Effect of Third Trimester Lamaze Preparation on Labor Pain Intensity and Pregnancy Outcome

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Abstract

Background: *Labor pain is unique and it is been accepted as a necessary part of childbirth. One of the practical methods that can be used to reduce labor pain is Lamaze childbirth preparation. It is a 'tool' that helps the women to maintain control during uterine contraction with relaxation.* ***Objective****: To determine the effect of third trimester Lamaze preparation on labor pain intensity and pregnancy outcome.* ***Design****: a quasi-experimental research design.* ***Setting****: The study was conducted in a private clinic as well as Walei- El-ahd private hospital.* ***Subjects:*** *A convenience sample of 100 pregnant women* ***Tools****: Four tools were used for data collection.* ***The first tool*** *was Socio-demographic, reproductive and clinical data structured interview schedule,* ***The second tool*** *Visual analog scale to assess labor pain intensity.* ***The third tool*** *was present behavioral intensity scale to assess women`s behavioral response to pain. the* ***fourth tool*** *was Pregnancy outcome assessment checklist to assess maternal and fetal outcome.* ***Results****: Findings of the present study revealed that the total score of pain intensity was significantly decreased among the study group after intervention (p=<0.001). In addition, the study group had positive maternal and fetal outcome compared to the control group.* ***Conclusion:*** *The study concluded that parturient women who receive third trimester Lamaze preparation exhibit lower labor pain intensity during first and second stage and more positive pregnancy outcome than those who won`t receive it.* ***Recommendations****: Designing and applying Lamaze childbirth preparation classes as an essential component of standard antenatal care at different affiliated Egyptian public hospitals.*

Keywords: Third trimester, Lamaze preparation, labor pain, pain intensity, pregnancy outcome.

Introduction

Pregnancy and childbirth are among the most pleasant events and sensitive courses of women's lives. This important experience causes many social, psychological, behavioral and biological changes in women. Those changes can place significant strain on the mother, threatening the lives of both the mother and the fetus. Therefore, women should be the focus of maternity care with an emphasis on providing choice, easy access and continuity of care **(Koppad et al., 2014 , Mehrabadi.M et al.,2019).**

A variety of non-pharmacologic methods for pain are taught in many different types of prenatal preparation classes. Lamaze is known as a method of psycho prophylaxis. This method prepares a pregnant woman to deal actively with contractions. The theory of conditioned reflex is followed in the method that has two components: education and training. Childbirth preparation methods practiced around the world to prepare both the mother and/or through different

relaxation and breathing techniques (**Nilima R.Bhore., 2016,) .**

Lamaze international developed six Lamaze Healthy Birth Practices, each of which is fully supported by abundant research. The organization believes that the care practices, adapted from WHO, promote, support, and protect nature`s plan for birth: Labor begins on its own; Freedom of movement throughout labor, Continuous labor support; No routine intervention; Non-supine position for birth and No separation of mother and baby after birth with unlimited opportunity for breast feeding **(Lamaze International, 2010).**

Finally, Pregnancy is a unique, exciting and often joyous time in the midwife. The underpinning philosophy of Lamaze method is a midwife woman's life, it is tremendously powerful stage of development that brings a woman to motherhood, a couple to family and a beautiful child into the world. Keeping birth normal and the striving to interfere as little as possible with the natural process can be defined as a goal for led care on normality and the natural ability of women to experience birth with minimum or without routine interventions**(Kuruvilla, 2019).**

Aims of the Study

This study aims to determine the effect of third trimester Lamaze preparation on labor pain intensity and pregnancy outcome.

Research Hypotheses

1. Parturient women who receive third trimester Lamaze preparation exhibit lower labor pain intensity during first and second stage than those who won`t receive it.

2. Parturient women who receive third trimester Lamaze preparation exhibit more positive pregnancy outcome than those who won`t receive it.

Materials and Method

Materials

Design: Quazi-experimental design was used in this study

Settings: The study was conducted in a private clinic as well as Walei- El-ahd private hospital. This clinic was particularly chosen because pregnant women are already practicing antenatal classes where this research needs adherence and sustainability of the study subjects to antenatal exercises and preparation. The hospital was chosen because women who participate in the study were referred to it during delivery.

Subjects: A convenience sample of 100 pregnant women, was selected from the previously mentioned setting according to the following inclusion criteria

Inclusion criteria:
- Women had normal course of pregnancy
- In the 3th trimester of pregnancy.
- Multigravida & singleton pregnancy with cephalic presentation.
- Free from any medical or gynecological problems.

The selected subjects were equally assigned to either the control (50) or the study group (50).

Tools: Four tools were used to collect data of the study:

Tool(I): Socio-demographic, reproductive and clinical data structured interview schedule: It was developed by the researcher to collect the necessary data from women. It included: Socio demographic characteristics, reproductive history, history of current pregnancy, physical assessment, history of current labor.

Tool(II):Visual analog scale (VAS): It was developed by Melzac and Katz (1994). It was adopted and used by the researcher. It is a self-report device consisting of a horizontal line used for subjective estimation of pain. It comprises 10-point numerical scale, corresponding to the degree of pain with zero representing no pain and 10 representing the worst degree of pain. In between these two opposite ends, words as mild, moderate,

severe and very severe pain are assigned to each 2 cm distance, respectively (Ludington & Dexter, 1998).

SCORE KEYS:

1 to 3 = Mild pain
4 to 6 = Moderate pain
7 to 9 = Severe pain
10 = very severe

Tool (III): present behavioral intensity scale (PBI): It was developed by Bonnel and Boureau (1985). It was used to measure the present manifestation of pain. The PBI is a five categories behavioral observation scale:

- **Intensity 0**: Normal respiration, no grasping, no agitation.
- **Intensity 1**: The frequency or amplitude of respiratory rates is modified during contractions.
- **Intensity2**: Grasping reactions during contractions. These reactions increase during contraction relaxation.
- **Intensity 3**: Grasping reactions that persist between contractions.
- **Intensity 4**: Signs of agitation may arise during contractions and possibly between them. These signs include abrupt uncontrolled movements such as startled reactions.

Tool (IV): Pregnancy outcome assessment checklist: This tool was developed by the researcher based on the current review of literature **Blackburn, s. (2018)**, **Koutoukidis, G., & Stainton, K. (2020)** to collect data about:

Section I: Maternal pregnancy outcome assessment checklist which included presence of maternal distress, Vital signs (normal, abnormal), duration of three stages of labor (first, second, third), nature of delivery whether spontaneous or assisted, need for episiotomy as well as complication of labor

Section II: Fetal pregnancy outcome assessment checklist which included presence of fetal distress, Apgar score at one and five minutes (normal, mild, severe asphyxia), need for resuscitation as well as admission to neonatal intensive care unit.

Method

An official letter from the Faculty of Nursing was directed to the Alexandria Directorate of Health Affairs in order to obtain their approval to carry out the study in the previously mentioned settings.

The study was conducted through the following phases:

The control group: who received the routine antenatal care. The researcher interviewed each woman individually for about 30 minutes during their antenatal visits to collect basic data using (tool I). Then they are observed twice during labor (after 25minutes& after 45 minutes) to assess severity of labor pain using (tool II, III) and to assess maternal and fetal outcome using (tool IV).

The study group: comprised 50 pregnant women who received Lamaze preparation.

1.**Assessment phase:**

- The researcher interviewed each woman in the study group individually for about 30 minutes during their antenatal visits to assess basic data using (tool I).
- Women were given a proper explanation about the study purpose, design, and subject's role. The explanation was done using power point presentation at the clinic for small group each time according to their antenatal visits.

2.Developmental phase:

- Antenatal Lamaze preparation was done four times for a period of two months 2wks apart for each woman in the study group during their antenatal visits. It aimed to improve subjects' knowledge and performance regarding Lamaze preparation guidelines, it included two main parts: Theoretical part and Clinical part

- Lamaze preparation includes four sessions which were performed at 28wks, 30wks, 32wks, and 34wks of gestation.
- Each session took about 20-30 minutes .

3.Implementation phase (During labor):

- This phase includes implementation of Lamaze preparation guidelines, Non pharmacological pains relieve a measure as Lamaze breathing include (Slow paced breathing, modified based breathing, Patterned paced breathing)

4.Evaluation phase

- The subjects were assessed during first and second stage of labor to assess pain intensity using tool II, III.
- Pain intensity and present behavioral manifestations of labor pain were measured before intervention for both groups and were measured after 25 min from the start of the intervention time, followed by another assessment after 45 min, during and after contraction after intervention during the active and transitional phases using tool II (pain intensity) and tool III (present behavioral intensity scale).

Ethical considerations:

An informed written consent was obtained from each study subject after explanation of the study purpose. Anonymity and privacy of the study subjects, confidentiality of the collected data, and the subject's right to withdraw at any time were maintained.

Statistical Analysis

Data was analyzed using PC with statistical package for social science (SPSS) version 26. The level of significance was ≤ 0.05.

Results

Table (1) shows the socio-demographic characteristics of the studied women. The mean age among the study and control groups was (26.68 ± 3.07&26.68 ± 3.11) years respectively. One-half (50%) of the study group had university education, compared to (60%) of the control group. Most of both the study (96%) and control (98%) groups were from urban areas.as well as, the most of both the study (94%) and control (90%) had nuclear family.

Table (2) exhibits the distribution of the studied women according to labor pain rating scale before and after practicing Lamaze preparation. The table clearly reveals that all women of the study and control groups experienced labor pains of different intensity before practicing Lamaze preparation. More than half (52%) of the study group complained from severe labor pain compared to more than three fifths (64%) of the control group. Meanwhile, Unbearable labor pain was reported by more than one quarter (26%) of the study group compared to (16%) of the control group. On the other hand, those who felt moderate labor pain constituted 22%, 20% of the study and control group respectively. The table obviously illustrates that unbearable pain diminished among the study group after 25&45 minutes of Lamaze preparation, compared to (20% & 24%) of the control group who showed unbearable pain after 25 minutes & 45minutes of Lamaze preparation respectively.

Table (3) portrays the distribution of the studied women according to maternal outcome. Maternal distress was observed among 6% of the study group compared to 10% of the control group. Meanwhile, almost of study and control group (94%, 90%) respectively did not experience maternal distress. In addition, normal vital signs were measured among (96%, 90%) of study and control group respectively. Statistically significant difference was encountered between the both groups in relation to need for assisted birth. Where, around two fifths (42%) of the study group compared to more than three fifths (62%) of the control group.

Table (4) Shows distribution of the study and control groups according to duration of labor. Duration of first, second and third stage of

labor was significantly shorter among the study than the control group in (P= 0.013, 0.049, 0.002) respectively.

Table (5) reveals the distribution of the studied women according to fetal outcome. fetal outcome was better among study group compared to the control group, where fetal distress was observed among a sizable portion of study group (10%), compared to more than one third (34%) of control group. Moreover, mean APGER score after1min was (7.64 ± 1.44) among study group, compared to (5.78 ± 1.58) among control group. After 5min mean APGER score was (9.24 ± 0.87), compared to (8.60 ± 1.12). Fetal complication during labor was present among only (12%) of the study group, compared to around half (48%) of the control group. On the other hand, none of the both groups need for cardio-pulmonary resuscitation (CPR). Meanwhile, less than one- quarter (22%) of the study group need neo-natal ICU, compared to one half (50%) of the control group.

Discussion

Lamaze classes are an effective non-invasive, non-pharmacologic, supportive education for reducing labor pain and improving the behavioral responses of women in labor. Lamaze preparation encourages women to recognize their innate abilities to cope successfully with the challenges of labor and birth in any setting and to help them to have a stress free and safe delivery (**Nagvanshi S, Linson CC.,2020).**

The present study revealed a highly statistically significant differences between the two groups in relation to pain intensity after intervention 25 min and 45min of Lamaze practice. This was clearly demonstrated when severe & unbearable labor pain among study group was sharply and significantly declined. Also, there were statistically significant differences between pain intensity scores before with after (25min) or (45min) for study group (table 2). This finding is consistent with meta-analysis done in china by WU.C.et al.,2021, In Egypt by El-Kurdy.R.et al ,2017. Such an agreement between the results of the present study and the previous mentioned study is supported by other relevant literatures pointed that Lamaze practice training could assist parturient to relax both physically and psychologically. Thus, when labor pains come, the training led parturient to relieve muscular tension and relax muscle initially, which decreased levels of 5-hydroxytryptamine, and finally alleviated the pain (Wu, C. et al, 2021).

Regarding maternal outcome, the present study results apparently reveal highly statistically significant differences between the control and study groups in relation to need for assisted birth This result is in line with at least other two studies First, Karkada.S.R. et al (2022), second Gluck.O, (2018). Conversely, Sipahi, M. (2020) in Turky, claimed that there was no significant difference between the women gave birth by vaginal route and cesarean section regarding the rate of participation in the childbirth preparation education . Moreover, the rate of cesarean section was also lower than vaginal delivery in the women who completed the prenatal education but the difference was not significant.

The results of the current study apparently reveal highly statistically significant differences between the control and study groups in relation to duration of labor (Table 4). This finding may be explained by the fact that the psychological relief provided by Lamaze method could ulteriorly reduce heart rate, blood pressure and breathing rate, which brought down the release of norepinephrine and shorten

the delivery stages. This finding is congruent with that of another study done by Yohai.D (2018).

Regarding fetal outcome, The result shows that fetal outcome was better among study group compared to the control group, where fetal distress was observed among a sizable portion of study group, compared to

more than one third of control group. The current findings correspond with a study carried out by Parsa.P.(2020) in Iran.

Conclusion

Based upon the findings of the current study, it could be concluded that parturient women who receive third trimester Lamaze preparation exhibit lower labor pain intensity during first and second stage and more positive pregnancy outcome than those who won`t receive it.

Recommendations

In line with the findings of the study, the following recommendations are made:

- Designing and applying Lamaze childbirth preparation classes as an essential component of standard antenatal care at different affiliated Egyptian public hospitals.
- Designing and applying childbirth preparation classes during pregnancy particularly for primigravida's to promote their self-control during labor that lead to a more satisfactory birthing experience

Table (I): Number and percent distribution of the study and control groups according to their socio-demographic characteristics.

Personal data	Study (n = 50)		Control (n = 50)		Test of sig.	P
	No.	%	No.	%		
Age in years						
20<25	15.00	30.00	14.00	28.00		
25<30	24.00	48.00	28.00	56.00	χ^2=0.816	0.665
≥30	11.00	22.00	8.00	16.00		
Mean ± SD.	26.68 ± 3.07		26.68 ± 3.11		t=0.00	1.000
Education level						
Secondary or technical	24.00	48.00	20.00	40.00		
University	25.00	50.00	30.00	60.00	χ^2= 1.753	^{MC}p= 0.430
Master degree	01.00	02.00	00.00	00.00		
Occupation						
House wife	44.00	88.00	37.00	74.00	χ^2=1.753	0.074
Working	06.00	12.00	13.00	26.00		
Current residence						
Urban	48.00	96.00	49.00	98.00	χ^2=0.344	^{FE}p=1.000
Rural	02.00	04.00	01.00	02.00		
Family type						
Nuclear	47.00	94.00	45.00	90.00	χ^2=0.056	0.813
Extended	03.00	06.00	05.00	10.00		

χ^2: Chi square test FE: Fisher Exact U: Mann Whitney test
p: p value for comparing between the studied groups *: Statistically significant at p ≤0.05

Table (2): Number and percent distribution of the study and control groups according to labor pain rating scale before and after practicing Lamaze preparation

Intensity of labor pain	Before Lamaze preparation				After 25 minutes of Lamaze preparation				After 45 minutes of Lamaze preparation			
	Study(n=50)		Control(n=50)		Study(n=50)		Control(n=50)		Study(n=50)		Control(n=50)	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Zero (no pain)	00.00	00.00	00.00	00.00	08.00	16.00	00.00	00.00	09.00	18.00	00.00	00.00
1 to 3 cm (mild pain)	00.00	00.00	00.00	00.00	13.00	26.00	00.00	00.00	17.00	34.00	00.00	00.00
4 to 6 cm (moderate pain)	11.00	22.00	10.00	20.00	14.00	28.00	04.00	0800	18.00	36.00	01.00	02.00
7 to 9 cm (severe pain)	26.00	52.00	32.00	64.00	10.00	20.00	36.00	72.00	05.00	10.00	37.00	74.00
10 cm (unbearable pain)	13.00	26.00	08.00	16.00	05.00	10.00	10.00	20.00	01.00	02.00	12.00	24.00
χ^2(p)	0.363 (0.920)				8.519* (^{MC}p= 0.009*)				41.989* (^{MC}p<0.001*)			
Fr(p_0) Before with after (25min) or (45min) for study group	**13.482*(0.001*)**											

χ^2: Chi square test FE: Fisher Exact U: Mann Whitney test
p: p value for comparing between the studied groups *: Statistically significant at p ≤ 0.05

Table (3): Number and percent distribution of the study and control groups according to maternal outcome

Maternal outcome	Study (n=50)		Control (n=50)		Test of sig.	P
	No.	%	No.	%		
Presence of maternal distress						
Present	03.00	06.00	05.00	10.00	χ^2=0.0	1.000
Not present	47.00	94.00	45.00	90.00		
Vital signs						
Normal	48.00	96.00	45.00	90.00	χ^2=0.0	^{FE}p= 1.000
Abnormal	02.00	04.00	04.00	10.00		
Assisted birth						
Need	21.00	42.00	31.00	62.0	χ^2= 4.006*	0.045*
Not need	29.00	58.00	19.00	38.0		
Instrumental delivery						
Need	03.00	06.00	07.00	14.00	χ^2= 1.778	0.182
Not need	47.00	94.00	43.00	86.00		
Need of episiotomy						
Need	17.00	34.00	19.00	38.00	χ^2= 0.174	0.677
Not need	33.00	66.00	31.00	62.00		

χ^2: Chi square test FE: Fisher Exact U: Mann Whitney test
p: p value for comparing between the studied groups *: Statistically significant at $p \leq 0.05$

Table (4): Number and percent distribution of the study and control groups according to duration of labor

Duration of labor	Study(n=50)		Control(n=50)		Test of sig.	P
	No.	%	No.	%		
First stage (min)						
Min. – Max.	7.0 – 15.0		7.0 – 16.0		U=898.50*	0.013*
Mean ± SD.	10.38 ± 1.83		11.34 ± 1.98			
Median	10.0		11.0			
Second stage (min)						
Min. – Max.	15.0 – 90.0		1.0 – 90.0		U= 969.50*	0.049*
Mean ± SD.	36.90 ± 17.78		40.37 ± 16.28			
Median	30.00		45.00			
Third stage (min)						
Min. – Max.	10.0 – 35.0		10.0 – 85.0		U=834.50*	0.002*
Mean ± SD.	17.30 ± 4.76		23.0 ± 12.66			
Median	15.00		20.00			

χ^2: Chi square test FE: Fisher Exact U: Mann Whitney test
p: p value for comparing between the studied groups *: Statistically significant at $p \leq 0.05$

Table (5): Number and percent distribution of the study and control groups according to fetal outcome

Fetal outcome	Study (n=50)		Control (n=50)		Test of sig.	P
	No.	%	No.	%		
Presence of fetal distress						
Present	05.00	10.00	17.00	34.00	χ^2= 8.392*	0.004*
Not present	45.00	90.00	33.00	66.00		
APGAR score						
1 minute						
Min. – Max.	3.0 – 10.0		3.0 – 10.0		U= 480.0*	<0.001*
Mean ± SD.	7.64 ± 1.44		5.78 ± 1.58			
Median	08.00		06.00			
5 minute						
Min. – Max.	6.0 – 10.0		6.0 – 10.0		U= 827.50*	0.002*
Mean ± SD.	9.24 ± 0.87		8.60 ± 1.12			
Median	09.00		08.00			
Fetal complication during labor						
Present	06.00	12.00	24.00	48.00	χ^2= 15.429*	<0.001*
Not present	44.00	88.00	26.00	52.00		
Need for CPR						
Not present	50.00	100.0	50.00	100.0	–	–
Need for new natal ICU						
Present	11.00	22.00	25.00	50.0	χ2= 8.507*	0.004*
Not present	39.00	78.00	25.00	50.0		

χ^2: Chi square test FE: Fisher Exact U: Mann Whitney test
p: p value for comparing between the studied groups *: Statistically significant at $p \leq 0.05$

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