

Effect of Effleurage Massage On Reducing First-Stage Labor Pain Among Women Giving Birth At Independent Midwifery Practices In Purwakarta Regency, Indonesia

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Abstract.

Labor pain is a physiological process experienced by every woman during childbirth. Excessive labor pain may increase maternal anxiety, prolong labor, and negatively affect maternal and fetal well-being. Effleurage massage is a non-pharmacological complementary intervention that has been widely used to reduce labor pain because it is simple, safe, inexpensive, and easy to implement in clinical practice. To determine the effect of effleurage massage on reducing first-stage labor pain among women giving birth at independent midwifery practices in Purwakarta Regency. This quantitative study employed a pre-experimental one-group pretest–posttest design. The study was conducted at independent midwifery practices in Purwakarta Regency from October 2025 to Januari 2026. Thirty-three women in the active phase of the first stage of labor were recruited using purposive sampling. Labor pain intensity was assessed using the Numeric Rating Scale (NRS) before and after the effleurage massage intervention. Data were analyzed using the Shapiro–Wilk test for normality and the Wilcoxon Signed-Rank Test with a significance level of 0.05. Before the intervention, 75.8% of participants experienced severe labor pain, while 24.2% experienced moderate pain. After effleurage massage, pain intensity decreased substantially, with 45.5% reporting mild pain, 51.5% moderate pain, and only 3.0% severe pain. The Wilcoxon Signed-Rank Test demonstrated a statistically significant reduction in labor pain following the intervention ($p < 0.001$). Effleurage massage significantly reduced first-stage labor pain among women giving birth at independent midwifery practices in Purwakarta Regency. This technique may be incorporated into routine midwifery care as an effective complementary non-pharmacological intervention to improve maternal comfort during labor.

Keywords: effleurage massage; labor pain; first stage of labor; midwifery and complementary therap.

I. INTRODUCTION

Labor pain is one of the most intense physiological experiences encountered by women during childbirth. During the active phase of the first stage of labor, increasing uterine contractions, cervical dilatation, and fetal descent stimulate visceral pain receptors, resulting in progressively greater pain intensity. Although labor pain is considered a normal physiological phenomenon, inadequate pain management may increase maternal anxiety, fatigue, stress hormone secretion, and prolonged labor, potentially affecting both maternal and neonatal outcomes. ^{1, 11, 12, 13, 14, 15}

Pain perception during labor is influenced by multiple physiological and psychological factors, including maternal age, parity, anxiety, previous childbirth experience, emotional support, and individual pain threshold. Therefore, comprehensive labor pain management should not only focus on pharmacological interventions but also incorporate complementary non-pharmacological approaches that are safe, affordable, and easily implemented by healthcare providers. ^{14, 15}

Effleurage massage is one of the most commonly used complementary techniques for labor pain management. This technique involves gentle, rhythmic stroking movements applied to the abdomen or lower back during uterine contractions. According to the Gate Control Theory, tactile stimulation activates large-diameter sensory nerve fibers that inhibit pain transmission to the central nervous system, thereby reducing pain perception. Furthermore, massage promotes muscle relaxation, improves local circulation, and stimulates the release of endogenous endorphins, contributing to increased maternal comfort during labor. ^{4, 9, 10, 13, 14, 15}

Several previous studies have demonstrated that effleurage massage is effective in reducing labor pain during the active phase of the first stage of labor. However, evidence regarding its effectiveness in

independent midwifery practices in Purwakarta Regency remains limited. Moreover, differences in maternal characteristics and clinical settings may influence the effectiveness of the intervention, highlighting the need for local evidence to support evidence-based midwifery practice.^{3,5,8,14}

Therefore, this study aimed to determine the effect of effleurage massage on reducing first-stage labor pain among women giving birth at independent midwifery practices in Purwakarta Regency.

II. METHODS

This study employed a quantitative approach using a pre-experimental one-group pretest–posttest design. This research design is commonly used to evaluate changes before and after an intervention within the same group of participants.⁷ The study was designed to evaluate the effect of effleurage massage on first-stage labor pain by comparing pain intensity before and after the intervention in the same participants. The study was conducted at Independent Midwifery Practices (PMB) in Purwakarta Regency, West Java, Indonesia, from October 2025 to January 2026. The study population comprised women in the active phase of the first stage of labor who received maternity care at the selected independent midwifery practices during the study period. A total of 33 participants were recruited using purposive sampling according to the predetermined inclusion and exclusion criteria. Purposive sampling was selected to recruit participants who fulfilled specific clinical characteristics relevant to the study objectives.⁷

Inclusion criteria: Women in the active phase of the first stage of labor, Singleton pregnancy, Cephalic fetal presentation, Gestational age of 37–42 weeks, Able to communicate effectively, Willing to participate and signed informed consent. Exclusion criteria: Women receiving pharmacological analgesia, High-risk pregnancies requiring emergency referral, Maternal or fetal complications during labor.

Participants received effleurage massage administered during the active phase of the first stage of labor by trained midwives. The massage consisted of gentle, rhythmic, circular stroking movements over the abdominal and/or lower back area following standard effleurage techniques. The intervention was administered according to a standardized effleurage massage procedure based on complementary midwifery care guidelines and implemented consistently by trained midwives throughout the study.^{9,10}

The primary outcome was labor pain intensity. Pain intensity was measured before and after the intervention using the Numeric Rating Scale (NRS), ranging from 0 (no pain) to 10 (worst imaginable pain). Pain scores were subsequently categorized into: Mild pain, moderate pain, severe pain.

Baseline pain intensity was assessed immediately before the administration of effleurage massage. Following completion of the intervention, pain intensity was reassessed using the same instrument. Participant demographic characteristics, including maternal age and parity, were also recorded using a structured observation sheet.

Data were analyzed using IBM SPSS Statistics. Descriptive statistics were used to summarize participant characteristics and labor pain intensity before and after the intervention. The selection of statistical tests followed the recommendations for health research data analysis described by Dahlan.² Data normality was evaluated using the Shapiro–Wilk test. Because the pain score distribution was not normally distributed ($p < 0.05$), differences between pre-intervention and post-intervention pain scores were analyzed using the Wilcoxon Signed-Rank Test, as recommended for paired non-parametric data.²

This study adhered to the ethical principles of human research, including respect for autonomy, confidentiality, beneficence, and justice. Written informed consent was obtained from all participants prior to data collection. Participant identities were kept confidential and used solely for research purposes.

III. RESULT AND DISCUSSION

Participant Characteristics

Table 1. Characteristics of Participants (n = 33)

Variable	Category	n	%
Age	<20 years and >35 years	7	21,2
	20–35 years	26	78,8

Parity	Primiparous	8	24,2
	Multiparous	20	60,6
	Grandmultiparous	5	15,2

The study involved 33 women in the active phase of the first stage of labor. Most participants (78,8%) were within the healthy reproductive age (20–35 years), while 21,2% belonged to the high-risk age group. Multiparous women accounted for the largest proportion (60,6%), followed by primiparous (24,2%) and grand multiparous women (15,2%).

Maternal age and parity are recognized as important factors influencing labor pain perception. Women within the optimal reproductive age generally demonstrate better physiological adaptation during childbirth, while previous childbirth experience among multiparous women may enhance maternal confidence and coping ability during labor. Nevertheless, labor pain remains a highly subjective experience influenced by physiological, psychological, and environmental factors.^{1, 11, 12, 14, 17}

Labor Pain Intensity Before Effleurage Massage

Table 2. Labor Pain Intensity Before the Intervention (n = 33)

Pain Intensity	n	%
Mild	0	0,0
Moderate	8	24,2
Severe	25	75,8

Table 2 shows that before receiving effleurage massage, most participants experienced severe labor pain (75,8%), while the remaining participants (24,2%) reported moderate pain.

The predominance of severe pain before the intervention reflects the physiological changes occurring during the active phase of labor. Progressive cervical dilatation, increasing uterine contractions, ischemia of the uterine muscles, and fetal descent stimulate visceral pain receptors, resulting in increased pain intensity. Besides physiological factors, maternal anxiety, fear, fatigue, and lack of previous childbirth experience may further increase pain perception.^{12, 14, 15}

These findings are consistent with previous studies, which reported that women in the active phase of the first stage of labor generally experience moderate-to-severe pain before receiving non-pharmacological pain management interventions. Similar findings were reported by Herinawati et al., Fitria et al., and Nur Mariyah, who found that the majority of laboring women experienced moderate to severe pain prior to the administration of effleurage massage or other complementary interventions.^{3, 5, 8}

Labor Pain Intensity After Effleurage Massage

Table 3. Labor Pain Intensity After the Intervention (n = 33)

Pain Intensity	n	%
Mild	15	45,5
Moderate	17	51,5
Severe	1	3,0

Following the administration of effleurage massage, labor pain intensity decreased considerably. Nearly half of the participants (45,5%) reported mild pain, while 51,5% experienced moderate pain. Only one participant (3,0%) remained in the severe pain category.

The observed reduction in pain intensity indicates that effleurage massage effectively improved maternal comfort during labor. The technique provides continuous tactile stimulation that promotes relaxation, decreases muscle tension, improves peripheral circulation, and stimulates the release of endogenous endorphins. These physiological responses contribute to reduced pain perception and improved maternal coping during uterine contractions.^{3, 4, 5, 8, 9, 10, 14, 15}

The findings are consistent with previous studies demonstrating that effleurage massage is an effective complementary intervention for reducing labor pain and improving the childbirth experience. Similar results have been reported by Herinawati et al., Fitria et al., and Nur Mariyah, who found significant reductions in

labor pain following the application of effleurage massage during the active phase of the first stage of labor.
3,5,8

Comparison of Labor Pain Before and After Effleurage Massage

Table 4. Comparison of Labor Pain Scores Before and After the Intervention (n = 33)

Variable	Mean $\pm$ SD	Median	Minimum	Maximum
Pre-intervention	2,76 $\pm$ 0,435	3,00	2	3
Post-intervention	1,58 $\pm$ 0,561	2,00	1	3

The mean labor pain score decreased from 2,76 $\pm$ 0,435 before the intervention to 1,58 $\pm$ 0,561 after effleurage massage. Likewise, the median pain score decreased from 3,00 to 2,00, indicating a clinically meaningful reduction in labor pain intensity following the intervention.

The decrease in pain scores suggests that effleurage massage is an effective non-pharmacological intervention for reducing labor pain among women in the active phase of the first stage of labor. Given its simplicity, safety, low cost, and non-invasive nature, effleurage massage may be incorporated into routine midwifery care to enhance maternal comfort and promote a positive childbirth experience.^{4, 9, 14, 15}

Normality Test

Table 5. Shapiro–Wilk Normality Test

Variable	p-value
Pre-intervention	<0,001
Post-intervention	<0,001

The Shapiro–Wilk test indicated that both pre-intervention and post-intervention pain scores were not normally distributed ($p < 0,05$). Therefore, a non-parametric statistical test was selected for hypothesis testing.

Effect of Effleurage Massage on First-Stage Labor Pain

Table 6. Wilcoxon Signed-Rank Test

Statistical Test	p-value
Wilcoxon Signed-Rank Test	<0,001

The Wilcoxon Signed-Rank Test demonstrated a statistically significant reduction in first-stage labor pain following effleurage massage ($p < 0.001$). Therefore, the study hypothesis was accepted, indicating that effleurage massage had a significant effect on reducing labor pain among women giving birth at independent midwifery practices in Purwakarta Regency.

The findings support the physiological mechanism described by the Gate Control Theory, whereby tactile stimulation activates large-diameter nerve fibers that inhibit pain transmission to the central nervous system. In addition, effleurage massage promotes relaxation, reduces maternal anxiety, improves blood circulation, and stimulates the release of endogenous endorphins, all of which contribute to lower pain perception during labor.^{4, 9, 14, 15}

The present findings are consistent with previous studies reporting significant reductions in labor pain following effleurage massage. Collectively, these findings further strengthen the existing evidence supporting the integration of effleurage massage into routine intrapartum care as a complementary non-pharmacological pain management strategy. Furthermore, because the intervention is safe, inexpensive, easy to learn, and does not require specialized equipment, it has considerable potential for implementation, particularly in independent midwifery practices and other primary healthcare settings.^{3, 5, 8, 15}

IV. CONCLUSION

Effleurage massage significantly reduced first-stage labor pain among women giving birth at independent midwifery practices in Purwakarta Regency. Following the intervention, the proportion of women experiencing severe pain decreased markedly, while the proportion reporting mild pain increased. Statistical analysis using the Wilcoxon Signed-Rank Test confirmed a significant reduction in pain intensity ($p < 0.001$).

As a simple, safe, low-cost, and non-pharmacological intervention, effleurage massage may be incorporated into routine intrapartum care to improve maternal comfort and promote a positive childbirth experience. Midwives are encouraged to integrate this technique into evidence-based maternity care. Future studies employing randomized controlled trial designs with larger sample sizes and multicenter settings are recommended to further strengthen the existing evidence.^{14, 15}

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