Effect of Nursing Approach Based on Levine's Conservation Model on Fatigue, Depression and Sleep Quality among Postpartum Women

[1]Fatma Kamal Ali, [2]Sara Saied Hassan, [3] Lamees Mahmoud Mohamed Fahmy Elnawasany, [4]Ola Abdel-Wahab Afifi Araby

[1], [4] Assistant Professor of Obstetrics and Gynecological Nursing, Faculty of Nursing, Benha University, Egypt,[2]Lecturer at obstetric and gynecological nursing department, faculty of nursing, Suez Canal University, Egypt,[3]Lecturer of family and community health nursing, faculty of nursing, Suez Canal University, Egypt

Received: 01/07/2025

Revised:19/09/2025

Accepted:19/09/2025

ABSTRACT

Background: A critical period for women and their families is the postpartum period. There are physical, social, and emotional changes that can result in increased fatigue, depression, and a decrease in both the quality and quantity of sleep. The aim of this research was to evaluate the effect of nursing approach based on Levine's conservation model on fatigue depression, and sleep quality among postpartum women. **Design:** A quasi-experimental design (Two-Group: control group and study group, Pre/Post study design). **Setting:** The research was conducted at antenatal outpatient clinic and postpartum unit in Obstetrics and gynecological department in Benha University Hospital. **Data collection tools:** Four tools were used: A structured interviewing questionnaire, Visual similarity scale for fatigue, Patient health questionnaire-9 and the Groningen sleep quality Scale. **Results:** After applying Levine's conservation model, the study group of women reported significantly better sleep, vitality, depression, and fatigue than the control group of women. Additionally, the Levine conservation model found a negative correlation between the total sleep quality and the total depression and fatigue score of the women in both groups who were studied. This correlation was highly statistically significant. There was a positive statistically significant correlation between total energy and total sleep quality in both groups. **Conclusion:** The implementation of Levine's conservation model was effective in improving the levels of fatigue, energy, depression and sleep quality among postpartum womenwhen the Levine conservation model was used. **Recommendation:** It is recommended that the Levine's conservation model be applied to all postpartum women to aid in improving their sleep quality and conserving energy.

Keywords: Approac , Depression, Fatigue ,Nursing Levine's Conservation Model, Sleep Quality

INTRODUCTION

As postpartum women transition into motherhood, they experience a range of physiological and psychological transformations. Commonly, the initial six weeks following childbirth are referred to as the postpartum period. This period of time is essential for the recovery and overall well-being of a woman. Every woman's life is impacted by becoming a mother, and it's a delicate time when women are most exposed. Women attempt to manage the physical changes and the responsibilities of motherhood during this time. Women's adjustment to this time is negatively impacted by a number of factors, such as exhaustion and sleep issues **(Gholami et al., 2022).**

Postpartum fatigue is a common problem for women after giving birth and is defined as a prolonged feeling of extreme tiredness and reduced ability to perform physical and mental tasks, including decreased energy and diminished cognitive functions. Postpartum fatigue is influenced by a number of factors, including youth, low socioeconomic status, diminished self-efficacy, hormonal fluctuations, and poor sleep quality **(Baattaiah et al., 2024).**

A woman's conduct and physical health are significantly affected by postpartum depression, a severe mental illness that occurs after childbirth. Postpartum depression may be affected by various factors, such as insufficient social support, negative interpersonal encounters, hormone changes postpartum, psychosocial pressures, individual traits, and maladjustment. Women experiencing postpartum depression may exhibit symptoms such as feeling agitated, experiencing sadness and frequent crying, contemplating harm towards their child or themselves, lacking emotional connection with the child, feeling fatigued or unmotivated, changes in appetite, experiencing feelings of guilt and worthlessness, loss of interest in activities, and distancing themselves from friends and family **(Moline et al., 2024).**

Postpartum women frequently encounter challenges with their sleep, including deprivation (lack of sleep) and fragmentation (frequent awakenings). Sleep is essential for our bodies. It not only replenishes our energy levels but also plays a crucial role in

providing physical restoration. The primary causes of sleep disruptions during the postpartum period include the baby's crying, the necessity for frequent night feedings, physical discomfort following childbirth, and maternal anxiety. Sleep disruption in new mothers presents significant challenges, including impeding daily tasks for a few months after giving birth **(Elkheshen et al., 2023).**

Engaging in physical activity during this period has been proven to bring about a wide range of advantages. It can uplift women mood, boost thier cardiovascular health, and lower the chances of experiencing postpartum depression. Postpartum women often encounter obstacles when trying to engage in consistent physical activity. These barriers include fatigue, limited time, and physical discomfort **(Apostolopoulos et al., 2021).**

Nursing theories and models offer helpful frameworks for identifying and meeting the health needs of particular populations. The focus of Myra Levine's 1970s in Levine Conservation Model is on maintaining energy and three types of integrity: , structural, personal, and social. This model emphasizes the importance of attending to a person's psychological, emotional, and social needs in addition to their physical health. For the postpartum population, Levine's Conservation Model sheds light on how to best encourage women to engage in physical exercise for the sake of their health and wellbeing **(Bana, 2014).**

Nurses play a significant role in supporting women during the postnatal period. In their interventions, they tackle issues related to energy efficiency, building preservation, individual health, and social relationships. Nurses play a crucial role in enhancing the well-being of both the mother and child from the moment after childbirth to the early postpartum phase, providing assistance in the physical and emotional transition for postpartum mothers. Nurses are highly skilled in monitoring and assessing levels of fatigue and sleep disturbance **(Ozcan and Eryilmaz, 2021).**

The nursing approach aims to empower postpartum women to feel self-assured in tending to themselves and their newborns, while also being prepared to resume their regular duties at home and within the community. To achieve this goal smoothly, the

nurse helps new mothers navigate the anticipated physical, emotional, and social changes that occur after giving birth. The nurse also provides support to help them apply Levin's conservation model techniques. Moreover, the nurse contributes by providing social support and fostering the connection between mother and fetus in the postpartum period, aiming to improve adjustment in postpartum women **(Sharifipour et al., 2022).**

Significance of the study:

The postpartum period can be a challenging time, marked by feelings of fatigue, mood swings, and sleep disturbances. Preventing postnatal maternal sleep disturbances and fatigue is a crucial aspect of comprehensive health services, as it has the potential to bring significant public health benefits. Although there has been extensive research on the impact of sleep disorders and sleep deprivation on vulnerable populations throughout history, over 50% of women continue to experience excessive daytime sleepiness on weekdays.

Between 0.5 and 60.8% of women worldwide experience postpartum depression during the first few months after giving birth. Postpartum depression ranges in prevalence from 5.2% to 74% in developed nations and from 1.9% to 82.1% in developing nations. Due to a lack of focus and care for children's needs, postpartum depression may increase the risk of growth impairment and illness in infants **(Shorey et al., 2018)**.

Postpartum fatigue is the most prevalent issue among postpartum women, affecting over 60% of mothers. Poor physical and mental performance is a result of fatigue. Over the course of the postpartum period, postpartum fatigue is a dynamic phenomenon that both stabilizes and gets worse. It has been demonstrated that postpartum exhaustion negatively impacts both the development of the newborn and the health of the mother. Fatigue has been the fifth most common cause of postpartum distress in women for the past 20 years. From 20% prenatal to 50–64% postpartum, the rate rises **(Badr et al., 2021).** Although the development of maternal-infant sleep in the

immediate postnatal period has been largely unstudied, it is evident. It is reported that 78% of women reported poorer quality of sleep during childbirth than at any other stage of life **(Hassan et al., 2019).** Postpartum women's sleep, depression, and exhaustion were the foci of this study because of the nursing approach's foundation in Levine's conservation model.

AIM OF THE RESEARCH:

This research aimed to:

Evaluate the effect of nursing approach based on Levin's conservation model on fatigue, depression, and sleep quality among postpartum women.

Research hypotheses:

H1: Post-partum women who receive nursing care based on the Levin's conservation model will exhibit less level of fatigue and high level of energy compared to those in the control group

H2: Nursing care based on Levin's conservation model will result in a lower level of depression in postpartum women compared to the control group.

H3: Post-partum women who receive nursing care based on the Levin's conservation model will exhibit high sleep quality compared to those in the control group.

SUBJECTS AND METHOD

Research design: A quasi-experimental design (Two-Group : control group and study group , Pre/Post study design).

Setting: This research was conducted at antenatal outpatient clinic and postpartum unit in Obstetrics and gynecological department in Benha University Hospital.

Sampling: A purposive sample of 152 postpartum women was recruited for this study, representing 10% of the total flow rate of 1520 women who underwent delivery at Benha University Hospital by the end of 2023, according to their statistical center data. The sample was divided into two equal groups of 76 women each. One group served as a control, receiving only standard hospital care post-delivery. The other group, randomly selected, received both standard hospital care and nursing interventions based on Levine's Conservation Model. **inclusion criteria**: Participants were selected based on the following criteria: primigravida , being between the ages of 18 and 35, attending antenatal clinic at 34 weeks gestational age, women can read and write and free from any medical or obstetrics disorders and agree to participate in the research

Data collection tools:

Four tools were used for data collection:

Tool (I): A structured interviewing questionnaire: it consisted of two parts:

Part one*:* Personnel characteristics of the studied women. It included four items (age, educational level, residence, occupation).

Part two*:* knowledge related postpartum period: This part was developed by researchers in arabic language after reading relevant literature **(Alkalasha et al., 2022; Abazie et al., 2021)** in order to test the women's knowledge about post partum period. In a pre/post test format, this component was used before and after Levine's conservation model was put into action. The survey was divided into four sections and contained nineteen closed-ended questions. In Section 1, we cover the basics of the postpartum period with five items. What was known about healthy eating at this period (5 items) is covered in Section (2).Section (3) discusses personal hygiene in the postpartum period (5 items). Section (4) focuses on knowledge about physical activity and the best exercises during the postpartum period (4 items).

Scoring system: a two-point scoring system was applied: a score of 2 was assigned for each accurate answer, and a score of 1 for each inaccurate or faulty

response. The total knowledge score for each participant was calculated by summing the scores from all correct responses. A higher cumulative score indicated a more comprehensive understanding of the postpartum period. The classification of total knowledge scores was defined as follows:

- Unsatisfactory knowledge: less than 60%
- Satisfactory knowledge: 60% to 100%

Tool (II): Visual Similarity Scale for Fatigue (VSSF):

Fatigue levels among participants were assessed using the Visual Analogue Scale for Fatigue (VAS-F), which was adapted into Turkish by Yurtsever and Beduk (2003). This scale consists of 18 items, with 13 items specifically addressing fatigue and 5 items measuring energy levels.

Scoring system: A set of 10 cm long horizontal lines, with positive and negative expressions on each end, make up the scale. Each woman pointed to the exact emotional point on the scale that best described how they were feeling. An objective assessment was then performed by measuring the distance of the marked point from one end of the line using a ruler. Scores for the fatigue sub-dimension ranged from 0 to 130, while scores for the energy sub-dimension ranged from 0 to 50. A higher score on the fatigue sub-dimension items and a lower score on the energy sub-dimension items indicated greater severity of fatigue.

Tool (III): Patient Health Questionnaire-9 (PHQ-9):

This tool was adapted from **Kroenke et al., (2001)** and included 9 items to evaluate the level of depression over the past 2 weeks.

Scoring system: The Likert scale for each item features a 4-point scale:(0) "Not at all", (1) "Several days", (2) "More than half the days", and (3) "Nearly every day". A total score was calculated for each participant by adding up the scores of their responses

to each item. Total scores can range from 0 to 27, with higher scores reflecting more severe depressive symptoms. The total depression score was categorized as follows:

- No depression (0) point
- Minimal depression (1 to 4) points
- Mild depression (5 to 9) points
- Moderate depression (10 to 14) points
- Moderately severe depression (15 to 19) points
- Severe depression (20 to 27) points.

Tool (IV): The Groningen Sleep Quality Scale (GSQS):

It was adapted from **Meijman et al., (1988)** to evaluate the general quality of sleep. The scale consists of fifteen "yes or no" questions designed to assess the previous night's sleep quality.

Scoring system: Women responded to each item by marking "1" for a "yes" response and "0" for a "no" response. The total score ranged from 0 to 15. A higher score on the GSQS indicated more severe sleep disturbances. The total sleep quality score was categorized into the following classifications**:**

Normal sleep: Score of 0

Mild sleep disturbance: Scores ranging from 1 to 5

Moderate sleep disturbance: Scores ranging from 6 to 10

Severe sleep disturbance: Scores ranging from 11 to 15

Validity

In order to verify the validity of the content, the data collection tools were shared with a panel consisting of three nursing specialists specialized in obstetrics , gynecology and family&community health nursing. Modifications were subsequently

implemented based on the panel's feedback concerning the clarity of the sentences and the overall suitability of the content.

Reliability

The reliability of the tools was tested using Cranach's alpha test, which revealed that the tools have consistent properties.

Tool	Cronbach's alpha value
Tool I- Part 2: Knowledge regarding dysmenorrhea	0.86
Tool II: Visual Similarity Scale for Fatigue (VSSF)	0.93
Tool III: Patient Health Questionnaire-9 (PHQ-9)	0.91
Tool IV: Groningen Sleep Quality Scale (GSQS)	0.89

Ethical considerations:

The Scientific Research Ethical Committee of the Faculty of Nursing at Benha University granted study approval to facilitate this research. Before introducing the instruments to promote cooperation and enhance confidence, the purpose of the research was explicitly communicated to each participant to foster cooperation and trust. Each woman who participated in the investigation executed a signed consent form. All data collection tools were destroyed after statistical analysis to ensure the confidentiality of the research. The research tools were designed to safeguard the dignity, culture, traditional and religious aspects of the participants, ensuring no harm was caused during data collection. Ensure no immoral statements are included and respect human rights. The women will have the freedom to withdraw from the research at any time. After the study was completed, the control group would be provided with a booklet on postpartum care according to Levine's conservation model.

Pilot Study:

Ten percent of the total sample, or sixteen women who delivered recently, participated in an exploratory study. The goal was to determine how long the research

tools would take to complete, how useful they would be, and how efficient they were. The women who participated in the pilot study were also included in the main sample because the tools were not changed.

Field work:

The research objective was pursued throughout the preparatory, interviewing, and assessment phases, as well as the implementation and evaluation phases of Levine's conservation model. The phases were conducted over an eight-month period, commencing in March 2024 and concluding in October 2024. The researchers visited the aforementioned location twice a week from 9:00 am to 12:00 pm until they attained the predetermined sample size.

Preparatory Phase:

The initial stage of the study involved an exhaustive examination of both domestic and international literature that addressed the research problem in its various aspects. The researchers were able to gain a comprehensive understanding of the extent and severity of the issue at hand, as well as provide guidance for the development of the necessary data collection instruments and methods. The instruments were submitted to three experts in Obstetrics , Gynecological and Family&Community health Nursing for evaluation as to their comprehensiveness, clarity, importance, and applicability.

Interviewing and assessment Phase:

The researcher conducted bi-weekly visits to the outpatient clinic at Benha University Hospital to facilitate data collection. During these visits, structured interviews were conducted with women meeting the predefined inclusion criteria. The process commenced with the researcher introducing herself to each participant, followed by an explanation of the study’s purpose, objectives, duration, and procedures to ensure informed participation. Verbal informed consent was obtained prior to data collection.

Participants were then invited to complete a structured interview questionnaire (Tool I), which encompassed demographic variables and a maternal knowledge assessment. The researcher provided clarification and addressed any queries raised by the participants. Data collection was scheduled at two key time points: initially at the 34th week of gestation to establish baseline (pretest) data, and subsequently three weeks postpartum during the postnatal follow-up (posttest). Participants also provided contact details, including residential address and phone number, to facilitate reminders regarding post-test data collection. The average duration per interview ranged from 20 to 25 minutes, with an average of two to three interviews conducted per day.

Planning phase:

Based on the pre-program assessment baseline data and the available scientific literature, the researcher crafted an Arabic-language booklet with illustrations to tackle the knowledge gaps women have about the postpartum period. The Levine's conservation model was utilized as a reference point in developing the nursing care program. The study group was considered when deciding the number of sessions and their content, as well as the different teaching methods and instructional material. the program objective was established.

Implementation phase:

Only routine postpartum care was administered by hospital staff to women in the control group. The study group of women received both standard hospital care and an intervention program developed by nurses using Levine's conservation model. Each of the four sessions of the program lasted for one week. To guarantee that each session had enough attention and active engagement from the female participants, we limited it to no more than five or six women. Thirty to forty-five minutes was the duration of each session. During the first session, women learned about the postpartum nursing intervention program that follows Levine's conservation model. Upon the session's end, every woman was notified of the time of the following one. With basic Arabic language to accommodate women's comprehension levels, the subsequence commenced with

feedback on the previous session and its objective. Materials used included Power Point presentations, video films, posters, and designed booklets; instructional methods included group discussion, role playing, demonstration, and redemonstration. To avoid any confusion, the questions from the women were addressed at the end of each session.

The conservation model's fundamental objective is to enhance an individual's emotional and physical health by examining the four domains of conservation. The purpose of nursing in conservation is to assist the individual in maintaining the entirety of the individual with the least amount of effort. The four scheduled sessions were developed in accordance with the four principles of Levine's conservation model.

The first session based on the first principle of the Levine's conservation model (Energy Conservation): It relies on the unrestricted flow of energy within both the internal and external environments to uphold the equilibrium between energy provision and consumption.

The session was held at the 34th week of the gestational age for each woman. The session focused on encouraging women to conserve energy during postpartum period through following a healthy eating habits and adequate rest measures. Incorporating a low-fat diet, eating a diverse range of foods from each food group, drinking plenty of water throughout the day, continuing to take prenatal vitamins, limiting caffeine consumption, and eating foods rich in omega-3 fatty acids were all part of the healthy eating habits. Getting enough sleep involves a number of steps, such as (trying to sleep when the baby sleeps, even during the day), taking a nap or lying down and getting off your feet for at least 30 minutes every day, practicing relaxation exercises or meditation, and setting aside time each day to relax.

The second session based on the second principle of the Levine's conservation model (Structural integrity): It relies on having a fully functioning defense system that aids in the process of healing and restoration, to maintain the integrity and operation of the entire entity.

The session was held at the 35th week of gestational age. It was applied by encouraging women to follow adequate exercise following birth (walking which help in healing process, deep breathing exercise, follow some relaxation exercises such as yoga stretching exercises, and pelvic exercise). It is also important to encourage women to adhere to general hygiene guidelines to aid in the healing of compromised tissue integrity and to minimize the risk of infections and discomfort.

The third session based on the third principle of the Levine's conservation model (Personal integrity): It encompasses the preservation or renewal of a patient's feelings of self-worth, self-esteem, humanity, self-identity, and self-reliance.

The session was held at the 36 th week of the gestational age. It entailed nurturing and enhancing women' feelings of self-worth, self-esteem, humanity, self-identity, and autonomy by suggesting women to maintain a diary to document both positive and negative emotions and thoughts, which they may be hesitant to share with others, instruct the women to discuss health concerns with health professionals, advice women to avoid comparing self to others. To promote emotional well-being, women were offered support through phone conversations.

The fourth session based on the fourth principle of the Levine's conservation model (Social integrity): It acknowledges the essence of each person as a social being who is in constant interaction with their society, family, and community.

The fourth session took place one week after delivery in the waiting area of the outpatient clinic at Benha University Hospital. Firstly, the content of the previous sessions was reviewed with the women after delivery. Researchers then implemented the final element of Levine's conservation paradigm, which emphasizes social integrity. In order to prevent sensory deprivation and promote social interaction with other women, as well as to encourage the use of periodicals, magazines, radio, and TV, and to provide support and assistance to their family, women are encouraged to avoid staying in bed. Women should also consider redesigning their external environment to suit their new situation. For instance, placing baby care items in easily accessible locations can

aid in adapting to the external environment. Finally, women were encouraged to openly share any issues they may come across.

Evaluation phase:

The efficiency of Levine's conservation model was assessed three weeks later after giving birth. Both women in the control group and study group were requested to fill out the women's knowledge questionnaire (Tool I), Visual Similarity Scale for Fatigue (Tool II), Patient Health Questionnaire-9 (Tool III), and Groningen Sleep Quality Scale (TOOL IV). After the posttest data collection was finished, the control group received an educational booklet based on Levine's conservation model, taking into account the ethical aspect of the research. The researchers kept in touch with the women by phone, almost all the time.

Statistical Design:

The collected data was organized, classified, computerized, and analyzed using SPSS version 22 (Statistical Package for the Social Sciences). Statistics like means, standard deviations, frequencies, and percentages were used for descriptive purposes. Separate t-tests, chi-square tests, and Pearson correlation coefficients were utilized. Statistical tests indicate a highly significant difference when the p-value is less than or equal to 0.001, a statistically significant difference when the p-value is less than or equal to 0.05, and a statistically insignificant difference when the p-value is greater than 0. 05.

RESULTS

Table 1. Clarifies that, (53.9% and 43.4%) of both control and study groups, respectively, were in the age group (18-23 years), with a mean age of 23. 55 ± 4.61 and 24. 86 ± 4. 06 years. Regarding where they lived, 71.1% of the control group and 60.5% of the study group were from rural areas, respectively. In terms of education, it was clear that 55.3% of the control group and 52.7% of the study group had finished secondary school. In terms of occupation, Housewives made up 60.5% and 68.4% of the

control and study groups, respectively, when looking at occupations. In terms of demographic characteristics, there was no statistically significant difference between the study and control groups (p ˜ 0.05), suggesting that the groups were similar.

Table (2): illustrates that, there was a highly statistically significant difference between study and control regarding total fatigue and total energy score at post intervention of Levine's conservation model (P= <0.001). The mean fatigue score among control group was 71.24±16.72 compared to 41.60±13.69 among study group. Moreover, the mean energy score among control group was 22.28±4.02 compared to 36.31±2.86 among study group.

Table 3. It shows that there was a significant difference (P ≤ 0.05) in all items related to depression between the women in the study group and the control group. The total mean score of depression after Levine's conservation model intervention was also significantly different among the women in the study and control groups (P ≤ 0.001). the mean depression score was 18.78±3.46 among women in control group and was 13.76±4.56 among women in the study group.

Table 4. Reveals that, at post intervention of Levine's conservation model, the total mean scores of sleep quality among both study and control groups were (6.52 ± 6.76 and 10.94 ± 5.89) respectively with a highly statistically significant difference between them (P= 0.000).

Table (5): clarifies that, there was a highly statistically significant negative correlation between total sleep quality and total depression as well as total fatigue score among studied women in the both groups at post intervention of Levine's conservation model. while there was a highly statistically significant positive correlation between total energy and total sleep quality among studied sample in the both groups at post intervention of Levine's conservation model.

Figure 1. reveals that, 35.5% and 30.3% of both control and study groups respectively had satisfactory knowledge at preintervention phase compared to 38.2% and 75.0% at post intervention of Levine's conservation model.

Figure 2. Shows that, 30.3% of the study group and 40.8% of control group had moderately severe depression. As well as, 44.7% of the study group and 32.9% of control group had moderate depression level at post intervention of Levine's conservation model.

Figure 3. Shows that 42.1% and 22.4% of women in both study and control groups respectively had mild sleep disturbance compared to 26.3% and 51.3% of them respectively had sever sleep disturbance at at post intervention of Levine's conservation model.

Table (1): Distribution of the studied women (control and study groups) according to their socio-demographic characteristics (n= 152).

Socio-demographic characteristics	Control group n= 76		Study group n=76		X2	p-value
	No	%	No	%		
Age (years)						
18-23	41	53.9	33	43.4		
24-29	23	30.3	25	32.9	2.13	0.34
30- 35	12	15.8	18	23.7		
Mean ± SD	23.55±4.61		24.86±4.06		t-test 1.866	0.06
Residence						
Rural	54	71.1	46	60.5	1.87	0.17
Urban	22	28.9	30	39.5		
Educational level						
Read and write	4	5.3	2	2.6	1.32	0.73
Basic education	9	11.8	8	10.5		
Secondary education	42	55.3	40	52.7		
University education	21	27.6	26	34.2		
Occupation						
House wife	46	60.5	52	68.4	1.03	0.30
Working	30	39.5	24	31.6		

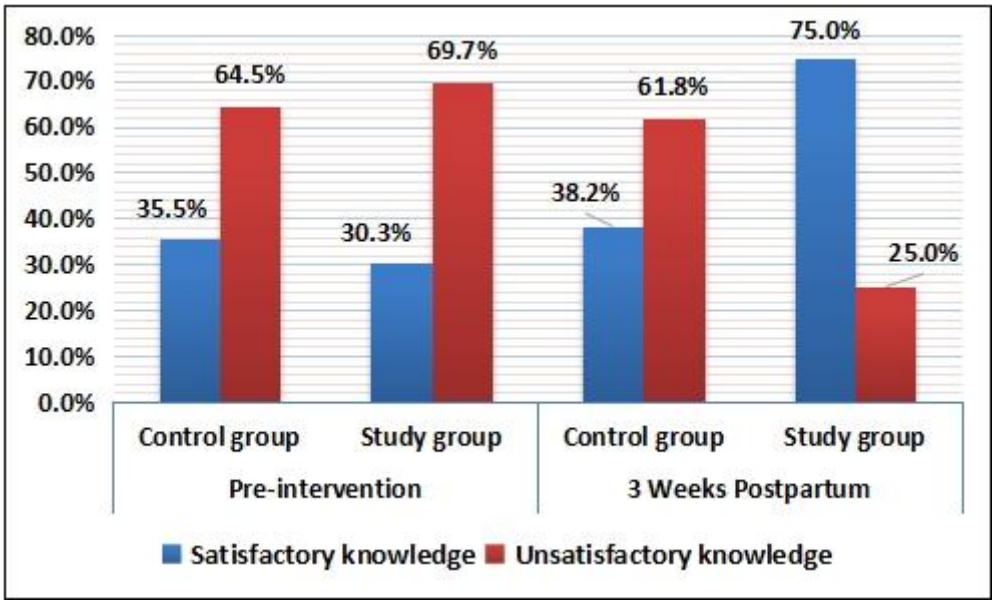

Figure (1): Statistical difference between the studied women' total knowledge score at pre and post intervention of Levine's conservation model (n=152).

Table (2): Mean scores of total fatigue and total energy among the studied women in both groups at post intervention of Levine's conservation model (three weeks postpartum) (n=152).

Dimensions	Possible score	Control group (n=76)	Study group (n=76)	t test	P value
		Mean ±SD	Mean ±SD		
Total Fatigue	0-130	71.24±16.72	41.60±13.69	8.06	0.000**
Total Energy	0-50	22.28±4.02	36.31±2.86	12.04	0.000**

t= independent t test ****Highly statistically significant (P ≤ 0.001).**

Table (3): statistical difference of the mean scores of depressions among studied women at post intervention of Levine's conservation model (three weeks postpartum) (n=152).

Depression Items	Range of possible score	Control group n= 76	Study group n=76	Independent t test P-value
		Mean ± SD	Mean ± SD	
There is little pleasure in performing tasks.	0-3	2.00±0.36	1.76±0.70	2.58 0.01*
Feeling down, discouraged or unfortunate.	0-3	2.27±0.66	1.95±0.20	3.16 0.002*
Having trouble falling asleep or staying asleep.	0-3	2.07±0.60	1.78±0.65	2.81 0.005*
Feeling fatigued or lacking energy.	0-3	2.02±0.54	1.71±0.70	3.08 0.002*
Insufficient appetite or excessive eating.	0-3	1.98±0.57	1.76±0.65	2.24 0.02*
Feeling down on yourself, or thinking that you are unsuccessful.	0-3	2.06±0.75	1.71±0.74	2.92 0.004*
Trouble centering on things, as perusing daily papers or observing tv.	0-3	2.13±0.68	1.80±0.75	2.83 0.005*
Moving or speaking at a pace that might have been noticeable to others.	0-3	2.09±0.61	1.78±0.61	3.02 0.003*
Thoughts of self-harm or feeling that one would be better off not existing.	0-3	2.13±0.68	1.80±0.73	2.87 0.005*
Overall Score	**0-27**	**18.78±3.46**	**13.76±4.56**	**6.87** **0.000****

*** Statistically significant difference (P ≤ 0.05)**

**** Highly statistically significant difference (P ≤ 0.001)**

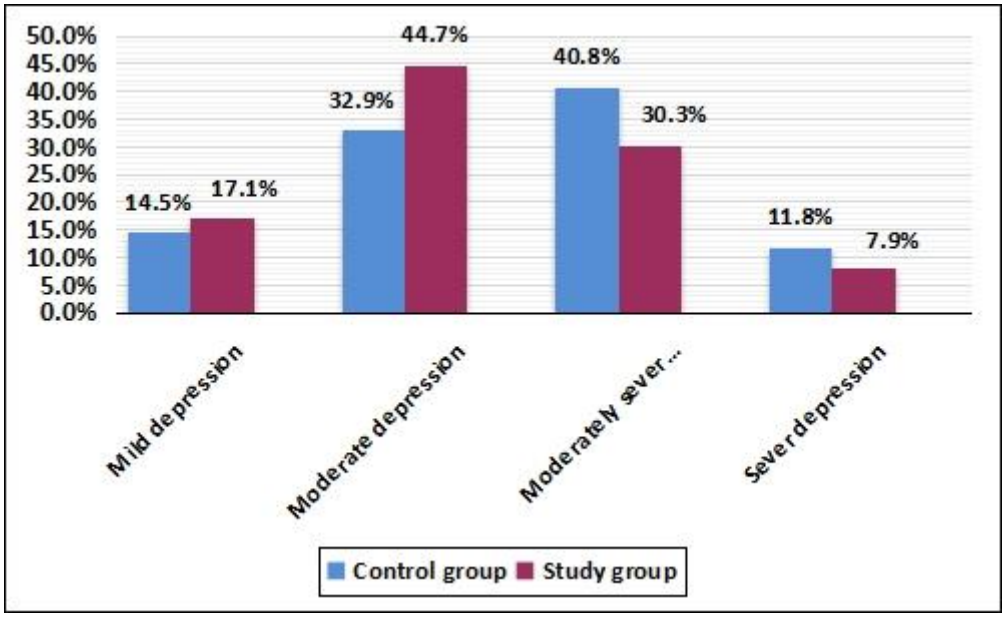

Figure 2. Statistical difference between studied women of both groups regarding their total depression score at post intervention of Levine's conservation model (three weeks postpartum) (n=152).

Table (4): statistical difference between the studied women in both groups according to sleep quality at post intervention of Levine's conservation model (three weeks postpartum) (n=152).

Groningen Sleep Quality items	Study group n=76		Control group n=76		X^2	P-value
	Yes		Yes			
	No	%	No	%		
I didn't get a restful night's sleep.	35	46.1	60	78.9	17.52	0.000**
I feel like I rested ineffectively final night.	42	55.3	66	86.8	18.41	0.000**
It took me over half an hour to drop snoozing final night.	34	44.7	57	75.0	14.42	0.000**
I woke up a few times final night.	35	46.1	58	76.3	14.65	0.000**
I found myself feeling a bit weary upon waking up this morning.	38	50.0	58	76.3	11.31	0.000**
I feel as though I didn't get enough sleep last night.	34	44.7	56	73.7	13.18	0.000**
I found myself waking up in the middle of the night.	34	44.7	55	72.4	11.95	0.000**

I didn't feel at ease after waking up this morning.	29	38.2	49	64.5	10.53	0.000**
I feel like I as it were had two hours of rest final night.	26	34.2	47	61.8	11.62	0.000**
I didn't get a wink of sleep last night.	29	38.2	50	65.8	11.62	0.000**
I had difficulty falling asleep last night.	32	42.1	55	72.4	14.21	0.000**
After I woke up last night, I had trouble sleeping once more.	28	36.8	50	65.8	12.74	0.000**
I tossed and turned all through the night.	31	40.8	57	75.0	18.24	0.000**
I only managed to get 5 hours of sleep last night.	35	46.1	60	78.9	17.54	0.000**
I woke up prior than normal within the morning.	34	44.7	55	72.4	11.95	0.000**
Mean ±SD	6.52 ± 6.76		10.94 ± 5.89		t= 4.29	0.000**

X2 = Chi square test; t= independent t test; **A highly statistically significant difference (P ≤ 0.001)

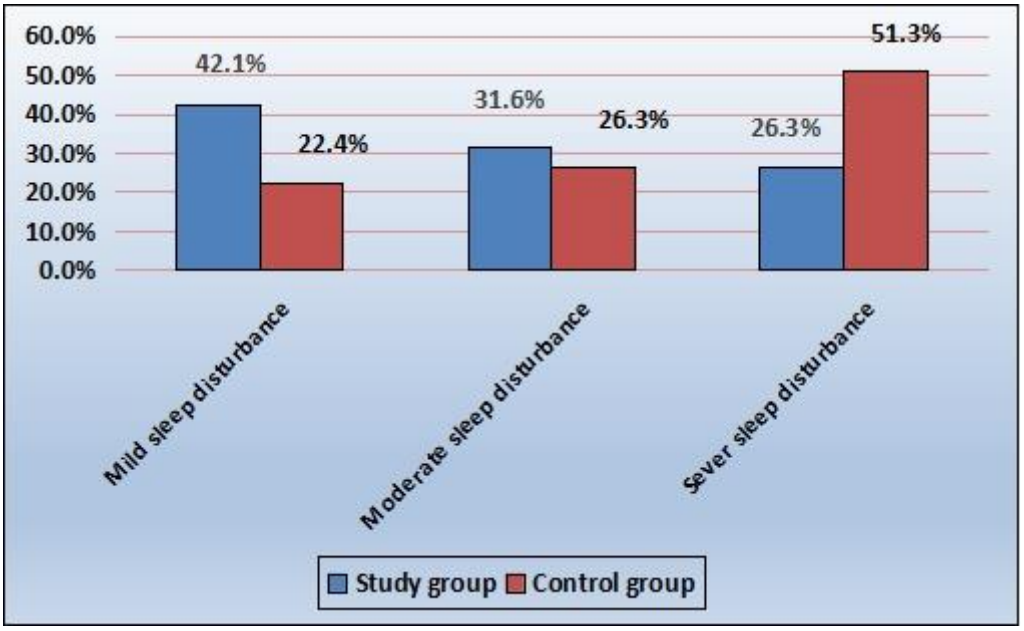

Figure 3. Statistical difference between studied women' total sleep quality in both study and control groups at post intervention of Levine's conservation model (three weeks postpartum) (n=152).

Table (5): Correlation between the studied women' total sleep quality, total depression and total fatigue as well as total energy score at post intervention of Levine's conservation model (three weeks postpartum) (n=152).

Variables	Total Sleep Quality			
	Study group n=76		Control group n=76	
	R	P value	r	P value
Total depression	-.608-	.000**	-.498-	.000**
Total fatigue	-.620-	.000**	-.582-	.000**
Total Energy	.542	.000**	.501	.000**

r= person correlation ****A high statistically significant difference (P ≤ 0.001**

DISCUSSION

Postpartum sleep and fatigue are among the most pressing and persistent challenges that mothers face on a daily basis in the months following childbirth. Postpartum fatigue, described as encompassing both physical and mental elements, significantly affects the health of both the mother and the newborn child. This period in life has a noticeable effect on the body, emotions, and social interactions, not only for women but also for their families **(Ercel and Sut, 2020).**

In this study, Levine's conservation model was used to examine the effects of the nursing approach on on sleep quality, depressive symptoms, and fatigue levels among postpartum women. According to this study, women who used Levine's conservation model reported significantly improved levels of energy, sleep, depression, and fatigue compared to a control group. The hypotheses of this investigation were significantly accepted by the results.

The present study's results showed no statistically significant differences in demographic characteristics between the study and control groups of women. The age group of 18-23 years comprised more than 50% of the control group and less than 50% of the study groups, respectively, with an average age of 23.55 ± 4.61 and 24.86 ± 4.06 years. Regarding where they lived, approximately two-thirds of the women in the study and control groups were from rural regions. In terms of education, it was clear that over 50% of the female participants in the study and control groups had finished secondary school. The majority of the women in both the control and study groups were employed as housewives.

This result comparable to a study by **Beraki et al. (2020),** which found that the majority of the study sample were married and that almost two thirds of the sample was in the 17–30 age range. Eighty-seven percent were housewives. Nearly three-quarters of them were from rural areas. Of them, 57.2% are enrolled in secondary school. This could be because different countries have different educational systems.

As well as, these findings align with the study conducted by **Taalab et al., (2021)**, which suggested that the age group of 18-30 years was the most prevalent among the women in the study. This observation may indicate that the women included in the study were in their childbearing years. Additionally, the results were consistent with **El-Kheshen et al., (2023)**, who revealed that both the control and intervention groups' participants lived in rural areas by a significant margin. In addition, the percentage of individuals with a secondary education was higher than 50% in both groups.

The present findings showed that approximately two thirds of the women in both the control and study groups had inadequate knowledge about the postpartum period prior to the intervention. It is worth mentioning that more than 50% of the women surveyed from both categories had completed secondary education and were staying at home to raise their children. They had no idea what to expect in the time after giving birth. This finding corroborated **Mohamed et al ., (2024)** findings that women lacked adequate knowledge about postnatal care. However, at three weeks postpartum, there was a statistically significant difference between the control group and the study group in terms of the percentage of participants who had satisfactory total knowledge scores.

This enhancement could be linked to Levine's conservation program and educational sessions. These initiatives have a positive impact on the knowledge of women, as all mothers in the study participate in the program and gain valuable insights into the postnatal period. Moreover, the subject of the study holds significant importance for pregnant women throughout both pregnancy and the postpartum period. So, women found the educational sessions and the accompanying booklet with pictures to be very engaging and helpful, serving as a valuable resource that they, including illiterate mothers, could refer to at any time.

The results of the current study consistent with **Alasser et al., (2024)** who reported that the average knowledge score of postpartum women in the study related to Levin's conservation model of nursing care both before and after the intervention. It is apparent from the data that the study group's knowledge score was 2. 32 ± 1. 74 before the intervention, and 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. As well as, **Teslim et al. (2023),** revealed that the majority of participants, around 75%, initially lacked accurate information. However, after receiving thorough counseling and health education, there was a noticeable improvement in the understanding, awareness, perception, and utilization of postnatal care services by new mothers. Moreover, the results backed up **El-Kheshen et al. 's (2023)** study, revealing that initially, there was no significant disparity in the average knowledge score between the two groups. Following the intervention, however, the study group exhibited a higher average knowledge score than the control group.

The conservation model centers on the efficient use of energy and the reduction of energy consumption. The preservation of physiological, psychological,

and social functions requires the conservation of energy. When planning and implementing nursing interventions tailored to patient care within the conservation model, the main focus should always be on conserving the individual's energy and enhancing their energy levels. Fatigue happens when energy is depleted **(Levine, 1989).**

In this study, we found that the control group and the study group differed significantly from one another on two measures of total energy and total fatigue at the post-intervention stage of Levine's conservation model. The average fatigue score in the control group was 71.24±16.72, whereas in the study group it was 41.60±13.69. In addition, the control group had an average energy score of 22.28±4.02, while the study group had an average energy score of 36.31±2.86. The nursing care program that follows Levine's conservation model is responsible for this improvement. It emphasizes conserving energy by providing educational sessions on maintaining a nutritious diet and engaging in appropriate exercises during the postpartum phase.

Levine's Conservation Model is crucial in aiding these women, as it promotes energy conservation. This, in turn, assists in managing fatigue and encouraging sustained physical activity **(Maulida et al., 2023).** Postpartum women can sustain or even enhance their levels of physical activity thanks to the model's all-encompassing approach, which places an emphasis on energy, structural, personal, and social integrity **(Qotrunnada et al., 2023).** As well as, **Ozcan and Eryilmaz (2021)** Results from a study conducted in Turkey showed that the control group and the intervention group of women differed significantly on measures like quality of life and exhaustion. Compared to the control group, those in the intervention group reported feeling less tired.

There was a statistically significant difference between the research and control groups of women on all depression-related items following the implementation of Levine's conservation model intervention. The women in the study and the control group also had significantly different total mean depression scores. While the experimental group had a score of 13.76±4.56, the control group had an average depression score of 18.78±3.46. In addition, approximately half of the control group and slightly under a third of the research group experienced moderate to severe depression, according to the results. Moderate depression was reported by over a third of the control group and under half of the research group. The results of this study point to the significant role that social and personal integrity play in preventing postpartum depression. If postpartum women want to feel less alone, they need to surround themselves with supportive people and participate in their communities. The model's emphasis on energy conservation, maintaining structural and personal integrity, and cultivating social support also contributes to this improvement.

The findings from the research carried out by **Özcan and Kirca (2021),** emphasized that physical activity had a vital role in improving the mental and physical well-being of postpartum women. The results have shown that postpartum women who incorporate regular physical activity into their routine observe notable enhancements in their mental health and physical recuperation. The results by **Nurhidayah et al., (2019),** suggested that postpartum women who engage in community activities and receive ongoing social support experience a lower risk of depression and an improved sense of mental well-being.

The present findings concerning sleep quality indicate that the total mean scores of sleep quality for the study and control groups were (6.52 ± 6.76 and 10.94 ± 5.89, respectively) at the post-intervention of Levine's conservation model, with a highly statistically significant difference between the two groups. The women's improved quality of sleep is ascribed to their compliance with the health guidelines enumerated in the nursing program, which is particularly focused on rest and sleep and is inspired by Levine's conservation model.

The results of the current study agreed with **Elkheshen et al., (2023),** When comparing the two groups' average pre-intervention sleep quality and patterns, the results revealed no statistically significant difference ($P > 0.05$). Comparing the study and control groups six weeks after the intervention, significant differences were found in overall sleep efficiency, daytime dysfunction, and the use of sleep medication ($P \leq 0.05$). There were statistically significant differences between the experimental and control groups on six weeks after the intervention for measures of subjective sleep quality, total sleep latency, total sleep duration, total sleep disturbance, and overall score for sleep patterns and quality. A p-value of less than 0.001 is indicated. In addition, the results were in agreement with **Ozcan and Eryilmaz, (2021),** who found no statistically significant difference ($t=-0.239$, $p>0.05$) between the control and intervention groups on the sleep quality item's mean pretest scores. However, the mean posttest scores showed a statistically significant difference ($t=-9.135$ $p<0,001$).

At the end of Levine's conservation model intervention, the women in both groups showed a negative correlation between total sleep quality and total depression and fatigue scores. This correlation was highly statistically significant. In both

groups, after Levine's conservation model intervention, there was a positive correlation between total energy and total sleep quality that was highly statistically significant. As per reference **Jacqueline and Hunter (2019),** a noteworthy positive correlation was observed between sleep disturbances and fatigue during the initial eight weeks following childbirth. This could be due to the fact that sleep deprivation might lead to increased fatigue in women.

CONCLUSION

In accordance with the results of the present study, a conclusion can be drawn which states that:

The present study demonstrates the significant effectiveness of Levine's Conservation Model as a holistic nursing approach in improving the well-being of postpartum women. Women who received care based on Levine conservation model showed marked improvements in sleep quality, energy levels, and knowledge, as well as significant reductions in depressive symptoms and fatigue. These outcomes underscore the model's emphasis on conserving energy and maintaining the structural, personal, and social integrity of individuals.

Furthermore, the structured educational sessions and supportive materials provided through the intervention played a crucial role in enhancing women' understanding of the postpartum period.

RECOMMENDATIONS

Recommendations derived from this research are as follows:

- All postpartum women should be provided with printed educational materials, such as booklets and brochures, containing comprehensive information on postnatal care and the principles of Levine's Conservation Model. These resources should be made readily available within postnatal care units
- It is recommended that the Levine's conservation model be applied to all postpartum women to aid in improving their sleep quality and conserving energy.
- It is recommended that Levine's Conservation Model be integrated into standard postpartum nursing care to enhance sleep quality, reduce fatigue, and support energy among new mothers.

Further researches:

- Further studies should be conducted using diverse samples across various healthcare settings and hospital environments to enhance the generalizability and applicability of the findings.

"Acknowledgements:

The researchers want to extend their heartfelt gratitude to all the women who took part in this study. Their willingness to cooperate and engage actively is truly appreciated. Additionally, the researchers would like to express their gratitude towards the institution that facilitated this research and the jury committee for their valuable support."

references

Abazie, O., Iniobong, I., & Usoro, I. (2021). Knowledge of postpartum depression among mothers at immunization clinics in Mushin, Nigeria. *African Journal of Midwifery and Women's Health, 15*(1), 203–220.

Alasser, A. M. F., Abdullah, A. E. S. H., Ashour, E. S., Abu Setta, S., & Mohamed, R. F. (2024). Levin's conservation model nursing care: Impact on fatigue and sleep quality among postpartum women. *Egyptian Journal of Health Care, 15*(3).

Alkalasha, S. H., Osama, A., El Kelany, B., & Zayed, H. I. (2022). Knowledge, attitude, and practice regarding postpartum care among mothers attending an Egyptian family health unit. *Menoufia Medical Journal, 35*, 528–534.

Apostolopoulos, M., Hnatiuk, J. A., Maple, J.-L., Olander, E. K., Brennan, L., van der Pligt, P., & Teychenne, M. (2021). Influences on physical activity and screen time amongst postpartum women with heightened depressive symptoms: A qualitative study. *BMC Pregnancy and Childbirth, 21*(1), 1–13. https://doi.org/10.1186/s12884-021-03847-w

Baattaiah, B., Alharbi, M., Aldhahi, M., & Khan, F. (2024). Factors associated with postpartum fatigue: An exploration of the moderating role of resilience. *Frontiers in Public Health, 12*, 1394380. https://doi.org/10.3389/fpubh.2024.1394380

Badr, H. A., Zauszniewski, J. A., Griffin, M. Q., Burant, C. J., Przeworski, A., Almutairi, W. M., & Alsharif, F. H. (2021). Effects of postpartum fatigue and

depressive cognitions on life satisfaction and quality of life in Arab postpartum women: The intervening role of resourcefulness. Nursing Reports, 11, 84–94. https://doi.org/10.3390/nursrep11010009

Bana, E. D. (2014). Cryopreserved and lyophylized amniotic fluids using Levine's conservation model: A breakthrough in the process of wound healing. Liceo Journal of Higher Education Research, 10(1). https://doi.org/10.7828/LJHER.V10I1.658

Beraki, G. G., Tesfamariam, E. H., Gebremichael, A., Yohannes, B., Haile, K., Tewelde, S., & Goitom, S. (2020). Knowledge on post-natal care among postpartum mothers during discharge in maternity hospitals in Asmara: A cross-sectional study. BMC Pregnancy and Childbirth, 20(1), 1–10.

Elkheshen, S., Elbanna, H., & Salama, A. (2023). Effect of Levin's conservation model application on fatigue and sleep quality among postpartum women. Egyptian Journal of Nursing and Health Sciences, 4, 19–41. https://doi.org/10.21608/ejnhs.2023.292138

Ercel, O., & Sut, H. K. (2020). Sleep quality and quality of life in postpartum women. Journal of Turkish Sleep Medicine, 1, 23–30. (In Turkish(

Gholami, Z., Mohammadirizi, S., & Bahadoran, P. (2022). Study of the impact of educational behavioral interventions on fatigue in mothers in the postpartum period in the groups of face-to-face and electronic training. http://www.ijnmrjournal.net

Hassan, F. B., Abdel Aziz, G., & Al-Darwish, Youness, E. M. (2019). Impact of educational intervention on reducing postpartum sleeping pattern alterations. ASNJ, 7(16), 177–189. https://doi.org/10.21608/ASNJ.2019.61538

Jacqueline, R., & Hunter, L. P. (2019). The relationship between sleep characteristics and fatigue in healthy postpartum women. Women's Health Issues, 19(1), 38–44. https://doi.org/10.1016/j.whi.2008.07.015

Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: Validity of a brief depression severity measure. Journal of General Internal Medicine, 16(9), 606–613. https://doi.org/10.1046/j.1525-1497.2001.016009606.x

Levine, M. E. (1989). The conservation principles of nursing: Twenty years later (1st ed.(.

Maulida, A. R., Tesha, A., Sabrina, N., Fadilla, A. R., Amanda, D., Azizah, E. L., & Maulidya, N. I. (2023). Time management and priority scale as strategies to improve learning motivation and self-leadership at SMP Ma'arif, Batu City. Health Frontiers, 1(2), 115–122.

Meijman, T., Vries-Griever, A., & Vries, G. (1988). The evaluation of the Groningen Sleep Quality Scale. Groningen: Heymans Bulletin (HB88-13-EX).

Mohamed, Y. I., Mahran, D. G., Ibrahim, M., & Fathalla, M. (2024). Effect of pre-discharge postpartum counseling on knowledge, attitude and use of family planning in a tertiary hospital in Upper Egypt. *Egyptian Journal of Evidence-Based Women's Health*, *14*(4), 1–12. Retrieved from

https://ebwhj.journals.ekb.eg/article_391825_f48c597e6d2185517f1497f77728b231.pdf

Moline, M. L., Kahn, D. A., Ross, R. W., Altshuler, L. L., & Cohen, L. S. (2024). Postpartum depression: A guide for patients and families. Retrieved April 25, 2024, from www.womensmentalhealth.org

Nurhidayah, I., Pahria, T., Hidayati, N. O., & Nuraeni, A. (2019). The application of Levine's conservation model on nursing care of children with cancer experiencing chemotherapy-induced mucositis in Indonesia. KnE Life Sciences, 448–462. https://doi.org/10.18502/KLS.V4I13.5277

Ozcan, S., & Eryilmaz, G. (2021). Using Levine's conservation model in postpartum care: A randomized controlled trial. Health Care for Women International,42(4–6), 794–814. https://doi.org/10.1080/07399332.2020.1797038

Özcan, Ş., & Kirca, N. (2021). Effects of care given in line with Levine's conservation model on the quality of life of women receiving infertility treatment: A single-blind randomized controlled trial. Health Care for Women International, 1–22. https://doi.org/10.1080/07399332.2021.2007927

Qotrunnada, D. N. A., Safira, R., Azizah, S. N., & Romadlona, N. A. (2023). Self-leadership: Unveiling the key strategies for personal and professional empowerment at SMP Ma'arif Batu. Inovasi Lokal, 1(2), 94–101.

Sharifipour, F., Javadnoori, M., Behboodi Moghadam, Z., Najafian, M., Cheraghian, B., & Abbaspoor, Z. (2022). Interventions to improve social support among

postpartum mothers: A systematic review. Health Promotion Perspectives, 12(2), 141–150. https://doi.org/10.34172/hpp.2022.18

Shorey, S., Ang, L., & Goh, E. (2018). Lived experiences of Asian fathers during the early postpartum period: Insights from qualitative inquiry. Midwifery, 60(4), 30–35 .

Taalab, A. A., Kassem, I. K. A., Gamal, A. M., & Ashour, E. S. S. (2021). Relationship between postpartum primiparous sleep quality and self-care. Menoufia Nursing Journal. https://menj.journals.ekb.eg

Teslim, S., Adeola, A., & Adesina, O. (2023). Attitude of postpartum women towards multiple postnatal clinic schedules in southwest Nigeria. European Journal of Obstetrics & Gynecology and Reproductive Biology: X, 18, 100197. https://doi.org/10.1016/j.eurox.2023.10019

Yurtsever, S., & Bedük, T. (2003). Evaluation of fatigue in hemodialysis patients. Journal of Research and Development in Nursing, 2, 3–12 .

تأثير نهج التمريض القائم على نموذج لافين للحفاظ على الصحة في الإرهاق، الاكتئاب، وجودة النوم لدى النساء بعد الولادة

فاطمة كمال علي[1] **سارة سعيد حسن**[2] **لميس محمود محمد فهمي النواصاني**[3] **علا عبد الوهاب عفيفي عربي**[4]

[1] أستاذ مساعد تمريض نساء وتوليد، كلية التمريض، جامعة بنها، مصر
[2]مدرس تمريض نساء وتوليد، كلية التمريض، جامعة قناة السويس، مصر
[3] مدرس تمريض صحة الأسرة والمجتمع، كلية التمريض، جامعة قناة السويس، مصر

الخلاصة

تُعد الفترة التالية للولادة مرحلة حرجة للمرأة وعائلتها، إذ تشهد تغيرات بدنية واجتماعية وعاطفية قد تؤدي إلى زيادة الشعور بالإرهاق والاكتئاب، وانخفاض في كلٍّ من جودة وكمية النوم. هدف هذا البحث هو تقييم تأثير نهج التمريض القائم على نموذج لافين للحفاظ على الصحة في معدلات الإرهاق والاكتئاب وجودة النوم لدى النساء بعد الولادةوتم استخدام تصميم شبه تجريبي (مجموعة ضابطة ومجموعة دراسة، تصميم قبلي–بعدي) وقد تم اجراء البحث في العيادة الخارجية لرعاية ما قبل الولادة ووحدة ما بعد الولادة بقسم التوليد وأمراض النساء في مستشفى جامعة بنها.وقد استخدم لجمع البيانات أربع أدوات، وهي: استبيان مقابلة منظّمة، مقياس التشابه البصري للإرهاق، استبيان الصحة النفسية ومقياس خرونينغن لجودة النوم.النتائج :بعد تطبيق نموذج لافين للحفاظ على الصحة، أبلغت مجموعة الدراسة عن تحسّن ملحوظ في جودة النوم والحيوية وانخفاض معدلات الاكتئاب والإرهاق مقارنة بالمجموعة الضابطة. كما أظهر النموذج وجود علاقة عكسية ذات دلالة إحصائية عالية بين جودة النوم الإجمالية وبين مجموع درجات الاكتئاب والإرهاق لدى النساء في كلتا المجموعتين.ووجد كذلك ارتباط إيجابي ودال إحصائيًا بين إجمالي الطاقة وجودة النوم في المجموعتين عند استخدام نموذج لافين. الاستنتاج :كان تطبيق نموذج لافين للحفاظ على الصحة فعالًا في تحسين مستويات الإرهاق والطاقة والاكتئاب وجودة النوم لدى النساء بعد الولادة.التوصيات: يُوصى بتطبيق نموذج لافين للحفاظ على الصحة على جميع النساء بعد الولادة، لما له من دور في تحسين جودة النوم والحفاظ على الطاقة.

الكلمات المرشدة **:** النهج، الاكتئاب، الإرهاق، التمريض، نموذج ليفين للحفاظ، جودة النوم