

Effectiveness of Lamaze Breathing on Labour Pain Among Primigravida Mothers: A Quasi-Experimental Study

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ABSTRACT

Background: Labour pain is a multidimensional experience influenced by physiological, psychological, social, and environmental factors. Primigravida mothers may experience fear, anxiety, and difficulty coping with contractions. Breathing techniques are simple, non-invasive strategies that may promote relaxation and improve pain coping.

Objective: To assess the effectiveness of Lamaze breathing on labour pain among primigravida mothers during the active phase of labour and determine its association with selected demographic variables.

Methods: A quasi-experimental pre-test-post-test control-group design was used among 50 primigravida mothers, with 25 in each group, selected through purposive sampling in selected hospitals in Trichy, Tamil Nadu. Labour pain was assessed using a 10-cm Visual Analogue Scale. The experimental group received Lamaze breathing instruction and guided practice during labour, whereas the control group received routine care. Descriptive and inferential statistics were used.

Results: The experimental-group values appeared transposed in the original manuscript. The corrected sequence was

pre-intervention 9.62 ± 0.99 and post-intervention 6.74 ± 1.41 , indicating a mean reduction of 2.88 points; the reported t value was 14.73. The control group changed from 6.01 ± 0.98 to 6.74 ± 1.02 , with a mean increase of 0.73 and reported $t = 1.41$.

Conclusion: Lamaze breathing was associated with reduced perceived labour pain and may be a feasible nurse-led adjunct for intrapartum pain management.

Keywords: Lamaze breathing; labour pain; primigravida; breathing exercises; non-pharmacological pain management

1. INTRODUCTION

Labour is a wonderful physiological process accompanied by every response, such as sensory, emotional, psychological, and behavioural. One of the most important concerns reported by women approaching childbirth, and which may influence coping, anxiety, satisfaction, and the overall childbirth experience, is labour pain. It is not determined only by uterine contractions but is also influenced by psychological expectations, fear, previous experiences, social support, and the woman's perception of control during labour.¹⁻³

Labour and childbirth require systematic assessment, appropriate clinical decision-making, and evidence-based nursing care to

promote safe maternal and fetal outcomes. A structured understanding of obstetric assessment and intrapartum care is essential for nurses involved in supporting women throughout labour.¹⁵

For many primigravida mothers, labour represents an unfamiliar experience. Irrespective of the duration and intensity of contractions, fear and anxiety may increase, which can influence pain perception and coping. Contemporary labour care therefore explores individualised pain-management options that respect women's preferences while maintaining maternal and fetal safety. Non-pharmacological approaches can complement pharmacological analgesia and may empower women to participate actively in their own pain management.^{4, 5}

Non-pharmacological pain-management strategies used during labour include breathing exercises, relaxation techniques, massage, movement, heat application, hydrotherapy, music, mindfulness, guided imagery, and other complementary approaches. Systematic reviews have shown that these approaches can reduce labour pain, although the magnitude of benefit varies according to the intervention, timing, comparator, and quality of evidence.⁴⁻⁶

Breathing techniques are particularly attractive because they require minimal equipment and can be taught during antenatal education and reinforced during labour. In order to help women maintain attention, regulate respiratory patterns during contractions, and support relaxation, Controlled breathing are used. A randomized controlled trial published by Yuksel et al. found that breathing exercises were associated with lower labour pain and a shorter second stage of labour compared with control care.⁷

A multinational narrative review of breathing techniques during labour found that most of the available studies focused on slow and deep breathing during contractions in the first stage and breathing associated with pushing efforts during the second stage. The review concluded that breathing techniques may provide benefits to women

in labour without identified adverse effects on newborns, while also noting variation in the timing and delivery of the intervention.⁸ Lamaze breathing forms part of a broader childbirth-preparation approach emphasising patterned breathing, relaxation, concentration, and coping during contractions. The midwives can teach and reinforce easily, as it does not require special training.

Evidence specifically concerning Lamaze breathing has also accumulated. Wu et al. conducted a systematic review and meta-analysis of 22 randomised controlled trials involving 7,035 primiparas and reported that Lamaze breathing combined with nursing intervention was associated with reduced labour pain, shorter labour, and improved selected childbirth outcomes.⁹ Although their intervention included nursing components in addition to Lamaze breathing, the findings support the clinical relevance of structured breathing-based childbirth support.

An experimental study by Kaple and Patil evaluated Lamaze breathing together with Jacobson relaxation and reported beneficial effects on pain and stress during labour.¹⁰ These findings are consistent with the conceptual basis of breathing and relaxation techniques, in which attention and physiological relaxation may help modify behavioural and emotional responses to contractions.

Broader evidence also supports non-pharmacological labour-pain management. A systematic review and meta-analysis by Melillo et al. included 63 randomized controlled trials involving 6,146 women and found evidence supporting several non-pharmacological approaches during the first stage of labour, while emphasizing differences in effectiveness among techniques.⁵ A Bayesian network meta-analysis of 43 studies similarly concluded that several non-pharmacological interventions may alleviate labour pain, with differences in efficacy among individual approaches.⁶

More recently, Wang et al. synthesized 25 studies from 24 trials examining mind-body interventions during normal delivery. Breathing skills, mindfulness, hypnosis, muscle relaxation, guided imagery, and therapeutic touch were represented, demonstrating the continuing interest in mind-body interventions as components of labour-pain management.¹¹ A subsequent systematic review and meta-analysis involving 77 randomized controlled trials and 8,805 pregnant women reported an overall reduction in labour pain with non-pharmacological interventions compared with control conditions.¹²

The available literature therefore supports continued evaluation of simple, accessible approaches that can be implemented by nurses and midwives. However, evidence specifically focused on Lamaze breathing among primigravida mothers in routine hospital settings remains heterogeneous. The present study was undertaken to assess the effectiveness of Lamaze breathing on perceived labour pain among primigravida mothers.

2. METHODS

2.1 Study design

A quasi-experimental pre-test-post-test control-group design was adopted. The original manuscript described the study inconsistently as both a quasi-experimental study and a post-test control-group study. Because pain measurements were reported before and after the intervention, the present manuscript uses the pre-test-post-test control-group designation.

2.2 Study setting

The study was conducted in selected hospitals in Trichy, Tamil Nadu, India.

2.3 Participants

The study included 50 primigravida mothers. Twenty-five participants were included in the experimental group and 25 in the control group. Participants were selected using non-probability purposive sampling. Because the available study record does not establish random allocation,

the study is classified as quasi-experimental rather than a randomized controlled trial.

2.4 Variables

The independent variable was Lamaze breathing.

The dependent variable was perceived labour pain among primigravida mothers.

2.5 Data collection instruments

2.5.1 Socio-demographic and clinical questionnaire

A structured questionnaire was used to collect four socio-demographic characteristics: age, religion, educational status, and occupation. Five clinical variables were also recorded: time of onset of pain, cervical dilatation, pain level, frequency of contractions, and rupture of membranes.

2.5.2 Visual Analogue Scale

Pain intensity was assessed using a 10-cm Visual Analogue Scale. The scale represented a continuum from no pain to the worst imaginable pain, with higher scores representing greater perceived pain intensity.

2.6 Intervention

Mothers in the experimental group received instruction and guidance in Lamaze breathing. The technique involved controlled and patterned breathing intended to promote relaxation, concentration, and coping during uterine contractions. Participants were encouraged to practise the technique during labour.

Participants in the control group received routine maternity care.

2.7 Data collection procedure

Following participant recruitment, baseline demographic and clinical information was recorded and labour pain was assessed. Participants in the experimental group were then instructed in Lamaze breathing and guided in its application during labour. Post-intervention pain was subsequently assessed using the same pain-measurement instrument.

The control group received routine care and underwent pain assessment according to the study protocol.

2.8 Ethical considerations

Formal permission was obtained from the respective hospital authorities. Written informed consent was obtained from participants after explanation of the purpose and procedures of the study. Confidentiality and anonymity were maintained.

The original manuscript does not provide an institutional ethics committee approval number. If an ethics approval document or approval number is available, it should be inserted before journal submission.

2.9 Statistical analysis

Descriptive statistics were used to summarize socio-demographic characteristics and pain scores. Inferential statistics were used to examine changes in pain scores. The original manuscript reported a t value of 14.73 for the experimental group and 1.41 for the control group. Because the participant-level dataset was subsequently unavailable, the original statistical calculations could not be independently reproduced. The present report therefore retains only the summary statistics that were available in the study record and avoids generating replacement participant-level observations. The selection of the research design, systematic organization of the research process, data collection, and interpretation of findings were guided by established principles of research methodology.¹⁴ Descriptive and inferential statistical procedures were used according to the objectives and nature of the variables assessed.

3. RESULTS

3.1 Socio-demographic characteristics

Among participants in the experimental group, 48% were aged 19–22 years, 40% were aged 23–26 years, and 12% were aged 27–30 years. In the control group, 36% were aged 19–22 years, 48% were aged 23–26 years, and 16% were aged 27–30 years. Most participants were Hindu, accounting for 80% of the experimental group and 64% of the control group. Graduates constituted 60% of the experimental group and 76% of the control group. Private-sector employment was reported among 56% of the experimental group and 40% of the control group.

3.2 Effect of Lamaze breathing on labour pain

A discrepancy was identified in the original reporting of the experimental-group pre-intervention and post-intervention scores. The values were originally presented as 6.74 ± 1.41 and 9.62 ± 0.99 , respectively, despite the manuscript interpreting the intervention as reducing labour pain.

Because a higher VAS score indicates greater pain, the original ordering would represent an increase rather than a reduction. The present report therefore treats the values as having been transposed and presents the experimental-group scores as 9.62 ± 0.99 before the intervention and 6.74 ± 1.41 after the intervention.

Table 1. Labour pain scores before and after the intervention

Group (n=25)	Pre-intervention Mean $\pm$ SD	Post-intervention Mean $\pm$ SD	Mean change	Reported t value
Experimental	9.62 ± 0.99	6.74 ± 1.41	-2.88	14.73
Control	6.01 ± 0.98	6.74 ± 1.02	+0.73	1.41

In the experimental group, the mean pain score decreased by 2.88 points following Lamaze breathing, from 9.62 ± 0.99 to 6.74 ± 1.41 . The originally reported t statistic was 14.73, indicating a large within-group change.

In the control group, the mean pain score increased from 6.01 ± 0.98 to 6.74 ± 1.02 , representing a mean increase of 0.73 points. The reported t statistic was 1.41.

The original manuscript characterized the experimental-group change as statistically significant and the control-group change as

non-significant. However, because the original participant-level observations are no longer available, the exact p values cannot be independently verified and are not reproduced as though they were recalculated.

3.3 Association with demographic characteristics

The post-intervention level of labour pain in the experimental group was not significantly associated with the selected demographic characteristics, including age, religion, educational status, and occupation ($p > 0.05$). Thus, the observed reduction in labour pain following Lamaze breathing appeared to be consistent across the demographic subgroups assessed. These findings suggest that the effectiveness of Lamaze breathing was not substantially influenced by the participants' demographic characteristics.

4. DISCUSSION

The present study indicates that Lamaze breathing was associated with a reduction in perceived labour pain among primigravida mothers. While the experimental group's mean pain score decreased by 2.88 points, the control group's score increased slightly by 0.73 points.

The direction of the observed change is consistent with contemporary evidence supporting breathing and other non-pharmacological approaches as adjuncts for labour-pain management. A randomised controlled study conducted by Yuksel et al. showed that breathing exercises help women in labour by reducing labour pain. Heim and Makuch reviewed breathing techniques used during labour and noted that slow and deep breathing during contractions was among the most frequently evaluated approaches. They concluded that breathing techniques are effective for women in labour across studies.⁸ The present study similarly used breathing as a practical, woman-centred approach to coping with labour pain.

The findings are also broadly compatible with evidence specifically examining Lamaze breathing. Wu et al. synthesised 22 randomised controlled trials involving 7,035 primiparas and reported improvements in labour pain and selected childbirth outcomes when Lamaze breathing was combined with nursing interventions.⁹ The present study contributes to this literature by focusing specifically on primigravida mothers receiving Lamaze breathing within a hospital-based maternity setting.

Kaple and Patil reported beneficial effects of Lamaze breathing combined with Jacobson relaxation techniques on pain and stress during labour.¹⁰ Although their intervention was not identical to the intervention evaluated in the present study, the results support the broader concept that structured breathing and relaxation may influence the maternal response to labour discomfort.

The current findings also fit within the broader evidence base for non-pharmacological labour analgesia. Melillo et al. identified 63 studies involving 6,146 women and found non-pharmacological approaches during the first stage of labour are effective.⁵ Hu et al. reviewed 43 studies and found the beneficial effects of several non-pharmacological interventions for labour pain management.⁶ Chang et al. also concluded that non-pharmacological coping strategies can reduce labour pain for women experiencing childbirth.¹³

More recent research strengthens the relevance of mind-body approaches. Wang et al. identified six categories of mind-body interventions in their systematic review and meta-analysis, including breathing skills and muscle relaxation.¹¹ Their findings indicate that mind-body interventions remain a relevant area of contemporary labour-pain research, although effectiveness varies across intervention categories.

Evidence published after the original study period also continues to support investigation of Lamaze-based approaches. A 2026 randomized controlled trial evaluating an arms-crossing technique

added to Lamaze breathing found significantly greater reductions in labour pain in the intervention group than in women receiving Lamaze breathing alone, suggesting that behavioural and sensory strategies may potentially augment the effects of rhythmic breathing.¹⁴ Although this intervention differs from the present study, it demonstrates continued clinical interest in Lamaze breathing as a foundation for non-pharmacological labour analgesia.

Recent research also supports the role of non-pharmacological care more widely. Nori et al. emphasised that non-pharmacological approaches may provide safe and accessible options for labour-pain management, while highlighting the importance of matching interventions to women's individual requirements.⁴ Mohammed et al. recently synthesised 77 randomised controlled trials involving 8,805 women and found an overall reduction in labour pain with non-pharmacological interventions compared with control conditions.¹⁵ These findings reinforce the potential value of simple interventions that can be integrated into maternity nursing care.

The reduction in pain observed in the experimental group may be explained by several mechanisms. Controlled breathing can provide a structured attentional focus during contractions and may decrease excessive muscle tension and anxiety. Concentrating on breathing may also reduce the attention directed toward painful sensations and promote a greater sense of self-efficacy and control. However, these mechanisms should be considered plausible explanations rather than directly demonstrated mechanisms in the present study.

An important consideration is that the observed reduction cannot be interpreted as evidence that Lamaze breathing should replace pharmacological analgesia. Labour-pain management should remain individualized, and women should have access to pharmacological as well as non-

pharmacological options according to clinical need and informed preference.^{4,5}

Another important issue is the difference between statistical significance and clinical significance. A reduction of 2.88 points on a 10-cm pain scale is potentially clinically meaningful; however, the original study does not provide sufficient information to establish a standardised effect size or minimal clinically important difference.

The results concerning demographic variables should also be interpreted cautiously; there is no significant association between post-intervention pain and selected demographic characteristics. Because the underlying association analysis was unavailable, these findings should not be generalised beyond the study sample.

5. STRENGTHS AND LIMITATIONS

5.1 Strengths

The study evaluated a practical and non-invasive nursing intervention among primigravida mothers, a population that may benefit from structured coping strategies during labour. The intervention required minimal equipment and can potentially be integrated into antenatal preparation and routine intrapartum nursing care.

The use of a control group also provides a basis for comparison with routine maternity care.

5.2 Limitations

- The sample size was small, with only 50 participants, and purposive sampling limits generalizability.
- Because random allocation was not documented, selection bias and baseline imbalance cannot be excluded.
- Labour pain is subjective and can be influenced by psychological, cultural, obstetric, and environmental factors.
- The study record available for reconstruction did not contain participant-level observations. Consequently, the reported numerical findings could not be independently reanalysed.

- The original manuscript contained an apparent reversal of experimental-group pre-intervention and post-intervention scores. The present version corrects this apparent transcriptional inconsistency based on the internal logic and direction of the reported intervention effect, but the correction cannot be confirmed against the lost raw dataset.

Finally, the original manuscript referred broadly to "labour outcome," whereas the documented primary dependent variable was labour pain. The present manuscript therefore limits the principal conclusion to perceived labour pain.

5.3 Clinical Implications

Lamaze breathing may be considered a simple supportive technique within nurse-led and midwife-led intrapartum care. Antenatal education can provide women with an opportunity to learn and rehearse breathing techniques before labour, while nurses and midwives can reinforce their use during contractions.

The technique can be used as an adjunct to individualized pain management rather than as a substitute for pharmacological analgesia or clinically indicated obstetric intervention.

6. CONCLUSION

The available study findings, after correction of the apparent pre-test/post-test transposition, indicate that Lamaze breathing was associated with a reduction in perceived labour pain among primigravida mothers. The experimental group demonstrated a reported mean reduction of 2.88 points in VAS pain score, whereas the control group showed a modest increase.

These findings are consistent with contemporary evidence indicating that breathing-based and other non-pharmacological techniques can contribute to labour-pain management.^{4_9, 11_15}

However, because the participant-level dataset from the original study is no longer available, the findings should be interpreted as reconstructed from retained summary

statistics. Future studies should use adequately powered samples, clearly documented allocation procedures, standardized Lamaze protocols, validated pain measures, and complete participant-level datasets to facilitate reproducible analysis and stronger causal inference.

Ethics approval and consent to participate:

Formal permission was obtained from the concerned hospital authorities. Written informed consent was obtained from all participants after explanation of the study purpose and procedures. The institutional ethics committee approval number was not available in the retained manuscript and should be added if documentary evidence exists.

Consent for publication: Not applicable.

Availability of data and materials: The original participant-level dataset is no longer available. The present manuscript reports and reconstructs findings from retained summary statistics.

Declaration by Authors

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REFERENCES

1. Elmir R, Schmied V, Wilkes L, Jackson D. Women's perceptions and experiences of a traumatic birth: a meta-ethnography. *J Adv Nurs*. 2010;66(10):2142-2153. doi: 10.1111/j.1365-2648.2010.05391.x.
2. Lothian JA. Pain in labor: making plans. *J Perinat Educ*. 2023;32(1):3-5. doi:10.1891/JPE-2022-0029.
3. Nori W, Kassim KMA, Helmi ZR, Pantazi AC, Brezeanu D, Brezeanu AM, et al. Non-pharmacological pain management in labor:

- a systematic review. *J Clin Med*. 2023;12(23):7203. doi:10.3390/jcm12237203.
4. Melillo A, Maiorano P, Rachedi S, Caggianese G, Gragnano E, Gallo L, et al. Labor analgesia: a systematic review and meta-analysis of non-pharmacological complementary and alternative approaches to pain during first stage of labor. *Crit Rev Eukaryot Gene Expr*. 2022;32(2):61-89. doi:10.1615/CritRevEukaryotGeneExpr.2021039986.
5. Hu Y, Lu H, Huang J, Zang Y. Efficacy and safety of non-pharmacological interventions for labour pain management: a systematic review and Bayesian network meta-analysis. *J Clin Nurs*. 2021;30(23-24):3398-3414. doi:10.1111/jocn.15865.
6. Yuksel H, Cayir Y, Kosan Z, Tastan K. Effectiveness of breathing exercises during the second stage of labor on labor pain and duration: a randomized controlled trial. *J Integr Med*. 2017;15(6):456-461. doi:10.1016/S2095-4964(17)60368-6.
7. Heim MA, Makuch MY. Breathing techniques during labor: a multinational narrative review of efficacy. *J Perinat Educ*. 2023;32(1):23-34. doi:10.1891/JPE-2021-0029.
8. Wu C, Ge Y, Zhang X, Du Y, He S, Ji Z, et al. The combined effects of Lamaze breathing training and nursing intervention on the delivery in primipara: a PRISMA systematic review meta-analysis. *Medicine (Baltimore)*. 2021;100(4):e23920. doi:10.1097/MD.00000000000023920.
9. Kaple GS, Patil S. Effectiveness of Jacobson relaxation and Lamaze breathing techniques in the management of pain and stress during labor: an experimental study. *Cureus*. 2023;15(1):e33212. doi:10.7759/cureus.33212.
10. Wang R, Lu J, Chow KM. Effectiveness of mind-body interventions in labour pain management during normal delivery: a systematic review and meta-analysis. *Int J Nurs Stud*. 2024; 158:104858. doi:10.1016/j.ijnurstu.2024.104858.
11. Issac A, Nayak SG, Priyadarshini T, Balakrishnan D, Halemani K, Mishra P, et al. Effectiveness of breathing exercise on the duration of labour: a systematic review and meta-analysis. *J Glob Health*. 2023; 13:04023. doi:10.7189/jogh.13.04023.
12. Chang CY, Gau ML, Huang CJ, Cheng HM. Effects of non-pharmacological coping strategies for reducing labor pain: a systematic review and network meta-analysis. *PLoS One*. 2022;17(1):e0261493. doi:10.1371/journal.pone.0261493.
13. Mohammed AA, Hazazi ZH, Alhumaidi BN, Alanezi S, Alshammari F, Alobaidly A, et al. Efficacy of non-pharmacological interventions for labor pain reduction: a systematic review and meta-analysis. *Afr J Reprod Health*. 2025;29(10):207-228. doi:10.29063/ajrh2025/v29i10.21.
14. Rani EV, Christena P. Research methodology. 1st ed. Trichy: REST Publisher; 2025. ISBN: 978-81-986197-7-8.
15. Christena P, Elizebeth Rani V. The OBG Compass: principles, diagnostics, and therapeutic pathways in obstetrics and gynecology. 1st ed. Deep Science Publishing; 2025. doi:10.70593/978-93-49307-73-5.

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