Effect of Lamaze Technique on Pain, Anxiety, Sleep Disturbance and Quality of Recovery among Women Undergoing Hysterectomy

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Abstract: The most frequent and upsetting side effects of an abdominal hysterectomy include anxiety, sleep disorders and postoperative pain. It is supposed that teaching women about Lamaze breathing exercises both before and after surgery could lower the risk of complications after surgery. **Purpose**: To evaluate the effect of Lamaze technique on pain, anxiety, sleep disturbance and quality of recovery among women undergoing hysterectomy. **Design**: A quasi-experimental design (two group posttest only design). **Setting**: The research was conducted at Obstetric and Gynecological department in Benha University Hospital. **Sample**: A purposive sample of 80 women undergoing hysterectomy divided into two groups (control and study). **Instruments**: Five instruments were used: A structured interviewing questionnaire, Numeric pain rating scale, Self-rating anxiety scale, Groningen sleep quality scale and Postoperative quality of recovery scale. **Results**: There was a statistical significant improvement in total mean scores of the pain severity, anxiety level, sleep disturbances and quality of recovery among women in the study group compared to women in control group at 24 and 48 hours post hysterectomy. **Conclusion**: The implementation of Lamaze technique was effective in reducing level of pain, level of anxiety and sleep disturbances; as well as, improving quality of recovery among women undergoing hysterectomy. **Recommendation**: It was recommended that Lamaze technique should be offered as a part of standard nursing care for women undergoing hysterectomy in hospitals.

Keywords: Anxiety, Hysterectomy, Lamaze technique, Pain, Quality of Recovery, Sleep Disturbance

Introduction:

In the entire world, women's reproductive health is a crucial issue with significant effects on their health, happiness, and the growth of the whole population. Hysterectomy is one of the most common gynecological procedures carried out worldwide. The name "hysterectomy" derives from two Greek words: "hystera" (uterus) and "ectomy" (removal). Accordingly, a

hysterectomy is a medical operation in which the uterus which usually includes the cervix is removed (Cockrum and Tu, 2022).

In many nations nowadays, hysterectomy is one of the most frequently performed gynecological procedures. In 2020, many reports stated that over 600,000 hysterectomies were carried out annually in the United States and that by the age of fifty, 27% of Indian women had undergone a hysterectomy (Abdelbaseer et al., 2022). Uterine myomas account for about 40% of all abdominal hysterectomy indications in Egypt, along with uterine prolapse 3.0%, pelvic inflammatory disease 3.7%, abnormal uterine hemorrhage 9.5%, malignancy 12.6%, and endometriosis 12.8% (Ibrahim et al., 2022).

All hysterectomy women have the risk of experiencing immediate and long-term problems following surgery. Following abdominal surgery, post-operative pain is a substantial cause of breathing difficulties, sleep disturbances, appetite loss, and extended hospital stays. According to earlier research, women who have had hysterectomies are typically at a significant risk of developing chronic post hysterectomy pain (Gamel and Mohammed, 2022; Thomas, 2018). Due to the uncertainty of the future and inability to forecast a desired outcome, women who have gynecological surgery are more likely to experience sadness and anxiety (Shen et al., 2020).

Pain and recovery play crucial roles in the surgical process. It is difficult to define pain, due to its complexity in anatomical and physiological bases, the individual nature of experience as well as social and cultural significance. Pain is defined by the International Association for the Study of Pain as an unpleasant emotional and sensory experience associated with actual or potential tissue damage, or described as such damage. Many patients who undergo abdominal surgeries commonly encounter post-operative pain, which triggers heightened stress responses and expedites tissue deterioration. Insufficient control of post-operative pain can lead to various complications, including impaired breathing, sleep disturbances, prolonged hospital stays, decreased patient satisfaction, increased medical costs, and delayed recovery (Sellgren, 2023).

Sleep disturbances in the preoperative phase are increasingly associated with anxiety, pain, extent of operation, type and duration of operation, and disease severity. Sleep quality is important for everyone's health because it affects the quality of life and the day. Sleep disturbances are common in women undergoing hysterectomy, as the loss of a uterus can represent severe psychological trauma resulting in reduce immune function, slow wound healing, increase blood pressure, increase heart contractility, increase the secretion of stress-related hormones and have a negative impact on women's quality of life, activities and physical condition (Varallo et al., 2022).

Physical, psychological, emotional, and pain manifestations in

postoperative patients frequently have an impact on their recovery. The results of several research, including (Shashi and Rakesh, 2022; Li et al., 2021), showed that doing breathing exercises during the postoperative period primarily reduces the indicated manifestation and improves postoperative outcomes.

Postoperative recovery is an important indicator of women's health after surgery. However, pain, nausea, vomiting and a variety of anesthesia-related complications can negatively impact the quality of recovery. Nurses can make a difference in the recovery room. They play a key role in managing these unwanted symptoms by relieving women's discomfort and speeding up their recovery (Yu et al., 2022).

Lamaze breathing exercise is a non-pharmacological behavioral method for reducing pain and improving sleep. This approach is the simplest to understand and use for a given patient. This treatment is affordable, accessible, self-initiated by the patient, and risk-free. Lamaze breathing exercise is a systematic approach to achieving a deep state of relaxation, reducing stress and pain, and improving sleep quality. Through muscle relaxation followed by focused breathing, the production of endorphins, and an emphasis on reducing psychological and physical stress and anxiety, Lamaze breathing exercise enhances the body's immunity and feelings of well-being (Wu et al., 2021).

Maternity nurses can make a significant contribution to improving women's knowledge and improving their quality of sleep by helping women undergoing hysterectomy to manage pain, different emotions, manage the psychological problems of this surgery well and know how the woman will do afterwards. A woman's life can be improved with adequate nursing monitoring and care. The nurse can help the women make the necessary adjustments to be able to live after a hysterectomy (Jafarigiv et al., 2020).

In addition, nurses continue to play a role in helping women prepare for discharge from the hospital. Before discharge from the hospital, women and their families receive verbal and written instructions. These instructions include when to call a surgeon, what activities are prohibited, how to take medications, how to recognize symptoms of infection, and when to schedule examinations (Wall, 2020).

Significance of the study:

Hysterectomy is one of the most common gynecological procedures worldwide. Moreover, hysterectomy is one of the most common procedures for women in the United States. In total, around 600,000 procedures are carried out every year, of which around 10% are being subtotal (cervix-preserving) and roughly 140,000 in Germany each year (Mohamed et al., 2023). According to the National Center for Health Statistics in Egypt, the annual incidence rate was 165 per 100,000 hysterectomies, meaning that a significant number of women in the

Egyptian community suffer from this health problem (Ibrahim and Mohammed 2020).

Postoperative women often experience a variety of conditions that affect their postoperative recuperation counting psychological, physical, emotional pain. Utilization of Lamaze technique "as non-pharmacological method" during postoperative period basically diminished the expressed manifestation and progress postoperative results. Lamaze technique is a straightforward, secure, affordable, accessible, self-administered technique that can be easily implemented by individuals. It represents an essential aspect of nursing care for gynecological patients as they offer a structured approach to alleviate stress, anxiety, pain perception, muscle tension, contractions, and enhance sleep quality (Kaple and Patil, 2023). Therefore, this study aimed to evaluate the effect of Lamaze technique on pain, anxiety, sleep disturbance and quality of recovery among women undergoing hysterectomy.

Purpose:

To evaluate the effect of Lamaze technique on pain, anxiety, sleep disturbance and quality of recovery among women undergoing hysterectomy.

Research hypotheses:

- **H1**: Women who practise Lamaze technique will have less postoperative pain than women who receive routine perioperative care.
- **H2**: Women who practice Lamaze technique will show less postoperative anxiety than women who receive routine perioperative care.
- **H3**: Women who practise Lamaze breathing exercise will show less postoperative sleep disturbances than women who receive routine perioperative care.
- **H4**: Women who practise Lamaze breathing exercise will have higher postoperative quality of recovery than women who receive routine perioperative care.

Operational definitions:

Lamaze technique:

It is a type of breathing exercise used as a nursing intervention for reducing or improving pain, anxiety, sleep disturbance and quality of recovery among women undergoing hysterectomy. It involves cleansing breathing exercise, slow-paced breathing, modified paced breathing and patterned-paced breathing by women undergoing hysterectomy 3 times daily (once in the morning, once in the afternoon and once in the evening) for 15 minutes.

Quality of Recovery:

It refers to physical independence, emotional state, psychological support, and pain among women undergoing hysterectomy which is measured by postoperative quality of recovery scale (instrument 5)

Subjects and Method

Research design:

A quasi-experimental design (two group posttest only design) was adopted for this research. According to

Cambell and Slanley, (1966) "The term quasi experimental design refers to a type of research design that does not have the element of random assignment." This study began from August 2022 to the end of July 2023 covering one year.

Setting:

This research was conducted at the Department of Obstetrics and Gynecology, Benha University Hospital.

Sampling

A purposive sample of 80 women was selected. According to Benha university Hospital statistical center, (2022), flow rate of the women undergoing total hysterectomy were 800 women at the end of year 2022. Ten percent of flow rate (80 women) were selected and divided into two groups at random: the control group, which consisted of 40 women received only routine perioperative hospital care, meanwhile the study group which consisted of 40 women followed Lamaze technique in addition to routine perioperative hospital care.

The studied sample was selected concurring to the consideration inclusion criteria; according to eligibility for hysterectomy, undergoing hysterectomy for benign conditions, and accepted to participate in the study.

Instruments:

Five instruments were used for data collection:

Instrument one: Characteristics of women structured interviewing questionnaire:

It contained two parts:

- **Part one**: Personnel characteristics of studied women. It included five items (age, marital status, educational level, occupation, residence).

- **Part two**: Current surgical history: It included four items (mode of delivery, surgical indications of hysterectomy, surgical approach of hysterectomy, type of anesthesia).

Instrument two: Numeric Pain Rating Scale (NRS):

This instrument was adopted from Coll et al., (2004) for evaluating postoperative pain. It is a 10-point rating scale extending from 0 (no pain) to 10 (worst pain).

Scoring system:

The pain scores are deciphered as: 0 representing no pain. 1-4 indicating mild pain, 5-6 indicatinga moderate pain, and 7-10 severe pain. This scale was chosen for its ease of organization and generalizability.
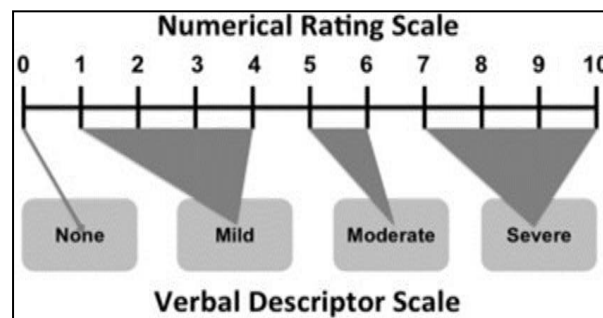
Instrument three: The Self-Rating Anxiety Scale: (SAS)

This instrument was adopted from Samakouri et al., (2012) and encompassed 10 items to assess anxiety level. It is 5-points scale: (0)"never", (1)"sometime", (2)"half the time", (3)"frequently", and

(4)"Always". A total score was calculated for each subject by summing the response scores for each item, and a mean anxiety score was calculated for each subject.

Total anxiety scoring system:

▪ Severe anxiety ranges from 25 to 40 points

▪ Moderate anxiety ranges from17 to 24 points

▪ Mild anxiety ranges from 0 to 16 points

Instrument four: The Groningen Sleep Quality Scale: (GSQS)

It was adopted from Meijman et al., (1988) to assess the overall quality of sleep. The scale contains fifteen "yes or no" questions to evaluate the sleep quality the previous night.

Scoring system:

A score of "1" for the answer "yes" and "0" for the answer "no". The total number of points ranged from 0 to 15. A higher score on the scale indicates severe sleep disturbances. The score of total sleep quality was classified as the following:

▪ Normal sleep if the score "0"

▪ Mild sleep disturbance if the score "1 – 5"

▪ Moderate sleep disturbance if the score "6 – 10"

▪ Severe sleep disturbance if the score "11 – 15"

Instrument five: Postoperative Quality of Recovery Scale: (QoR40).

It was adopted from Myles et al., (2000). It was used to measure the quality of postoperative recovery. It contains 40 items grouped according to five dimensions of recovery,

including emotional state "9" items such as feeling relaxed, having a general sense of control, feeling in control, nightmares, feeling anxious, feeling angry, feeling depressed, feeling lonely and difficulty sleeping. Physical comfort includes 12 items such as being able to breathe easily, sleeping well, enjoying food, feeling rested, nausea, vomiting, dry vomiting, feeling restless, shaking or muscle twitching, chills, feeling cold and dizziness whereas, psychological support included7 items such as being able to communicate with medical professionals, able to communicate with friends or family, utilize support from hospital physicians, Utilize support from hospital nurses, from loved ones, being capable to understanding instructions or suggestions and Feeling confused) Meanwhile physical independence contained 5 items such as able to resume regular household chores or employment, Capable of writing, speaking normally, cleaning teeth, shaving, and taking care of oneself, and pain contained 7 items such as (moderate pain, severe pain, headache, backache, sore throat, sore mouth, and muscle aches).

Scoring system:

Women rated their responses on a 5-point Likert scale; "1 = none of the time, 2 = some of the time, 3 = usually, 4 = most of the time, and 5 = all of the time". The total score on the QoR40 scale could be between 40 and 200. The higher the score, the better the quality of postoperative recovery.

Validity

To check the validity, the data collection tools were presented to a panel of three nursing specialists in the field of obstetrics and gynecology. Modifications and changes were made such as additions, rewording and omission of some questions.

Reliability

The reliability of the instruments was tested using Cranach's alpha test, Values of reliability tests for instruments two (numeric pain rating scale), three (Self-rating anxiety scale), four (Groningen sleep quality scale) and five (postoperative quality of recovery scale) were 0.94, 0.91, 0.89 and 0.92 (domains range from 0.84 to 0.94).

Ethical considerations:

Approval of the Ethical and Research Committee at Faculty of Nursing-Benha University, (No13 date11/2/2024) was obtained. A written consent was obtained from women related to their acceptance to share in the study. The women were given assurance that the findings would be utilized for research purpose, the privacy of the gathered information would be upheld, and they would be allowed to withdraw from the study whenever they wished.

Pilot Study:

It was carried out on ten percent of the total sample (8 women). The purpose was to assess the ease, clarity, suitability, and feasibility of the tools that were developed. Based on the findings from the pilot study, certain questions were rephrased, and the pilot sample was removed from the main study.

Procedure:

A letter was submitted from the dean of the Faculty of Nursing, Banha University to the director of Benha University hospital including the purpose and methods of data collection. Stages of data collection (assessment, implementation and evaluation) lasted from the beginning of August 2022 until the end of July 2023.

The researchers went to the specified location three days a week, from 9:00 am to 2:00 pm. The research process encompassed the following steps:

Assessment Phase:

The researcher screened all women who undergo hysterectomy the day prior to the operation. To make sure the women qualified for the study, their records were examined. After explaining the goal of the study, the researcher conducted one-on-one interviews with each of the women to get their consent. At the start of the interview, the researcher greeted each woman, gave a brief introduction, and went over the goals of the study as well as the procedures, timing, and length of the Lamaze technique.

The researcher collected personal characteristics and current surgical data used (A structured interviewing questionnaire -instrument I) from both groups immediately after obtaining consent, while Numeric pain rating scale, self-rating anxiety scale, the Groningen sleep quality and Postoperative quality of recovery scale (Tool II, III, IV &V) were collected on

the second and third postoperative day (after 24 hr. & 48 hr. of the surgery).

Implementation phase: control group only received routine perioperative hospital care

The researcher had the sole duty of observing and recording the techniques employed in the treatment of women during surgical procedures. The control group received standard nursing care, which encompassed: (1) upon admission, women were greeted and provided with assistance to help them become familiar with the hospital setting and daily routines. (2) The day prior to surgery, detailed instructions were provided to women regarding preoperative precautions including fasting, the administration of medication, various examinations, and precautions related to specimen retention. (3) After the surgery, women and their families were instructed on the management of pelvic drains, dietary restrictions, and how to prevent potential complications. (4) To ensure any discomfort was promptly addressed, women were given further oral discharge instructions outlining precautionary measures.

For study group (Practiced Lamaze technique)

Women in the study group received combinations of routine hospital care and practised Lamaze technique. They received health education about Lanaze technique and its practice. Each woman was individually instructed about Lamaze therapy. Two sessions were applied; each session lasted for 30–45 minutes.

1) The first session. (Theoretical)

On the day before operation, immediately after assessment phase, the women were provided with information about hysterectomy, including its definition, types, methods, causes, initial risks, psychological and sexual effects, guidelines, and the importance of communicating with healthcare providers and following up.

2) The second session (Practical)

The session included the practices of Lamaze technique which involves cleansing breathing exercise (an organizing breath) as well as other three patterns including slow-paced breathing, modified paced breathing and patterned-paced breathing. (Wu et al., 2021; Nagvanshi and Linson, 2020; Jothi, 2019).

The researcher taught the women how to apply patterns of Lamaze technique as the following:

▪ Firstly, the "Cleansing Breathing exercise" (an organizing breath) applied through took slow and deep breath through the nose then exhale it actively through the gently opening and relaxing mouth in small bursts (Like a sigh) Meanwhile the hand was resting lightly on lower ribs to feel them rise and fall, releasing all physical tension from head to toes.

▪ Then, the researcher informed woman how to apply "Slow breathing exercises" as the following: Start with Cleansing Breathing exercise (an organizing breath).

❖ Take a gentle and slow nasal inhalation while counting 4 (1, 2, 3, 4) for about 2-4 seconds,and then pause. Afterwards, mother were instructed to exhale through their relaxed and slightly opened mouth while counting 6 (1, 2, 3, 4, 5, 6) for about 4-6 seconds (totally about 8-10 breath/minute). The procedure was conducted while mothers were paying attention towards on a specific object, pictures, sound or even breath to clear mind from distractions. This same technique was repeated for five cycles. A pause for 5 seconds was provided afterwards

▪ Also, the researcher informed the woman how to apply "Modified-Paced Breathing exercise" as the following:

❖ Breathe in through the nose and out through the mouth.

❖ Breathe a shallow inhalation of air. Then, exhale an even and short and shallow breathing accompanied by a vowel sound ("Hee") with keep shoulder relax. With the air exchange, the women remained the face relaxed and the lips are slightly parted.

❖ Rest for 5 seconds then repeated the same technique.

▪ Additionally, the researcher informed the woman how to apply "Patterned-Paced Breathing exercise" as the following:

❖ The same technique of modified Paced Breathing. Then, the woman done an extra "blow or who" interspersed at intervals.

❖ Focus attention on one thing as a picture or a spot on the wall.

❖ Breathe in and out through the mouth at a rate of 1 to 10 breaths every 5 seconds.

❖ The woman made a regular combination between ("Hee") and "who" as (Pattern 3 "Hee"/1 "who" or 4 "Hee"/1 "who" or 5 "Hee"/1 "who" ....etc.)

▪ An instructional video describing four breathing exercise patterns was shown to the women at the conclusion of the practical session. They were instructed to repeat these patterns as soon as they were taught and were encouraged to practice them three times a day. (Once in the morning, once in the afternoon and once in the evening) for 15 minutes.

Evaluation phase:

Reassessment for pain intensity, anxiety level, sleep disturbances and quality of recovery was conducted at 24 hours and 48 hours postoperatively used (tool II, III, IV and V).

Statistical Design:

The collected data were coded, arranged, computerized, and analyzed using SPSS version 22 (Statistical Package for Social Sciences). Descriptive statistics, variables like mean, standard deviations, frequencies, and percentages were utilized. Pearson correlation coefficients, independent t-tests, and chi-square tests were also used.A statistical significant difference was considered if $P \leq .05$, a highly statistical significant difference was considered if $P \leq .01$, and a very highly statistical significant difference was considered if $P \leq .001$.

Results

Table 1: clarifies that 40.0% and 37.5% of both study and control groups respectively were ≥50 years with a mean age of 45.19±10.31 and 47.28±9.53 years. In relation to marital status, 57.5% and 62.5% of both study and control groups respectively were married. Concerning level of education, it was clear that 60.0% and 47.5% of both study and control groups respectively had secondary education. According to occupation, 67.5% and 60.0% of both study and control groups were housewives. Regarding residence, 65.0% and 57.5 % of both study and control groups respectively lived in rural area. Additionally, there was no statistically significant differences between both study and control groups (P > 0.05) that reflected groups homogeneity.

Table 2: reveals that, 65.0% and 57.5% of both study and control groups respectively had abdominal hysterectomy. According to indication of hysterectomy, 50.0% and 45.0% of both study and control groups respectively had abnormal uterine bleeding. As regarding surgical approach of hysterectomy, hystosalpingo-oophoroctomy was the most common surgical approach of hysterectomy in both study and control groups 47.5% and 52.5% respectively. Additionally, 95.0% and 97.5% of both study and control groups respectively had general anesthesia with no a statistically significant difference between study and control groups regarding history of hysterectomy (p > 0.05) which

reflecting homogeneity between both groups.

Table 3: demonstrates that, 24 hour post hysterectomy, the total mean scores of pain severity among both study and control groups were 5.10 ± 2.32 and 6.62 ± 1.87 respectively with highly a statistically significant difference between them (P= 0.002*). following, 48 hours post hysterectomy, the total mean scores of pain severity among both study and control groups were 4.85 ± 2.53 and 6.05 ± 1.70 respectively with highly a statistically significant difference between them with (P= 0.01*). Additionally, there was a significant reduction in pain severity among women in the study group compared with women in the control group, after application of Lamaze technique.

Table 4: reveals that following 24 hours post hysterectomy, the total mean scores of anxiety among both study and control groups were 20.82 ± 7.38 and 30.05 ± 5.92 respectively with a very highly statistical significant difference between them (P≤ 0.000*). Meanwhile, 48 hours post hysterectomy, the total mean scores of pain severity among both study and control groups were 18.25 ± 6.46 and 28.17 ± 8.36 respectively with a highly statistically significant difference between them (P= 0.01*). Additionally, there was a significant reduction in anxiety level among women in study group compared with women in the control group, after application of Lamaze technique.

Figure 1: shows that 27.5% and 42.5% of women in both the study and control groups respectively had severe

anxiety 24 hours post hysterectomy. Meanwhile, at 48 hours post hysterectomy, only 17.5% of women in the study group compared to 37.5% of women in the control group had severe anxiety.

Table 5: reveals that following 24 hours post hysterectomy, the total mean scores of sleep quality among both study and control groups were 6.70 ± 6.97and 10.32 ± 6.32 respectively with a highly statistical significant difference between them (P= 0.01*). Meanwhile, 48 hours post hysterectomy, the total mean scores of sleep quality among both study and control groups were 4.62 ± 6.34 and 8.22 ± 6.98 respectively with a highly statistical significant difference between them (P= 0.01*). Additionally, there was a significant improvement in sleep quality among women in the study group compared with women in the control group, after application of Lamaze technique.

Figure 2: shows that 32.2% and 57.5% of women in both study and control groups respectively had severe sleep disturbances 24 hours post hysterectomy. Meanwhile, at 48 hours post hysterectomy, only 22.5% of women in the study group compared to 42.5% of women in the control group had severe sleep disturbance.

Table 6: reveals that following 24 hours post hysterectomy, the total mean scores of quality of recovery among both study and control groups were 119.77 ± 9.87 and 97.77 ± 14.39 respectively with a very highly statistical significant difference between them (P≤ 0.000**). Meanwhile, 48 hours post hysterectomy, the total mean scores of pain severity among both study and control groups were 133.40 ± 6.67and 109.55 ± 16.74 respectively with a very highly statistically significant difference between them (P≤ 0.000**). Additionally, there was a significant improvement in quality of recovery among women in study group compared with women in the control group, after application of Lamaze technique.

Table 7: shows that there was a very highly statistically significant positive correlation between total pain score and total anxiety score as well as total sleep disturbances scores in the study and control groups at 24 and 48 hours post hysterectomy (P ≤ 0.001).

Table 8: shows that there was a very highly statistically significant negative correlation between total quality of recovery score and total sleep disturbance score in both groups at 24 and 48 hours post hysterectomy (P ≤ 0.001).

Effect of Lamaze Technique on Pain, Anxiety, Sleep Disturbance and Quality of Recovery among Women Undergoing Hysterectomy

Table (1): Distribution of women in the study and control groups according to their personal characteristics (n=80)

Groups / Variables	Study group n=40		Control group n=40		X^2	P-value
	No	%	No	%		
Age (years)						
< 30 year	7	17.5	5	12.5	0.68	0.91 ns
30 < 40 years	6	12.0	7	17.5		
40 <50 years	11	27.5	13	32.5		
≥ 50 years	16	40.0	15	37.5		
Mean ± SD	45.19±10.31		47.28±9.53		Independent t test 0.964	0.338 ns
Marital status						
Single	7	17.5	9	22.5	1.33	0.51 ns
Married	23	57.5	25	62.5		
Divorced	10	25.0	6	15.0		
Educational level						
Primary education	8	20.0	10	25.0	1.27	0.57 ns
Secondary education	24	60.0	19	47.5		
University education	8	20.0	11	27.5		
Occupation						
Working	13	32.5	16	40.0	0.48	0.48 ns
Housewife	27	67.5	24	60.0		
Residence						
Rural	26	65.0	23	57.5	0.47	0.49 ns
Urban	14	35.0	17	42.5		

Chi-square test (x2); ns no statistical significant difference (p > 0.05)

Table (2): Distribution of women in the study and control groups according to their history of hysterectomy (n=80).

Current surgical history of hysterectomy	Study group n=40		Control group n=40		X^2	P value
	No	%	No	%		
Mode of hysterectomy						
Abdominal	26	65.0	23	57.5	0.47	0.78 ns
Vaginal	9	22.5	11	27.5		
laparoscopy	5	12.5	6	15.0		
Indication of hysterectomy						
Abnormal uterine bleeding	20	50.0	18	45.0	0.67	0.71 ns
Uterine fibroids	13	32.5	12	30.0		
Endometriosis	7	17.5	10	25.0		
Surgical approach						
Total hysterectomy	7	17.5	7	17.5	0.29	0.96 ns
Hystosalpingo-oophoroctomy	19	47.5	21	52.5		
Subtotal hysterectomy	10	25.0	9	22.5		
Radical hysterectomy	4	10.0	3	7.5		
Type of anesthesia						
General anesthesia	38	95.0	39	97.5	0.34	0.55 ns
Spinal anesthesia	2	5.0	1	2.5		

Chi-square test (x2); ns Non statistically significant; P-value>0.05

Table (3): Distribution of women in the study and control groups according to severity of pain at 24 and 48 hours after hysterectomy (n=80).

Severity of Pain	24 hours post hysterectomy						48 hours post hysterectomy					
	Study group n=40		Control group n=40		x^2	P-value	Study group n=40		Control group n=40		x^2	P-value
	No	%	No	%			No	%	No	%		
Mild pain	13	32.5	5	12.5	7.74	0.02*	23	57.5	15	37.5	6.17	0.04*
Moderate pain	17	42.5	14	35.0			15	37.5	16	40.0		
Severe pain	10	25.0	21	52.5			2	5.0	9	22.5		
Mean ±SD	5.10 ± 2.32		6.62 ± 1.87		t= 3.22	0.002*	4.85 ± 2.53		6.05 ± 1.70		t= 2.48	0.01*

x^2 =chi square test   t= independent t test   ** statistically significant difference (P ≤ 0.05)

Table (4): Mean scores of anxiety from hysterectomy in the study and control groups at 24 and 48 hours after hysterectomy (n=80).

Items / Groups	Range of Possible Scores	24 hours post hysterectomy Mean ± SD	T test P-value	48 hours post hysterectomy Mean ± SD	T test P-value
I feel tense, nervous, restless, or agitated — Study group (n=40)	0-4	2.02 ± 0.86	4.59	1.67 ± 0.69	5.45
Control group (n=40)		2.90 ± 0.84	0.000**	2.70 ± 0.96	0.000**
I feel afraid for no apparent reason — Study group (n=40)	0-4	1.97 ± 0.83	4.46	1.70 ± 0.72	5.15
Control group (n=40)		2.87 ± 0.96	0.000**	2.70 ± 0.99	0.000**
I fear that negative things will happen to me. — Study group (n=40)	0-4	2.00 ± 0.75	5.99	1.75 ± 0.70	5.51
Control group (n=40)		3.05 ± 0.81	0.000**	2.82 ± 1.00	0.000**
It's hard for me to go asleep, stay asleep, or wake up early. — Study group (n=40)	0-4	2.12 ± 0.85	4.10	1.85 ± 0.76	4.08
Control group (n=40)		2.92 ± 0.88	0.000**	2.70 ± 1.06	0.000**
I have trouble eating too much, too little, or properly processing food. — Study group (n=40)	0-4	2.10 ± 0.87	3.95	1.80 ± 0.75	4.21
Control group (n=40)		2.87 ± 0.88	0.000**	2.62 ± 1.97	0.000**
I wish I knew a way to make myself more relaxed — Study group (n=40)	0-4	2.07 ± 0.79	6.02	1.85 ± 0.80	5.03
Control group (n=40)		3.00 ± 0.55	0.000**	2.72 ± 0.75	0.000**
I have trouble focusing, remembering things, or thinking. — Study group (n=40)	0-4	2.02 ± 0.89	5.37	1.80 ± 0.85	5.97
Control group (n=40)		3.12 ± 0.93	0.000**	3.05 ± 1.01	0.000**
I would say I am anxious much of the time — Study group (n=40)	0-4	2.10 ± 0.77	5.13	1.90 ± 0.81	4.67
Control group (n=40)		3.02 ± 0.83	0.000**	2.87 ± 1.04	0.000**
Occasionally, I have a rapid heartbeat, cold extremities, dry mouth, tense muscles, and numbness. — Study group(n=40)	0-4	2.17 ± 0.87	5.09	1.95 ± 0.87	5.03
Control group (n=40)		3.12 ± 0.79	0.000**	3.00 ± 0.98	0.000**
I wish I could be as at ease with who I am as people seem to be. — Study group (n=40)	0-4	2.22 ± 0.80	5.38	1.97 ± 0.86	4.93
Control group (n=40)		3.15 ± 0.73	0.000**	2.97 ± 0.94	0.000**
Overall score — Study group (n=40)	0-40	20.82 ± 7.38	6.16	18.25 ± 6.46	5.93
Control group (n=40)		30.05 ± 5.92	0.000**	28.17 ± 8.36	0.000**

t= independent t test   **A high statistical significant difference (P ≤ 0.001)

Figure (1): Distribution of studied women' total anxiety score in both study and control groups at 24 and 48 hours after hysterectomy (n=80).
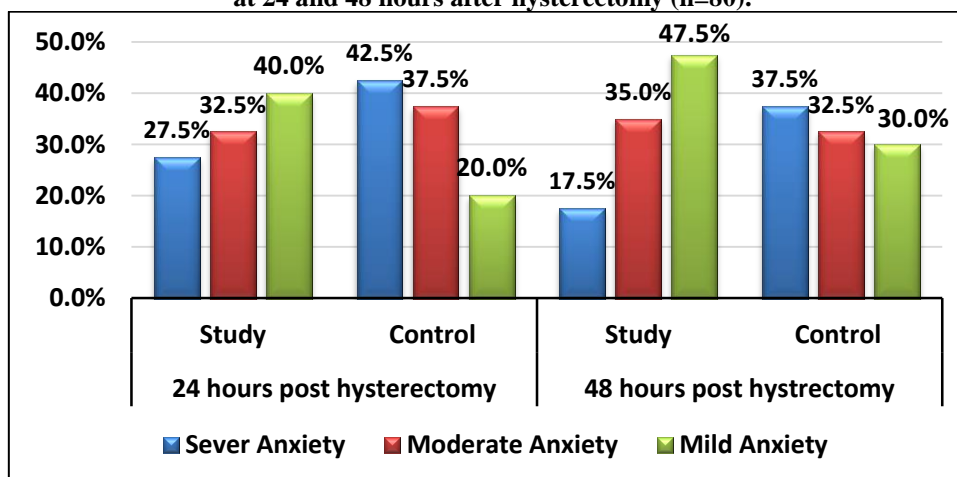

Table (5): Distribution of studied groups according to sleep quality at 24 and 48 hours after hysterectomy (n=80).

Groningen Sleep Quality Scale items	24 hours post hysterectomy					48 hours post hysterectomy				
	Study group n=40		Control group n=40		x^2 P-value	Study group n=40		Control group n=40		x^2 P-value
	Yes		Yes			Yes		Yes		
	No	%	No	%		No	%	No	%	
I didn't sleep deeply last night.	22	55.0	31	77.5	4.52 0.03*	18	45.0	27	67.5	4.11 0.04*
I feel like I slept poorly last night.	24	60.0	33	82.5	4.94 0.02*	16	40.0	25	62.5	4.05 0.04*
Last night, it took me more than thirty minutes to get to sleep.	19	47.5	30	75.0	6.37 0.01*	14	35.0	23	57.5	4.07 0.04*
I woke up several times last night.	17	42.5	30	75.0	8.71 0.003*	11	27.5	20	50.0	4.26 0.03*
I felt tired after waking up this morning	19	47.5	29	72.5	5.20 0.02*	14	35.0	24	60.0	5.01 0.02*
It seems like I slept in too little last night.	17	42.5	28	70.0	6.14 0.01*	11	27.5	22	55.0	6.24 0.01*
I woke up in the middle of the night.	19	47.5	29	72.5	5.20 0.02*	13	32.5	23	57.5	5.05 0.02*
I didn't feel comfortable after waking up this morning.	16	40.0	26	65.0	5.01 0.02*	11	27.5	20	50.0	4.26 0.03*
I slept for what seems like two hours last night.	14	35.0	23	57.5	4.07 0.04*	9	22.5	18	45.0	4.52 0.03*
I didn't sleep for the blink of an eye last night	16	40.0	25	62.5	4.05 0.04*	10	25.0	20	50.0	5.33 0.02*
I found it hard to sleep last night.	19	47.5	28	70.0	4.17 0.04*	9	22.5	20	50.0	6.54 0.01*
Last night, I woke up and found it difficult to fall back asleep.	17	42.5	26	65.0	4.07 0.04*	14	35.0	23	57.5	4.07 0.04*
I flipped and turned all last night.	18	45.0	28	70.0	5.11 0.02*	15	37.5	24	60.0	4.05 0.04*
I didn't sleep more than 5 hours last night	17	42.5	29	72.5	7.36 0.007*	11	27.5	21	52.5	5.20 0.02*
I woke up earlier than usual in the morning	13	32.5	23	57.5	5.05 0.02*	8	20.0	17	42.5	4.71 0.03*
Mean ±SD	6.70 ± 6.97		10.32 ± 6.32		t= 2.43 0.01*	4.62 ± 6.34		8.22 ± 6.98		t= 2.41 0.01*

x^2 = Chi square test   t= independent t test   * A statistically significant difference (P ≤ 0.05)

Figure (2): Distribution of studied women' according to total sleep quality in both study and control groups at 24 and 48 hours after hysterectomy (n=80).
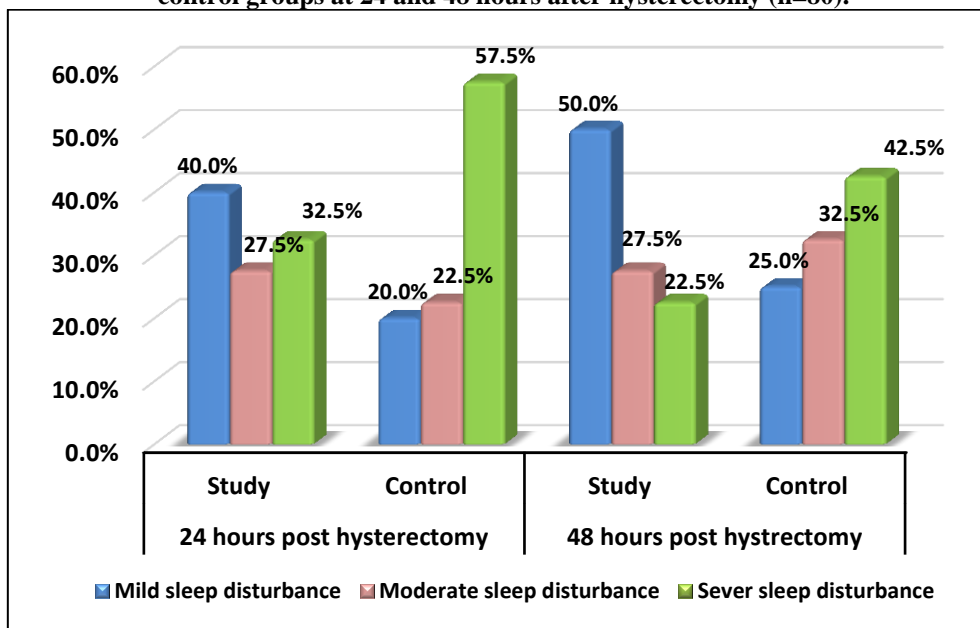

Table (6): Mean scores of quality of recovery in the study and control groups at 24 and 48 hours after hysterectomy (n=80).

Dimensions	Range of Possible Scores	Study group n=40	Control group n=40	Independent t-test	P value
		Mean ±SD	Mean ±SD		
Emotional state (9 items)					
24 hours post hysterectomy	9-45	28.62 ± 3.46	22.25 ± 3.62	8.04	0.000**
48 hours post hysterectomy		31.07 ± 4.23	24.47 ± 5.48	6.02	0.000**
Physical comfort (12 items)					
24 hours post hysterectomy	12-60	36.87 ± 2.91	31.37 ± 4.33	6.66	0.000**
48 hours post hysterectomy		39.52 ± 1.96	33.35 ± 5.09	7.15	0.000**
Psychological support (7 items)					
24 hours post hysterectomy	7-35	21.75 ± 4.36	18.00 ± 4.24	3.89	0.000**
48 hours post hysterectomy		25.27 ± 2.77	20.57 ± 6.10	4.43	0.000**
Physical independence (5 items)					
24 hours post hysterectomy	5-25	12.60 ± 1.85	10.75 ± 2.57	3.68	0.000**
48 hours post hysterectomy		15.20 ± 1.47	12.97 ± 2.06	5.54	0.000**
Pain (7 items)					
24 hours post hysterectomy	7-35	19.92 ± 2.92	15.40 ± 3.07	6.66	0.000**
48 hours post hysterectomy		22.32 ± 3.48	18.17 ± 1.72	6.74	0.000**
Overall score					
24 hours post hysterectomy	40-200	119.77 ± 9.87	97.77 ± 14.39	7.96	0.000**
48 hours post hysterectomy		133.40 ± 6.67	109.55 ± 16.74	8.36	0.000**

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

Table (7): Correlation between total pain score, total anxiety score and total sleep disturbances score in both study and control group at 24 and 48 hours post hysterectomy (n=80)

Variables	Total pain score							
	Study group n= 40				Control group n= 40			
	24 hours Post-intervention		48 hours Post-intervention		24 hours Post-intervention		48 hours Post-intervention	
	R	P value	r	P value	r	P value	r	P value
Total anxiety	0.431	.000**	0.512	.000**	0.574	.000**	0.612	.000**
Total sleep disturbances	0.493	.000**	0.448	.000**	0.523	.000**	0.499	.000**

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

Table (8): Correlation between total quality of recovery score and total sleep disturbances score in both study and control group at 24 and 48 hours post hysterectomy (n=80)

Variables	Total quality of recovery score							
	Study group n= 40				Control group n= 40			
	24 hours Post-intervention		48 hours Post-intervention		24 hours Post-intervention		48 hours Post-intervention	
	R	P value	r	P value	r	P value	r	P value
Total sleep disturbances	-.460-	.000**	-.559-	.000**	-.516-	0.000**	-.509-	.000**

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

Discussion:

Abdominal hysterectomy is the most common major gynecological surgery, even though less invasive methods like laparoscopic or vaginal procedures are recommended in the first instance (Torné et al., 2021). Patients recovering from surgery typically experience a range of symptoms, including pain, psychological, emotional, and physical symptoms. The implementation of breathing exercises Lamaze technique in the postoperative phase primarily aims to diminish these symptoms and enhance the overall outcomes of the surgery (Shashi and Rakesh, 2022).

The current research aimed to evaluate the effect of Lamaze technique on pain, anxiety, sleep disturbance and quality of recovery among women undergoing hysterectomy.

In terms of personal traits, the current study's findings showed that about half of the study and control groups belonged to the age group of people over 50, with mean ages of 45.19±10.31 and 47.28±9.53 years, respectively. In terms of marital status, less than two thirds of the control group and more than half of the study group were married. Concerning level of education, it was obvious that three fifth of study group and less than half of control group had secondary education. The results showed that over two thirds of the study group and three fifths of the control group were housewives based on occupation. In

terms of housing, roughly three-quarters of the control group and less than two-thirds of the study group were in rural areas. Furthermore, when it came to the homogeneity of the groups, there was no statistically significant difference found between the study and control groups' personal characteristics.

The findings mentioned above aligned with Mahmoud et al., (2020), which indicated that there were no notable variations in personal attributes between the control and experimental groups. Additionally, most of the women involved in the study belonged to the age range of 35-55 years, with an average age of 44.3±3.8 years. Elgi and Viswanath (2019) corroborated these findings by demonstrating that a significant proportion of women, typically in the range of 45 to 55 years old, were predominantly unemployed. Moreover, the results indicate that the majority (67.5%) of women originated from rural areas. Furthermore, these outcomes align with the findings of El-Sayed et al., (2017) which indicated that approximately 60% of women resided in rural regions and fell within the age bracket of 40-60 years.

Obtaining a surgical history in a meticulous manner is crucial for promptly and precisely diagnosing ailments, thereby enhancing outcomes. Moreover, surgical history holds significance for two primary reasons. Firstly, it allows the nurse to gain a comprehensive understanding of the patient and establish baseline observations, which will help in creating a care plan and evaluating progress. Secondly, it offers valuable

hints to the healthcare provider regarding the patient's health risks (Sakko et al., 2022)

With respect to the historical background of hysterectomy, the results of this study made it clear that, about less than two thirds of study group and less than three fifth of control groups undergo abdominal hysterectomy. According to indication of hysterectomy, about half of both study and control groups had abnormal uterine bleeding. Regarding surgical approach of hysterectomy, less than half of study group and more than half of control group undergo hystosalpingo-oophoroctomy.

Additionally, most of both study and control groups had general anesthesia. These results are consistent with studies by Afify et al. (2022), who found that over 50% of the study group and over 75% of the control group had abdominal hysterectomy, and that over 40% of the study group and about 50% of the control group had abnormal uterine bleeding that resulted in hysterectomy. Also, Webb-Tafoya, (2021) found that almost half of the women in their study were diagnosed with abnormal uterine bleeding as the primary reason for hysterectomy. It is possible that the similarity in results can be attributed to the inclusion criteria, which focused on selecting women with similar characteristics. Furthermore, the results of this study were consistent with those of Shekhar et al. (2019), who found that fibroids or cysts (20%) were the most common reasons given for having a hysterectomy, with excessive menstrual bleeding (56%).

Individuals who undergo surgical procedures encounter severe pain after the operation, necessitating the identification of reliable and secure approaches to assist them in quickly resuming their normal routine. There are numerous strategies available for managing pain before, during, and after surgery. Guidelines were developed in conjunction with the American Society of Anesthesiologists by the American Pain Society to promote evidence-based, safe, and effective management of postoperative pain in both adults and children. These guidelines address the utilization of non-pharmacological techniques such as Lamaze technique (Debra et al., 2017).

Concerning pain among studied women undergoing hysterectomy; the current study's results indicated that women in the study group had fewer levels of pain than women in the control group (5.10 ± 2.32 Vs 6.62 ± 1.87 post 24 hours and 4.85 ± 2.53 and 6.05 ± 1.70 post 48 hours) The findings indicate a potential beneficial impact of utilizing Lamaze breathing techniques to manage acute postoperative pain in individuals who have enduring abdominal surgery. This finding could be explained by the ability of Lamaze breathing exercises to alleviate pain by reducing muscle tension, reducing anxiety levels, and diverting attention. Additionally, it enhances pain relief by aligning with the gate control theory of pain, which suggests that altering pain signals sent from the peripheral nerve receptors to the brain can diminish or eliminate the perception of pain.

The current study outcomes agreed with Wang et al. (2022), who found that the Lamaze group patients had much less severe pain than the control group As well, ElSaqaa et al., (2021) found that Lamaze breathing technique was effective in alleviating postoperative pain. Additionally, Subakeerthi and Moses, (2019), assessed the impact of rhythmic breathing exercises on postoperative pain in female patients undergoing major abdominal surgery. It was found that Lamaze technique was effective in reducingpostoperative pain in patients who had undergone major abdominal surgery.

The above-mentioned results supported the first study hypothesis which stated that women who practise Lamaze breathing exercise will show less postoperative pain than women who only receive standard perioperative care.

Regarding anxiety among studied women undergoing hysterectomy, the recent study findings indicated that, 24-hour post hysterectomy, the total mean scores of anxieties among both study and control groups were (20.82 ± 7.38 and 30.05 ± 5.92) respectively with a highly statistically significant difference between them. Meanwhile, 48 hours post hysterectomy, the total mean scores of pain severity among both study and control groups were (18.25 ± 6.46 and 28.17 ± 8.36) respectively with a statistically significant difference between them. Additionally, more than one quarter of the study group and more than two fifth of control group had sever anxiety 24 hours post hysterectomy.

Meanwhile, at 48 hours post hysterectomy, less than one fifth of women in the study group compared to about two fifth of women in the control group had sever anxiety. The reason for these findings was breathing exercise increases the flow of oxygen to the brain, helps slow the heart, and stabilizes blood pressure. Together they stimulate the nervous system, which is a balance that promotes a state of relaxation and relief from anxiety.

The results aligned with those of Gamel and Mohammed (2022), who found that the control group's postoperative anxiety level scores were significantly higher than those of the breathing exercise study group (p<0.05). Additionally, Kuruvilla, (2019), found that the experimental group's mean anxiety score of 2.8 (SD=1.2) was lower than that of the control group's 4.0 (SD=1.5). Significant results were obtained with "t" value t=6.44 (p=0.01). It was concluded that, in comparison to the control group, the experimental group's level of anxiety was noticeably lower. Moreover, these findings matched with a study conducted by Hussein and Taha, (2018), which indicated that the study group experienced a decrease in anxiety and distress postoperatively compared to the control group.

The above-mentioned results supported the second study hypothesis which stated that women who practiced Lamaze technique will show less postoperative anxiety than women who received standard perioperative care.

Sleep disturbances during the preoperative period are associated with anxiety, pain, and the magnitude of the surgery. Sleep disturbances frequently occur in women who are undergoing hysterectomy due to the significant emotional impact of losing their uterus. Additionally, these disturbances can have various adverse effects on the patient's health, such as compromising immune function, impeding wound healing, elevating blood pressure, intensifying heart contractions, increasing the secretion of stress-related hormones, and detrimentally impacting overall quality of life (Varallo et al., 2022).

Regarding sleep disturbances among studied women undergoing hysterectomy; the results of this investigation demonstrated that, 24-hour post hysterectomy, the total mean scores of sleep quality among both study and control groups were (5.10 ± 6.53 and 8.80 ± 6.78) respectively with a statistically significant difference between them. Meanwhile, 48 hours post hysterectomy, the total mean scores of sleep quality among both study and control groups were (3.20 ± 5.65 and 6.65 ± 6.98) respectively with a statistically significant difference between them. Additionally, about one third of study group and less than three fifth of control group had sever sleep disturbance 24 hours post hysterectomy. Meanwhile, at 48 hours post hysterectomy, nearly one quarter of women in the study group compared to more than two fifth of the control group had sever sleep disturbance. The reason for these findings could be that the Lamaze breathing exercise method

enhances the quality of sleep among women in study group by inducing body relaxation, maintaining normal blood pressure, promoting blood flow, and facilitating muscle relaxation. As well, it can help to divert attention away from a painful body part, reduce anxiety, and establish a sense of control over pain and hence improve sleep quality.

The results of Bulut and Karabulut, (2023), who finished with 58 patients in the experimental group and 57 patients in the control group, were consistent with these findings. Patients in the control group had higher mean Visual Analog Sleep Scale and state anxiety scores than patients in the experimental group on the morning of the procedure and on the first, fifteenth, and thirty days following the procedure; this difference was statistically significant ($p < .05$). Additionally, Ibrahim et al. (2021), demonstrated that the intervention group's mean sleeping quality score significantly dropped in comparison to the control group, indicating improved sleeping quality following the intervention ($F1 = 361.49$, $p < 0.001$). Findings indicate that, with pre-test results serving as a baseline, sleeping quality significantly improved following the intervention ($F1 = 16.37$, $p < 0.001$), with the intervention accounting for 12% of the improvement.

The above-mentioned results supported the third study hypothesis which stated that women who practiced Lamaze technique will show less postoperative sleep disturbances than women who received standard perioperative care.

Postoperative quality of recovery is a frequently utilized measure of surgical outcomes that affects numerous patients worldwide who are undergoing surgical procedures. It encompasses various aspects of a patient's well-being following surgery, such as their emotional state, physical comfort, psychological support, physical independence, and management of pain. This comprehensive approach is vital in delivering exceptional postoperative nursing care, ensuring optimum recovery for patients (Rady and El-Deeb, 2020).

As regards quality of recovery among studied women undergoing hysterectomy; the results of the current study showed that, 24-hour post hysterectomy, the total mean scores of qualities of recovery among both study and control groups were (119.77 ± 9.87 and 97.77 ± 14.39) respectively with a highly statistically significant difference between them. Meanwhile, 48 hours post hysterectomy, the total mean scores of pain severity among both study and control groups were (133.40 ± 6.67 and 109.55 ± 16.74) respectively with a highly statistically significant difference between them. Additionally, there was a significant improvement in quality of recovery among women in study group compared with women in the control group, after application of Lamaze breathing exercise. This may be due to improvement of emotional status as the level of anxiety and distress was decreased.

The results of a study by Rady and El-Deeb (2020), which found that all aspects of postoperative quality of recovery were similar in the study and control groups prior to the intervention, provided support for this conclusion. But following the first day of the intervention, a noteworthy difference was seen in every facet of the postoperative quality of recovery, including pain, emotional state, physical comfort, psychological support, and physical independence. Furthermore, following the third day of intervention, there was a statistically significant difference in every item on the postoperative quality of recovery scale. Additionally, these findings supported by the study conducted by Hussein and Taha, (2018), which discovered that there was a highly statistically significant difference between the studied women regarding various aspects of postoperative quality of recovery, such as pain, emotional support, physical comfort, and psychological support. Additionally, a significant differentiation was noted between physical autonomy and self-sufficiency.

The above-mentioned results supported the fourth study hypothesis which stated that women who practiced Lamaze breathing exercise will show higher postoperative quality of recovery than women who received standard perioperative care.

Concerning correlation between studied variables, the results of the current study revealed that, there was a highly statistically significant positive correlation between total pain score and total anxiety score as well as total sleep disturbances scores in both groups at 24 and 48 hours post hysterectomy. This means that the less pain level, the less anxiety and the less sleep disturbances. Moreover, there was a highly statistically significant negative correlation between total quality of recovery score and total sleep disturbances score in both groups at 24 and 48 hours post hysterectomy. This means that the less sleep disturbances, the higher the quality of recovery score.

These results concurred with those of Ibrahim et al., (2023), who portrayed that, there was a significant association between Visual Analogue Scale score and sleep score of both group post-intervention at (P <0.001). The findings also matched with Bulut and Karabulut, (2023), who reported that the correlations between recovery quality, state anxiety, and sleep quality on the first postoperative day were significant at (p < .05). As well as Abd- Elhalim et al., (2023), clarified that, in both control and study groups; there was a highly negative statistical correlation between total pain severity and total sleep quality scores of studied groups at pre-and post-intervention phase (p≤0.001). Lastly, pain is linked to poor sleep patterns and quality because of nursing care, being in unfamiliar surroundings, being unable to rest for two to three hours at a time, and difficulty maintaining regular routines Köybaş and Oskay, 2019. These findings may be explained by the fact that improved sleep quality was associated with a reduction in the intensity of post-operative pain. The

Lamaze technique is known to enhance sleep quality by promoting blood circulation, promoting relaxation of the muscles, and relaxing the body.

Conclusion

The current study's results led to the conclusion that the research hypotheses were supported, and the application of Lamaze technique was effective in reduction pain level, anxiety level, sleep disturbances and quality of recovery among women undergoing hysterectomy. Additionally, there was a highly statistically significant positive correlation between total pain score and total anxiety score as well as total sleep disturbances scores in both groups. Moreover, there was a very highly statistically significant negative correlation between total quality of recovery score and total sleep disturbances score in both groups.

Recommendations:

- Conducting a workshop for health care provider about the importance of applying Lamaze breathing exercise for all women undergoing hysterectomy.

Recommendations derived from this research are as follows:

- During the hospital stay, a simple, affordable, and efficient technique to use is the Lamaze breathing exercise. As a result, when providing post-operative nursing care, nurses should implement such techniques.
- Booklets and brochures with comprehensive information on hysterectomy and Lamaze breathing exercise should be printed and kept

in obstetrics and gynecological department in hospitals and distributed to all women going through hysterectomy.

Further research:

Replication of the study on large representative probability sample is recommended to ensure more generalization of the results.

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