APPLICATION OF ENDORPHIN AND EFFLEURAGE MASSAGE TO REDUCE BACK PAIN IN THIRD TRIMESTER PREGNANT WOMEN

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ABSTRACT

Pregnant women in the third trimester often experience back pain due to increased fetal weight, postural changes, and ligament stretching. If left untreated, this pain can affect sleep quality, increase anxiety, and complicate the labor process. Endorphin massage and effleurage are non-pharmacological complementary therapies that are safe and effective in relieving pain and promoting muscle relaxation. Objective To identify the effectiveness of combining endorphin massage and effleurage in reducing back pain, lowering anxiety levels, and improving sleep quality in third-trimester pregnant women. This study used a descriptive observational case study design involving two third-trimester pregnant women with acute back pain. The intervention was conducted for three consecutive days without additional relaxation techniques. Evaluation was carried out using pain scale assessment, vital signs, facial expressions, and sleep patterns. Results, Both subjects experienced a gradual decrease in pain from a scale of 5 to 2, along with reduced signs of discomfort and significant improvement in sleep quality. Anxiety levels also decreased, and the participants showed a calmer and more confident attitude toward the upcoming labor. The combination of endorphin massage and effleurage is effective in reducing back pain, lowering anxiety, and improving sleep quality in third-trimester pregnant women. This intervention can be integrated into maternity nursing care as a holistic, <u>complementary</u> therapy to enhance maternal comfort and well-being.

Keywords: Endorphin Massage, Effleurage Massage, Lower Back Pain, Third Trimester Pregnancy, Complementary Therapy, Maternity Nursing

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INTRODUCTION

Pregnancy is a physiological process that begins with conception and ends with childbirth, lasting approximately 40 weeks (Mardiani & Resna, 2022). In Indonesia, the estimated number of pregnancies in 2023 reached 232,524, with 6,581 cases in South Sumatra and 618 third-trimester pregnant women (Ministry of Health, 2023). In Lubuklinggau City, the number of third-trimester pregnant women was recorded at 4,578 in 2023 and 4,209 in 2024 (Lubuklinggau City Health Office Profile, 2024).

Physiological changes during pregnancy affect the musculoskeletal system, including uterine enlargement that alters posture, weakens abdominal muscles, and strains the back, leading to lower back pain (Astri, 2019; Ruliati, 2019). Back pain is more common in the second and third trimesters, with a global prevalence of 50–70% (Mardiani & Resna, 2022). In Indonesia, the prevalence reaches 60–80%, with 76% of pregnant women at 20 weeks and 90% at 32 weeks reporting such complaints (Khairunnisa et al., 2022).

At Perumnas Community Health Center in Lubuklinggau City, there were 407 third-trimester pregnant women in 2024, of whom 204 (50%) experienced back pain (Perumnas Community Health Center Profile, 2024). This complaint affects daily activities, quality of life, and may lead to chronic postpartum pain if left untreated (Prananingrum, 2022).

Pain management can be pharmacological or non-pharmacological. Pharmacological methods are effective but costly and may cause side effects, while non-pharmacological methods are safer, more affordable, and easier to apply, such as relaxation techniques, compresses, and massage (Restu Amalia & Pristiana Dewi, 2020). Massage stimulates the release of endorphins, which act as natural analgesics, reduce muscle tension, and improve circulation (Rahareng, 2021).

Endorphin massage uses gentle touch to stimulate endorphin release, reducing pain and stress (Septiana, 2023; Handayani et al., 2021). Studies have shown this technique to be effective in reducing back pain intensity in third-trimester pregnant women (Rini et al., 2023). Effleurage massage involves light stroking that provides relaxation and reduces pain in accordance with the Gate Control theory (Magfirah & Idwar, 2020; Suryani et al., 2022). Research has reported that effleurage massage can reduce back pain, improve sleep quality, and decrease anxiety (Pratiwi et al., 2023).

Data from Perumnas Community Health Center indicate that back pain remains a significant issue, with 28 new cases reported in February 2025. This highlights the importance of effective interventions to reduce back pain complaints for the well-being of both mothers and their babies (Wulandari & Wantini, 2021).

RESEARCH METHODS
This study employed a descriptive method with a case study approach to provide an objective overview of the application of a combination of endorphin massage and effleurage massage in reducing back pain intensity among third-trimester pregnant women at Perumnas Community Health Center, Lubuklinggau City, in 2025. The research subjects consisted of two third-trimester pregnant women selected using a random sampling technique from a population that met the inclusion criteria: third-trimester pregnancy with gestational age over 35 weeks, experiencing lower back pain, and willing to participate as respondents. The exclusion criteria included fever, skin diseases (eczema, psoriasis, or other skin infections), edema, or acute injuries (sprains, bruises).

The study was conducted in the working area of Perumnas Community Health Center, Lubuklinggau City, from April to June 2025 through three home visits for each respondent: April 11–13, 2025 for Respondent I, and April 25–27, 2025 for Respondent II. The focus of the study was the application of endorphin massage and effleurage massage to reduce back pain, with procedures including assessment, planning, implementation, and evaluation, as well as monitoring of pain intensity during each session. The instruments used included nursing care forms according to the standards and evaluation sheets of massage effectiveness, with pain measured using the Numeric Rating Scale (NRS). Data were collected through interviews, observation, physical examination, and evaluation during the intervention.

RESULTS AND DISCUSSION
The assessment results of two third-trimester pregnant women showed the main complaint of back and waist pain, which interfered with daily activities and sleep. In Respondent 1, the pain occurred mainly during prolonged standing and at night, characterized as pulling, aching, and sore, with a pain scale of 5 (moderate). The patient grimaced when changing positions and demonstrated protective behavior. Objective findings revealed a fundal height of 32 cm, contractions occurring 1–2

times per 10 minutes, with vital signs within normal limits (BP 110/70 mmHg, HR 82 bpm, T 36.8°C, RR 20 breaths/min).

In Respondent 2, similar complaints were found, with back pain experienced during both activity and sleep. The pain was described as pulling, aching, and sore, with a pain scale of 5. The patient frequently changed sitting positions and showed signs of fatigue. Objective examination showed fundal height consistent with 35 weeks of gestation, ultrasound confirming a healthy fetus, MUAC 25 cm, body weight 54 kg, and vital signs within normal limits (BP 108/72 mmHg, HR 88 bpm, T 36.6°C, RR 22 breaths/min).

The back pain experienced by both respondents was associated with biomechanical changes during late pregnancy, increased intra-abdominal pressure, and fetal pressure on the back tissues. The identified nursing problem in both respondents was "Acute Pain."

Table 1. Data Analysis (n=2)

Data		Etiologi	Masalah
Responden 1 DS: Patient complained of back and waist pain. O (Onset): Pain appeared when standing for long periods and at night. P (Provoking/Palliative): Triggered by prolonged standing, reduced after intervention. Q (Quality): Described as pulling, aching, and sore. R (Region/Radiation): Waist and back. S (Severity): Pain scale 5. T (Time): Intermittent. DO: 1. Patient appeared to grimace when changing positions. 2. Patient appeared restless and displayed protective behavior. 3. Uterine fundus: 32 cm. 4. Contractions: 1–2 times per 10 minutes. 5. Vital Signs (VS): 6. BP: 110/70 mmHg 7. HR: 82 beats/minute 8. Temp: 36.8°C	Responden 2 DS: Patient complained of back pain that interfered with activities and sleep. O (Onset): Pain appeared when standing for long periods and at night. P (Provoking/Palliative): Triggered by prolonged standing, reduced after intervention. Q (Quality): Described as pulling, aching, and sore. R (Region/Radiation): Waist and back. S (Severity): Pain scale 5. DO: 1. Patient was observed frequently changing sitting positions. 2. Eyes appeared fatigued. 3. Fundus consistent with 35 weeks gestational age (Ultrasound: healthy baby). 4. MUAC (Mid-Upper Arm Circumference): 25 cm. 5. Body weight: 54 kg. 6. Vital Signs (VS): 7. BP: 108/72 mmHg 8. HR: 88 beats/minute	Biomechanical changes of the body due to advanced pregnancy ↓ Increased intra-abdominal pressure ↓ Fetal pressure on the back tissues ↓ MK : Acute Pain	Acute Pain

Data		Etiologi	Masalah
9. RR: 20 breaths/minute	9. Temp: 36.6°C		
	10. RR: 22 breaths/minute		

Comparison of Pain in Third-Trimester Pregnant Women Between the Two Respondents

The nursing implementation in Respondents I and II showed a reduction in back pain intensity experienced during the late trimester of pregnancy. In Respondent I, the initial pain scale was reported as 5, which decreased to 4 on the second day, and reached 2 on the third day after the intervention. The respondent showed a more relaxed facial expression and reported improved rest. This gradual reduction indicates that the nursing intervention had a positive effect on decreasing pain intensity.

In Respondent II, pain reduction occurred more rapidly. The initial pain scale of 5 decreased to 2–3 on the second day and reached 1–2 on the third day. The respondent stated that the pain was only mild and no longer interfered with daily activities or rest. The difference in the rate of pain reduction between the two respondents suggests that responses to nursing interventions may vary among individuals, depending on physiological, psychological, and patient involvement factors during care. These findings are supported by Handayani et al. (2021), who reported a significant reduction in back pain following nursing interventions in pregnant women. Similarly, Pratiwi et al. (2023) showed a significant difference in back pain scores before and after interventions, with $p < 0.05$. Overall, these results reinforce that appropriate and consistent nursing approaches contribute to reducing back pain in late-trimester pregnant women.

A comparison of the characteristics between Respondents I and II revealed differences influencing the effectiveness of pain reduction during the nursing process. Respondent I was 25 years old, while Respondent II was 21 years old. The younger age of Respondent II likely contributed to a better physiological response to non-pharmacological interventions such as effleurage massage and endorphin stimulation. This is supported by Carvalho et al. (2017), who stated that age is a risk factor for lower back pain, with younger patients being more likely to experience back pain during pregnancy.

Furthermore, Respondent II received greater family support, allowing sufficient rest and lighter activity compared to Respondent I, who was still actively engaged in housework and caring for children independently. This resulted in higher physical strain for Respondent I, which hindered maximal pain reduction. Family support, especially from the husband, plays an important role during pregnancy, both in providing care and in responding to the mother's vulnerability, affecting both biological and psychological aspects (Nurvembrianti et al., 2021).

In terms of response to intervention, Respondent II demonstrated a more stable emotional condition and a more relaxed attitude during therapy. This enhanced the physiological effects of nursing interventions, such as the increase in endorphin release, which helps reduce pain perception. Conversely, Respondent I showed higher anxiety levels, which psychologically may increase pain sensitivity and decrease the effectiveness of the interventions. The evaluation results indicated that pain reduction in Respondent II was more significant, from a pain scale of 5 to 2 within three days of care, while Respondent I showed a reduction from 5 to 2.

Evaluation of Acute Pain Diagnosis Related to Physiological Injury Agents

Evaluation of the acute pain problem was conducted based on the reported pain scale, facial expressions, restlessness, ability to rest, and responses to non-pharmacological and pharmacological interventions. In Respondent I, the initial pain scale was 5, described as pulling pain in the lower back, worsening at night and during movement. After interventions such as endorphin and effleurage massage, environmental control, education, and Paracetamol administration, the evaluation showed a reduction to a pain scale of 4 on the first day, although the patient still grimaced. On the second day, the pain decreased further (scale 3), and by the third day, the pain scale was 2. The patient no longer appeared restless, was able to take naps, and reported that the pain was very mild. With the achievement of these outcome indicators, including decreased pain scale and improved comfort, the problem was considered resolved by the third day.

Meanwhile, in Respondent II, the evaluation showed faster progress. The pain scale decreased to 3 on the second day after interventions such as endorphin and effleurage massage, repositioning, continued education, and collaborative administration of analgesics. By the third day, the patient reported pain only at scale 2 during contractions and no longer showed grimacing. Objective evaluation supported these findings, as the patient appeared comfortable, calm, and able to sleep. With all outcome indicators achieved, the problem was also considered resolved on the third day.

CONCLUSION

The implementation and evaluation results in two third-trimester pregnant women showed that the combination of endorphin massage and effleurage massage was effective in reducing back pain. Both techniques stimulate endorphin release, improve circulation, and relax the muscles. Despite differences in age, occupation, and emotional condition, both respondents experienced a gradual decrease in pain scale within three days of intervention. In addition to reducing pain, the massage also enhanced emotional comfort, making it a potential complementary therapy in maternity nursing to improve the quality of life of pregnant women.

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