



Effectiveness of lumbosacral massage on labor pain in primigravida women in Kanpur

Jyoti Katiyar, Dr. Maneesh Kumar Sharma*

Department of Nursing, Shri Venkateshwara University, Gajraula, Uttar Pradesh, India

Abstract

This study evaluates the efficacy of lumbosacral massage as a non-pharmacological intervention for pain management during the active phase of labor among primigravida women. Labor pain is often perceived as one of the most intense experiences in a woman's life, particularly for first-time mothers who may lack effective coping strategies. Given the potential side effects associated with pharmacological pain relief methods, exploring alternative interventions like lumbosacral massage is essential for enhancing maternal care. This research employed a true experimental design with a sample of 60 primigravida women, randomly assigned to an experimental group receiving lumbosacral massage and a control group receiving standard care. Pain levels were measured using the Modified McGill Pain Scale, allowing for a comprehensive assessment of sensory, affective, and evaluative dimensions of pain before and immediately after the intervention. The results indicated a significant reduction in pain levels for the experimental group, with pre-test scores averaging 25.1 (SD \pm 5.2) and post-test scores dropping to 12.3 (SD \pm 4.0), yielding a t-value of 12.90 and p-value of <0.001 . In contrast, the control group exhibited minimal change in pain, with pre-test scores of 24.7 (SD \pm 5.5) and post-test scores of 23.9 (SD \pm 5.2) ($t = 1.3$, $p = 0.203$). Additionally, 86.6% of participants in the massage group reported moderate to high satisfaction with their pain management experience. These findings suggest that lumbosacral massage is an effective complementary method for managing labor pain, enhancing maternal comfort and satisfaction. The study advocates for the integration of such non-pharmacological interventions into standard obstetric care practices, paving the way for improved maternal outcomes during childbirth.

Keywords: Labor pain, lumbosacral massage, primigravida, non-pharmacological intervention, maternal well-being.

Introduction

Labor pain is often regarded as one of the most profound experiences in a woman's life, marking a significant transition filled with both excitement and apprehension. This pain can be particularly intense for primigravida women, those who are experiencing childbirth for the first time. These women frequently encounter heightened anxiety and stress levels due to their inexperience, which can magnify the physical sensations of pain. The unfamiliarity with the labor process may leave them feeling vulnerable and overwhelmed, complicating their ability to manage pain effectively. The perception of labor pain varies widely among women, influenced not only by physiological factors but also by psychological and emotional states (Lowe, 2002) [3]. Recognizing these challenges is crucial, as effective pain management can significantly impact maternal well-being and satisfaction during childbirth. While various analgesic methods exist to alleviate labor pain, their side effects and potential complications can sometimes outweigh their benefits. Pharmacological interventions such as epidural anesthesia, opioids and other analgesics are widely used, but they may lead to unintended consequences, including decreased maternal blood pressure, prolonged labor, and impacts on fetal heart rate (Simkin, 2014) [5]. Furthermore, in resource-limited settings, access to effective pain relief options may be restricted, rendering many women reliant on inadequate pain management strategies (Smith et al., 2018) [6]. Consequently, there is an increasing demand for non-pharmacological alternatives that can provide effective relief and support the dignity and autonomy of women during the labor process. Among the various non-pharmacological strategies, lumbosacral massage has emerged as a promising intervention for managing labor pain. This technique focuses on the lower back region,

which is often a site of discomfort for laboring women and involves applying manual pressure to stimulate the skin, muscles, and underlying tissues. Research indicates that lumbosacral massage can enhance blood circulation, promote muscle relaxation, and stimulate the release of endorphins, natural hormones in the body that help modulate pain perception (Gallo et al., 2013 [1]; Milette et al., 2019) [4]. These physiological responses may contribute significantly to alleviating the perception of pain and creating a more positive labor experience for women. The objective of this study is to evaluate the effectiveness of lumbosacral massage in reducing the intensity of pain experienced by primigravida women during the active phase of labor. By focusing specifically on this non-invasive intervention, the research aims to provide valuable insights into pain management during labor and contribute to the growing body of literature advocating for non-pharmacological approaches in obstetric care. The active phase of labor, characterized by regular and powerful uterine contractions, can be particularly taxing for first-time mothers who may feel overwhelmed by the experience. Understanding the efficacy of lumbosacral massage holds the promise of improving maternal comfort levels and overall satisfaction during childbirth. In contemporary obstetric practice, there is a growing emphasis on patient-centered care, an approach that prioritizes the needs and preferences of women during their childbirth experience. Non-pharmacological methods like lumbosacral massage align with this philosophy by empowering women to participate in their care actively. Research shows that women who take an active role in pain management report higher satisfaction rates and a more positive overall childbirth experience (Hodnett, 2002) [2]. This evidence underscores the relevance of studying lumbosacral massage

not only as a means of pain reduction but also as a method to enhance the overall birthing experience for women.

Additionally, exploring and validating non-pharmacological interventions becomes particularly important in areas with limited access to advanced pain relief options. In such settings, incorporating simple, cost-effective strategies like lumbosacral massage can enhance pain management while optimizing maternal and neonatal outcomes (Gallo et al., 2013) [1]. The adoption of lumbosacral massage as a routine practice in labor care has the potential to reduce reliance on pharmacological methods, thereby alleviating the associated risks and complications for both mother and child. Despite the recognized benefits of non-pharmacological pain management techniques, research remains limited regarding the systematic evaluation of massage therapies during labor, particularly in primigravida populations. This study seeks to bridge that gap by providing empirical evidence on the effectiveness of lumbosacral massage in managing labor pain. By measuring pain levels before and after the intervention, the research aims to contribute to the existing body of knowledge, guiding healthcare providers in integrating massage techniques into standard labor practices. As the field of maternity care continues to evolve toward more holistic and patient-centered approaches, understanding the role of non-pharmacological methods such as lumbosacral massage is increasingly important. This research aims not only to elucidate the effectiveness of lumbosacral massage in reducing labor pain but also to enhance the overall childbirth experience for primigravida women. Exploring this intervention presents a valuable opportunity to empower women during labor and support their journey through one of life's most significant transitions.

Methodology

Study Design: This research employed a true experimental design to rigorously evaluate the impact of lumbosacral massage on labor pain among primigravida women. This approach enables a clear comparison between two distinct groups: the experimental group receiving lumbosacral massage and the control group receiving standard care. The randomized assignment of participants to either group constitutes a robust mechanism for minimizing bias and enhancing the validity of findings. The true experimental design further facilitates the establishment of cause-and-effect relationships regarding the effectiveness of the intervention in alleviating pain during labor.

Population and Sample: The study sample comprised 60 primigravida women in the active phase of labor, recruited from selected hospitals in Kanpur, India. This particular population was chosen due to its relevance in assessing the effectiveness of interventions aimed at first-time mothers who may not have prior experience in managing labor pain.

Eligibility Criteria: The following criteria were imposed to ensure that participants selected for the study would suit the research objectives:

Inclusion Criteria: Primigravida status: Participants must be first-time mothers, providing insights specific to women without prior childbirth experience.

Active phase of labor: Participants must be characterized by cervical dilation of at least 4 cm, indicating they are in active labor, which is critical for assessing pain during a relevant phase.

Informed consent: Participants must provide adequate written informed consent to partake in the study willingly.

Exclusion Criteria: Contraindicated medical conditions: Individuals with significant obstetric complications such as preeclampsia, eclampsia, or other severe pregnancy-related health risks were excluded to minimize confounding variables and ensure participant safety.

Previous analgesic treatment: Women who had received any form of analgesic treatment or pharmacological pain relief during labor prior to the intervention were excluded to establish a baseline pain perception without prior influence.

Known allergies or contraindications: Participants with known allergies to massage techniques or conditions prohibiting manual therapy were not eligible to ensure safety and prevent adverse effects.

Sampling Technique: Participants were recruited using a purposive sampling technique, which allowed for a focused and efficient enrollment of eligible mothers based on the previously outlined criteria. Once the sample of 60 primigravida women was secured, participants were randomly assigned to either the experimental group (lumbosacral massage) or the control group (standard care). The random allocation was facilitated using computerized randomization software to ensure an unbiased distribution of participants across the two groups.

Intervention

Lumbosacral Massage: Participants in the experimental group received a 30-minute session of lumbosacral massage during the active phase of labor, administered by trained nursing staff following a standardized protocol. The implementation of this intervention was key to providing a controlled approach to evaluating its effects on pain levels among participants.

Preparation of the Environment: Quiet and comfortable setting: The massage was conducted in a private and serene environment to promote relaxation, thus enhancing the effectiveness of the intervention.

Comfortable positioning: Participants were positioned either on their side or in a semi-reclined position to optimize accessibility to the lumbosacral area while maintaining comfort throughout the session.

Massage Technique

The massage consisted of various techniques, including:
Effleurage: Long, gliding strokes over the lower back aimed at enhancing blood flow and promoting relaxation.
Petrissage: Kneading motions to relieve muscle tension.
Circular motions: Applying pressure in circular patterns on sore areas to stimulate comfort.
Pressure and feedback: A moderate pressure level was employed, and continual communication was maintained to

adapt the pressure at the discretion of each participant’s comfort level.

Duration

The lumbosacral massage was continuously administered for 30 minutes to ensure that participants received a consistent intervention designed to maximize its therapeutic effect during the active phase of labor.

Control Group

The control group received standard care in accordance with hospital protocols. This standard care included:

Continuous monitoring: Routine fetal heart rate monitoring and maternal well-being checks were carried out to ensure safety and adherence to clinical best practices.

Emotional support: Basic encouragement and emotional support were provided by the healthcare staff to help alleviate stress and anxiety, but no massage or additional pain relief techniques were employed during the observed period.

Pain Assessment

Measurement Instrument

Pain levels were quantitatively assessed using the Modified McGill Pain Scale (MMPS). This comprehensive scale captures multiple dimensions of pain perception, allowing for a thorough evaluation:

Sensory Dimension: This aspect evaluates the intensity and quality of pain through patients' subjective descriptions of their pain experiences.

Affective Dimension: This dimension captures the emotional response tied to pain, assessing factors such as anxiety, fear, or distress associated with labor pain.

Evaluative Dimension: This component measures the overall perception of pain severity, providing a holistic view of the individual’s pain experience.

Assessment Procedure

Pre-Test Assessment: Pain levels were evaluated immediately before the intervention for both groups using the Modified McGill Pain Scale. This baseline measurement established a reference point for understanding the effectiveness of the intervention.

Post-Test Assessment: Following the intervention, participants in the experimental group underwent immediate post-test assessments. For the control group, post-test assessments were conducted after the same duration of 30 minutes without any massage intervention. This consistency was essential for ensuring comparative accuracy between the groups.

Data Analysis

Statistical Methods

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) software. The following statistical approaches were instituted to analyze the collected data:

Descriptive Statistics: Summary statistics, including means, standard deviations, and frequency distributions, were calculated to describe demographic characteristics and baseline pain levels of participants. This initial analysis provides insight into the sample's characteristics and variability.

Inferential Statistics: A paired t-test was utilized to analyze the differences in pain scores before and after the intervention in both groups, allowing for an assessment of the lumbosacral massage's effectiveness. This approach is suited to determine whether observed changes in pain levels are statistically significant. A significance level of $p < 0.05$ was established, meaning that any p-value below this threshold would indicate that the intervention had a statistically significant effect on pain levels.

Ethical Considerations

This study adhered to the ethical guidelines set forth by the Research Ethics Committee. Prior to enrolling in the study, informed consent was obtained from all participants, ensuring they were fully informed of their rights and the nature of the study, including potential risks and benefits associated with participation. Confidentiality was strictly maintained throughout the research process, safeguarding participants' identities and data. Furthermore, participants had the right to withdraw from the study at any point without any repercussions on their medical care or treatment. By meticulously following these guidelines, the study aimed to ensure the ethical integrity of the research process while prioritizing participant safety and autonomy.

Results and Discussion

The study aimed to evaluate the effectiveness of lumbosacral massage on labor pain among primigravida women. The results presented are based on the demographic characteristics of the participants, pain assessments before and after the intervention, participant satisfaction levels, and trends regarding the duration of labor. As outlined in Table 1, the demographic characteristics of the participants did not show significant differences between the experimental and control groups:

Table 1: Demographic Characteristics of Participants

Characteristics	Experimental Group (n=30)	Control Group (n=30)
Age (Mean ± SD)	24.5 ± 2.3	25.1 ± 2.5
Education		
- High School	12 (40%)	11 (36.67%)
- Graduate	18 (60%)	19 (63.33%)
Duration of Marriage (Mean ± SD)	2.5 ± 1.25	2.4 ± 1.15

Note: No significant differences in demographic characteristics were found between groups ($p > 0.05$).

The average age of participants in the experimental group is 24.5 years, while the control group is slightly older at 25.1 years. The standard deviation (SD) indicates variability in age; lower SD values suggest that most participants' ages are close to the mean. This demographic is relevant because age can influence childbirth experiences and perceptions of pain. A breakdown of educational attainment shows that 40% of the experimental group completed high school, while 60% are graduates. In the control group, 36.67% completed high school and 63.33% achieved graduate status. This distribution indicates that both groups are relatively well-educated, which may affect their knowledge and attitudes toward pain management during labor. The average duration of marriage for the experimental group is 2.5 years, compared to 2.4 years for the control group. Similar durations suggest that marital experience is not

likely to have influenced the labor pain experiences, thereby contributing to the comparability between the groups. The lack of significant differences in demographic variables ($p > 0.05$) assures that any observed effects of the intervention (lumbosacral massage) on pain levels can be attributed to the intervention itself rather than demographic disparities.

Table 2: Comparison of Pain Levels Pre- and Post-Intervention

Group	Pre-Test Pain Score (Mean \pm SD)	Post-Test Pain Score (Mean \pm SD)	t-value	p-value
Experimental (Massage)	25.1 \pm 5.2	12.3 \pm 4.0	12.90	<0.001
Control (Standard Care)	24.7 \pm 5.5	23.9 \pm 5.2	1.3	0.203

The experimental group (lumbosacral massage) had a mean pre-test pain score of 25.1 with a standard deviation of 5.2, indicating a high level of pain before the intervention. The control group had a mean pre-test pain score of 24.7 (SD \pm 5.5), also indicating significant discomfort but very similar to the experimental group, reinforcing the comparability between groups prior to the intervention. In the experimental group, post-test mean pain scores dramatically dropped to 12.3 (SD \pm 4.0), demonstrating a substantial effect of the intervention on reducing labor pain. The control group exhibited minimal change in their post-test pain level, with scores averaging 23.9 (SD \pm 5.2), indicating that standard care alone did not alleviate pain as effectively as the massage. The t-value of 12.90 and p-value of <0.001 in the experimental group suggest that the decrease in pain levels is highly significant and that lumbosacral massage has a significant positive effect on pain management. Conversely, the control group's t-value of 1.3 with a p-value of 0.203 indicates no significant difference in pain levels after receiving standard care, confirming that the absence of the intervention did not lead to meaningful pain reduction. This table quantitatively highlights the effectiveness of lumbosacral massage as an intervention for managing labor pain. The significant differences between the experimental and control groups clearly demonstrate the benefits of incorporating such non-pharmacological techniques in labor management protocols.

Further analysis regarding participant satisfaction revealed that 86.6% of women in the experimental group reported moderate to high satisfaction with their pain management experience during labor. This emphasizes the perceived effectiveness of lumbosacral massage not only in alleviating pain but also in enhancing overall maternal satisfaction with the labor experience. Observations also indicated a potential trend towards shorter labor durations among women receiving lumbosacral massage; however, this difference was not statistically significant ($p > 0.05$). These findings warrant further investigation in future studies involving a larger sample to validate these preliminary observations.

The findings from this study highlight the effectiveness of lumbosacral massage as a non-pharmacological intervention for managing labor pain among primigravida women. The significant reduction in pain levels observed in the experimental group aligns with previous research that supports the use of non-invasive methods to alleviate labor pain (Gallo et al., 2013^[1]; Simkin, 2014)^[5]. The substantial decrease in mean pain scores from a high baseline indicates that lumbosacral massage can serve as a viable alternative or complementary strategy to pharmacological interventions in clinical settings. The demographic data displayed that both the experimental and control groups were well matched,

Pain Assessment

Pain levels were quantitatively assessed using the Modified McGill Pain Scale. Results summarized in Table 2 demonstrate significant differences in pain scores pre- and post-intervention:

which reinforces the internal validity of the findings. The age and educational background of participants were comparable, suggesting that these factors did not confound the results. This is particularly important, as previous studies have demonstrated that maternal background can influence labor experiences and perceptions of pain (Lowe, 2002; Whitburn et al., 2017)^[7]. Additionally, the high satisfaction levels expressed by the majority of participants who received lumbosacral massage suggest that this intervention not only contributes to physical relief but also enhances the subjective experience of childbirth. This is consistent with the principles of patient-centered care, emphasizing the importance of involving women in their own pain management strategies (Hodnett, 2002)^[2]. By empowering women to engage actively in their pain relief, healthcare providers can improve maternal satisfaction and foster a positive birthing experience. The results concerning the duration of labor, although not statistically significant, indicate a noteworthy trend that could be explored in future research. While the lack of statistical significance underscores the need for more extensive studies, the observation suggests that lumbosacral massage might facilitate shorter labor durations, potentially due to the relaxation and pain relief afforded by the intervention. Overall, this study adds to the growing body of evidence supporting non-pharmacological pain management approaches in childbirth. Given that many women are apprehensive about pharmacological pain relief options, lumbosacral massage offers a safe, accessible, and effective method for improving the labor experience without the associated risks of medications (Smith et al., 2018)^[6].

Conclusion

This research highlights the effectiveness of lumbosacral massage in reducing labor pain among primigravida women during the active phase of labor. Lumbosacral massage has proven to be an effective intervention for reducing labor pain among primigravida women, significantly enhancing maternal satisfaction. The promising findings warrant further exploration through larger-scale studies to validate these results and explore additional implications of lumbosacral massage on labor dynamics. Integrating such non-pharmacological approaches into standard obstetric care practices holds the potential to transform the childbirth experience for many women, promoting both physical and emotional well-being during this crucial life event. Further investigations are warranted to explore the long-term effects of massage and other complementary therapies on labor and postpartum recovery.

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