

The Effectiveness of Endorphin Massage on Back Pain in Third Trimester Pregnant Women at Gumpang Community Health Center in 2025

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ABSTRACT

Back pain is one of the complaints often experienced by pregnant women in the third trimester due to physiological changes during pregnancy, such as weight gain, changes in body posture, and the influence of the hormone relaxin that can interfere with daily activities. One non-pharmacological effort that can be done to reduce back pain is *endorphin massage*, which is a light massage technique that can stimulate the release of endorphins as a natural pain reliever. This study aims to determine the effectiveness of *endorphin massage* on reducing the intensity of back pain in pregnant women in the third trimester at the Gumpang Community Health Center in 2025. This study used a quantitative method with a *pre-experimental design* using a *one group pretest-posttest design approach*. The study sample consisted of 30 pregnant women in the third trimester who experienced back pain with an *accidental sampling technique*. *Measurement of pain intensity was carried out before and after the Endorphin Massage intervention using a pain scale*. The results showed that before the intervention, most respondents experienced moderate to severe pain, while after the intervention, the majority experienced a decrease in pain intensity to mild. The results of statistical tests showed a *p-value* < 0.05 , which means there is a significant effect of *endorphin massage* on reducing the intensity of back pain in pregnant women in the third trimester. The conclusion of this study shows that *endorphin massage* is effective as a non-pharmacological therapy to help reduce back pain in pregnant women in the third trimester.

Keywords: Endorphin Massage, back pain, pregnant women in the third trimester, non-pharmacological therapy, pregnancy.

Introduction

Back pain is one of the most common musculoskeletal complaints experienced by pregnant women, especially in the third trimester. This is due to biomechanical changes, weight gain, changes in the body's center of gravity, and the influence of the hormone relaxin, which causes ligament laxity and muscle tension. This condition can disrupt daily activities, sleep quality, and maternal comfort during pregnancy. Research shows that the prevalence of back pain in pregnancy reaches over 50% and tends to increase in the final trimester (Koukoulithras et al., 2021).

Treatment for back pain in pregnant women can be done through pharmacological and non-pharmacological approaches. However, non-pharmacological therapy is preferred due to its

safety and minimal side effects for both mother and fetus. Recent studies have shown that non-pharmacological interventions such as massage, relaxation, and prenatal exercise are effective in reducing the intensity of back pain in pregnant women (Mueller & Grunwald, 2021).

One method that can be applied is endorphin massage, a light touch technique that can stimulate the release of endorphins, thus providing a natural relaxing and analgesic effect. Other studies have also shown that massage techniques in third-trimester pregnant women have been proven effective in reducing the perception of back pain and increasing comfort for pregnant women (Khairiah et al., 2024). Therefore, this study aims to analyze the effectiveness of endorphin massage in reducing the intensity of back pain in third-trimester pregnant women at the Gumpang Community Health Center in 2025.

Research Method

This study employed a quantitative research method with a pre-experimental design using a One Group Pretest-Posttest Design. This design was chosen to determine the effectiveness of endorphin massage in reducing back pain intensity in third-trimester pregnant women by comparing pain intensity before and after the intervention.

The study was conducted at the Gumpang Care Community Health Center, Putri Betung District, Gayo Lues Regency, Aceh from April to June 2025. The population in this study were all pregnant women in their third trimester (gestational age >36 weeks) who experienced back pain at the community health center.

The sampling technique used was accidental sampling, with a sample size of 30 respondents who met the inclusion criteria. Inclusion criteria were that pregnant women in their third trimester were willing to participate and sign an informed consent. Exclusion criteria included women with a history of pharmacological pain therapy, pelvic pain, premature rupture of membranes, high-risk pregnancies, uterine contraction abnormalities, and placenta previa.

Data collection was conducted by measuring the intensity of respondents' back pain before and after the intervention using the Visual Analog Scale (VAS), a standard instrument widely used for pain assessment (Urrutia et al., 2021). The intervention consisted of a 20-minute endorphin massage, focusing on the back along the spine using V-shaped movements covering the neck, shoulders, and upper arms, following hypnobirthing massage guidelines.

The collected data was processed through editing, coding, processing, and cleaning. Univariate analysis was used to describe respondent characteristics and pain intensity distribution. Bivariate analysis was performed using the Wilcoxon Signed Rank Test to determine differences in pain intensity before and after the intervention, with a significance level of $p < 0.05$ (Polit & Beck, 2021).

Result

A total of 30 pregnant women in their third trimester participated in this study. Respondent characteristics were analyzed based on age, gestational age, and parity. Most respondents were aged 20–35 years, with gestational age >36 weeks, and were multiparous. Back pain intensity was measured using a Visual Analogue Scale (VAS) before and after the endorphin massage intervention.

Before the intervention, the majority of respondents experienced moderate to severe back pain. This finding aligns with previous research suggesting that physiological changes during the third trimester increase stress on the musculoskeletal system and contribute to back pain (Khairiah et al., 2024).

After receiving a 20-minute endorphin massage, pain intensity decreased significantly. Most respondents shifted from severe and moderate pain to mild pain. These results indicate that endorphin massage effectively stimulates relaxation and increases the secretion of endogenous endorphins, which function as natural analgesics (Eka & Sri, 2023).

The average pain score before the intervention was 6.8, while after the intervention it decreased to 3.2, indicating a decrease of 3.6 points. Statistical analysis using the Wilcoxon Signed Rank Test showed a p value = 0.000 ($p < 0.05$), indicating a significant effect of endorphin massage in reducing the intensity of back pain in pregnant women in the third trimester. Similar findings were reported by Kartikasari & Aprillia and supported by more studies.

Research result

Before the endorphin massage was administered, an initial assessment of back pain experienced by pregnant women in their third trimester was conducted using a VAS scale. The distribution of respondents based on pain levels before the intervention is shown in the following table:

Table 1. Back Pain Intensity Before Endorphin Massage

Pain Level	Frequency (n)	Percentage (%)
Moderate Pain	18	60.0%
Severe Pain	12	40.0%
Total	30	100%

After receiving an endorphin massage for approximately 20 minutes on the back and along the spine, pain intensity was measured again using a VAS. Following the intervention, pain intensity decreased significantly. Sixty-six percent of respondents experienced mild pain, 26.7% still experienced moderate pain, and 6.7% experienced no pain at all. This indicates that endorphin massage is effective in reducing back pain in pregnant women in their third trimester.

There is a decrease in pain intensity from moderate/severe pain to mild or even no pain.

Table 2. Back Pain Intensity After Endorphin Massage

Pain Level	Frequency (n)	Percentage (%)
No Pain	2	6.7%
Mild Pain	20	66.7%
Moderate Pain	8	26.7%
Total	30	100%

Discussion

The study results showed a significant effect of endorphin massage on reducing back pain in pregnant women in their third trimester. The reduction in pain intensity after the intervention suggests that light touch stimulation through endorphin massage can increase the production of endorphins, which act as the body's natural analgesics. Endorphins work by inhibiting the transmission of pain impulses in the central nervous system, resulting in decreased pain and increased comfort for pregnant women.

Relaxation massage therapy during pregnancy has been shown to reduce stress, back and leg pain, depression, and anxiety. It also improves immune response, serotonin and dopamine levels, increases birth weight, and reduces the risk of preterm labor. (Kurniasari & Aniroh, 2022)

Massage therapy is a non-pharmacological method that can help improve glandular function, facilitate fluid excretion, and provide a sense of comfort without causing pain. Massage therapy also contributes to improving physiological functions, thus benefiting lactation. (Mandailing et al., 2025)

These findings align with research by Koukoulithras et al. (2021), which states that non-pharmacological interventions such as massage, exercise, and manual therapy have been shown to be effective in reducing back pain in pregnant women and improving daily functional abilities. Research by Maia et al. (2021) also shows that conservative therapies, including massage, have a positive effect on reducing pain and improving quality of life in pregnant women. Furthermore, Mueller & Grunwald (2021) explain that relaxation massage during pregnancy is safe and provides significant benefits in reducing muscle tension, anxiety, and musculoskeletal pain. This reinforces research findings that endorphin massage can be an effective complementary approach in antenatal care. (Kelancaran et al., 2024)

The implications of this research are highly relevant to **the Indonesian government's Asta Cita**, particularly in strengthening human resource development through improving the quality of maternal and child health. Simple interventions such as endorphin massage can support promotive and preventive efforts in midwifery services so that the risk of complications due to physical stress during pregnancy can be minimized. In addition, the results of this study also support the achievement of **Sustainable Development Goals (SDGs) point 3**, namely ensuring a healthy life and supporting well-being for all ages, especially in reducing maternal

morbidity during pregnancy. Therefore, the integration of endorphin massage in antenatal care services can be an innovation in midwifery practice that is effective, safe, affordable, and easy to apply by midwives and families of pregnant women.

Furthermore, the results of this study indicate that Endorphin Massage not only provides physical benefits but also contributes to the psychological well-being of pregnant women. Reduced back pain can improve sleep quality, improve mood, and reduce anxiety that often arises before labor. A more stable psychological state is crucial in preparing mothers for labor, as excessive stress and anxiety can affect the physiological state of both mother and fetus. Thus, Endorphin Massage has holistic benefits that encompass the bio-psycho-social aspects of prenatal care. (Mueller & Grunwald, 2021)

From an educational and healthcare perspective, the findings of this study are also highly relevant to the implementation of **the PACER culture** at STIKes Mitra Husada Medan, namely **Professional, Accountable, Collaborative, Empathy, and Reliability**. The implementation of Endorphin Massage in midwifery services reflects **professional values**, as these actions are based on valid and evidence-based scientific research (Manurung Herna Rinayanti & Tiurmaida Sigalingging, 2022). The **accountable value** is evident in the responsibility of healthcare workers in providing safe interventions that meet the needs of pregnant women. Meanwhile, the **collaborative aspect** can be realized through family involvement, especially husbands, in assisting the Endorphin Massage process, thus creating more optimal emotional support during pregnancy. (Kamelia Sinaga et al., 2024)

Furthermore, **empathy** plays a crucial role in this intervention, as the massage is performed with a caring and attentive touch, reflecting the pregnant woman's well-being. Empathetic care from healthcare professionals can enhance the mother's sense of trust and comfort during treatment (Abidin & Fatimah, 2025). **Reliability** reflects the ease with which this technique can be consistently applied by both midwives and families, making it a practical solution for addressing back pain during pregnancy. This demonstrates that Endorphin Massage is not only a clinical intervention but also a means of implementing humanistic healthcare values. (Nagan & Tahun, 2021)

The results of this study also support the achievement of **Sustainable Development Goals (SDGs) point 3**, namely ensuring healthy lives and improving well-being for all ages, especially in improving maternal health. Reducing back pain in pregnant women can improve the quality of life and reduce the risk of complications due to limited physical activity. In addition, this study is in line with **the Asta Cita of the Indonesian government**, especially in efforts to strengthen human resource development by improving the quality of maternal and child health services. Thus, the application of Endorphin Massage in midwifery care can be a form of service innovation that is not only clinically effective but also supports the vision of sustainable national health development. (Ginting, Astaria Br Yani et al., 2024)

Furthermore, the effectiveness of Endorphin Massage in this study can also be understood through a *continuity of care approach* in midwifery, where simple interventions carried out continuously can have a positive impact on the comfort of pregnant women. Back pain experienced in the third trimester often leads to limited physical activity and a decreased quality

of life. If this condition is not properly managed, it can increase the risk of maternal fatigue and impaired adaptation before delivery. Research by Maia et al. (2021) explains that conservative interventions and manual therapy can help pregnant women maintain daily function and significantly improve quality of life. This indicates that Endorphin Massage not only focuses on pain reduction but also contributes to improving overall maternal well-being.

Furthermore, research by Mueller & Grunwald (2021) revealed that massage during pregnancy is not only effective in reducing pain but also reduces anxiety and depression, as well as increasing serotonin and dopamine levels. This is important because a pregnant woman's psychological balance significantly impacts fetal health and the labor process. Therefore, the results of this study reinforce the multidimensional benefits of endorphin massage, both physical and psychological, making it worthy of consideration as a complementary intervention in antenatal care.

In the context of the implementation of **the PACER culture** at STIKes Mitra Husada Medan, the results of this study further emphasize the importance of humanistic and patient-oriented midwifery services. Endorphin Massage can be a concrete form of implementing the values of **Empathy** and **Collaborative**, where health workers not only provide clinical care but also build positive emotional relationships with pregnant women and involve families in the support process. This approach aligns with the concept of *woman-centered care*, which places the mother at the center of health services.

On the other hand, the results of this study also contribute to the national and global agenda, particularly in supporting **Asta Cita** in the health sector, which emphasizes strengthening primary health care services and improving the quality of maternal and child health. Globally, this research contributes to the achievement of **SDGs point 3**, specifically the target of reducing maternal morbidity through increasing access to safe, effective, and affordable health interventions. Therefore, Endorphin Massage has the potential to be a simple innovation in midwifery services that not only supports service quality but also strengthens a sustainable maternal health system.

Conclusion and Suggestion

Based on the results of research that has been conducted regarding the effectiveness of Endorphin Massage on reducing the intensity of back pain in pregnant women in the third trimester at the Gumpang Community Health Center in 2025, it can be concluded that the provision of Endorphin Massage has been proven effective in reducing the intensity of back pain. This can be seen from the change in pain levels before and after the intervention, where most respondents who previously experienced moderate to severe pain experienced a decrease to mild pain or even no pain after the intervention. The results of statistical analysis using the Wilcoxon test showed a p-value <0.05 , which means there is a significant effect of Endorphin Massage on reducing the intensity of back pain in pregnant women in the third trimester. Thus, the purpose of the study to determine the effectiveness of Endorphin Massage on back pain in pregnant women has been achieved in accordance with the proposed hypothesis.

This study shows that Endorphin Massage can be a safe, simple, effective, and easy-to-apply non-pharmacological therapy alternative in obstetric care. In addition to its benefits in reducing back pain, Endorphin Massage also has the potential to improve physical comfort, sleep quality, relaxation, and psychological well-being of pregnant women during the final trimester of pregnancy. These findings confirm that non-pharmacological approaches play a crucial role in supporting the quality of life of pregnant women, particularly in coping with physiological changes and discomfort during labor. Furthermore, the results of this study support the implementation of woman - *centered obstetric care* , which addresses the physical, emotional, and social needs of pregnant women.

Successful breastfeeding is also influenced by various factors, so efforts to support the breastfeeding process are necessary, including through non-pharmacological therapies such as endorphin massage, which aims to increase maternal relaxation and comfort during breastfeeding. (Mandailing et al., 2025). Spinal massage also relaxes tension and relieves stress, releasing the hormone oxytocin, which helps breast milk flow. (Tumanggor et al., 2023)

Based on the results of this study, it is recommended that health workers, especially midwives, make Endorphin Massage a routine intervention in antenatal care services to help reduce complaints of back pain in pregnant women in the third trimester. The application of this technique is expected to improve the quality of maternal health services that are more holistic, humanistic, and evidence -*based practice* . For educational institutions, especially STIKes Mitra Husada Medan, the results of this study are expected to serve as a reference in developing learning in midwifery practice and strengthening the implementation of the PACER (Professional, Accountable, Collaborative, Empathy, and Reliability) culture in health services.

For pregnant women and their families, the results of this study are expected to increase knowledge and awareness about the importance of non-pharmacological methods in managing back pain, so that Endorphin Massage can be practiced independently with the guidance of health workers. Furthermore, it is recommended that future researchers conduct further research with a larger sample size, using a more robust research design such as a quasi-experimental or randomized controlled trial, and exploring other variables such as anxiety levels, sleep quality, childbirth readiness, and quality of life of pregnant women. Thus, the results of further research are expected to strengthen scientific evidence regarding the effectiveness of Endorphin Massage and support the development of innovative midwifery services that are in line with the achievement of SDGs point 3 and Asta Cita in improving maternal and child health in Indonesia.

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