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Effectiveness of Lamaze Technique for Parturient on Pain Intensity and Labour Progress at Women's Health Hospital

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ABSTRACT

Background: Lamaze, as a non-pharmacological nursing technique, helps parturients physically and psychologically relax during labour, so the antenatal preparation led the parturient to relax, which decreased the pain. Labour proceeded more smoothly. Objective: Determine the effectiveness of the Lamaze technique for parturients in terms of pain intensity and labour progress. **Methods:** A randomised control trial. The study was conducted in the Women's Health Hospital's antenatal clinic and labour unit at Assiut University, Egypt. It started at the beginning of April 2023 and was completed by the end of March 2024 over a period of one year. A total of 150 pregnant women randomly divided equally into two groups of pregnant women enrolled based on eligibility criteria. Using three methods to collect data: The study employed a structured interviewing questionnaire, a Visual Analogue Scale, and a labour progress assessment checklist. **Results:** The study Findings show that there is a significant difference with a p-value of 0.021 between the study group and control group related to the level of pain, and the study group's labour progress was better than that of the control group. So, the Lamaze technique should be included in maternity nursing care to manage pain and improve labour progress. **Conclusion:** Applying the Lamaze technique for parturients during labour stages had a positive effect on lowering the intensity of labour pain and enhancing labour progress during labour. Applying an antenatal educational programme for all pregnant women to increase awareness and knowledge about the Lamaze technique.

Keywords: Effectiveness; Labor Progress; Lamaze Technique; Pain Intensity; Parturient

INTRODUCTION

Every two minutes, a woman worldwide loses her life during the perinatal period. Addressing women's health is an essential human rights issue and essential to reaching the Sustainable Development Goals by the United Nations (WHO, 2022). Lamaze breathing techniques are one way to enhance maternal outcomes and encourage positive birth experiences during pregnancy and childbirth. Beyond the experiences of individual births, Lamaze breathing is significant because it connects with larger global health priorities, such as the Sustainable Development Goals (Karkada, Noronha & Bhat, 2024).

The World Health Organisation's emphasis on preparing for childbirth is pivotal (WHO, 2022). Such preparation helps in reducing maternal mortality rates and plays a critical role in ensuring that women have positive and empowering childbirth experiences (Alizadeh-Dibazari *et al*., 2024). Absolutely, providing maternity nursing care to women during labour is crucial. Non-pharmacologic intervention, such as breathing techniques, massage, and emotional support – these methods not only help in managing pain but also promote a sense of control and empowerment for the mother. By minimising the use of medical interventions, nurses can reduce the risk of complications and support a more natural birthing process (Ahmed, Abd Elrahman & Abdelaleem, 2023).

The Lamaze technique facilitates a natural, healthy, fearless, and joyful birth by raising awareness of women physically and emotionally (Mohamed *et al*., 2024). During childbirth, it helps parturients feel calm and relaxed, experience less painful contractions, actively contribute to the foetus's health, and establish a closer bond with their newborns directly. Also, the Lamaze method aimed to reduce pain sensations and increase

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comfort during labour. The nurse can use it on their own and in cooperation with the woman (Karkada, 2023).

Significance of the Study

The experience of labour is highly individual, but pain and labour progress are universal concerns for all parturients. Various approaches have been developed to address these concerns, ranging from medical interventions to non-pharmacological techniques (Fumagalli et al., 2022).

Pain of labour is described as the most severe pain in the lives of women; psychologically, pain Severity affects a mother's self-esteem and may lower the confidence and increase labour duration (Alan Dikmen, Gönenç & Ataş, 2024; Ji *et al*., 2024). Pain during labour is unique and recognised as an essential aspect of childbirth. Lamaze technique preparation is One of the technical methods that can be used to lower pain during labour. It is a method that helps the women to relax and maintain control during uterine contraction (Ramdan *et al*., 2022).

Objective of the Study

To determine the effectiveness of the Lamaze technique for parturients on pain intensity and labour progress, implement an antenatal educational programme for these women about the Lamaze technique.

Research Hypothesis

H1: The study group who received the Lamaze technique had lower intensity of labour pain during stages of labour than the control group.

H2: The study group who received the Lamaze technique had more positive labour progress chances than the control group.

METHODOLOGY

Study Design

The study was designed as a randomised controlled trial (RCT)

Study Settings

The study was conducted at the antenatal clinic during preparation sessions and at the labour unit during the assessment and evaluation phase of labour pain and progress at Women's Health Hospital, which was selected for its high number of annual deliveries at Assiut University.

Sample

The sample size included 150 pregnant women randomly divided into a study and control group based on eligibility criteria, with seventy-five pregnant women in each group. It started at the beginning of April 2023 and was completed by the end of March 2024 over a period of one year. Inclusion criteria: Women must have normal pregnancies in their third trimester, be either primigravida or multipara, carry a singleton foetus, be free from gynaecological and medical problems, be willing to participate in the study, and be easily contactable.

Randomisation Procedure

The participating women were randomised in a 1:1 ratio to either group using a basic method of simple randomisation, which is flipping a coin with two groups (control versus study); the side of the coin (i.e., heads—control, tails—study) determined the assignment of each subject.

Data Collection Tools

Tool I: Structured Interview Questionnaire: It was used to collect data from women after reviewing the related literature After reviewing the related literature by Mohamed *et al.* (2024); Lai *et al.* (2021), the researcher developed the following tools: personal data collection, physical assessment, reproductive history, current pregnancy history, and current labour data.

Tool II: Visual Analogue Scale (VAS): It was used and adopted by the researcher after reviewing the related literature (Pawale & Salunkhe, 2020; Katz & Melzack, 2024). It is a numerical scale used for pain assessment. It

consists of 10 points, regarding the grade of pain.

Score System

The pain scoring system is classified as follows: a score of 1 to 3 indicates mild pain, 4 to 6 corresponds to moderate pain, and 7 to 9 reflects severe pain. A score of 10 represents the worst imaginable pain.

Tool III: This tool, adapted from the works of Ramadan et al. (2022), Blackburn (2017), and Koutoukidis, Stainton, and Hughson (2013), was utilized to gather data on key aspects of labour progress, including the mode of delivery (whether spontaneous, induced, augmented, or via caesarean section) and the duration of each stage of labour.

Validity of the Tools

Validity of the tools and modification are done according to the revision and suggestions given by five expertise from maternity nursing faculty.

Reliability

The reliability of the developed tools was assessed using Cronbach's alpha. The results were: Tool I, $\alpha = 0.639$; Tool II, $\alpha = 0.735$; and Tool III, $\alpha = 0.741$.

Pilot Study

10 % of the study sample (15 women) was used to test the clarity, feasibility, and objectivity of the study tool.

Procedure

To conduct this study, official permission from the dean and the Faculty of Nursing's Research Ethics Committee was obtained, as well as from the director of Woman's Health Hospital. The control (who took routine hospital care) and study groups (who took Lamaze technique) were interviewed individually using tool I to assess essential data and obtained oral consent from each participant after describing the nature and goal of the study. Preparation of the antenatal Lamaze technique was done for the study group during their third trimester sessions; it included: Theoretical and practical sessions, and each session took about 30–45 minutes. Finally, the women were instructed during labour to use one or more of the Lamaze methods, such as Cutaneous Stimulation, which includes massage, sacral pressure, thermal stimulation, and positioning. Distraction, which includes breathing techniques and focusing on the particular object as imagery and music. Reduction of anxiety through providing information to the woman regarding the labour process and presence of a support person, and the women were assessed during stages of labour (first and second) using tool II to assess intensity of pain and to assess labour progress using tool III.

Statistical Analysis

We utilised the Statistical Package for Social Science (SPSS) version (28) for both data entry and statistical analysis. For data analysis using frequencies, percentages, means and standard deviations, the reliability of the tools was determined by measuring their internal consistency using Alpha Cronbach's test. The Chi square was utilised to illustrate the relationships between the variables. A *t*-test was used to compare the mean. Probability (*p*-value) is significant if it is less than 0.05.

Ethical Consideration

The research obtained ethical clearance from the Faculty of Nursing's Research Ethics Committee at Assiut University in Egypt with Reference Number 1120230555 on 29th January, 2023.

RESULTS

According to Table 1, the personal data of the studied women reflect that nearly four-fifths (78.6%) in the study group and more than two-thirds (69.4%) in the control group were from the 18–35 years age group, with mean ages of 24.15 ± 4.967 years and 25.84 ± 6.191 years, respectively. Regarding residence, more than three-quarters of the women (80% and 74.7%) were from rural areas. Concerning educational level, more than one-third (33.3% and 34.7%) had attained secondary education. Regarding occupation, nearly two-thirds (64%) and almost three-quarters (72%) of the women were housewives, respectively.

Table 1: Personal Characteristics of the Studied Women in the Study and Control Group (n=150)

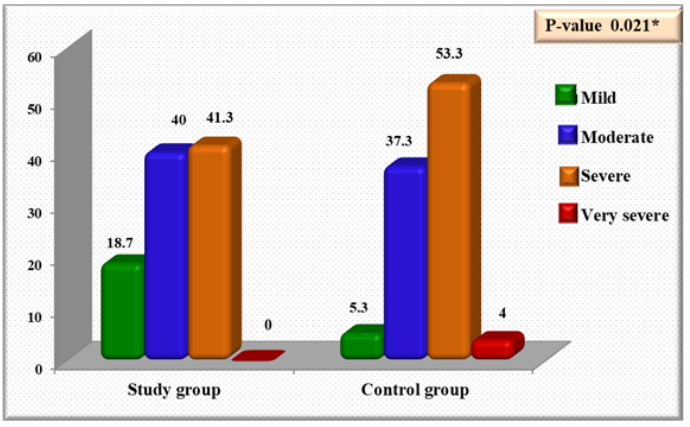
Personal Characteristics	Study Group		Control Group		*P*-value
	N	%	N	%	
Age\ years:					
Less than 18years	11	14.7	10	13.3	0.132
18-35 years	59	78.6	52	69.4	
More than 35 years	5	6.7	13	17.3	
Age (mean ± SD)	**24.15±4.967**		**25.84±6.191**		
Residence					
Rural	60	80.0	56	74.7	0.435
Urban	15	20.0	19	25.3	
Educational level					
Cannot read and write	17	22.7	13	17.4	0.875
Read and write	6	8.0	7	9.3	
Basic education	13	17.3	15	20.0	
Secondary	25	33.3	26	34.7	
University	14	18.7	13	17.3	
Postgraduate and above	0	0.0	1	1.3	
Occupation					
Housewife	48	64	54	72	0.294
Employed	27	36	21	28	

Table 2 Illustrates that there is no statistically significant difference among the studied women in the two groups. Related to physical assessment, gestational weeks; the Mean ± SD in the study group was 38.11 ± 1.146 weeks and 38.03 ± 1.252 weeks in the control group.

Table 2: Physical Assessment of the Studied Women in the Study and Control Group (n=150)

Items	Study Group		Control Group		*P*-value
	N	%	N	%	
General Examination					
Weight (kg)	76.55± 9.918		78.17±11.967		0.108
Height (cm)	160.27±4.035		159.43±4.694		0.195
BMI	29.81±3.872		30.74±4.887		0.560
Abdominal Examination					
Gestational weeks					0.071
37 weeks	3	4.0	9	12.0	
37 or more	72	96.0	66	88.0	
Mean ± SD	**38.11±1.146**		**38.03±1.252**		
Pelvic Examination					
Engagement					0.502
Yes	48	64.0	44	58.7	
No	27	36.0	31	41.3	

Figure 1 indicates that there is a significant difference between the studied women in the two groups regarding the level of pain with a *p*-value of 0.021.



The p-value is 0.021, marked with an asterisk (*), indicating that the difference in pain levels between the two groups is statistically significant (χ^2, df = 3, $p < 0.05$).

Figure 1: Level of Pain of the Studied Women in the Study and Control Group (n=150)

Table 3 demonstrates that there is a statistically significant difference with a *p*-value of 0.039 between the study and control groups. Related to the duration of labour in the second stage and a highly statistically significant difference in the third stage with a *p*-value of 0.001.

Table 3: Current Labor Data of the Studied Women in the Study and Control Group

Duration of Labour	**Study Group**		**Control Group**		***P*-value**
	N	**%**	**N**	**%**	
First stage\hrs. (150)					0.744
<10 hours	37	49.3	35	46.7	
10 hours or more	38	50.7	40	53.3	
Mean ± SD	11.84±6.208		11.31±5.973		
Second stage\min (115)	**(N=62)**		**(N=53)**		**0.039***
< 60 minutes	40	64.5	24	45.3	
60 or more	22	35.5	29	54.7	
Mean ± SD	58.225±30.889		59.54±33.711		
Third stage\min (115)	**(N=62)**		**(N=53)**		**0.001****
< 10 minutes	29	46.8	6	11.3	
10 or more	33	53.2	47	88.7	
Mean ± SD	15.23±17.604		28.38±19.652		

Chi-square test (**) Highly statistically significant difference (*) Statistically significant difference

Table 4 shows that there is a significant difference with a *p*-value of 0.038 among the studied women. Related to the comparison between two groups regarding mode of labour, one third (33.3%) of the control group were delivered by caesarean section and less than one fifth (14.7%) of the study group.

Table 4: Maternal Outcomes (Labour) of the Studied Women in the Study and Control Group (n=150)

Item	**Study Group**		**Control Group**		***P*-value**
	N	**%**	**N**	**%**	
Mode of Delivery					**0.038***
Spontaneous normal vaginal delivery without episiotomy	37	49.3	26	34.7	
Normal vaginal delivery with episiotomy	26	34.7	24	32.0	
Instrumental	1	1.3	0	0.0	
Caesarean section	11	14.7	25	33.3	
Induced					0.742
Yes	34	45.3	32	42.7	
No	41	54.7	43	57.3	
Methods of Induction					0.244
Oxytocin	30	88.2	23	71.9	
Rupture of membrane	2	5.9	5	15.6	
Both	2	5.9	4	12.5	
Augmented					**0.044***
Yes	15	20.0	26	34.7	
No	60	80.0	49	65.3	
Methods of Augmentation					0.138
Suppository	2	13.3	9	34.6	
Misotac	13	86.7	17	65.4	

Chi-square test (*) Statistically significant difference

Table 5 demonstrates that there is a significant difference between the studied women. Regarding Maternal condition, the means of respiration between the study and control groups were 19.89±4.120 and 23.45±5.038, respectively. In addition, the mean temperature between both groups was 36.401±.786 and 36.463±1.6248 respectively and the mean pulse between both groups was 82.36±11.347 and 86.31±14.622 respectively. Generally, there is a significant difference ($p < 0.05$) between the two groups related to maternal vital signs.

Table 5: Maternal Condition (Vital Signs) of the Studied women in the Study and Control Group (n=150)

Item	Study Group		Control Group		*P*-value
	N	%	N	%	
Blood Pressure					
Normal	65	86.7	51	68.0	**0.014***
High	4	5.3	5	6.7	
Low	6	8.0	19	25.3	
Respiration (mean ± SD)	19.89±4.120		23.45±5.038		**0.001****
Temperature					
Hypothermia	7	9.3	14	18.7	**0.041***
Normal	64	85.3	51	68.0	
Hyperthermia	4	5.3	10	13.3	
Temperature (mean ± SD)	36.401±.786		36.463±1.6248		**0.004****
Pulse (mean ± SD)	82.36±11.347		86.31±14.622		**0.030***

Chi-square test (**) Highly statistically significant difference; (*) Statistically significant difference

DISCUSSION

The Lamaze technique is a non-pharmacologic technique, supportive and effective for lowering labour pain of parturients and enhancing the labour progress. It is referred to as a psychoprophylactic technique that actively prepares a parturient to deal with labour. Lamaze preparation helps women to have a safe delivery by coping with the difficulties of labour successfully (Inam *et al*., 2021).

Lamaze breathing exercises play an important role in increasing the blood flow for improved oxygen saturation that could increase the endorphin level, activate large nerve endings and close the gate. Therefore, reassuring the mother can reduce pain and shorten the labour duration (Mohamed *et al*., 2024).

A participant may receive a variety of nursing interventions, but the most common ones are postural nursing, doulas, massages, delivery balls, and psychological nursing. Clinical studies have examined how nursing interventions and Lamaze breathing training affect maternal pain relief and improve outcomes (Wu *et al*., 2021).

The Lamaze method has emerged as a non-pharmacological approach designed to reduce pain and encourage labour progress. So, this study explores the effectiveness of the Lamaze technique for pain intensity and labour progress.

The present study reflected a significant difference between the study and control groups regarding pain intensity. These findings matched with a previous study of Kaple and Patil (2023); they revealed that the Lamaze technique is useful in labour pain management and there were highly significant differences regarding the degree of labour pain before & after applying the Lamaze technique with mean labour pain scores of 8.77 ± 1.00 and 7.22 ± 1.00 in group A respectively and 8.94 ± 0.93 and 7.55 ±0.92 in group B respectively ($p < 0.001$).

This result is supported by Mohamed *et al*. (2024); they clarified that the Lamaze method significantly reduced the pain intensity score during the first stage of labour after the 1st, 3rdand 5th hours from practising the Lamaze technique with a *p*-value ($p<0.001$). This finding is consistent with Ramdan *et al*. (2022); they found that there was a highly significant difference regarding pain intensity after receiving the Lamaze technique during the first stage of labour among both groups.

Many studies, such as the meta-analysis by Wu *et al*. (2021) and by El-Kurdy *et al*. (2017), mentioned that labour pain had decreased in women during the first stage of labour who were applying the Lamaze technique. At the same time an agreement between the previously cited studies and the current study, supported by other literature reviews, determined that Lamaze technique preparation helps parturients to relax both psychologically and physically. This study disagrees with Thomson *et al*. (2019), who found that many studies declared that the gold standard for reducing labour pain is still epidural anaesthesia and other forms of neuraxial analgesia. The disagreement may be related to the order of the physician, the preference of the mother and negative beliefs of mothers about labour pain tolerance.

The current results of this study show a significant difference with a *p*-value (0.039) among the studied women in both groups related to the duration of labour in the second stage and a highly significant difference in the third stage with a *p*-value (0.001). This result parallels Ramdan *et al*. (2022), who mentioned that there was a statistically significant difference regarding the duration of labour in the first, second and third stages with *p*-values (0.013, 0.049, 0.002), respectively, among both groups.

These findings are parallel to a study by Yasmin, Yasmeen, and Yasmin (2024), which showed that there was a significant difference ($p < 0.05$) regarding the duration of the first stage of labour (682.95 ± 189.74 minutes vs. 1038.07 ± 263.05 minutes) between the study group and the control group. The result agrees with Issac et al.'s (2023) finding that there is a highly significant difference between both groups regarding the total duration of labour ($p<0.0001$). Also, this study's result is supported by Leutenegger *et al*. (2024).

Moreover, these results correspond with Mohammed *et al*. (2024); they found a highly significant difference between both groups, as there was a shorter duration in the first stage of labour (active and transition phases) with $p<0.001$. This finding is congruent with that of another study done by Yohai *et al.* (2018).

The above-mentioned results are in agreement with Marzouk and Emarat (2019); they found that there was a significant difference between the parturients who received the Lamaze technique during labour and the control group regarding the duration of the first stage of labour (5.9 ± 0.8 vs. 7.9 ± 0.8 hours), respectively, and there was a highly significant difference regarding the first stage of labour between both groups ($p<0.001$).

The current study supports the effectiveness of Lamaze technique as non-pharmacological maternity nursing care to address pain intensity and progress of labour.

Limitation

The study sample was limited to pregnant women who met specific inclusion criteria, which may restrict the generalisability of the findings. Some participant dropout occurred due to factors such as withdrawal during the study, premature delivery, or labour commencing at times unsuitable for researcher observation. Despite these challenges, the study offers a valuable foundation for future research involving more diverse populations and enhanced follow-up strategies.

CONCLUSION

This study concludes that studied parturient who receive Lamaze technique preparation reveal lower intensity of labour pain during labour and using the Lamaze technique in the stages of labour improved the progress of the labour process. (shortens duration of labour and enhancing labour progress, hence facilitating natural childbirth). So Lamaze technique should include into maternity nursing care to manage pain and improve labour progress.

Recommendation

This study recommended Enhancing the nurse's knowledge and practice regarding Lamaze childbirth preparation through regular training sessions, workshops, and teaching programs, particularly in obstetrics departments and applying of antenatal educational program for all pregnant women to increase awareness and knowledge about Lamaze technique. Additional research should be carried out to include a larger sample and consider special strategies to decrease dropout rates such as giving brochures to all pregnant women and taking convenient sample during onset of labour to determine the impact of the Lamaze technique application on pregnancy and foetal outcomes.

Conflict of Interest

The authors have no conflicts of interest.

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