

The Effect of Back Massage on Labor Pain in the Active Phase of the First Stage of Labor: A Case Study

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ABSTRACT

Background: Labor pain is one of the physiological experiences encountered by nearly all women in labor, resulting from uterine contractions and cervical dilation. Poorly managed pain can increase anxiety and fatigue, as well as affect the progress of labor. One non-pharmacological method that can be used to reduce labor pain is back massage, which works through nerve stimulation and improved maternal relaxation.

Objective: This case study aims to determine the effectiveness of back massage as a strategy for managing labor pain in women during the active phase of the first stage of labor.

Methods: This research uses a descriptive method with a case study approach involving one woman in labor during the active phase of the first stage. Pain intensity was measured using the Numeric Rating Scale (NRS) before and after the back massage intervention. The intervention was performed for 20 minutes on the lumbar and sacral regions using stroking and gentle pressure techniques in accordance with standard procedures.

Results: The study results showed a reduction in pain intensity following the administration of back massage. The pain score, which initially stood at 8 (severe pain), decreased to 5 (moderate pain). Additionally, the mother appeared more relaxed, was able to control her breathing better, and felt more comfortable throughout the labor process.

Conclusion: Back massage is effective in helping reduce the intensity of labor pain in women during the active phase of the first stage of labor. This intervention can be used as a safe, simple, and easy-to-apply non-pharmacological method in midwifery practice to improve maternal comfort during labor.

Keywords: back massage, labor pain, pain management, women in labor, midwifery care

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INTRODUCTION

Labor is a physiological process that marks the end of pregnancy through the expulsion of the fetus, placenta, and fetal membranes from the mother's uterus. Although it is a natural process, labor is often accompanied by pain, which is considered one of the most intense experiences a woman encounters throughout her life.¹ Labor pain arises from uterine contractions, cervical dilation, stretching of the lower uterine segment, and pressure on the pelvic structures and tissues surrounding the birth canal.^{2,3}

The intensity of labor pain varies among individuals and is influenced by multiple factors, including age, parity, psychological condition, cultural background, educational level, previous childbirth experience, and family support during labor.⁴ Poorly managed pain can increase anxiety and stress in the mother. This condition triggers the release of catecholamine and cortisol hormones, which may inhibit uterine contractions, reduce uteroplacental perfusion, prolong the duration of labor, and raise the risk of complications for both the mother and the newborn.⁵

Management of labor pain can be carried out through pharmacological and non-pharmacological approaches. Pharmacological methods, such as opioid analgesics and epidural anesthesia, are proven effective in reducing pain; however, their use may cause certain side effects, including maternal hypotension, nausea, vomiting, and respiratory depression in the newborn.¹ Therefore, non-pharmacological methods are increasingly recommended because they are safer, easier to apply, and support the physiological process of labor.⁶

One of the most widely used non-pharmacological methods in midwifery practice is back massage.^{7,8} Back massage is a tactile stimulation technique performed by applying pressure or stroking movements to the mother's back during labor to promote comfort and reduce the perception of pain.⁹ This intervention works according to the gate control theory proposed by Melzack and Wall, which states that stimulation of large-diameter nerve fibers through touch can block the transmission of pain impulses to the central nervous system, thereby reducing the sensation of pain felt.¹⁰

In addition to blocking pain transmission, back massage can also increase the secretion of endorphins and enkephalins, which act as the body's natural analgesics.^{11,12} The release of these hormones helps induce a sense of relaxation, reduce muscle tension, improve blood circulation, and raise the mother's tolerance toward labor pain.¹³ The state of relaxation achieved through massage also contributes to lower anxiety levels and greater self-confidence in the mother throughout the labor process.^{14,15}

Several studies have shown that back massage effectively reduces labor pain intensity during the active phase of the first stage of labor. Research conducted by Mardiyarningsih and Sabri (2021) found a significant decrease in pain scores after back massage was administered to women in labor. Another study by Fitriani et al. (2022) also observed that mothers who received back massage intervention reported higher comfort levels compared to those in the control group. These findings indicate that back massage has the potential to serve as an effective, simple, and affordable midwifery intervention to help mothers cope with labor pain. Although various studies have demonstrated the benefits of back massage, the effectiveness of this intervention still requires further evaluation across different maternal characteristics and healthcare settings. Accordingly, research on back massage as a strategy for managing labor pain is important to strengthen scientific evidence regarding its benefits in midwifery practice. The findings of such studies are expected to serve as a basis for midwives and healthcare providers to optimize mother-centered care and improve the quality of labor services

METHODS

Research Design

This study uses a descriptive method with a case study approach. The case study design was selected to provide an in-depth description of the application of back massage as a method for managing labor pain in a woman in labor. This approach allows the researcher to directly observe changes in pain intensity before and after the administration of back massage intervention throughout the labor process.

Research Setting and Time

The research was conducted in the delivery room of TPMB Inggit Cahyani, S.Tr.Keb., Bdn. in March 2026. Data collection was carried out from the active phase of the first stage of labor up to the evaluation period following the intervention.

Case Study Subject

The subject of this case study was a woman in labor who met the following criteria:

Inclusion Criteria

1. Woman in the active phase of the first stage of labor with cervical dilation of 4–10 cm.
2. Singleton pregnancy with cephalic presentation.
3. Good physical condition of both the mother and the fetus.
4. Willing to participate as a respondent and sign the informed consent form.

Exclusion Criteria

1. Woman with obstetric complications requiring immediate intervention.
2. Woman receiving pharmacological analgesics during the observation period.
3. Woman with abnormalities in the back area that prevent the administration of massage.

Research Instruments

The instruments used in this study included:

1. Observation sheet for respondent characteristics.
2. Labor progress monitoring sheet.
3. Numeric Rating Scale (NRS) with a score range of 0–10 to measure labor pain intensity.
4. Standard Operating Procedure (SOP) for back massage.

Implementation Procedure

The study began by explaining the purpose and procedures of the research to the respondent and obtaining consent for participation. An initial assessment was then conducted, including collection of personal data, obstetric history, labor condition, and measurement of pain intensity using the Numeric Rating Scale (NRS).

The intervention, in the form of back massage, was administered while the mother was in the active phase of the first stage of labor. Massage was applied to the lower back area (sacral and lumbar regions) using stroking and gentle pressure techniques with circular movements for

15–20 minutes during uterine contractions. The massage was performed by the researcher in accordance with established procedures.

Upon completion of the intervention, pain intensity was measured again using the Numeric Rating Scale (NRS). Changes in pain scores before and after back massage were then recorded and analyzed to determine the effectiveness of the intervention in reducing labor pain.

Data Collection Technique

Data were obtained through:

1. Interviews to gather information on respondent characteristics.
2. Direct observation throughout the labor process.
3. Measurement of pain intensity using the Numeric Rating Scale (NRS) before and after the intervention.

Data Analysis

Data analysis was carried out descriptively by comparing pain scores before and after the administration of back massage. The results of the analysis are presented in narrative form and tables to illustrate changes in pain levels experienced by the respondent following the intervention.

Research Ethics

This study was conducted in accordance with the ethical principles of health research, including respect for the respondent's autonomy, confidentiality of data, the principle of beneficence, and the principle of non-maleficence. Before the study began, the respondent received an explanation regarding the purpose, benefits, and procedures of the research and signed an informed consent form.

RESULTS

Respondent Characteristics

This case study was conducted on a woman in labor, Mrs. L, aged 30 years, with a history of G1P0A0, a gestational age of 37 weeks and 5 days, a singleton pregnancy, cephalic presentation, and good condition of both the mother and fetus. She entered the active phase of the first stage of labor with a cervical dilation of 5 cm. During labor, she complained of increasing pain in the lower abdomen radiating to the back. Based on assessment using the Numeric Rating Scale (NRS), the pain intensity felt before the intervention was a score of 8, categorized as severe pain.

Implementation of the Intervention

The back massage intervention was administered for 20 minutes on the lumbar and sacral regions using stroking techniques and gentle circular pressure applied in coordination

with uterine contractions. During the intervention, the mother was accompanied by family members and guided to perform breathing relaxation techniques.

Changes in Pain Intensity Before and After the Intervention

Table 1. Labor Pain Intensity Before and After the Intervention

Measurement Time	Pain Score (NRS)	Category
Before intervention	8	Severe pain
After intervention	5	Moderate pain

Based on Table 1, there was a reduction in pain intensity from a score of 8 (severe pain) to a score of 5 (moderate pain) following the administration of back massage. A decrease of 3 points indicates an improvement in the mother's perception of pain after receiving the intervention.

Clinical Observation Results

In addition to the reduction in pain score, observations showed that after receiving back massage, the mother appeared more relaxed, was able to control her breathing better during contractions, and had a calmer facial expression compared to before the intervention. She also reported feeling more comfortable and was able to rest between contractions. The fetal heart rate remained within the normal range (120–160 beats per minute), and no signs of complications were observed during the intervention. The labor process progressed physiologically until full cervical dilation was achieved.

Summary of Findings

The administration of back massage to the mother in the active phase of the first stage of labor yielded positive results, with labor pain intensity decreasing from a score of 8 to a score of 5. This intervention also improved the mother's comfort and relaxation throughout labor. The findings of this case study indicate that back massage can be used as one of the non-pharmacological methods to help reduce labor pain.

DISCUSSION

The results of this case study show that providing back massage to Mrs. L during the active phase of the first stage of labor was able to reduce pain intensity from a score of 8 (severe pain) to a score of 5 (moderate pain). This reduction in pain score demonstrates that back massage has a positive effect in helping the mother cope with labor pain through non-pharmacological means.

The labor pain experienced by the respondent before the intervention was classified as severe. This condition aligns with existing theory, which states that during the active phase of the first stage of labor, the frequency and strength of uterine contractions increase, leading to greater cervical dilation and more intense pain sensation.^{1,16,17} In addition to physiological changes, psychological factors such as anxiety and fear can also intensify the perception of pain felt by women in labor.^{18,19}

After back massage was performed for 20 minutes on the lumbar and sacral areas, pain intensity decreased. This result can be explained through the Gate Control Theory proposed by Melzack and Wall (1965). The theory suggests that mechanical stimulation such as touch or pressure on the skin activates large-diameter nerve fibers, which in turn block the transmission of pain impulses to the brain. As a result, the mother's perception of pain is reduced.

Beyond the gate control mechanism, back massage also stimulates the release of endorphins, hormones that function as the body's natural analgesics. Endorphins reduce pain perception while producing a relaxing effect, making the mother feel more comfortable during labor.^{20,21} In this case study, after the intervention, the respondent appeared calmer, was able to regulate her breathing properly, and did not show excessive signs of pain as she did before. This indicates that back massage affects not only physical aspects but also provides psychological benefits for women in labor.^{22,23}

The findings of this case study are consistent with research by Mardiyarningsih and Sabri (2021), who reported that back massage administered to women in the active phase of the first stage of labor significantly reduced pain intensity. Another study by Fitriani et al. (2022) also found that mothers who received back massage had higher comfort levels compared to those who did not receive the intervention. These consistent results reinforce the evidence that back massage is an effective non-pharmacological method for labor pain management.^{20,24,25}

Back massage offers several advantages over pharmacological methods: it is easy to perform, requires no special equipment, is relatively low-cost, and causes no side effects for either the mother or the fetus. This intervention can also be carried out by midwives or birth companions after receiving proper training. Therefore, back massage can be integrated into mother-centered care practices aimed at improving comfort and creating a positive childbirth experience. Nevertheless, the results of this case study have limitations, as it involved only one respondent, meaning the findings cannot be generalized to all women in labor. Labor pain intensity is influenced by various factors, including age, parity, individual pain threshold, psychological state, and social support, which vary among individuals. Consequently, further research with larger sample sizes and stronger study designs is required to obtain more comprehensive evidence regarding the effectiveness of back massage in reducing labor pain. Overall, the results of this case study show that back massage is effective in reducing labor pain intensity and improving maternal comfort during the active phase of the first stage of labor. This intervention can be considered as a safe and easily applicable alternative for non-pharmacological pain management in midwifery practice.

CONCLUSION

Based on the results of a case study involving one woman in labor during the active phase of the first stage, the administration of back massage was proven to help reduce labor pain intensity. Before the intervention, the mother experienced pain at a score of 8, classified

as severe pain, which then decreased to a score of 5, classified as moderate pain, after receiving back massage for 20 minutes. In addition to the reduction in pain intensity, the mother also appeared more relaxed, better able to control her breathing during contractions, and felt more comfortable throughout the labor process.

The findings of this case study indicate that back massage is an effective, safe, and easy-to-perform non-pharmacological method that can be implemented as part of midwifery care to help reduce labor pain. However, since this study involved only one respondent, the results obtained cannot yet be generalized to the entire population of women in labor. Therefore, further research with a larger sample size and a more robust study design is required to strengthen the evidence regarding the effectiveness of back massage in labor pain management.

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