

THE EFFECT OF *ENDORPHIN MASSAGE AND WARM COMPRESSES* ON THE INTENSITY OF *LOW BACK PAIN* IN THIRD-TRIMESTER PREGNANT WOMEN

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Article Info

Submitted 28 02 2025

Revised 23 06 2025

Published 27 06 2025

Keywords:

Endorphine massage, low back pain, warm compresses

P-ISSN: 2086-3292

E-ISSN: 2655-9900

National Accreditation:

Sinta 4

Abstract

Background: *Lower back pain is a common problem among pregnant women, especially in the third trimester, affecting around 70% in Indonesia. This discomfort significantly impacts daily activities and quality of life. Endorphin massage, a light touch technique that stimulates the release of the body's natural pain-relief hormones, and warm compresses, which use heat to reduce pain, are two methods to address this issue. This study aimed to evaluate the effect of these methods on the intensity of lower back pain in third-trimester pregnant women. A quasi-experimental design with a one-group pre-test post-test approach was employed, and 15 pregnant women were selected from a population of 51 through purposive sampling. Pain intensity was measured on the first and third days using the Numeric Rating Scale (NRS). Results showed a significant reduction in pain intensity, from an average of 5.40 before the intervention to 1.60 after the intervention. A paired sample T-test yielded a p-value of 0.000, indicating a significant effect of endorphin massage and warm compresses on reducing lower back pain in third-trimester pregnant women at the working area of the Karikil Public Health Center. In conclusion, it can be stated that endorphin massage and warm compresses can reduce lower back pain in third-trimester pregnant women.*

INTRODUCTION

Pregnancy is a unique condition experienced by women during which the body undergoes adjustments, resulting in physical changes and discomfort (Puspitasari, 2020). One joint discomfort is *low back pain*, which is caused by changes in the musculoskeletal system (Badrus & Khairoh, 2023). The prevalence of *low back pain* in pregnant women varies in Scandinavia and England at around 50%. In Australia, it almost reaches 70% (Baiq Eka Putri Saudia & Oky Nila Kencana Sari, 2018) and in Indonesia, around 70% in the third trimester (Permatasari, 2019). Low back pain can interfere with the daily activities of pregnant women, such as changing positions, prolonged standing, prolonged sitting, putting on and taking off clothes, and lifting objects. If left untreated, low back pain can lead to long-term complications, including the risk of postpartum back pain and chronic back pain (Suryanti et al., 2021)

Management of low back pain can be done through pharmacological and non-pharmacological methods

approaches. Although pharmacological approaches are practical, they pose a risk to maternal and fetal health. In contrast, non-pharmacological approaches are the leading choice because they do not cause side effects, do not require high costs, and are easy to do at home (Movahedi et al., 2017). One of the non-pharmacological interventions is *Endorphine Massage*, which stimulates the body to secrete endorphin hormones as natural analgesics (Rohma & Rejeki, 2023). Research shows that Endorphine Massage is effective in reducing the intensity of back pain in third-trimester pregnant women (Suryanti et al., 2021; Ivana Argo Cahyani et al., 2020). In addition, warm compresses are also effective in relieving low back pain by utilizing warm temperatures of around 38-40 °C, aiming to reduce the sensation of low back pain and prevent muscle spasms (Aulianisa et al., 2023). Suryanti et al. (2021) showed that before receiving a warm compress, the average pain level reached 5.857, while after receiving a warm compress, the average pain level decreased to 4.513.

According to the Tasikmalaya City Health Office, in 2022, there were 11,711 pregnant women in the Tasikmalaya City area, with the highest number in the Mangkubumi Health Center (900 pregnant women or 7.68%) (Tasikmalaya City Health Office, 2022) Preliminary studies at the Mangkubumi Health Center in January 2024 showed that there were 135 pregnant women in the third trimester, with 51 of them in the working area of the Karikil Public Health Center. Interviews with the working area of the Karikil Public Health Center midwife revealed that many pregnant women in the third trimester complained of mild to moderate lower back pain before labour. Although the health centre has provided education on the use of body mechanics, endorphin massage, and warm compresses, these techniques have not been applied due to limited facilities and time. Interviews with three pregnant women showed that pregnant women had never heard of endorphin massage, and no one had tried it, while the use of warm compresses varied. Some had applied, and some had not. Treatment usually involves changing the sleeping position or using cream, but the results have not been very effective.

Seeing the number of pregnant women who experience low back pain, researchers are interested in combining endorphine massage with warm compresses as an alternative to reduce the intensity of lower back pain in third-trimester pregnant women working area of the Karikil Public Health Center This study aims to determine the effect of the combination of endorphin massage and warm compresses in reducing the intensity of low back pain in third-trimester pregnant women in the work area of the Karikil.

METHOD

This study was conducted at the Munjul Posyandu and the respondents' homes in the working area of the Karikil Public Health Center from March 29 to 31, 2024. The research design used a pre-experimental approach with a Group Pretest-Posttest design. The study population consisted of 51 third-trimester pregnant women who experienced low back pain. The sample was collected using the purposive sampling technique, resulting in 15 respondents who met the inclusion and exclusion criteria.

The independent variables in this study are *Endorphine Massage* and Warm Compress. Endorphine massage is a non-pharmacological therapy that uses a light touch, using ten fingers on the outer arm, neck, and lower back for 20 minutes. It is done once a day for 3 days. Warm Compress is a therapeutic method that involves applying a buli-buli with a temperature range of 38-40 °C to the lower back for 15-20 minutes, once a day for 3 days. The instruments used were the Standard Operating Procedure (SOP), Endorphine Massage, and Warm Compress. The dependent variable was low back pain measured using the Numeric Rating Scale (NRS). Pain evaluation was carried out on the first and third days. The statistical test used was the Paired Sample T-test. This research has obtained ethical approval with Number: 023/KEPL//FITKes-Unjani/III/2024

RESULTS AND DISCUSSION

The frequency distribution of the characteristics of people aged 23 years shows that four people (26.7%) are represented. The most multiparous parity was ten people (66.7%). The most active activity was light activity, nine people (60%) (Table 1). The average values before and after the intervention of endorphin massage and warm compresses were obtained as follows: before intervention, 5.40, and after intervention, 1.60. It indicates a significant difference in the average score of 3.80. The p-value is obtained as .000, which means $p < 0.05$, suggesting that there is an Effect of Endorphine Massage and

Table 1. Frequency Distribution of Respondent Characteristics

Characteristics	Frequency (f)	Percentage (%)
Age		
23	4	26.7%
24	3	20%
26	1	6.7%
27	2	13.3%
32	3	20%
34	2	13.3%
Total	15	100%
Paritas		
Primipara	4	26.7%
Multipara	10	66.7%
Grandemultipara	1	6.7%
Total	15	100%
Aktivitas		
Ringan	9	60%
Sedang	6	40%
Berat	0	0%
Total	15	100%

Table 2. Average low back pain intensity scores before and after intervention

	Mean	Selisih	P.Value
Pre	5.40	3.80	.000
Post	1.60		

DISCUSSION

A. Characteristics of respondents

The results of the analysis showed that most respondents were 23 years old, with four respondents (26.7%) falling into this category. According to Firdayani and Rosita (2019), many married couples in the 20- to 35-year age range expect a productive pregnancy. However, pregnant women in this age range often experience low back pain caused by hormonal changes, excessive activity, and changes in posture during pregnancy. Prananingrum (2022) noted that with increasing age, the pain threshold tends to decrease due to factors related to brain degeneration. Therefore, younger pregnant women are likely to be more sensitive to pain. In young third-trimester pregnant women, the response to pain tends to be higher compared to those who are older because the sensory nerves are still functioning optimally, so that pain is felt more intensely. Conversely, in older women, the decline in sensory nerve function results in a lower response to pain.

In terms of parity, most respondents in the Karikil Community Health Center working area in 2024 were multiparous, with a total of 10 respondents (66.7%). Yosefa et al. (2021) state that women who are often pregnant without doing exercises to restore their abdominal muscle strength have a risk of abdominal muscle weakness that increases with the number of pregnancies.

Puspasari (2019) added that women who give birth for the first time usually still have solid abdominal muscles because they have never experienced stretching before. Therefore, low back pain tends to increase with increasing parity; as stated by Ayu Handayani et al. (2020), the severity of low back pain generally increases with increasing parity.

In terms of activity, most respondents reported engaging in light activities, with a total of 9 respondents (60%). Fraser (2009) and Rahayu et al. (2020) suggest that back pain in pregnant women can arise from various activities carried out during pregnancy, such as doing housework in a seated position, standing for extended periods, and lifting heavy loads. Movements that involve turning the body while lifting can also increase the risk of back pain in pregnant women. According to Ayu Handayani et al. (2020), excessive physical activity can cause fatigue, sleep disturbances, and abdominal enlargement in pregnant women, ultimately leading to discomfort and varying degrees of back pain.

B. Average value of low back pain intensity before and after intervention

Based on the results of research on the effects of endorphin massage and warm compress interventions on the intensity of low back pain in third-trimester pregnant women. Before the intervention, the average score of low back pain in 15 respondents was 5.40, which was categorized as relatively high pain. After the intervention, the average pain score decreased to 1.60, indicating a 3.80-point decrease. This statistically significant decrease suggests that the intervention was effective in reducing low back pain. Low back pain in pregnant women is often caused by a combination of biomechanical, circulatory, hormonal, and psychosocial factors. Biomechanically, pain is caused by a forward shift of the center of gravity due to abdominal and breast enlargement, which leads to postural changes such as accentuation of lumbar lordosis and tension in the paravertebral muscles. Decreased blood flow to the spine due to vascular compression by the uterus also contributes to pain (Carvalho et al., 2017).

Other factors that influence back pain during pregnancy include a history of back pain in previous pregnancies, young maternal age, high parity, stress, and physical stress at work (Salari et al., 2023). The hormones relaxin and progesterone, whose levels increase during pregnancy, also play a role in increased joint spasticity and back pain (Casagrande et al., 2015). Previous studies have shown that the prevalence of back pain in pregnancy ranges from 25% to 90%, with about 50% of pregnant women experiencing back pain and one-third of them experiencing severe pain (Said et al., 2021).

C. Effect of Endorphine Massage and Warm Compress on Reducing Lower Back Pain Intensity

The statistical test results show a p-value of 0.000, which means $p < 0.05$. Based on these results, it can be concluded that the alternative hypothesis (H_a) is accepted, indicating a significant difference in the intensity of low back pain in pregnant women before and after treatment. Therefore, endorphin massage and warm compresses have been proven to reduce the intensity of low back pain in pregnant women in the working area of the Karikil Public Health Center during the third trimester.

The significant reduction in pain scores after the intervention can be explained by the positive effects of endorphin massage and warm compresses. Endorphin massage stimulates the release of endorphins, which act as natural analgesics. At the same time, warm compresses help to improve blood flow to the affected area and relieve muscle tension, thereby reducing pain. The combination of these two interventions works synergistically, producing a more significant reduction in the intensity of low back pain. Endorphins are polypeptides that function as natural pain-relieving hormones, binding to nerve receptors in the brain. Produced in the brain, spinal cord, and other nerve endings, endorphins are mainly released during activities such as sexual intercourse, pregnancy, childbirth, and breastfeeding (Melinawati, A. 2018). Endorphin massage or light massage stimulates the body to produce endorphins, reducing pain and increasing feelings of comfort (Martilova et al., 2021). Research by Amir et al. (2022) supports this study, demonstrating that endorphin massage is effective in reducing the intensity of lower back pain in pregnant women in Trimester III. The Wilcoxon signed-rank test results showed a p-value of 0.000 ($p < 0.05$). Before treatment, 15 out of 20 respondents experienced severe pain, but after treatment, the number of respondents experiencing severe pain was reduced to 1. Another study by Handayani et al. (2021)

yielded similar results, with a decrease in back pain from severe and moderate to mild pain after endorphin massage, as supported by a chi-square test with a p-value of 0.002.

The application of warm compresses also shows significant physiological effects. According to Ridawati and Fajarsari (2020), warm compresses soften fibrous tissue, relax muscles, reduce pain, and increase blood flow. This mechanism is explained by Gate Control Theory, which states that cutaneous stimulation reduces pain transmission through small nerve fibers. Suryanti et al. (2021) suggest that warm temperatures cause dilation of blood vessels, increase blood flow, and relieve pain.

CONCLUSIONS AND RECOMMENDATIONS

This study reveals that the majority of respondents are 23 years old (26.7%), multiparous (66.7%), and engage in light activities (60%). The results of the analysis showed a significant decrease in the intensity of low back pain after the intervention of endorphin massage and warm compresses, with the average pain score decreasing from 5.40 to 1.60. The paired sample t-test shows a p-value of 0.000 ($p < 0.05$), indicating a significant effect of endorphin massage and warm compresses on reducing the intensity of low back pain in pregnant women in the third trimester of pregnancy in the working area of the Karikil Public Health Center.

Future research is recommended to increase the number of respondents, extend the study duration to observe long-term changes, and consider psychological factors, psychosocial variables, and other confounding factors that affect pain intensity in pregnant women. It is also recommended that a control group be included in the study to facilitate a more accurate comparison of the tested methods. Additionally, it is necessary to enhance the approach to socialization, privacy, and comfort of pregnant women during the intervention to increase cooperation from respondents.

ACKNOWLEDGEMENTS

The authors are grateful to the Head of the working area at the Karikil Public Health Center, who provided initial data and facilitated the implementation of research on breastfeeding mothers in their area of work. The authors are also grateful to the Director of the Tasikmalaya Health Polytechnic, Indonesia, who facilitated the financing of the research as needed, providing a single research fund.

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