Effect of Lamaze Technique on Labor Pain and Women's Satisfaction during First Stage of Labor

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Abstract

Background: Labor pain is the most severe pain a woman might ever experience in the life. Severity of pain psychologically affects a mother and may lower the confidence, self-esteem and increase duration of labor. **Aim**: to evaluate the effect of Lamaze technique on labor pain and women's satisfaction during first stage of labor. **Design:** A Quasi-experimental study design. **Setting:** The study was conducted at obstetrics and gynecological out-patient clinic and labor unit of obstetrics and gynecological department affiliated to Benha University Hospital. **Sample:** A purposive sample of 140 pregnant women divided randomly into two groups. **Tools of data collection:** five tools were used: A structured interviewing questionnaire sheet, Numeric Pain Rating Scale, Partograph**,** Apgar score and Woman's Satisfaction scale. **Results:** The result of current study showed that there was no statistically significant difference between both groups regarding intensity of labor pain score during first stage of labor before applying of Lamaze technique while, there was a reduction of intensity of labor pain score among study group compared to control group during the first stage of labor after practicing the Lamaze technique with a highly statistically significant difference between both groups**.** Also**,** indicated that there were more than three quarters of studied women were satisfied with applying Lamaze technique compared to more than one fifth of them were unsatisfied. **Conclusion:** applying Lamaze technique during first stage of labor had a positive effect on enhancing labor pain and increasing women's satisfaction. **Recommendation:** brochures regarding Lamaze breathing exercise should be available at outpatient clinics and obstetrics and gynecology departments for all pregnant women.

Keywords: First stage of labor, Labor pain, Lamaze technique, women's satisfaction.

Introduction

Labor pain is an unpleasant sensation often described as the worst pain in a women's life, but the experience is highly variable. The experience of labor pain is a complex, subjective and multi-dimensional response to sensory stimuli generated during labor. The intensity of pain is a reflection of different stimuli influenced by emotional, cognitive, motivational, social and cultural factors; thus, it is difficult to evaluate the severity of pain because labor is a dynamic process and pain intensity changes throughout labor (*Mary and KalaBarathi,2022)*.

Labor pain is more severe and longer in primiparous women, which can lead to invert effects such as fear, anxiety and loss of self-confidence (*Liu et al., 2023).* Childbirth is an intricate biological occurrence that encompasses numerous mechanisms comparable to those activated during stress reactions. It is a profound

experience characterized by intense physical strain and holds great emotional, social, and cultural importance *(Dahan, 2023)*.

The primi parturient women are scared of labor due to a lack of information regarding the childbirth process, its duration, bearing down techniques and the pain; therefore, education to these women play an imperative role in preparing themselves for the labor process, diverting their mind from this pain. Thus the management of women in the first stage by the health care professionals is essential to enhance the better fetal and maternal outcomes of the labor(*Adhikari and Devi, 2022)*.

Lamaze method is the most common method of preparation for childbirth ,refers to a whole of practices that informing and educating pregnant women before birth, supporting during labor, providing relaxation and relief pain through breathing exercises. Lamaze method also termed as psycho prophylactic method that deal actively with contractions by the use of mind (psyche) *(Erkaya and Çalik, 2021)*.

The Lamaze technique helps to make normal birth natural, healthy, fearless and happy by raising awareness of women emotionally and physically. It makes women feel calm during childbirth, work actively for the health of the fetus, feel less pain contractions and establish a much stronger bond with babies immediately after birth. Also, Lamaze method aimed to reduce the physical sensation of labor pain and increase comfort. It can be applied independently by the nurse in cooperation with the woman *(Karkada, 2023)*.

Birth satisfaction is greatly affected by labor pain, so that women with lower labor pain feel higher birth satisfaction. Accordingly, effective management of labor pain is considered as the most significant predictor of birth satisfaction and hence, labor pain management is the most important goals of midwifery care. There are several factors contributed to the determinants of women's satisfaction with maternity care. It includes structural elements such as pleasant physical environment, adequate human and medicinal resources *(Didevar et al.,2022)*.

Significance of the study:

Labor pain is excruciating, and bodily tension, anxiety, and fear can exacerbate it. Many women desire to give birth naturally, without the use of medicines or intrusive procedures like an epidural *(Konlan,et al., 2021)*. Complementary therapies are frequently used by these women to help lower the severity of pain and improve labor experience *(Tabatabaeichehr and Mortazavi, 2020)*.

The incidence of caesarean sections is increasing throughout the developed and developing countries. Many of women (68%) are requesting for caesarean section because of psychological indications. On other hand, women with adequate psychological support and relaxation techniques had reduced the incidence of caesarean section and 38% of them agreed for normal vaginal delivery *(Khamehchian et al., 2021)* .Lamaze breathing exercise helps in relaxation makes the muscle more flexible and increases stamina. Also, improves mental wellbeing, controls emotions and reduces stress, which in turn helps to center attention. Finally, it opens the door to spiritual ecstasy that helps the pregnant woman to get connected with fetus *(Weljale, 2023)*.Therefore, looking at the benefits, safety and cost-effectiveness of the intervention and researcher's interest to bring about a stereo- type shift from restrictive birthing environment to relaxing birthing experience, so the researcher conduct this study to evaluate the effect of Lamaze technique on labor pain and women's satisfaction during first stage of labor.

Aim of the Study:
This study was aimed to evaluate the effect of Lamaze technique on labor pain and women's satisfaction during first stage of labor.

Research Hypotheses:

H1: Women who will apply Lamaze technique will have decrease of labor pain than those who will not apply it.

H2: Women who will apply Lamaze technique will become satisfied during first stage of labor than those will not apply it.

Subjects and Method

Study design:

A Quasi-experimental study design (study group and control group) was utilized to fulfill the aim of this study.

Setting:

This study was conducted at obstetrics and gynecological out-patient clinic and labor unit of obstetric and gynecological department affiliated to Benha University hospital in Benha city.

Sampling:

A purposive sample of 140 pregnant women was included in the study. A total of sample size was attended at previously mentioned study setting and represented 10% of total admission of pregnant women with normal vaginal delivery (1457) according to Benha University Hospital Statistical Center, (2021). The sample selected according to the following inclusion criteria: Woman age 20–35 years old , pregnant woman with gestational age from 34 weeks till labor, women with singleton fetus with cephalic presentation, primigravida women, women with expected normal vaginal delivery, woman free from any medical or obstetrical related complications, women were plan to giving birth in Benha University Hospital and can read and write. Exclusion criteria: women were take analgesics to relieve labor pain during first stage of labor.

Tools of data collection:

Five tools were used in this study:

Tool(I):A structured interviewing questionnaire sheet :-It was designed by the researcher after reviewing the related literature *(Dekker, 2021)***,** it was written in the form of close and open-ended question and used to assess general characteristics of studied women as (age, educational level, occupation, residence) anthropometric measurements and gestational age.

Tool (II): Numeric Pain Rating Scale (NPRS): It was adopted from *(McCaffery and Beebe, 1989)* and was used by the researcher to assess the pain intensity experienced by the woman during labor. This tool consists of horizontal line numbered from 0 "no pain "to 10 "very severe or the worst degree of pain". In-between these opposite ends, words as mild, moderate and severe were considered. The woman was asked to place a mark on the line that indicated the pain being experienced. The woman was asked to place a mark on the line that indicated the pain being experienced. The researcher used the scale four times: before applying Lamaze technique and after (one, three and five hours) from practicing Lamaze technique.

Tool (III): Partograph: - It was adopted from *(WHO, 1994)* to assess and monitor the progress of labor as well as fetal and maternal conditions. It is a composite graphical record of key data (maternal and fetal) during labor entered against time on a single sheet of paper. It included three parts as the following: part 1: Fetal condition (at top), part 2: Progress of labor (at middle) and part 3: Maternal condition (at bottom).

Tool (IV): Newborn assessment sheet (Apgar score): It was adopted from *(Virginia, 1953)* to evaluate neonatal outcome. It was done at one and five minutes after birth, this included five variables (heart rate, respiratory rate, muscle tone, reflex and color of neonatal skin). These signs were given a score of 0, 1 or 2 and total score ranging from 0-10.

Tool (V): Woman's Satisfaction scale: It was adapted from *(Martin and Fleming, 2011)* to measure level of women's satisfaction regarding

applying Lamaze technique and consisted of (16 items). **Scoring system:** Each item had a score (2) for satisfied and a score (1) for unsatisfied. The total score was calculated by the addition of the score of each item and was classified into:

- Satisfied ≥ 70%
- Unsatisfied < 70%

Tools validity

Tools of data collection were reviewed by three panel expertise of obstetrics and gynecological nursing to ascertain clarity, relevance, comprehensiveness and applicability of tools. Modifications were done in the light of the valuable comments such as adding, rephrasing, omitting and modify some phrases which were unclear.

Tools reliability:

Reliability was assessed by Cronbach's alpha coefficient test and the internal consistency of Numeric Pain Rating Scale (Tool II) was α=0.93. Partograph (Tool III) was α=0.96. APGAR score (Tool IV) was 0.91. Additionally, Cronbach's alpha for the Woman's satisfaction scale score (Tool V) was 0.86.

Ethical considerations:

Ethical aspects were considered before starting the study as the following-:Approval to conduct the study was obtained from the Scientific Research Ethical Committee at Faculty of Nursing, Benha University before collecting data.An official permission from the selected study settings was obtained for the fulfillment of the study.The aim of the study was explained to each pregnant woman before applying the tools to gain their confidence and trust.The researcher took informed oral consent from pregnant women before participation in the study.The data was collected and treated confidentially.All pregnant women were given the option to withdraw from the study at any time .The study tools were ensuring that the study didn't touch woman's dignity, culture, traditional and religious aspects and didn't cause any harm for any woman during data collection. Also, didn't include any immoral statements and respect human rights.

Administrative approval:

A written official approval to conduct the study was obtained from the Dean of Faculty of Nursing to the director of Benha University Hospital and delivered to the director of the Obstetrics and Gynecology outpatient clinic and labor unit, in order to obtain agreement to conduct the study after illustrating the title and its purpose.

Pilot study:

The pilot study was conducted on 10 % of the total sample (14 pregnant women) before starting data collection to estimate the time required for completing the sheets and to check the simplicity, clarity, applicability and feasibility of the developed tools. No modifications were done Thus; women involved in the pilot study were included in the final sample size.

Field work:

To fulfill the aim of the study, the following phases were adopted, preparatory phase, interviewing & assessment phase, implementation phase and evaluation phase. These phases were carried out from the beginning of January, 2023 and completed at the end of June, 2023 covering six months. The researcher visited the previously mentioned setting three days/week, (Sunday, Tuesday and Thursday), from 9.00 Am to 2:00 Pm.

1- Preparatory phase

It is the first phase of the study and included reviewing of current, local and international related literatures. Also, theoretical knowledge of various aspects of the study using books, articles, periodicals, magazines and internet were obtained to develop tools of data collection. This helped the researcher to be acquainted with magnitude and seriousness of the problem and guided the researcher to prepare the require data collection tools.

2-Interviewing and Assessment phase:

At the beginning of interview the researcher introduced herself and greeted with each pregnant woman who participated in the study, then the researcher explained the purpose of the study briefly to pregnant women who fulfilled the inclusion criteria.

The researcher distributed a structured interviewing questionnaire sheet (tool I) to assess general characteristics of the studied pregnant woman. The average time taken for completing sheet was around 10-15 minutes depending on the response of the women. Each woman was reassured that obtained information will be confidential and used only for the purpose of the study. The number of interviewed women per week was 3-6 women (1-2 women/day).

3-Implementation phase:

For control group: The women were received only routine hospital care and observed to assess the degree of labor pain and monitor the progress of labor as well as fetal and maternal conditions. Then, the neonatal outcome (Apgar score) assessed at first and fifth minute after delivery.

For study group:

Firstly the researcher was prepared the private separate place to establish the confidence, trust of pregnant women and maintain privacy. This phase included application of Lamaze technique through determining steps of applying of this technique, choosing educational methods as discussion, pictures used in an Arabic language and using educational media as lab top, written material as procure to gain information and facilitate discussion. The implementation phase was achieved through 2 sessions of 45–60 minutes for each ,each woman attended two sessions either in a individually or group (two women can attend each session), the sessions were classified as the following:

The first session (theoretical): was conducted to provide the pregnant women with knowledge regarding Lamaze technique such as (definition, benefits, purpose, time of implementing and rate of breathing changes with the advancing stages of labor. Also , the researcher explained the physiological changes of labor and provide information about labor process and degree of labor pain during three phases of first stage of labor to help primigravida women to get an experience about labor process , increase self-esteem , self-confidence and helped pregnant women how to cope with labor pain and contraction.

The second session (practical): in which the researcher performed the technique of Lamaze breathing exercise in front of the participants which involves cleansing breathing exercise (an organizing breath) as well as slow-paced breathing, modified paced breathing and patterned-paced breathing, then the pregnant women asked to re-demonstrate it*.*

- Follow up (after last session till labor appointment):

- The pregnant women in the study group continued practicing breathing exercises and the researcher was contacted with pregnant women by phone and video call to ensure that they applied steps of technique correctly and effectively.

- Control group women followed by phone to avoid their drop out from the study, but no care provided to women to prevent study bias.

4- Evaluation phase:

This phase was done during first stage of labor for both groups to evaluate the effect of Lamaze technique on labor pain through numeric pain rating scale (Appendix II) and progress of labor as well as fetal and maternal conditions (Appendix III) were measured before applying Lamaze technique and after (one, three and five hours) from practicing Lamaze technique. Then, after delivery, the researcher assessed the neonatal outcome at first and fifth minute using newborn assessment sheet (Apgar score) (Appendix IV) and the researcher distributed the satisfaction scale among study group to evaluate the level of women's satisfaction (Appendix V).

Researcher compared the results of two groups to evaluate the effectiveness of applying Lamaze technique.

Statistical analysis:

Prior to automated input, data were checked. Data tabulation and analysis were done using SPSS version 22 (Statistical Package for Social Sciences). The use of descriptive statistics was used (e.g., mean, standard deviations, frequencies, and percentages). Pearson correlation coefficients, independent t-tests, Fisher Exact Test and Chi-square tests were applied. For all of the statistical tests done, p-value > 0.05 which indicated no statistically significant difference, p-value ≤ 0.05 indicated a statistically significant difference, and p-value ≤ 0.001 indicated a highly statistically significant difference.

Results:

Table (1): Shows general characteristics of the studied sample. It was cleared that more than one half (55.7%) and almost two thirds control group (65.7%) of study and control groups were in age group 25- < 30 years old with a mean age of study group 25.30±3.33 years and a mean age of control group 25.54±3.02 years respectively. Moreover, more than two thirds (67.1%) and (71.4%) of study and control groups were lived in rural area respectively. Concerning level of education, it was cleared that approximately less than half (47.1%) and three fifth of study and control groups (60%) had secondary education respectively. As regards occupational status, more than two thirds (67.1%) and approximately three quarters (74.3%) of study and control groups respectively were housewife.

Figure (1): displays that, there was no statistically significant difference between both groups regarding intensity of labor pain score during first stage of labor before applying of Lamaze technique ($p > 0.05$) while, there was a reduction of intensity of labor pain score among study group compared to control group during the first stage of labor after (1st, 3rd and 5th hours)

from practicing the Lamaze technique with a highly statistically significant difference between both groups ($p<0.001$).

Table (2): shows that, there was no statistically significant difference between both groups regarding the frequency, duration and interval of uterine contraction before applying of Lamaze technique. Also, there was a statistically significant difference between both groups regarding the frequency and duration of uterine contraction after (1st, 3rd and 5th hours) from practicing of Lamaze technique ($p < 0.05$). Additionally, regarding the interval of uterine contraction there was a statistically significant difference between both groups after 1st hour from practicing of Lamaze technique ($p < 0.05$) and there was a highly statistically significant difference between both groups after 3rd and 5th hours from practicing of Lamaze technique ($p < 0.001$).

Table (3): indicates that, the mean duration of active phase of first stage of labor for study and control groups were 4.86 ± 1.20 hours and 6.37 ± 1.41 hours respectively. Moreover, the mean duration of transition phase of first stage of labor for study and control groups were 1.67 ± 0.58 hours and 2.22 ± 0.66 hours respectively. Generally, there was a shorter duration of active and transition phase of first stage of labor among both groups with a highly statistically significant difference ($P< 0.001$).

Table (4): represents that the mean of Apgar score at 1st minute between both groups were 8.65±0.93 and 8.21±1.16 respectively. In addition the mean of Apgar score at 5th minute between both groups were 9.54±0.73 and 9.15±0.94 respectively. Generally, there was a statistically significant difference between both groups regarding Apgar score at 1st and 5th minute ($p < 0.05$).

Figure (2): displays that, more than three-quarters of women in study group were satisfied with practicing Lamaze technique during labor. Meanwhile, more than one fifths of them were unsatisfied.

Table (1): Distribution of the studied sample in both groups regarding general characteristics (n= 140).

General characteristics	Study group n= 70		Control group n=70		X^2	p-value
	No	%	No	%		
Age (years)						
20- < 25	22	31.4	16	22.9		
25- < 30	39	55.7	46	65.7	1.58	0.45 ns
30- 35	9	12.9	8	11.4		
Mean ± SD	25.30 ± 3.33		25.54 ± 3.02		t=.451	0.653 ns
Residence						
Rural	47	67.1	50	71.4	0.30	0.58 ns
Urban	23	32.9	20	28.6		
Educational level						
Primary education	10	14.3	12	17.1	4.07	0.13 ns
Secondary education	33	47.1	42	60.0		
University education	27	38.6	16	22.9		
Occupation						
Housewife	47	67.1	52	74.3	0.86	0.35 ns
Employee	23	32.9	18	25.7		

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

Figure (2) Distribution of studied sample in both groups regarding labor pain intensity during first stage of labor before and after intervention of Lamaze technique (n=140).
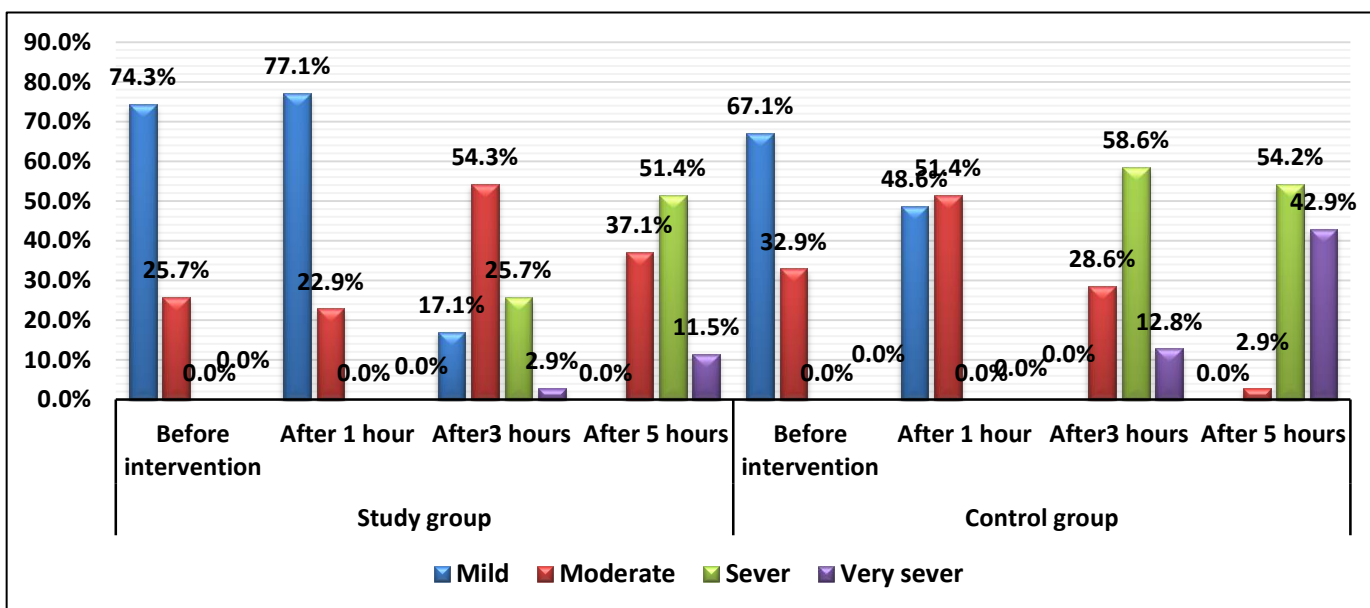
Table (3): Distribution of studied sample in both groups regarding mean score of uterine contraction before and after applying of Lamaze technique (n=140).

Characteristics of uterine contraction	Study group n=70	Control group n=70	Independent t test	P value
	Mean ±SD	Mean ±SD		
Before applying of Lamaze technique (1st observation)				
Frequency /10min	1.80±.52	1.77±.54	0.31	0.75 ns
Duration / sec	25.82±5.35	24.74±5.41	1.19	0.23 ns
Interval / min	5.45±1.20	5.57±1.29	0.54	0.58 ns
After one hour from practicing Lamaze technique (2nd observation)				
Frequency /10min	1.90±.42	1.70±.59	3.28	0.02*
Duration / sec	27.77±6.64	24.52±6.98	2.81	0.006*
Interval / min	5.15±1.17	5.55±.94	2.22	0.02*
After three hours from practicing Lamaze technique (3rd observation)				
Frequency /10min	3.22±.54	2.94±.69	2.69	0.008*
Duration / sec	55.10±7.41	51.68±8.45	2.54	0.01*
Interval / min	3.42±.57	4.35±.83	7.64	0.000**
After five hours from practicing Lamaze technique (4th observation)				
Frequency /10min	4.14±.64	3.77±.80	3.02	0.003*
Duration / sec	81.98±7.01	79.37±4.66	2.59	0.01*
Interval / min	2.21±.41	3.00±.53	9.68	0.000**

t= independent t   * statistically significant difference (p < 0.05)
 ** Highly statistically significant difference (p < 0.001)

Table (4): Distribution and mean score of studied sample in both groups regarding the duration of active and transition phase of first stage of labor (n=140).

Duration of active and transition phase of first stage of labor	Study group n=70		Control group n=70		FET/X^2	P value
	No	%	No	%		
Duration of the first stage of labor						
• Active Phase						
<3 hrs.	3	4.3	0	0.0		
3-6 hrs.	60	85.7	25	35.7	47.5$^\epsilon$	0.000**
>6 hrs.	7	10.0	45	64.3		
Mean ± SD	4.86 ± 1.20		6.37 ± 1.41		t=6.77	0.000**
• Transition phase						
<1 hrs.	9	12.9	3	4.3		
1-2 hrs.	57	81.4	20	28.6	62.6$^\epsilon$	0.000**
>2 hrs.	4	5.7	47	67.1		
Mean ± SD	1.67 ± 0.58		2.22 ± 0.66		t=5.28	0.000**

Chi-square test (x2) $^\epsilon$ Fisher Exact Test   t= independent t test
 ** Highly statistically significant difference (p < 0.001).

Table (5): Distribution and mean score of studied sample in both groups regarding Apgar scoring of neonates at first and fifth minute (n=140).

Variable	Study group n=70		Control group n=70		FET	P value
	No	%	No	%		
• **Apgar Score interpretation (1ˢᵗ minute)**						
Sever asphyxia(0-3)	0	0.0	2	2.9		
Mild to moderate asphyxia(4-6)	4	5.7	12	17.1	6.82	0.03*
Normal (7-10)	66	94.3	56	80.0		
Mean ± SD	8.65±0.93		8.21±1.16		t= 2.48	0.01*
• **Apgar Score interpretation (5ᵗʰ minute)**						
Sever asphyxia(0-3)	0	0.0	1	1.4		
Mild to moderate asphyxia(4-6)	1	1.4	7	10.0	5.95	0.05*
Normal (7-10)	69	98.6	62	88.6		
Mean ± SD	9.54±0.73		9.15±0.94		t= 2.69	0.008*

FET= Fisher exact test   t= independent t test   *statistical significant difference (p < 0.05)

Figure (3): Distribution of women in the study group according to satisfaction toward Lamaze technique (n=70).

78.6%   21.4%   ☐ Satisfied   ☐ Not satisfied
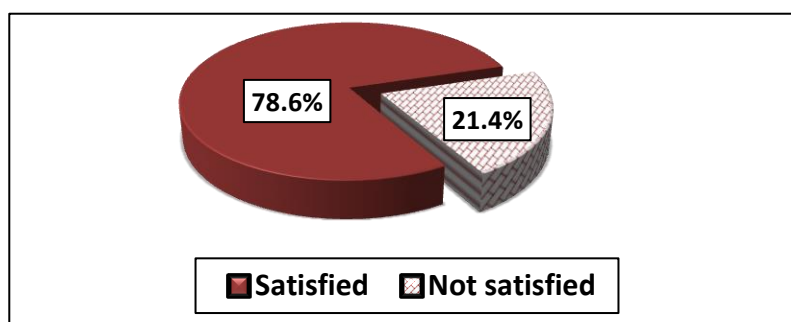
Discussion

The majority of women experience pain during labor and childbirth. For many women it is the most significant pain they will experience in their life. However, despite it being associated with the same fundamental physiological process, not all women experience labor pain in the same way. Women's evaluations of labor pain can range from excruciating to pleasurable in different individuals or on different occasions. Some women manage the pain well, requiring minimal assistance and reporting positive experiences, whilst others do not cope well and request intervention in order to avoid or alleviate the pain *(Leap and Hunter, 2022).*

Lamaze breathing technique is an effective noninvasive, non-pharmacologic and supportive technique for reducing labor pain and improving the behavioral responses of women in labor. It is known as a method of psycho prophylaxis that prepares a pregnant woman to deal actively with contractions. Lamaze preparation encourages women to recognize the innate abilities to cope successfully with the challenges of labor and birth in any setting and to help women to have a stress free and safe delivery *(Inam et al.,2021).*

Concerning general characteristics of the studied women , the present study findings revealed that, more than one half of study group and almost two thirds of control group were in age group 25- < 30 years old with a mean age of study

group 25.30 ± 3.33 years and a mean age of control group 25.54 ± 3.02 years respectively.

This result is agreement with **Erkaya and Çalik, (2021)** who studied *"The Outcome of Intra-partum Lamaze Philosophy in Low Risk Pregnant Women",* Turkey and mentioned that more than half of women were between 25-29 years old with mean age 28.48 ± 7.41 years.

The finding of the present study revealed that, more than two thirds of study and control groups lived in rural area. This result may be due to that the university hospital at which the study was conducted provides many health care services for surrounding villages, so majority of study sample were from rural area. This result agrees with **Nagvanshi and Linson, (2021)** who studied "Assessment *of Knowledge on Lamaze Breathing among Primigravida."* ,India and clarified that the majority of women lived in rural areas.

Concerning level of education, the result of the current study clarified that approximately less than half of study group and three fifth control groups had secondary education. As regards occupational status, more than two thirds of study group and approximately three quarters of control group were housewives. This results of current study agree with **KM and Nanjappan, (2023)** who studied *"Effectiveness of structured teaching programme on knowledge regarding Lamaze technique among antenatal mothers in selected maternity hospitals Bangalore.*", India and mentioned that more than half and more than two fifth of study and control groups have secondary education respectively and more than half and more than two fifth of study and control groups were housewives respectively also, there was no statistical difference between both groups regarding personal characteristics. This results are in the same line with **Ayalew et al., (2021)** who studied *"Women's satisfaction and its associated factors with antenatal care services at public health facilities",* Ethiopia and revealed

that majority of pregnant mothers participated in study were housewives.

Regarding level of pain among women in study and control groups, the finding of the present study revealed that approximately three quarters of study group and more than two thirds of control were mild intensity of labor pain before applying of Lamaze technique with a mean 3.01±1.08 and 3.18±1.17 respectively. Moreover, after one hour from practicing Lamaze technique there were more than three quarters of study group was mild intensity of labor pain as compared with more than half of control group was moderate intensity of labor pain with a mean 3.08±1.22 and 4.30±1.65 respectively. Also, after three hour from practicing Lamaze technique there were more than half of study group was moderate intensity of labor pain as compared with slightly less than three fifths of control group was severe intensity of labor pain with a mean 6.78±0.65 and 7.82±1.02 respectively. In additionally, after five hour from practicing Lamaze technique there were more than tenth of study group was very sever intensity of labor pain as compared with more than two fifths of control group was very severe intensity of labor pain with a mean 9.10±0.78 and 9.71±0.61 respectively. Generally, there was no statistically significant difference between both groups regarding intensity of labor pain score during first stage of labor before applying of Lamaze technique (p > 0.05) while, there was a reduction of intensity of labor pain score among study group compared to control group during the first stage of labor after (1st, 3rd and 5th hours) from practicing the Lamaze technique with a highly statistically significant difference between both groups (p<0.001).

There are many of studies mentioned that labor pain had decreased in women who applying Lamaze technique during first stage of labor as **Ramdan et al., (2022)** who studied *"Effect of Third Trimester Lamaze Preparation on Labor Pain Intensity and Pregnancy Outcome",* Egypt

and revealed that there was a highly statistically significant difference between the two groups in relation to pain intensity after intervention of Lamaze practice during first stage of labor. This was clearly demonstrated when severe and unbearable labor pain among study group was sharply and significantly declined. Also, the results of current study agreed with **Kaple and Patil, (2023)** who *studied " Effectiveness of Jacobson Relaxation and Lamaze Breathing Techniques in the Management of Pain and Stress During Labor ",* India and revealed that Lamaze breathing technique are very effective in managing labor pain and stress and there was a highly statistically significant differences regarding level of labor pain before and after applying Lamaze technique with mean labor pain scores 8.77 ±1.00 and 7.22 ±1.00 at group A respectively and 8.94 ±0.93 and 7.55 ±0.92 at group B respectively ($p < 0.001$).

Additionally, the above mentioned results are in accordance with **Majeed et al., (2022)** who studied *"Impact of Breathing Exercises on Labor Pain Among Pakistan Women ",* Pakistan and showed that during the assessment level of pain by visual analogue scale every 30 minutes, the mothers in study group have a lower mean score (6.72) than those in control group (9.36) and there was a highly statistically significant difference between study and control groups (P=0.001).

Regarding characteristics of uterine contraction (frequency, duration and interval) among women in study and control groups during first stage of labor, the results of the current study showed that there was no statistically significant difference between both groups regarding the frequency, duration and interval of uterine contraction before applying of Lamaze technique Also, there was a statistically significant difference between both groups regarding the frequency and duration of uterine contraction after (1st, 3rd and 5th hours) from

practicing of Lamaze technique ($p < 0.05$). Additionally, regarding the interval of uterine contraction there was a statistically significant difference between both groups after 1st hour from practicing of Lamaze technique ($p < 0.05$) and there was a highly statistically significant difference between both groups after 3rd and 5th hours from practicing of Lamaze technique ($p < 0.001$). *From the researcher's point of view*, the Lamaze breathing exercises play a crucial role in helping the women to accommodate the labor progress and effectively accelerate the process of cervical dilation and uterine contraction during vaginal delivery than the control group.

This finding is matching with the study of **Muhidayati et al., (2018)** who studied *"Effect of Hypnobirthing on the Progress of the Latent Phase of Labor in Primigravida.",* Indonesia and reported that the mean of frequency of contraction per 10 minutes in the experimental group was 3.929 times with standard of deviation of 0.534. While the mean of frequency of contraction in the control group was 3.000 times with a standard deviation of 0.549. Also, the mean of duration of contraction in each time of contraction in the experimental group was 39.335 seconds with standard of deviation of 2.863. While the mean of duration of contraction in each time of contraction in the control group was 35.539 seconds with standard of deviation of 2.708 and there was a highly statistically significant difference between both groups regarding frequency and duration of uterine contraction($p < 0.001$).

Also, this result is in agreement with **Subasri, (2023)** who studied *" A Pilot Study On A Mixed Method Study To Evaluate The Effectiveness Of Selected Childbirth Preparation Methods On Labor Outcomes Among Antenatal Women In Dr. Kamakshi Memorial Hospital & RKP Multi specialty Hospital At Chennai. ",* and showed that breathing exercise can provide positively impacts the mother's psychological state, which

affects the smoothness of the labor process. At the time of delivery, stress hormones, such as adrenaline, interact with beta-receptors in the uterine muscle and inhibit contraction and delay labor, therefore women require relaxed and comfortable conditions.

Regarding duration of the first stage of labor among the studied women in study and control groups, the result of current study, indicates that the mean duration of active phase of first stage of labor for study and control groups were 4.86 ± 1.20 hours and 6.37 ± 1.41 hours respectively. Moreover, the mean duration of transition phase of first stage of labor for study and control groups were 1.67 ± 0.58 hours and 2.22 ± 0.66 hours respectively. Generally, there was a shorter duration in active and transition phases of first stage of labor among both groups with a highly statistically significant difference (P< 0.001).

From the researcher's point of view, Lamaze breathing exercise play an important role in increase the blood flow for improvement oxygen saturation that could increasing the level of endorphins and stimulate large nerve endings and close the gate. Therefore, reassuring the mother can reduce pain and shorten the duration of labor.

The above mentioned results are in agreement with **Marzouk and Emarah, (2019)** who conducted a study entitled" *Effectiveness of Breathing Exercise on Reducing Pain Perception and State Anxiety among Primi Parturients*" Egypt and found that the parturient women who were performed the breathing exercise had significantly shorter duration of the active phase of first stage of labor than those in the control group (5.9 ±0.8 vs. 7.9 ±0.8 hours) respectively and there was a highly statistically significant difference between two groups regarding first stage of labor (p<0.001).

Moreover ,the result agrees with **Issac et al., (2023)** who found in their study about ″ *Effectiveness of breathing exercise on the duration of labor: A systematic review and meta-analysis* ,″ India that there was a highly statistically significant difference between the intervention and control group regarding total duration of labor (P<0.0001).

Regarding neonatal condition among studied women at first and fifths minutes (Apgar score), the result of current study revealed that the mean of Apgar score at 1st minute between study and control group were 8.65±0.93 and 8.21±1.16 respectively. In addition the mean of Apgar score at 5th minute between study and control group were 9.54±0.73 and 9.15±0.94 respectively and there was a statistically significant difference between both groups regarding Apgar score at 1st and 5th minute (p < 0.05).

The results of current study agrees with **Desmawati et al., (2020)** who studied ″ *The effects of childbirth preparation nursing intervention integrating Islamic praying program on duration of labor and neonatal outcomes in primiparous Muslim women* ″, Indonesia and revealed that the mean Apgar score in study and control groups at first minute were 8.8 ±0.45 and 8.79 ±0.41 respectively and at fifths minutes of neonatal life were 9.8 ±0.45 and 9.76 ±0.43 respectively with a statistically significant difference between the experimental and control groups (p < 0.05).

Furthermore the present study results are supported by a study carried out by **Baljon et al., (2022)**) who studied "*Effectiveness of breathing exercises, foot reflexology and massage (BRM) on maternal and newborn outcomes among primigravidae in Saudi Arabia*" Malaysia and mentioned that the mean Apgar score in study and control groups at first minute were (9) and (8) respectively and at fifths minutes were (10) and (9) respectively with a highly statistically significant difference between study and control groups (p < 0.001).

Concerning satisfaction regarding applying of Lamaze technique among study group, the findings of the current study clarified that more than three-quarters of women in study group

were satisfied with practicing Lamaze technique during labor. Meanwhile, more than one fifths of them were unsatisfied. *From the researcher's point of view* this result may reflect the effectiveness of applying of Lamaze technique in reducing intensity and duration of labor pain. Also, due to positive impact of Lamaze technique on progress of labor, fetal heart rate, vital signs and neonatal outcome. The pregnant women were consistent with the advantages of this technique as a simple, non-invasive technique without side effects on the pregnant woman and fetus, easy to use, being non-pharmacological, without cost and no specialized abilities or manpower required.

Moreover, this result agrees with **Ahmed et al., (2022)** who studied "*Effect of Four-Square Breathing Exercises on After Pains, Initiation of Breastfeeding, and Satisfaction with Intervention among Postpartum Mothers.",* Egypt and showed that a majority of study group were completely satisfied with using breathing exercise and that they were comfortable as it was a positive experience.

Also, these results are similar to another randomized controlled trial **Chitra, (2023)** who studied " *A study to assess the effectiveness of lamaze method in terms of labour pain perception, anxiety and progress of labour among primi mothers in active first stage of labour ",* India and revealed that 100% primi mothers were adequately satisfied with applying Lamaze technique during labor.

Conclusion:

Based on the results of the present study, it could be concluded that; applying Lamaze technique during first stage of labor had a positive effect on enhancing labor pain and increasing women's satisfaction as there was a reduction on labor pain scores among study group compared to control group during the first stage of labor after practicing Lamaze

technique. Therefore, the study hypotheses were supported.

Recommendations:

- Brochures regarding Lamaze breathing exercise should be available at outpatient clinics and obstetrics and gynecology departments for all pregnant women.
- Training programs regarding applying Lamaze breathing exercises should be conducted for all pregnant women at obstetrics and gynecology departments.

Recommendations for further studies:

- The effect of Lamaze breathing technique can be assessed in combination with other relaxation technique like meditation and progressive relaxation procedures to improve maternal and fetal outcome.

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