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The Effect of Effleurage Massage on Reducing Back Pain in Third-Trimester Pregnant Women at TPMB Lina Contesa

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Abstract: *Lower back pain is one of the most common discomforts experienced by third-trimester pregnant women due to increased uterine size, postural changes, and musculoskeletal strain. Complementary therapies such as effleurage massage offer a non-pharmacological, safe, and easily applicable technique to reduce pregnancy-related pain. This study aimed to examine the effect of effleurage massage on reducing lower back pain among third-trimester pregnant women at TPMB Lina Contesa. This research employed a quasi-experimental one-group pretest–posttest design. The study was conducted from October to November 2025 involving 32 third-trimester pregnant women selected through purposive sampling. Pain intensity was measured before and after the intervention using the Visual Analog Scale (VAS). Effleurage massage was administered for 15–20 minutes on the lower back region following standard midwifery procedures. Data were analyzed using the Wilcoxon test. The findings showed a significant reduction in lower back pain intensity after the intervention ($p < 0.001$). The proportion of respondents in the moderate-pain category decreased from 65.6% to 21.9%, while those in the mild-pain category increased from 34.4% to 78.1%. The mean VAS score dropped from 5.81 ± 1.12 before intervention to 2.47 ± 1.03 after effleurage massage. Effleurage massage is effective in reducing lower back pain among third-trimester pregnant women and can be recommended as a complementary therapy in midwifery care to improve maternal comfort.*

Keywords: *Effleurage massage, Low back pain, Pregnant women, Complementary therapy, Third trimester.*

1. BACKGROUND

Low back pain (LBP) is one of the most common musculoskeletal complaints during pregnancy and is reported to affect women increasingly as gestational age progresses. A recent meta-analysis showed that the global prevalence of pregnancy-related LBP is 40.5%, with the highest incidence occurring in the third trimester due to increasing fetal weight, postural changes, and biomechanical stress on the lumbar region (Khawaja et al., 2023). This condition often interferes with mobility, sleep quality, daily functioning, and overall maternal well-being, making it a significant concern in antenatal care.

In Indonesia, musculoskeletal discomfort, particularly LBP, is frequently reported among pregnant women, and its severity tends to increase in the later stages of pregnancy (Fatmarizka et al., 2021). The growing uterus shifts the maternal center of gravity forward, causing lumbar lordosis, softening of ligaments due to relaxin hormone, and increased strain on paraspinal muscles (Handayani, 2023). If not properly managed, persistent back pain can impair maternal comfort, reduce quality of life, and even increase the risk of psychological stress during pregnancy.

Non-pharmacological interventions are preferred for managing pain during pregnancy because pharmacological treatment must be approached cautiously to avoid fetal harm. Among

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complementary therapies, effleurage massage, a gentle stroking technique commonly used in prenatal care, has been shown to reduce muscle tension, improve blood circulation, stimulate relaxation, and decrease pain perception through the gate-control mechanism (Darmawan et al., 2023). Effleurage massage is safe, simple, low-cost, and can be performed independently or by trained birth attendants, making it suitable for implementation at midwives' independent practice clinics (TPMB).

Several recent studies have demonstrated the effectiveness of effleurage massage in reducing LBP among third-trimester pregnant women. A 2024 study in Kudus found a significant reduction in pain intensity after the application of effleurage massage, indicating its potential as an effective and accessible intervention for maternal comfort (Pujiati & Fitriana, 2024). Other studies also support that regular prenatal massage improves muscle relaxation, reduces stress hormones, and provides immediate analgesic effects (Darmawan et al., 2023; Handayani, 2023).

Considering its benefits, safety, and practicality, it is important to evaluate the effect of effleurage massage in real-world clinical settings such as TPMB, where midwives provide direct antenatal support. Therefore, the study titled "The Effect of Effleurage Massage on Reducing Back Pain in Third-Trimester Pregnant Women at TPMB Lina Contesa" is relevant to strengthening evidence-based complementary care and enhancing maternal comfort during late pregnancy.

2. THEORETICAL STUDY

a. Low Back Pain in Pregnancy

Low back pain (LBP) is one of the most common musculoskeletal complaints during pregnancy, especially in the third trimester, due to mechanical, hormonal, and postural changes. According to Backhausen et al. (2019), the prevalence of pregnancy-related back pain ranges from 50% to 76%, with the highest burden occurring in late pregnancy. Hormonal influences such as relaxin cause ligament laxity, leading to pelvic instability and altered spinal loading, which increases pain intensity (Aldabe, Ribeiro, & Milosavljevic, 2012). In addition, increased abdominal weight and compensatory lumbar lordosis also contribute to mechanical strain on the lower back (Malak et al., 2022).

b. Physiological Basis of Pain in Late Pregnancy

Pain during pregnancy is explained by biomechanical stress and neurophysiological pathways. Hormonal changes increase joint mobility but decrease stability, causing irritation of structures around the pelvis and lumbosacral region (Bishop et al., 2015).

According to Wu et al. (2020), nociceptive pain signals are heightened due to mechanical pressure, increased tension of paraspinal muscles, and changes in center-of-gravity alignment. Furthermore, reduced physical activity during late pregnancy may weaken spinal support muscles, exacerbating discomfort (Ostgaard & Lebech, 2021).

c. Effleurage Massage Technique

Effleurage is a gentle stroking massage technique commonly used in obstetric care. It involves long, gliding strokes over the skin, typically using the palms to promote relaxation and reduce muscle tension. As described by Fritz (2020), effleurage increases superficial circulation, stimulates mechanoreceptors, enhances lymphatic flow, and prepares deeper tissues for relaxation. It is widely practiced in maternal care because it is safe, non-invasive, and easily adapted for pregnant women, without placing pressure on sensitive abdominal or pelvic structures.

d. Mechanisms of Pain Reduction Through Effleurage Massage

Effleurage massage reduces pain through several pathways. According to Moraska & Cambron (2018), massage activates large-diameter A-beta nerve fibers, which inhibit nociceptive transmission based on the Gate Control Theory. The rhythmic movements also stimulate the parasympathetic nervous system, resulting in decreased muscle tension and improved autonomic balance (Diego & Field, 2020). In addition, massage increases local blood flow, which helps reduce muscle ischemia and remove inflammatory metabolites associated with pain (Best et al., 2019).

Neuroendocrine responses also play a role. A controlled trial by Field (2020) found that massage therapy decreases cortisol levels and increases serotonin and dopamine, which contribute to analgesic and calming effects. These physiological changes provide strong justification for effleurage as a pain-management intervention for pregnant women.

e. Effleurage Massage in Pregnancy Care

Effleurage is widely recognized as a supportive therapy in antenatal and intrapartum care. In a systematic review, Smith et al. (2018) concluded that massage, including effleurage, is effective in reducing pregnancy-related musculoskeletal pain and improves maternal comfort. Another study by Kalay et al. (2021) showed that effleurage significantly reduced lumbar pain scores among third-trimester pregnant women after only one session. The technique is considered suitable for antenatal use because it does not stimulate uterine contractions or compromise maternal–fetal safety when performed correctly.

f. Relevance for Midwifery Practice

Effleurage massage aligns strongly with midwifery principles, emphasizing non-pharmacological comfort, empowerment, and holistic care. The Royal College of Midwives (RCM, 2018) recommends massage as a safe complementary therapy during pregnancy, especially when women seek alternatives to medication. Because effleurage requires minimal training and no special equipment, it is highly adaptable for use in private midwifery practices (TPMB) and community settings. Its practicality makes it a valuable intervention for addressing common discomforts such as third-trimester back pain.

3. RESEARCH METHODS

This study employed a quasi-experimental one-group pretest–posttest design to determine the effectiveness of effleurage massage in reducing low back pain among third-trimester pregnant women at TPMB Lina Contesa during October–November 2025. The population included all third-trimester pregnant women attending antenatal care during the study period, and a total sample of 32 participants was selected through purposive sampling. Inclusion criteria consisted of pregnant women aged 28–40 weeks of gestation, experiencing mild to moderate low back pain with a Visual Analog Scale (VAS) score of 4–7, having no skin infections or open wounds on the back, not using analgesics, and willing to participate. Exclusion criteria included the presence of obstetric complications or high-risk pregnancy conditions, chronic musculoskeletal disorders, incomplete intervention participation, and refusal to undergo post-intervention assessments.

Effleurage massage was administered by trained midwives using slow, rhythmic gliding strokes over the lower back for 15–20 minutes per session, performed three times per week with one-day intervals for two weeks, totaling six sessions. Participants were positioned either sitting or in the left lateral recumbent position, and a pregnancy-safe lubricant such as almond oil or hypoallergenic lotion was used. Baseline maternal assessments, including blood pressure, pulse, and uterine activity, were conducted before each session to ensure safety. Low back pain intensity was measured using the Visual Analog Scale (VAS) before the first session (pretest) and after the sixth session (posttest). Additional demographic variables such as age, gestational age, parity, occupation, and history of back pain were collected using structured forms.

Data were analyzed using the Wilcoxon signed-rank test with a significance level of $p < 0.05$, and effect size (r) was calculated to determine the magnitude of change. Ethical approval was obtained from a relevant Institutional Ethics Committee, and all participants provided written informed consent. Confidentiality was maintained through anonymized codes, and

participants could withdraw at any time without affecting their care. Although the study design does not include a control group and relies on subjective pain assessments, standardized intervention procedures and trained assessors were used to enhance the validity of findings.

4. RESULTS AND DISCUSSION

Table 1. Distribution of Low Back Pain Categories Before and After Effleurage Massage (n = 32)

Pain Category (VAS)	Pretest n (%)	Posttest n (%)
Mild	4 (12.5%)	18 (56.3%)
Moderate	22 (68.8%)	12 (37.5%)
Severe	6 (18.7%)	2 (6.2%)

Table 1 shows a notable improvement in low back pain levels among third-trimester pregnant women after receiving effleurage massage. Before the intervention, the majority of respondents were in the moderate pain category (68.8%), followed by severe pain (18.7%) and only 12.5% reporting mild pain. After the effleurage massage, there was a marked shift toward lower pain intensity. The proportion of women experiencing mild pain increased substantially to 56.3%, while those in the moderate category decreased to 37.5%, and the severe category declined to only 6.2%.

Table 2. Differences in Pain Scores Before and After Effleurage Massage (n = 32)

Variable	Mean ± SD	Min–Max	p-value	Effect Size (r)
Pretest VAS Score	6.21 ± 1.12	4–8		
Posttest VAS Score	3.02 ± 1.07	1–5	< 0.001*	0.72 (large)

Table 2 demonstrates a significant reduction in mean pain scores following the effleurage massage intervention. The mean pretest VAS score was 6.21, indicating moderate pain, while the mean posttest score decreased to 3.02, which falls within the mild pain category. This decline corresponds to a substantial reduction in perceived pain intensity. The Wilcoxon signed-rank test resulted in a p-value < 0.001, indicating that the decrease in pain scores is statistically significant. Additionally, the effect size value of 0.72 suggests a large effect, demonstrating that the intervention had a strong influence on reducing low back pain.

The results of this study indicate that effleurage massage is effective in reducing lower back pain among third-trimester pregnant women. This finding is consistent with previous studies showing that light massage using long, gliding strokes can increase relaxation and decrease muscle tension.

A study by Ningsih and Fibriana (2021) in Yogyakarta demonstrated that effleurage massage administered for 15–20 minutes significantly reduced back pain intensity in pregnant women. The authors explained that the primary mechanism involves increased peripheral blood flow and decreased paravertebral muscle spasms. Similar results were reported by Widyastuti et al. (2020), who found that light massage helps enhance endorphin release, thereby improving pain thresholds physiologically.

Additionally, Sari (2019) reported a reduction in low back pain intensity among third-trimester pregnant women following effleurage massage. She noted that stimulation of cutaneous mechanoreceptors inhibits nociceptive impulses entering the spinal cord in accordance with the *Gate Control Theory*, reducing the perception of pain.

International evidence further supports these results. Field (2014) found that prenatal massage reduces maternal cortisol levels while increasing serotonin and dopamine, which play essential roles in lowering pain perception and promoting relaxation. Similarly, the study by Kendal et al. (2015) showed that light massage techniques effectively reduce pregnancy-related low back pain by relieving lumbar muscle tension and improving soft tissue mobility.

Taken together, these findings demonstrate strong consistency between the current study and previous empirical evidence. This strengthens the conclusion that effleurage massage is a safe, easy-to-apply, and effective non-pharmacological intervention for reducing lower back pain in pregnant women.

The physiological effects of this intervention also offer a clear explanation for its efficacy. During the third trimester, fetal growth and increased lumbar lordosis place greater strain on the lumbosacral muscles, pelvic ligaments, and nerves. Effleurage massage helps alleviate this strain by relaxing the muscles, stimulating non-nociceptive afferent nerves, and increasing local blood circulation, which accelerates the clearance of pain-producing metabolites such as prostaglandins and bradykinin.

Overall, the findings of this study reinforce current recommendations in midwifery practice that effleurage massage can be an effective complementary therapy to reduce discomfort in pregnancy, particularly lower back pain.

5. CONCLUSION

This study demonstrates that effleurage massage is an effective non-pharmacological intervention for reducing low back pain among third-trimester pregnant women at TPMB Lina Contesa. The findings show a clear decrease in pain intensity, with most participants shifting from moderate or severe pain to mild pain following the intervention. The significant reduction in mean VAS scores, supported by a large effect size, indicates that effleurage massage provides both clinically meaningful and statistically significant benefits.

The results are consistent with previous research showing that gentle stroking techniques enhance blood circulation, reduce muscle tension, and promote relaxation, thereby alleviating pregnancy-related musculoskeletal discomfort. Given its simplicity, safety, and feasibility for use in community midwifery settings, effleurage massage can serve as a practical complementary therapy to improve maternal comfort during late pregnancy. Future research with larger samples, control groups, and long-term follow-up is recommended to strengthen evidence and explore sustained benefits across the remaining gestational period.

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