 68.8% of the participants in the research group and 60.9% of those in the control group resided in rural regions.

Table 2 displays the overall mean knowledge score of postpartum women in the study regarding Levin's conservation model of nursing care before and after the intervention. It shows that the study group had a knowledge score of 2.32 ± 1.74 before the intervention, while the control group had a score of 1.96 ± 1.53 . After the intervention, the scores were 7.75 ± 0.77 and 1.84 ± 1.50 , respectively. Additionally, the study group had a knowledge score of 2.73 ± 2.42 regarding nutrition in the postpartum period before the intervention, while the control group had a score of 2.85 ± 2.34 . This increased to 9.81 ± 0.68 in the study group and 2.67 ± 2.37 in the control group after the intervention. During the study, the total knowledge score of the study group regarding personal hygiene after giving birth was 1.32 ± 1.35 before the intervention, while the control group scored 1.23 ± 1.26 . After the intervention, the study group's score increased to 7.51 ± 0.95 , whereas the control group's score was only 1.20 ± 1.41 . Additionally, the study group's overall knowledge score regarding newborn care and breastfeeding in the postpartum period was 3.15 ± 2.63 before the intervention, while the control group had a score of 2.87 ± 2.26 . After the intervention, the scores were 11.21 ± 1.73 for the study group and 2.65 ± 2.23 for the control group. Furthermore, the study group's overall total knowledge score regarding the postpartum period was 9.59 ± 7.80 before the intervention, while the control group's score was 8.93 ± 7.13 ,

and after the intervention, the scores were 36.29 ± 3.98 and 8.37 ± 7.18 , respectively.

Figure 1 displays the overall level of knowledge of the postpartum participants in the research both before and following the nursing care intervention using Levin's conservation model. It shows that 84.3% of the intervention group and 89.1% of the control group demonstrated poor knowledge levels before the intervention. In the meantime, a good knowledge level was observed in 93.70% of the participants in the study group 6 weeks post-intervention.

Table 3 displays the average fatigue and energy ratings of postpartum women before and after the utilization of Levin's conservation model nursing care in the study. The study group had an average fatigue score of 76.40 ± 6.94 before the intervention, whereas the control group's score was 76.51 ± 7.03 , as shown in the illustration. Following the intervention, the scores were 23.34 ± 6.08 and 76.51 ± 7.03 , respectively. Moreover, the intervention led to a total energy score of 6.40 ± 3.00 for the study group, compared to 6.34 ± 3.04 for the control group. After the intervention, the study group showed an increase to 27.25 ± 4.20 while the control group remained at 6.18 ± 3.13 . Additionally, the study group initially had an overall visual analogue scale score of 82.81 ± 7.62 for fatigue prior to the intervention, compared to the control group's score of 82.85 ± 7.79 . After the intervention, the study group's levels dropped to 50.59 ± 7.46 , while the control group's levels remained at 82.70 ± 7.82 .

Table 4 displays the overall mean sleep quality scores of postpartum women in the study before and after the implementation of Levine's conservation model of nursing care. It revealed that the study group had a subjective sleep quality score of 2.17 ± 0.52 before the intervention, which was lower than the score of 2.56 ± 0.61 observed in the control group. Following the intervention, the scores were 0.93 ± 0.24 and 1.65 ± 0.51 , respectively. Also, the research group displayed a sleep latency score of 2.70 ± 0.63 before the intervention, whereas the control group had a score of 2.53 ± 0.73 . After the intervention, there was a decrease to 2.53 ± 0.77 in the study group and 2.53 ± 0.81 in the control group. Meanwhile, the study group had a total sleep duration score of 1.78 ± 0.57 before the intervention, while the control

group scored 1.85 ± 0.53 . Following the intervention, the study group's score dropped to 0.84 ± 0.54 , while the control group's score remained at 1.90 ± 0.46 . Moreover, the study group had an average sleep efficiency score of 2.78 ± 0.41 before the intervention, compared to 2.75 ± 0.43 for the control group. Following the intervention, the study group had scores of 0.43 ± 0.68 , while the control group had scores of 2.79 ± 0.40 . Furthermore, the sleep disturbance score of the study group was 2.15 ± 0.51 before the intervention, compared to the control group's score of 2.01 ± 0.54 . Post-intervention, the scores changed to 1.21 ± 0.41 and 2.09 ± 0.58 for the study and control groups, respectively. Otherwise, the study group had a sleep medication score of 0.81 ± 0.92 before the intervention, compared to the control group's score of 0.59 ± 0.72 . Following the intervention, the scores for the study group and control group were 0.06 ± 0.24 and 0.45 ± 0.64 , respectively. In addition, the daytime dysfunction score of the study group was 2.21 ± 0.41 before the intervention, compared to the control group's

score of 2.00 ± 0.53 . Following the intervention, the scores changed to 0.90 ± 0.46 and 2.03 ± 0.53 for the study and control groups, respectively. Additionally, the study group had an overall sleep quality score of 14.62 ± 2.71 before the intervention, whereas the control group scored 13.31 ± 2.94 . Following the intervention, the scores lowered to 6.93 ± 2.51 and 13.46 ± 2.77 for each group.

Figure 2 illustrates the overall sleep quality and patterns of postpartum women before and after they were provided nursing care using Levin's conservation model. The data indicates that 87.0% of participants in the study group and 89% of those in the control group had low sleep quality scores before the intervention. Meanwhile, the intervention led to good sleep quality for 77.00% of the study group, while only 10.0% of the control group experienced the same after 6 weeks.

Table 1: Personal Characteristics of the Postpartum Women in the Study (n=128).

Variables	Study group n=64		Control group n=64		χ^2	P value
	No.	%	No.	%		
Age (years)						
18 < 23 years old	24	37.5%	22	34.4%	1.757	>0.05 ^{ns}
23 < 29 years old	30	46.9%	26	40.6%		
29-35 years old	10	15.6%	16	25.0%		
level of education						
Illiterate	2	3.1%	5	7.8%	2.402	>0.05 ^{ns}
Read and write	9	14.1%	7	10.9%		
Secondary education	40	62.5%	35	54.7%		
University	13	20.3%	17	26.6%		
Occupation						
Working	19	29.7%	14	21.9%	1.021	>0.05 ^{ns}
Housewife	45	70.3%	50	78.1%		
Place of residence						
Rural	44	68.8%	39	60.9%	0.857	>0.05 ^{ns}
Urban	20	31.3%	25	39.1%		

χ^2 = Chi square

^{ns} No statistically significant difference ($p > 0.05$)

Table 2: Total Mean Knowledge Score of the Postpartum Women in the Study about Levin's Conservation Model of Nursing Care before and after the Intervention (n=128).

Variables	Possible score	Study group (n=64)	Control group (n=64)	t test	P value
		Mean ±SD	Mean ±SD		
Total knowledge score about the postpartum period					
Before the intervention	0-8	2.32±1.74	1.96±1.53	1.237	>0.05 ^{ns}
After the intervention		7.75±0.77	1.84 ±1.50	27.92	≤0.001**
Total knowledge score about nutrition during the postpartum period					
Before the intervention	0-10	2.73±2.42	2.85±2.34	0.296	>0.05 ^{ns}
After the intervention		9.81 ±0.68	2.67±2.37	23.14	0.001**
Total knowledge score about personal hygiene during the postpartum period					
Before the intervention	0-8	1.32±1.35	1.23±1.26	0.404	>0.05 ^{ns}
After the intervention		7.51 ±0.95	1.20 ±1.41	29.52	≤0.001**
Total knowledge score about newborn care and breastfeeding during the postpartum period					
Before the intervention	0-12	3.15±2.63	2.87±2.26	0.648	>0.05 ^{ns}
After the intervention		11.21 ±1.73	2.65 ±2.23	24.23	≤0.001**
Overall total knowledge score					
Before the intervention	0-38	9.59±7.80	8.93±7.13	0.496	>0.05 ^{ns}
After the intervention		36.29 ±3.98	8.37 ±7.18	27.17	≤0.001**

NB: t= independent t test ^{ns} No statistically significant difference (p > 0.05) ** = highly statistically significant (p \leq .001).

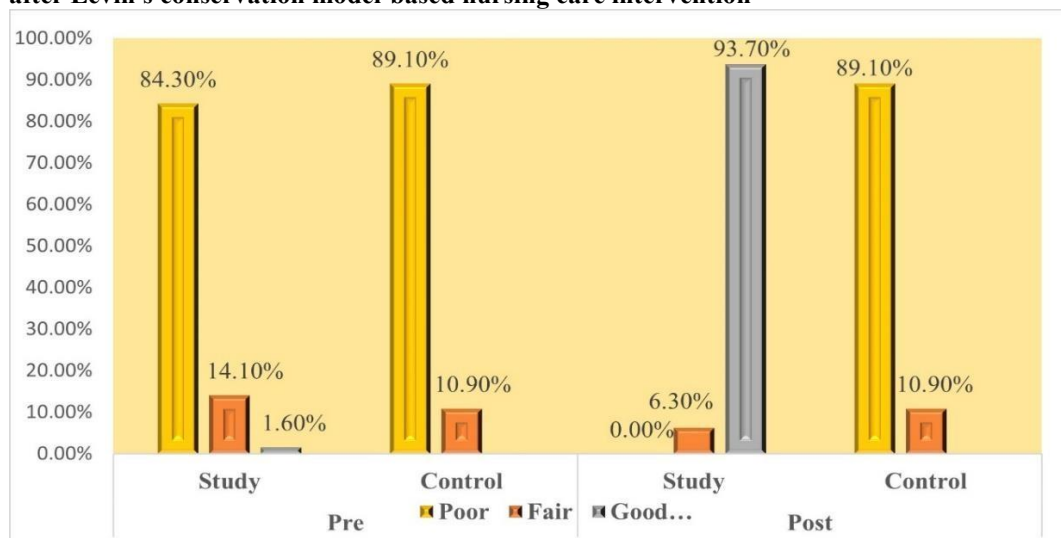
Figure 1: The overall level of knowledge of the postpartum women in the study before and after Levin's conservation model-based nursing care intervention

Table 3: Overall Mean Fatigue and Energy Scores of Postpartum Women in the Study before and after the Implementation of Levin's Conservation Model Nursing Care (n=128).

Variables	Possible score	Study group (n=64)	Control group (n=64)	t test	P value
		Mean ±SD	Mean ±SD		
Total fatigue score					
Before the intervention	12-89	76.40±6.94	76.51±7.03	0.08	>0.05 ^{ns}
After the intervention		23.34± 6.08	76.51± 7.03	45.70	≤0.001**
Total energy score					
Before the intervention	2-45	6.40±3.00	6.34±3.04	0.11	>0.05 ^{ns}
After the intervention		27.25± 4.20	6.18± 3.13	32.13	≤0.001**
Total visual analogue score for fatigue					
Before the intervention	37-98	82.81±7.62	82.85±7.79	0.03	>0.05 ^{ns}
After the intervention		50.59± 7.46	82.70± 7.82	23.76	≤0.001**

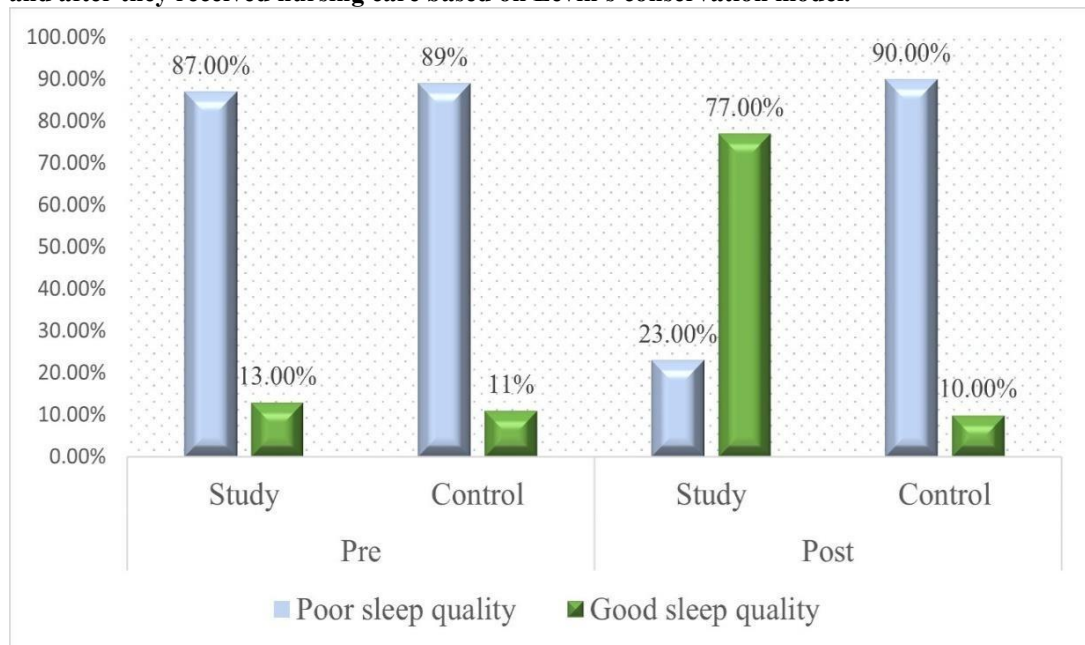
NB: t= independent t test ^{ns} No statistically significant difference (p > 0 .05) ** = highly statistically significant (p \leq 0.001)

Table 4: Overall Mean Sleep Quality Scores of Postpartum Women in the Study before and after the Implementation of Levin's Conservation Model Nursing Care (n=128).

Variables	Possibl e score	Study group (n=64)	Control group (n=64)	t test	P value
		Mean ±SD	Mean ±SD		
Subscale 1. Subjective sleep quality					
Before the intervention	0-3	2.17± 0.52	2.56± 0.61	1.05	>0.05 ^{ns}
After the intervention		0.93±0.24	1.65±0.51	10.15	≤0.001**
Subscale 2. Sleep latency					
Before the intervention	0-3	2.70±0.63	2.53±0.73	1.41	>0.05 ^{ns}
After the intervention		2.53±0.77	2.53±0.81	1.000	≤0.001**
Subscale 3. Sleep duration					
Before the intervention	0-3	1.78±0.57	1.85± 0.53	0.798	>0.05 ^{ns}
After the intervention		0.84±0.54	1.90± 0.46	11.95	≤0.001**
Subscale 4. Sleep efficiency					
Before the intervention	2-3	2.78±0.41	2.75±0.43	0.414	>0.05 ^{ns}
After the intervention		0.43±0.68	2.79±0.40	23.65	≤0.001**
Subscale 5. Sleep disturbance					
Before the intervention	1-3	2.15±0.51	2.01±0.54	1.50	>0.05 ^{ns}
After the intervention		1.21±0.41	2.09±0.58	9.76	≤0.001**
Subscale 6. Use of sleep medication					
Before the intervention	0-3	0.81±0.92	0.59±0.72	1.48	>0.05 ^{ns}
After the intervention		0.06±0.24	0.45±0.64	4.55	≤0.001**
Subscale 7. Daytime dysfunction					
Before the intervention	0-3	2.21±0.41	2.00±0.53	2.582	>0.05 ^{ns}
After the intervention		0.90±0.46	2.03±0.53	12.75	≤0.001**
Total score					
Before the intervention	2-20	14.62±2.71	13.31±2.94	2.62	>0.05 ^{ns}
After the intervention		6.93±2.51	13.46±2.77	13.96	≤0.001**

^{ns} No statistically significant difference (p > 0 .05) ** = highly statistically significant (p \leq 0.001).

Figure 2: Total quality and pattern of sleep level of postpartum women in the study before and after they received nursing care based on Levin's conservation model.



Discussion:

The results of the study showed that approximately half of both the study and control groups were aged between twenty-three and twenty-nine years old. The reason for this discovery could be that the women involved were in their childbearing years, and there is societal pressure to marry before the age of thirty. This may lead girls to think about getting married at this age to meet societal norms.

This aligns with the research of El-Naggar et al. (2023) on the "Knowledge and Practices of Postpartum Women Regarding Neonatal Care in El-Beheira Governorate" in Egypt. Their findings showed that more than two-thirds of the mothers in the study were aged between twenty and less than thirty years old.

The findings of the current research indicated that most of the postpartum women examined had a secondary level of education, were homemakers, and lived in rural areas. It could be understood that rural dwellers typically prioritize obtaining a secondary education before getting married. Moreover, this is not surprising, as most Egyptian women are unemployed.

This was in accordance with El-Kheshen et al.'s (2023) research on the impact of Levin's

conservation model on fatigue and sleep quality in postpartum women in Benha, Egypt. They found that over two-thirds of the participants in both the control and study groups lived in rural areas, with more than 50% of each group having finished secondary school.

Additionally, around two-thirds of the women who recently gave birth in both groups were homemakers, with no significant differences in personal characteristics between them. This indicates that the two groups were similar in composition. The resemblance can be explained by the fact that both the present study and the research by El-Kheshen et al. (2023) were conducted within the same population.

However, these findings contradicted those of Gholami et al. (2022), who examined the effects of educational behavioral interventions on fatigue in postpartum mothers in Isfahan. Their study found that most women in the study had received a higher level of education. These differences may stem from diverse cultures or sample populations.

The findings of the study showed that most postpartum women examined lacked sufficient understanding of Levine's conservation model of nursing care, including information about the postpartum phase, nutrition, personal hygiene, infant care, and breastfeeding, prior to receiving

Levine's conservation sessions compared to after the sessions. The reason for this lack of understanding could be that many postpartum women who were studied were homemakers with only a secondary level of education, resulting in their unawareness of the postpartum period.

It was also demonstrated that there was a noticeable increase in post-education knowledge scores in the post-test compared to the pretest. This could be attributed to the impact of health education sessions provided to the postpartum women and the clear and simple language of Levine's conservation sessions, which were easily grasped by the study group and helped them eliminate any confusion and improve their understanding of Levine's conservation model in nursing care.

The findings of the current research matched those of Thwin et al. (2023), who examined the impact of maternal and newborn care interventions on the maternal functioning of first-time mothers in Myanmar and Burma. An increase was observed in the self-care knowledge, maternal newborn care knowledge, social support, and postpartum self-efficacy of first-time mothers at six weeks postpartum.

This is also confirmed by Said et al. (2022) in Kalioubia, Egypt, who studied how the implementation of educational guidelines significantly improved nurses' performance in the postnatal care of mothers and neonates, with notable differences in knowledge and practices before and after implementation. The total knowledge score on postpartum care increased from thirty-four to forty-five percent post-implementation.

Additionally, Teslim et al. (2023) examined "postpartum women's perceptions of various postnatal clinic appointments in southwest Nigeria." Most participants, approximately 75%, had inadequate or incorrect information initially, but after receiving proper counselling and health education, there was a positive change in understanding, awareness, perception, and use of postnatal care services among new mothers.

These findings supported El-Kheshen et al.'s (2023) research on the impact of applying Levin's conservation model on fatigue and sleep quality among postpartum women in Benha, Egypt. They showed that the mean knowledge score did not have a significant difference

between the two groups before the intervention, but post-intervention, the study group had a higher mean knowledge score than the control group.

Similarly, the outcome mirrored the study conducted by Laokhompruttajarn et al. (2023), focusing on the impact of a self-efficacy-promoting program aligned with the public health development plan on the knowledge, attitude, and practices of postpartum women in Thailand. They reported that postpartum women who had antenatal care showed increased knowledge, attitude, and practice of postpartum self-care and newborn care after the intervention, surpassing both their pre-intervention levels and the control group with a significant statistical variance.

This finding was contradictory to Ellpody et al.'s (2023) research in Tanta, Egypt, on pregnant women's views on self-care measures after giving birth. Their findings showed a low knowledge score post-intervention, with less than 20% having a high knowledge level. Despite this, pregnant women showed positive attitudes towards postpartum self-care. It could be argued that the women lacked adequate health education and guidance during pregnancy on postpartum care and self-care practices.

The results of the current study showed that there was not a statistically significant variance in fatigue and total energy scores between the study and control groups prior to the introduction of Levin's conservation model nursing care sessions. Most women, after giving birth, experienced increased fatigue levels and decreased overall energy levels. The women's fatigue and low energy may be a result of their bodies experiencing exertion, stress, recovery from delivery, poor sleep quality, breastfeeding, and caring for a newborn.

Regarding fatigue and total energy of postpartum women after the intervention, it was found that fatigue decreased, and total energy increased in the study group compared to the control group following Levin's conservation sessions, suggesting a lower fatigue level in the study group. The alteration may be attributed to the influence of Levin's nursing care conservation model, which is crucial in assisting postpartum women in controlling their symptoms and dealing with the postpartum period.

In a study titled "Utilizing Levine's conservation model in postpartum care: a randomized controlled trial" by Ozcan and Eryilmaz (2021) in Turkey, it was highlighted that there was a notable discrepancy in variables like fatigue and quality of life between women in the intervention and control groups. Those in the intervention group reported lower levels of fatigue compared to the control group. The resemblance can be explained by the fact that both the present study and the study by Ozcan & Eryilmaz (2021) employ Levine's conservation model, which is considered the most efficient in aiding postpartum women in managing the postpartum period and its challenges.

This finding is in line with the study conducted by Pusparatri et al. (2022) in Indonesia on "Nursing Interventions for Mothers with Postpartum Fatigue." They mentioned that non-pharmacological nursing interventions can assist in reducing fatigue in postpartum mothers as they are simpler, more cost-effective, preferred by women, non-intrusive, and have no side effects. Furthermore, El-Kheshen and colleagues (2023) in Benha discovered that initially, there was no notable difference in the mean total fatigue and total energy scores between the study group and the control group. Nevertheless, after six weeks of the intervention, significant variations arose between the two groups.

The present findings were also supported by Qian et al. (2021), who conducted a study titled "Effectiveness of non-pharmacological interventions for reducing postpartum fatigue: a meta-analysis" in China. They stated that women's postpartum fatigue showed a marked improvement after the intervention, and non-drug treatments such as exercising and consuming tea could quickly assist in reducing postpartum fatigue, which also supported the current results.

The study showed no significant difference in sleep quality or patterns between the study and control groups prior to the intervention with Levine's conservation model of nursing care. Most postpartum women experienced decreased quality and patterns of sleep in terms of subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbance, use of sleep medication, and daytime dysfunction. This disruption could stem from physical discomfort after giving birth,

shifts in hormone levels, adjustments in household duties, breastfeeding, and taking care of the newborn.

However, there was a very significant difference in statistical terms between the study and control groups in terms of the total score for sleep quality and patterns six weeks after the intervention. The reason for this could be the beneficial impact of implementing Levine's conservation model in nursing care sessions.

The results of this research align with Amer et al.'s (2022) study on the impact of cognitive-behavioral therapy on postnatal women's depressive symptoms and sleep quality in Egypt. They demonstrated a notable enhancement in sleep quality levels for women in the study, as shown by the decrease from over one-third to less than one-tenth experiencing severe sleep problems before and after the intervention, respectively.

Similarly, Taalab et al. (2021) found in their study on the correlation between postpartum primiparous sleep quality and self-care in Menoufia that many women slept for less than seven hours. They also noted that the participants experienced sleep disruptions, such as low sleep quality and noticeable signs of insomnia. Ozcan and Eryilmaz (2021) also confirmed previous results by demonstrating that women in the intervention group had lower levels of fatigue, along with significant improvements in their sleep and quality of life. The utilization of Levine's conservation model allows for the delivery of comprehensive care to women during the postpartum period.

Conclusion:

According to the findings of the present study, it can be concluded that postpartum women exhibited an increased knowledge score about Levine's conservation model of nursing care after attending the educational sessions compared to those who did not attend. This supports the first research hypothesis. The current research results also indicate that postpartum women had a reduced fatigue score following participation in the educational sessions in comparison to those who did not participate, supporting the second research hypothesis. Moreover, the current research findings suggest that postpartum women exhibited a higher energy score after attending the educational sessions

compared to those who did not attend, confirming the third research hypothesis. In addition, the current research findings indicate that postpartum women experience improvements in their sleep quality after participating in educational sessions, as opposed to those who did not attend. This includes various aspects such as subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbance, use of sleep medication, and daytime dysfunction, providing backing for the fourth research hypothesis. Therefore, the findings of this study supported the research hypotheses and failed to accept the null hypothesis.

Recommendations:

Considering the results of the present investigation, the following suggestions are put forward:

- Offer postpartum health education programs for women to enhance the quality of their sleep.
- Health education programs should be provided to postpartum women to improve their understanding of nursing care based on Levine's conservation model.
- Postpartum women should have access to educational materials in Arabic, such as booklets and brochures, to enhance their knowledge about Levine's conservation model of nursing care, improve the quality and rhythm of their sleep, and decrease their fatigue.
- It is advisable to replicate the study with a diverse sample across various hospital environments to ensure the results can be applied more broadly.

Suggestions for future studies: -

- Analyzing the impact of Levin's conservation model in nursing care on postpartum women's depression.
- Researching how Levin's conservation model in nursing care impacts sexual function and satisfaction in postpartum women.
- Assessing the factors related to postpartum exhaustion.

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