Assiut Scientific Nursing Journal
http://asnj.journals.ekb.eg http://www.arabimpactfactor.com
DOI: 10.21608/asnj.2024.274852.1800 http://olddrji.lbp.world/indexedJournals.aspx
https://vlibrary.emro.who.int/journals/assiut-scientific-nursing-journal

Effect of Massage on Shoulder Pain Intensity and Quality of Recovery Post-Gynecological Laparoscopy

Enas Sabry Fathy Elbeltagy[1], Asmaa Anwar Abdelglil[2] & Samah Nasser Abd ElAziz El Shora[3]
[1.] Lecturer of Woman's Health and Midwifery Nursing, Faculty of Nursing, Mansoura University, Egypt.
[2.] Lecturer at Woman's Health and Midwifery Nursing, Faculty of Nursing, Kafrelshiekh University, Egypt.
[3.] Lecturer of Woman's Health and Midwifery Nursing, Faculty of Nursing, Mansoura University, Egypt.

Abstract
Background: Shoulder pain is a common complaint after a gynecological laparoscopy. Pharmacological or non-pharmacological techniques may be used to manage it. Using massage is one of the non-pharmacological strategies. **Aim:** Evaluate the effect of massage on shoulder pain intensity and the quality of recovery post-gynecological laparoscopy. **Method:** A randomized controlled trial (RCT) was used. The present study included a simple random sample of 150 women who performed gynecological laparoscopy at the Fertility Care Center (FCC) at Mansoura University Hospitals, Mansoura City, Egypt. Three tools were utilized to gather data: a structured interviewing questionnaire, the Visual Analogue Scale (VAS)/Pain, and the Postoperative Quality of Recovery Questionnaire. **Results:** Post-intervention, shoulder pain among the massage group was significantly less than that of the control group at different times of assessment at 6, 12, and 24 hours ($p<0.001$). Additionally, the postoperative quality of recovery score was significantly higher among the massage group, with a highly statistically significant difference. **Conclusion:** Shoulder massage is highly effective in decreasing shoulder pain and enhancing the quality of recovery post-gynecological laparoscopy. **Recommendation:** Massage should be integrated into the hospital routine as a non-pharmacological modality for improving shoulder pain and the quality of recovery post-gynecological laparoscopy.

Keywords: Gynecological laparoscopy, Massage, Pain intensity & Quality of recovery

Introduction
Gynecological laparoscopy facilitates direct visualization of the uterus, ovaries, and the external portion of the fallopian tubes. This procedure entails the introduction of carbon dioxide gas into the wall of the abdomen, which subsequently connects to the shoulder, diaphragm, and other bodily organs through the phrenic nerve **(Ibrahim & Ali, 2020)**. Laparoscopic surgery has increasingly gained popularity because of its numerous advantages over open surgery, encompassing quicker recovery times, shorter hospital stays, faster resumption of normal activities and employment, and enhanced cosmetic outcomes. Nevertheless, despite these benefits, numerous patients encounter upper abdominal and shoulder pain subsequent to laparoscopy **(Vigneswaran et al., 2020).**

Shoulder pain is a frequently reported complication after gynecological laparoscopic surgery, affecting 35 to 80 percent of patients. This pain, commonly referred to as gas pain, typically originates in the lower abdomen and radiates upward to the shoulder **(Kaloo et al., 2019; Li et al., 2021).** The precise cause of post-laparoscopic shoulder pain (PLSP) remains uncertain, but potential factors include manipulation of the tissues, diaphragmatic pressure resulting from the pneumoperitoneum, and the formation of carbonic acid **(Sao et al., 2019).** The discomfort frequently necessitates the utilization of analgesics, which can augment morbidity in women. Moreover, the primary factor contributing to the prolongation of women's recovery is the escalation in the consumption of painkillers **(Li & Li, 2021).**

In cases where analgesics prove ineffective or are contraindicated, non-pharmacologic techniques can be employed to complement the efficacy of analgesics. These techniques encompass stimulation of transcutaneous nerves, the use of heat and/or cold compresses, prescribed exercises, appropriate positioning, and massage **(Zeeni et al., 2020).**

Effleurage, a therapeutic massage technique employed for pain management, originates from the French verb effleurer, which signifies a gentle touch. This technique involves the continuous application of moving, sliding, or gliding strokes across the entire body. Commonly employed terms to describe this technique include gliding, stripping, broadening, and stroking **(Ibrahim & Ali, 2020).** During effleurage, the fingertips, forearm, palm of the hand, and thumb are used to execute a gentle massage **(Yosepha et al., 2020).**

The effleurage massage technique encompasses a crucial effect, namely the alleviation of pain through the activation of the neural-gating mechanism within the spinal cord, as postulated by the gate control theory within the field of neurology. Furthermore, this massage technique has been discovered to

increase the levels of serotonin, a neurotransmitter that has a prominent role in pain reduction and the enhancement of the quality of recovery **(Mohamed & Abd Elhady, 2016; Shady et al., 2018).** In addition, there has been little research conducted to evaluate the effect of massage on improving shoulder pain and the quality of recovery post-gynecological laparoscopy. Therefore, the researchers were motivated to conduct the current study.

Significance of the study

Laparoscopic gynecological surgeries are frequently performed by gynecologists and have become a prevalent surgical procedure. While laparoscopy has been shown to be superior to laparotomy in improving postoperative pain scores, the occurrence of shoulder pain after laparoscopic surgery remains a significant problem **(Zeeni et al., 2020)**. Shoulder pain occurs in a considerable proportion of laparoscopic surgeries, with prevalence rates ranging from 35% to 80%. While the pain can be quite severe, it generally diminishes within 24 to 48 hours and seldom persists beyond 72 hours following the procedure **(Chaichian et al., 2018)**.

Given the high prevalence of shoulder discomfort following laparoscopic procedures and the increasing number of patients with PLSP, it is crucial to ensure effective pain control to avoid prolonged recovery, unfavorable clinical outcomes, and increased treatment costs **(Kaloo et al., 2019).** Consequently, non-pharmacological techniques such as massage therapy have been suggested for pain management across various conditions **(Kukimoto et al., 2017)**. Hence, the objective of the present study was to evaluate the effect of massage on the intensity of shoulder pain and the quality of recovery following gynecological laparoscopy.

Aim of the study

The current study aimed to evaluate the effect of massage on improving shoulder pain and quality of recovery post-gynecological laparoscopy.

Research hypotheses

Two hypotheses were established to accomplish the study aim.

Hypothesis I: Women who are subjected to massage after gynecological laparoscopy exhibit lower shoulder pain compared to those who don't.

Hypothesis II: Women who are subjected to massage after gynecological laparoscopy experience rapid recovery compared to those who don't.

Subjects and Method

Design

This study used randomized controlled trials (RCTs); RCTs are often considered the gold standard for assessing the impact of new interventions. Subjects will be randomly assigned whether to receive the intervention or to be in a control group. The effectiveness of the intervention can be assessed by comparing the results of the two groups.

Setting

This study was conducted at the Fertility Care Center (FCC) at Mansoura University Hospitals, Mansoura City, Egypt. The FCC is a specialized facility that offers comprehensive care for fertility-related issues, including various treatment modalities and family planning methods, for women residing in the surrounding villages. The center comprises distinct areas such as an admission section, examination room, family planning insertion room, inpatient ward, laboratory room, storage room, waiting area, and staff office. The provision of care is overseen by a team of six obstetricians and twelve nurses. The center operates from Sunday to Thursday, encompassing five working days each week.

Sampling:

This study included a simple random sample of 150 women who performed gynecological laparoscopy and were recruited from the FCC using the random allocation method. Women were entitled to participate in this study if they fulfilled the following criteria: aged 18–37 years, free from medical diseases, and had shoulder pain rated more than 4 on VAS following laparoscopy.

Sample size

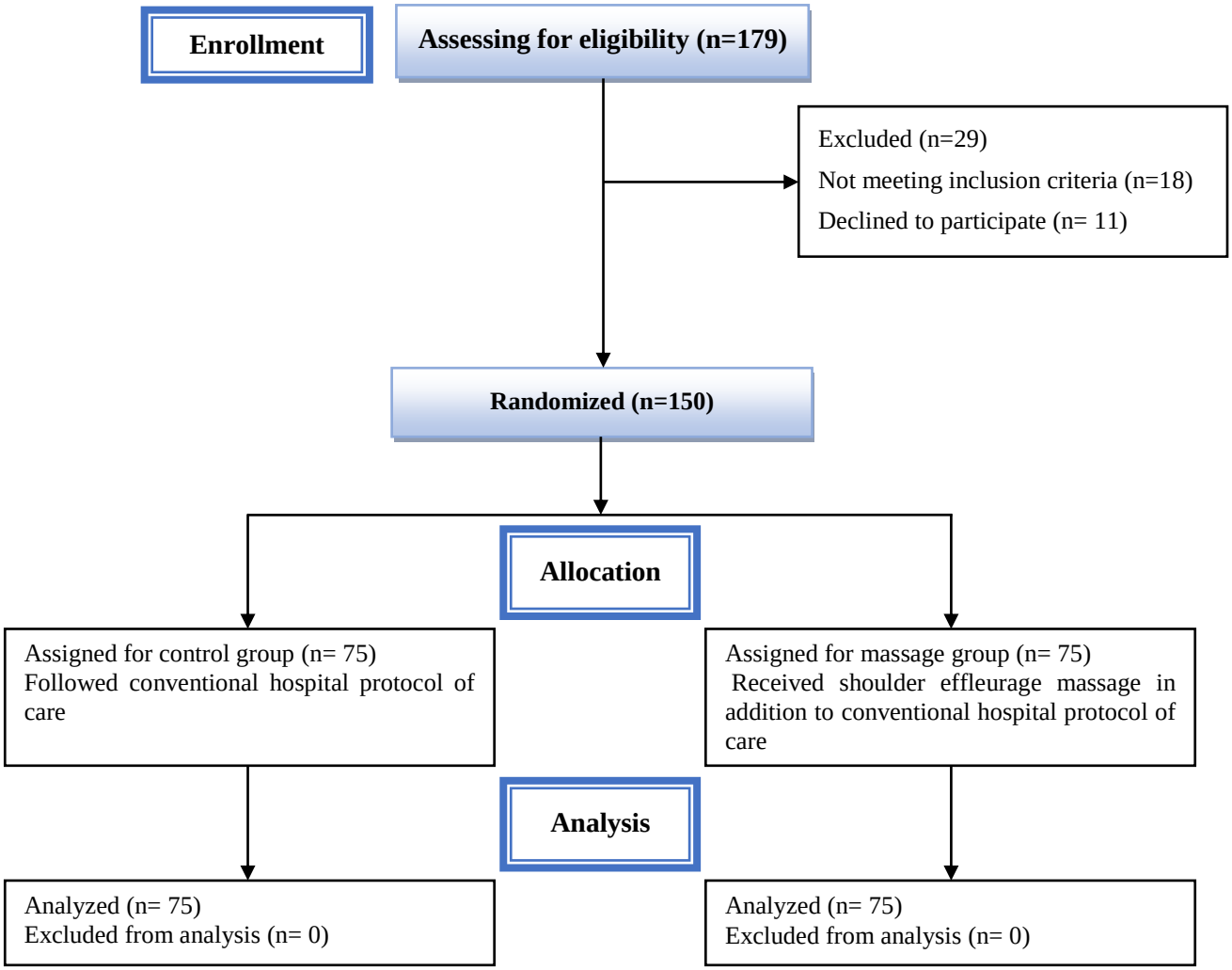
Based on data from literature **(Ibrahim & Ali, 2020)**, considering level of significance of 5%, and power of study of 80%, the sample size can be calculated using the following formula:

$$n = \frac{2(Z\alpha/2 + Z\beta)^2 \times p\,(1-p)}{(d)^2}$$ where, p = pooled proportion obtained from previous study; d = expected difference in proportion of events; $Z_{\alpha/2}$ =1.96 (for 5% level of significance) and Z_{β} = 0.84 (for 80% power of study). Therefore, $$n = \frac{2(1.96 + 0.84)^2 \times 0.70\,(1-0.70)}{(0.21)^2} = 74.7.$$

Accordingly, the sample size required was 75 for each group

Group Allocation

In order to achieve the required sample size, the women who were recruited for the study were chosen using a simple random method from the prepared operational laparoscopic list. Specifically, women who had even numbers were assigned to the massage group, while women with odd numbers were assigned to the control group. Every group has seventy-five women. The control group was treated according to standard hospital policy. In addition to standard hospital treatment, the intervention group also received effleurage massage.



Data collection tools:

Three instruments were used to collect data: a structured interviewing questionnaire, a visual analog scale (VAS) for pain, and a postoperative recovery quality questionnaire.

Tool (I): A Structured Interview Questionnaire

The tool was developed by the researchers after reviewing relevant literature and consisted of three parts. The first part included the general characteristics of the studied woman, such as age, education, occupation, place of residence, and BMI category (kg/m2). The second part included the obstetric history, such as gravidity, parity, and abortions. The third part included laparoscopic data such as causes, duration in minutes, site of shoulder pain, and factors increasing and decreasing pain.

Tool (II): Visual Analogue Scale (VAS)/pain:

A pain rating scale was adopted from **Crichton (2001)** and used to identify pain intensity. Ratings are based on self-reported pain measurements, recorded with a single handwritten mark at a point along the 10 cm line that represents the continuum between the two ends of the scale, with "no pain" at the left end of the scale and "strongest pain" at the right end of the scale. **Scoring system:** The VAS was divided into three main sections: the first part, which graded mild pain from 1-3 cm; the second part, which rated moderate pain from 4–7 cm; and the third part, which graded severe pain from 8–10 cm.

Tool (III): Postoperative Quality of Recovery Questionnaire (QoR-40)

This tool was adopted from **Myles et al. (2000).** It was employed to assess the degree of recovery of patients following a 24-hour period of gynecological laparoscopic surgery. It had forty items total, arranged into five categories based on different aspects of recovery: pain (7 items), psychological support (7 items), physical independence (5 items), emotional state (9 items), and physical comfort (12 items). **An algorithm for scoring:** A five-point Likert scale was used to evaluate it; 1 represented never, 2 meant some of the time, 3 meant usually, 4 represented most of the time, and 5 represented all of the time. The scoring was done in reverse for negative

items. The recovery's overall quality score falls between 40 and 200. 40–80, 81–120, 121–160, and 161–200 scores show poor, average, good, and better QOR, respectively.

Validity of the tools: The current study tools' validity was ascertained through evaluation by a panel of three experts in the field of Women's Health and Midwifery Nursing at the Faculty of Nursing at Mansoura University. The tools' contents were checked for completeness, relevancy, and clarity. The experts provided modifications, such as simplifying some words to be understood, rephrasing, and omitting some sentences, and these recommendations were taken into consideration.

Tools Reliability: The internal consistency of the tools was assessed with the Cronbach's alpha coefficient. Cronbach's alpha value of the Visual Analogue Scale was 0.903, and that of the Postoperative Quality of Recovery Questionnaire was 0.899, which indicated the high reliability of the tools.

Pilot study: To determine the time required to survey the studied women and to assess the applicability of the research instruments and the clarity of the designed questionnaire, a pilot study was conducted on 10% of the study sample (i.e., 15 women). The results of the pilot study were excluded from the study sample.

Ethical Considerations: Ethical approval was acquired from the Research Ethics Committee of the Faculty of Nursing, Mansoura University **(Ref. No. 0471)**, and a formal written approval letter from the Director of the Fertility Center stating the title and purpose of the study was obtained to complete the research application study. Before commencing the study, formal consent was obtained from all women after a detailed explanation of the nature and purpose of the study. The women were clearly informed that their participation in the study was voluntary and that they had the right to withdraw from the study at any time. The study ensured complete anonymity, privacy, security, and confidentiality throughout the study period.

Research Process: This study was conducted for four months, from the beginning of June 2023 to the end of September 2023, in three phases: baseline assessment, implementation, and evaluation.

Assessment phase: During the first contact, which took place within the initial four hours subsequent to the laparoscopy in the ward, the researchers explained the aim of the study was to attain women's cooperation. Later, written consent was taken from all women. Tool I was utilized to collect data from individual interviews with women regarding their general characteristics, obstetric history, and laparoscopic data. Additionally, Tool II (VAS)/pain was used to evaluate the pain states for both groups as a pre-test. Each woman's interview lasted approximately thirty minutes, during which the researchers spoke with them in Arabic and recorded their responses using the instruments at hand.

Implementation phase: The women were assigned to one of two groups, as follows:

Control group who received conventional hospital protocol of care, specifically antibiotics and analgesics (Cefotax 1 gm. every 12 hours and petro when needed).

Intervention group who was subjected to shoulder effleurage massage after four hours postoperatively in addition to conventional hospital protocols of care.

After four hours postoperatively, each woman in the intervention group was subjected to shoulder effleurage massage by a researcher. The woman assumed a supine position, which is considered to be the most comfortable position. Maintaining proper body alignment was beneficial for both the researchers and the woman. Using the large surface area of their palms, the researchers massaged the afflicted shoulder using their hands and fingers. Instead of pouring oil directly over the woman's shoulder, the researcher alternated between their hands. Before applying, they warmed the essential oil by rubbing it between their hands. In order to promote circulation and stretch the tissues, the researchers began the session with gentle contact and gradually increased the pressure with slower movements. They constantly encouraged venous return by applying greater pressure to the heart. Twenty minutes were spent massaging the shoulder.

Evaluation phase

Each woman in the two study groups had her pain severity assessed using the VAS/pain six, twelve, and twenty-four hours following the assigned intervention. Additionally, tool III (QoR-40) was used to assess the quality of recovery for each woman in both groups once, 24 hours postoperatively.

Statistical Analysis:

Version 20.0 of SPSS for Windows was used for all statistical analyses (SPSS, Chicago, IL). The continuous data were presented as mean ± standard deviation (SD) and had a normal distribution. Numbers and percentages were used to express categorical data. For continuous data variables, the one-way analysis of variance (ANOVA) test was used to compare more than two variables. The chi-square test (or Fisher's exact test when applicable) was used for the comparison of variables with categorical data. A correlation coefficient test was used to test for correlations between two variables with continuous data. The reliability (internal consistency) test for the questionnaires used in the study was calculated. Statistical significance was set at $p<0.05$.

Results

Table (1): General Characteristic of the Studied Women between Massage and Control Groups (n=150)

Items	Massage (n=75)		Control (n=75)		Chi-Square / Fisher's exact test	
	No.	%	No.	%	X^2	P
Age (years)						
18 – 22	18	24.0	12	16.0		
23 – 27	12	16.0	19	25.3		
28 – 32	19	25.3	21	28.0		
33 – 37	26	34.7	23	30.7	3.064	0.382
Mean ±SD	27.6 ±4.9		28.1 ±4.2		0.671	0.503
Level of Education						
Illiterate	4	5.3	6	8.0		
Primary	11	14.7	16	21.3		
Secondary	34	45.3	30	40.0		
High Education	26	34.7	23	30.7	1.760	0.624
Occupation						
Housewife	41	54.7	45	60.0		
Working	34	45.3	30	40.0	0.436	0.509
Place of residence						
Urban	31	41.3	39	52.0		
Rural	44	58.7	36	48.0	1.714	0.190
BMI categories (kg/m2)						
Underweight	7	9.3	7	9.3		
Normal Weight	36	48.0	23	30.7		
Overweight	22	29.3	27	36.0		
Obese	10	13.3	18	24.0	5.660	0.129

Table (2): Obstetric History of the Studied Women between Massage and Control Groups (n=150)

Items	Massage (n=75)		Control (n=75)		Chi-Square / Fisher's exact test	
	No.	%	No.	%	X^2	P
Gravidity						
Nulligravida	31	41.3	29	38.7		
1 – 2	32	42.7	30	40.0		
3 or More	12	16.0	16	21.3	0.703	0.704
Parity						
Nullipara	36	48.0	33	44.0		
1 – 2	30	40.0	35	46.7		
3 or More	9	12.0	7	9.3	0.557	0.756
Abortion						
None	70	93.3	71	94.7		
1 – 2	4	5.3	2	2.7		
3 or More	1	1.3	2	2.7	0.477	0.787

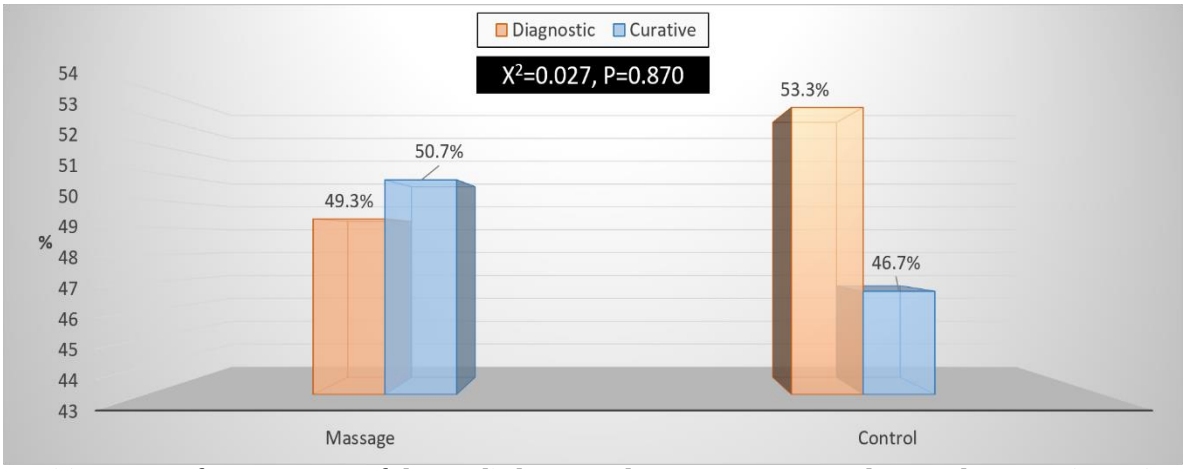


Figure (1): Causes of Laparoscopy of the Studied Women between Massage and Control Groups (n=150)

Table (3): Laparoscopic Data of the Studied Women between Massage and Control Groups (n=150)

Items	Massage (n=75)		Control (n=75)		Chi-Square	
	No.	%	No.	%	X^2	P
Duration (minutes)						
15 – 30	32	42.7	22	29.3		
31 – 45	31	41.3	37	49.3		
46 – 60	12	16.0	16	21.3	2.953	0.228
Site of shoulder pain						
Right Shoulder	23	30.7	21	28.0		
Left Shoulder	16	21.3	24	32.0		
Both Shoulders	36	48.0	30	40.0	2.236	0.326
Factors increasing pain						
None	18	24.0	12	16.0		
Eating	14	18.7	16	21.3		
Drinking	14	18.7	22	29.3		
Breathing	29	38.7	25	33.3	3.407	0.333
Factors decreasing pain						
None	25	33.3	25	33.3		
Walking	11	14.7	15	20.0		
Analgesics	39	52.0	35	46.7	0.832	0.660

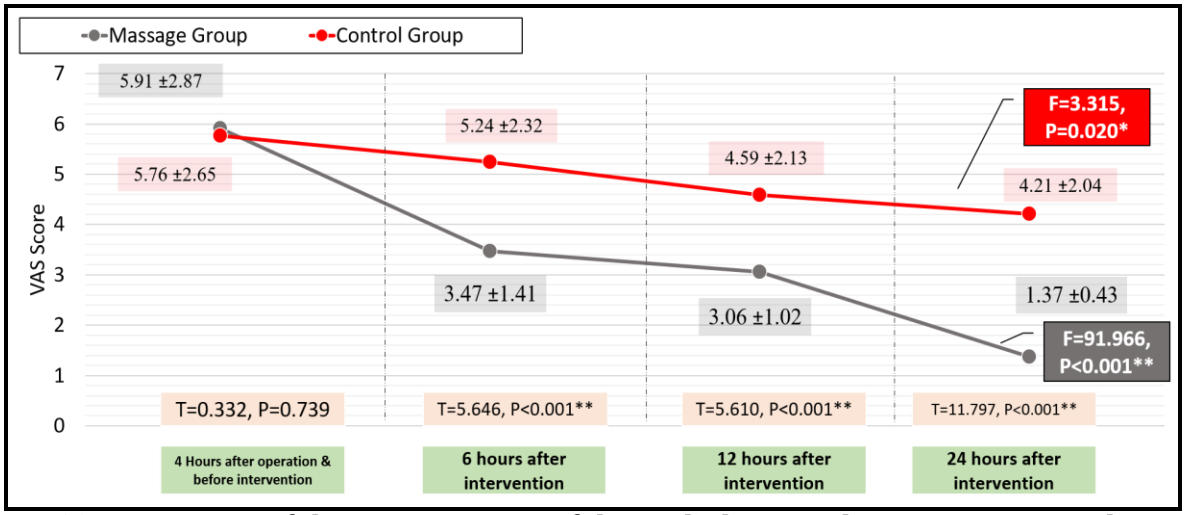


Figure (2): Comparison of the VAS/pain Score of the Studied Women between Massage and Control Groups (n=150)

Table 4. Comparison of the Quality Recovery Domains of the Studied Women between Massage and Control Groups (n=150)

Items	Intervention (n=75)	Control (n=75)	Student's t-test	
	Mean ±SD	Mean ±SD	T	P
Emotional State	33.04 ±4.09	25.21 ±3.74	12.229	<0.001**
Physical comfort	45.44 ±4.66	39.57 ±3.35	8.854	<0.001**
Psychological support	28.89 ±2.98	22.55 ±3.13	12.711	<0.001**
Physical independence	18.05 ±2.05	13.52 ±3.04	10.699	<0.001**
Pain	29.48 ±2.81	21.53 ±2.76	17.477	<0.001**
Total score of Quality Recovery	154.91 ±13.64	122.39 ±7.03	18.349	<0.001**

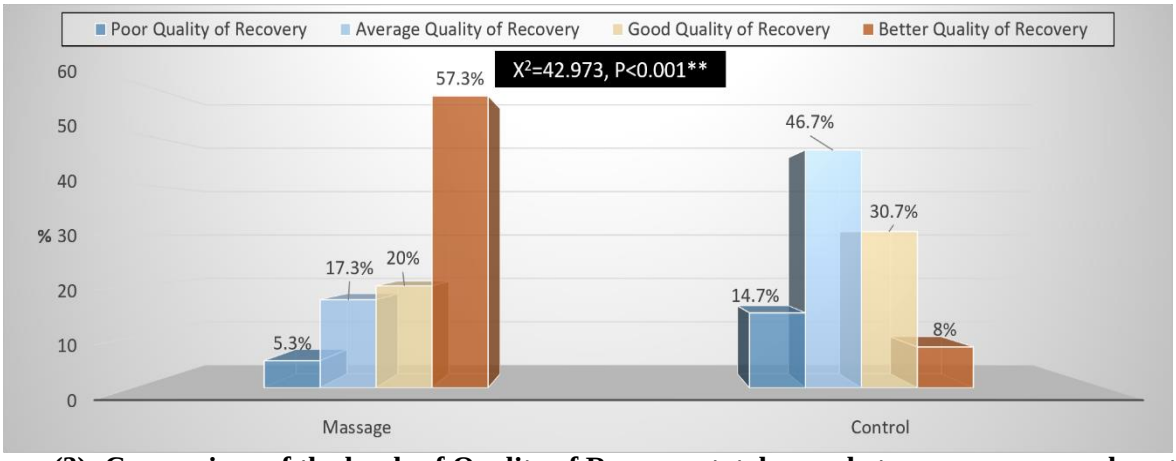


Figure (3): Comparison of the levels of Quality of Recovery total score between massage and control groups (n=150)

Table (5): Correlation between the Quality of Recovery and VAS total scores between massage and control groups at 24 hours after intervention (n=150)

Items	Patient Quality Recovery Score	
	R	P
VAS Score 24h after intervention		
Massage	- 0.378	<0.001**
Control	- 0.108	0.354

As shown in **Table (1):** The mean ±SD of the massage and control groups were (27.6 ±4.9 and 28.1 ±4.2), respectively. Secondary school education was evident among 45.3% and 40.0% of the intervention and control groups, respectively. 54.7% of the intervention group were housewives. 58.7% of the intervention group came from rural residents, compared to 48.0% of the control group. BMI indicated that 48.0% and 30.7% of the intervention and control groups had normal weight. No statistically significant differences were found between the two groups' general characteristics.

Corresponding to **Table (2):** Between one and two pregnancies occurred in 42.7% and 40.0% of the massage and control groups, respectively. In the massage group, 48.0% and the control group, 44.0%, respectively, were nulliparous. A comparable percentage of women in the massage and control groups did not undergo an abortion. There was no statistically significant difference in the obstetric history of the two groups.

Figure (1): Clarifies that about half (50.7%) of the massage group had laparoscopy for curative causes compared to 46.7% of the control group.

Table (3): Shows that for 41.3% and 49.3% of the massage and control groups, respectively, the laparoscope lasted 31 to less than 46 minutes. For 48.0% and 40% of the intervention and control groups, respectively, the pain was on both shoulders. In contrast to 33.3% of the control group, 38.7% of the massage group felt that breathing was a cause of increased pain. Compared to 46.7% of the control group, slightly more than half (52.0%) of the intervention group felt that analgesics decreased pain. Between the two groups, there was no statistically significant variation in the laparoscopic data.

Figure (2): Illustrates that there was no statistically significant difference in the pain score between the massage and the control groups prior to the massage ($p = 0.739$). After the application of massage, there was a highly statistically significant decrease ($p<0.001$) in the pain intensity at 6, 12, and 24 hours in the massage group.

Table (4): Reveals that the mean scores of patient quality of recovery domains were significantly higher in the massage group than in the control group, with a highly statistically significant difference noted between the studied groups at 24 hours after application of massage ($p <0.001$).

Figure (3): Demonstrates that 57.3% of the women in the massage group have a better quality of recovery compared to a small proportion of the studied women (8%) in the control group. There was a highly statistically significant improvement in the patient quality of recovery total score in the massage group at 24 hours ($p <0.001$).

Table (5): Displays that there was a highly significant negative correlation between the post-operative quality of recovery and VAS/pain total score between the intervention group at 24 hours after massage.

Discussion

The objective of this study was to investigate the effect of massage on the intensity of shoulder pain and the quality of recovery after gynecological laparoscopy. The study findings disclosed that massage is effective in relieving shoulder pain and improving the quality of recovery compared to pre-intervention. So, the research hypotheses were accepted.

According to the study findings, there were no statistically significant variations in pain levels at 4 hours prior to the intervention between the study groups that were examined. While, at 6, 12, and 24 hours following the intervention, shoulder pain among the intervention group was significantly less than that of the control group. The results of the present study confirmed the initial study hypothesis, "Women who are subjected to massage after gynecological laparoscopy exhibit lower shoulder pain compared to those who don't."

The findings of this study were consistent with a similar study carried out by **El-Naser et al. (2022)** in Menoufia governorate, Egypt, which evaluated the effectiveness of massage in easing shoulder pain following gynecological laparoscopy. The study found that women who received effleurage massage had significantly lower pain intensity compared to the control group after intervention, and the difference in pain intensity before and after effleurage massage was significantly decreased.

Quasi-experimental research performed by **Ahmed et al. (2022)** at the obstetric departments in Beni-Suef University Hospital and Zagazig University Hospitals titled "Effect of Warm Pads, Effleurage Massage, or Trendelenburg Position in Reducing Shoulder Pain after Gynecological Laparoscopic Operations". In their study, the severity of shoulder pain was assessed at different points in time; characteristics of pain were assessed immediately following surgery, at 4, 6, and 24 hours. It was discovered that women who received massage experienced less shoulder pain, which aligns with the present study findings.

In a parallel line, a comparative quasi-trial titled "Effect of effleurage massage versus warm application on shoulder pain among postoperative women with gynecological laparoscopic surgery" was conducted by **Ibrahim & Ali (2020)** at the Elshatby Maternity University Hospital in Alexandria. They concluded that shoulder massage was more effective than a warm application in relieving pain. The majority of the massage group reported no pain, whereas only a quarter of the warm application group experienced the same level of pain.

The consistent results among these studies can be attributed to the gate control theory, which suggests that massage helps reduce pain by closing the "gate" that transmits pain signals to the brain. Additionally, massage therapy may increase serotonin levels, a neurotransmitter that inhibits the transmission of pain signals to the brain **(Kukimoto & Ideguchi, 2017).**

It is widely known that a woman's recovery is impacted by postoperative laparoscopic shoulder discomfort. This could be because the woman's performance following laparoscopy was hampered by shoulder discomfort **(Mohamed & Elhady, 2016)**. The present study demonstrated that the effleurage massage group had improved postoperative recovery, and there was a highly statistically significant difference in the quality of recovery score between the effleurage massage group and the control group. This supports the second hypothesis of the study: "Women who are subjected to massage after gynecological laparoscopy experience rapid recovery compared to those who don't."

Researchers will utilize studies that looked at the effectiveness of other forms of massage on the quality of recovery because there hasn't been much study done in this area. The aforementioned results are in line with those of **Joy Roslin's (2016) & Vinojpriya's (2015)** studies, which investigated "the effectiveness of back massage in reducing postoperative pain and improving quality of recovery." Both studies showed a significant enhancement in the quality of recovery between participants who received back massage.

Efficient nursing care for post-laparoscopic shoulder pain can improve postoperative recovery since postoperative pain affects a woman's performance after laparoscopy. The current study's findings, which indicated a strong negative correlation between shoulder pain severity and postoperative recovery quality, support this. The aforementioned results are in line with those of **Joy Roslin (2016) & Vinojpriya (2015)**, who found a negative relationship between posttest pain intensity and recovery quality in the experimental group. As the pain severity declined in the intervention group, it was concluded that the quality of recovery had significantly improved.

The similarities observed in the results of these studies can be attributed to the fact that effleurage massage promotes improved circulation, muscle relaxation, lymphatic system stimulation, aids in digestion, enhances sleep, induces mental and physical relaxation, and helps release emotional tension. These factors contribute to better communication and coping with pain in women. Because effleurage massage proved successful in lowering the severity of shoulder discomfort, thus improving the postoperative quality of recovery, nurses may use it in addition to standard care **(Kaloo et al., 2019)**.

Conclusion

The two research hypotheses that shoulder effleurage massage is extremely helpful in lowering shoulder pain and improving the quality of recovery following gynecological laparoscopy were accepted based on the present study's results.

Recommendations

As a non-pharmacological modality for relieving shoulder pain following gynecological laparoscopy, effleurage massage should be integrated into the hospital routine.

Further studies are needed to:

- Evaluate women's satisfaction with effleurage massage as a post-laparoscopy shoulder pain relief method.
- Provide education to maternity nurses on the application and advantages of effleurage massage.
- To generalize the results, the current investigation should be repeated in a multicenter setting with a larger sample size.

Conflict of interest

The authors affirm that they do not have any competing interests.

Acknowledgement

The authors thank all the women who collaborated with them on this scientific research.

References

- **Adlan, A., Azhary, J., Tarmidzi, H., Kamarudin, M., Lim, R., & Ng, D. (2022):** Post Laparoscopy Pain Reduction Project I (POLYPREP I): intraperitoneal normal saline instillation—a randomized controlled trial. BMC Women's Health, 22(1), 116.
- **Chaichian, S., Moazzami, B., Haghgoo, A., & Sheibani, K. (2018):** A new approach to an old concept for reducing shoulder pain caused by gynecological laparoscopy. Journal of Reproduction & Infertility, 19(1), 56.
- **Crichton, N. (2001):** Visual analogue scale (VAS). J Clin Nurs, 10(5), 706-6.
- **El-Naser, A., El-Razek, A., & Ayoob, J. (2022):** Comparison between efficacy of Heat Pads and Effleurage Massage in Reducing Shoulder Pain after Gynecological Laparoscopic Operations. Menoufia Nursing Journal, 7(2), 111-134.
- **Ibrahim, H., & Ali, W. (2020):** Effect of effleurage massage versus warm application on shoulder pain among postoperative women with gynecological laparoscopic surgery. Journal of Nursing Education and Practice, 10(4), 51-64. https://doi.org/10.5430/jnep.v10n4p51.
- **Joy Roslin, A. (2016):** A quasi experimental study to assess the effectiveness of back massage in reducing postoperative pain and improving quality of recovery among patients undergone orthopedic surgery at selected hospitals in Vellore District (Doctoral dissertation, Arun College of Nursing, Vellore).
- **Kaloo, P., Armstrong, S., Kaloo, C., & Jordan, V. (2019):** Interventions to reduce shoulder pain following gynaecological laparoscopic procedures. Cochrane Database of Systematic Reviews, (1). https://doi.org/10.1002/14651858.CD011101.pub2.
- **Kukimoto, Y., Ooe, N., & Ideguchi, N. (2017):** The effects of massage therapy on pain and anxiety after surgery: a systematic review and meta-analysis. Pain Management Nursing, 18(6), 378-390.
- **Li, X., Tian, M., Li, A., Han, C., & Li, K. (2021):** The risk of shoulder pain after laparoscopic surgery for infertility is higher in thin patients. Scientific Reports, 11(1), 1-8.
- **Li, X., & Li, K. (2021):** Time characteristics of shoulder pain after laparoscopic surgery. JSLS: Journal of the Society of Laparoscopic & Robotic Surgeons, 25(2).
- **Mohamed, A., & Elhady, R., (2016):** Heating pads and early mobilization for reducing postoperative shoulder pain and enhancing recovery of women undergoing gynecological laparoscopic surgery. IOSR Journal of Nursing and Health

Science, 5(1), 10-16. https://doi.org/10.9790/1959-05121016.

- **Mottahedi, M., Shamsi, M., Babani, S., Goli, S., & Rizevandi, P. (2023):** Comparing the effect of transcutaneous electrical nerve stimulation and massage therapy on post laparoscopic shoulder pain: a randomized clinical trial. BMC Musculoskeletal Disorders, 24(1), 764.
- **Myles, P., Weitkamp, B., Jones, K., Melick, J., & Hensen, S. (2000):** Validity and reliability of a postoperative quality of recovery score: the QoR-40. British journal of anaesthesia, 84(1), 11-15.
- **Pilewska-Kozak, A., Pałucka, K., Łepecka-Klusek, C., Dobrowolska, B., Stadnicka, G., & Bulska, M. (2017):** Non-pharmacological methods of pain relief in labor in the opinion of puerperae-a preliminary report. Annals of Women's Health, 1(1), 1-4.
- **Shady, N., Sallam, H., Ali, S., & Abbas, A. (2018):** Effect of intraperitoneal and incisional port site lidocaine on pain relief after gynecological laparoscopic surgery: A randomized controlled study. Middle East Fertility Society Journal, 23(1), 63-67.
- **Sao, C., Chan-Tiopianco, M., Chung, K., Chen, Y., Horng, H., Lee, W., & Wang, P. (2019):** Pain after laparoscopic surgery: Focus on shoulder-tip pain after gynecological laparoscopic surgery. Journal of the Chinese Medical Association, 82(11), 819-826.
- **Ahmed, S., Helmy, H., Abdel Wahed, H., & Ragab, H. (2022):** Effect of Warm Pads, Effleurage Massage or Trendelenburg Position in Reducing Shoulder Pain after Gynecological Laparoscopic Operations. Egyptian Journal of Health Care, 13(4), 626-640.
- **Vigneswaran, Y., Prachand, V., Posner, M., Matthews, J., & Hussain, M. (2020):** What is the appropriate use of laparoscopy over open procedures in the current COVID-19 climate? Journal of Gastrointestinal Surgery, 24, 1686-1691.
- **Vinojpriya, C. (2015):** A quasi experimental study to assess the effectiveness of back massage in reducing post operative pain and Improving quality of recovery among patients undergone orthopaedic surgery at selected Hospitals in Dindigul District (Doctoral dissertation, Sakthi College of Nursing, Dindigul).
- **Yosepha, D., Ginting, G., Tarigan, L., Ginting, R., & Maharani, S. (2020):** The Effect of Effleurage Massage on the Intensity of Primigravida Stage I Labor Pain Latent Phase. DOI: 10.5220/0009467601350141
- **Zeeni, C., Chamsy, D., Khalil, A., Abu Musa, A., Al Hassanieh, M., Shebbo, F., & Nassif, J. (2020):** Effect of postoperative Trendelenburg position on shoulder pain after gynecological laparoscopic procedures: a randomized clinical trial. BMC anesthesiology, 20(1), 1-7. https://doi.org/10.1186/s12871-020-0946-9

This is an open access article under **Creative Commons by Attribution Non-Commercial (CC BY-NC 3.0)** (https://creativecommons.org/licenses/by-nc/3.0/)