Journal of Public Health Science (JoPHS)
Volume 3, No 2 – Juni 2026
e-ISSN :3047-3632

THE EFFECT OF WARM COMPRESSES AND EFFLEURAGE MASSAGE ON LOWER BACK PAIN IN PREGNANT WOMEN IN THE THIRD MONTH OF PREGNANCY IN THE DONOMULYO COMMUNITY HEALTH CENTER WORK AREA

Aprilia Suci Hatitama[1]*, Widia Shofa Ilmiah [2]
[1]Bachelor of Midwifery Study Program, Faculty of Health Sciences, Institute of Science and Health Technology, Dr. Soepraoen Hospital, Malang
[1]gira83998@gmail.com
[2] widiashofailmiah@itsk-sopraoen.com
* Coresponding Author

Received: 28-05- 2026	Revised: 10-06-2026	Approved: 22-06-2026

ABSTRACT

Lower back pain is one of the most common discomforts experienced by pregnant women during the third trimester due to physiological and postural changes during pregnancy. Safe and effective non-pharmacological interventions are needed to help reduce pain. This study aimed to analyze the effect of warm compresses and effleurage massage on lower back pain among third-trimester pregnant women in the Donomulyo Community Health Center area Methods: A pre-experimental study with a one-group pretest–posttest design was conducted involving 20 third-trimester pregnant women selected through purposive sampling. Pain intensity was measured before and after the intervention using the Numeric Rating Scale (NRS). Data were analyzed using the Wilcoxon Signed Rank Test with a significance level of 0.05. Before the intervention, most respondents experienced moderate to severe lower back pain. After receiving warm compresses and effleurage massage, pain intensity decreased, with most respondents reporting mild pain or no pain. Statistical analysis showed a p-value of <0.05, indicating a significant reduction in pain following the intervention. Warm compresses and effleurage massage were effective in reducing lower back pain among third-trimester pregnant women. These interventions can be considered safe, simple, and non-pharmacological alternatives for pain management during pregnancy.

Keywords: *Pregnancy, Third Trimester, Low Back Pain, Heat Therapy, Effleurage Massage.*

INTRODUCTION

The third trimester of pregnancy is the final phase of pregnancy, marked by increasingly complex physiological and psychological changes. During this phase, pregnant women often experience physical discomfort such as back pain, frequent urination at night, and difficulty finding a comfortable sleeping position[1]. Additionally, hormonal changes, weight gain, and the enlarging uterus shift the mother's center of gravity forward, triggering postural changes and increased stress on the lumbar spine. This condition is a major contributing factor to lower back pain in the third trimester of pregnancy[2].

Globally, lower back pain is one of the most common complaints among pregnant women, especially in the third trimester. The World Health Organization reports that approximately 50%–70% of pregnant women worldwide experience musculoskeletal disorders, including lower back pain, which impacts activity and quality of life[3]. At the national level, based on the Ministry of Health of the Republic of Indonesia, the prevalence of back pain in pregnant women in the third trimester in Indonesia reaches around 60%–80%, making it one of the most common complaints in antenatal care services[4]. At the provincial level in East Java, several studies show that more than 65% of pregnant women in their third

trimester experience lower back pain with mild to severe pain levels, but non-pharmacological treatment is still not optimal[5]. At the district level, namely Malang Regency, it was reported that around 60% of pregnant women in their third trimester experienced complaints of back pain that disrupted their daily activities and sleep quality. Specifically, in the Donomulyo Community Health Center (Puskesmas) work area, based on a preliminary study, of 10 pregnant women in their third trimester, approximately 7 (70%) experienced lower back pain, but most had not received optimal non-pharmacological interventions such as warm compresses and effleurage massage.

Lower back pain in pregnant women in their third trimester occurs due to physiological and biomechanical changes during pregnancy. Early in pregnancy, there is an increase in the hormones relaxin and progesterone, which causes ligament and joint loosening, thereby reducing spinal stability and triggering pain[6]. As pregnancy progresses, the uterus enlarges, shifting the center of gravity forward. Pregnant women adjust their posture by increasing the curvature of the spine (hyperlordosis), which puts pressure on the muscles and ligaments of the lower back, leading to pain[7]. Furthermore, increased body weight and uterine pressure on the nerves in the lumbar region exacerbate pain. Back muscles work harder to support the body, leading to muscle fatigue and increased pain intensity. This condition generally aligns with the World Health Organization's explanation that pregnancy causes various physical changes that can lead to discomfort and health problems for the mother.

Non-pharmacological therapies are recommended for managing lower back pain in the third trimester of pregnancy because they are relatively safe for both the mother and the fetus. One commonly used therapy is a warm compress. Warm compresses work by increasing blood vessel vasodilation, improving circulation, and reducing muscle tension, thereby reducing pain intensity. Furthermore, the warm sensation also has a relaxing effect, helping to reduce the perception of pain in pregnant women. In addition to warm compresses, another effective therapy is effleurage massage. The effleurage technique involves gentle, stroking movements on the skin's surface, aimed at increasing relaxation, improving blood flow, and stimulating the release of endorphins, which act as pain inhibitors. This therapy has been proven effective in reducing back pain in the third trimester of pregnancy[6]. Thus, the application of warm compresses and effleurage massage is expected to be an effective solution in reducing lower back pain in pregnant women in the third trimester and improving comfort and quality of life during pregnancy. However, the implementation of these two interventions in the field is still not optimal and has not been studied specifically at the primary health care level. Therefore, the researchers are interested in conducting a study entitled "The Effect of Warm Compresses and Effleurage Massage on Lower Back Pain in Pregnant Women in the Third Trimester in the Work Area of the Donomulyo Community Health Center."

RESEARCH METHODS

This study employed a quantitative research method with an experimental approach. The research design used was a pre-experimental design with a one-group pretest–posttest design. This design involved administering an intervention to a single group of participants without a control group and measuring the outcome before and after the intervention. The study aimed to

evaluate the effectiveness of warm compresses and effleurage massage in reducing lower back pain among third-trimester pregnant women.

The study was conducted in the working area of Donomulyo Community Health Center (Puskesmas), Malang Regency. The population consisted of all third-trimester pregnant women registered in the working area during the study period, totaling 20 individuals.

This study employed a total sampling technique because the number of eligible participants was relatively small. The target population consisted of third-trimester pregnant women who met the inclusion criteria. After screening, a total of 20 participants were found to be eligible for the study. Since all eligible participants were included, the final sample size was 20 respondents.

The sample size was determined as follows:

n=N

Where:

n = sample size

N = total number of eligible participant

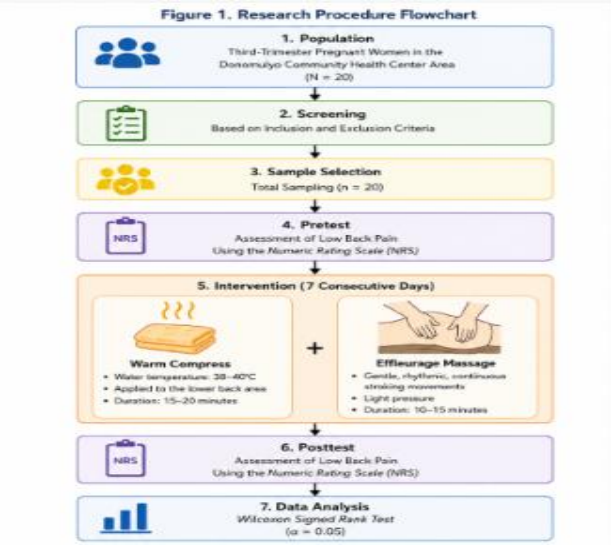
Therefore:

n=20

Thus, all 20 eligible third-trimester pregnant women were included in the study.Sampling was conducted using a purposive sampling technique based on predetermined inclusion and exclusion criteria. The inclusion criteria were: (1) third-trimester pregnant women willing to participate in the study, (2) experiencing lower back pain, and (3) having no skin disorders or other conditions that contraindicated the application of warm compresses and massage. The exclusion criteria were: (1) pregnant women with severe pregnancy complications and (2) those regularly consuming analgesic medications. The independent variables in this study were warm compresses and effleurage massage, while the dependent variable was lower back pain among third-trimester pregnant women. Data were collected through observation and direct assessment using the Numeric Rating Scale (NRS), which measures pain intensity on a scale from 0 to 10. The NRS assessment was conducted before the intervention (pretest) and after completion of the intervention period (posttest). The intervention was administered for seven consecutive days. Prior to the intervention, respondents underwent a baseline assessment using the NRS to determine their initial pain level. Warm compresses were then applied to the lower back area using a towel soaked in warm water with a temperature maintained at approximately 38–40°C. The compress was applied for 15–20 minutes while ensuring participant comfort and safety.Following the warm compress application, effleurage massage was performed on the lower back area. The massage consisted of gentle, rhythmic, and continuous stroking movements using light pressure. Each massage session lasted approximately 10–15 minutes and was conducted according to a standardized procedure. The intervention was repeated daily for seven days. At the end of the intervention period, respondents' pain levels were reassessed using the NRS.

The collected data were analyzed using the Wilcoxon Signed Rank Test with the assistance of SPSS software. This statistical test was selected because it is appropriate for comparing paired data obtained before and after an intervention. A significance level of $p < 0.05$ was used to determine whether the intervention had a significant effect on reducing lower back pain among third-

trimester pregnant women.



RESULTS AND DISCUSSION

A. Respondents' Characteristics

Table 1. Respondents' Characteristics

Variable	Category	n	%
Gravida	First pregnancy	6	30.0
	Second pregnancy	9	45.0
	Third pregnancy	5	25.0
	Total	20	100
Age	Late adolescence	6	30.0
	Early adulthood	14	70.0
	Total	20	100
Occupation	Housewife	14	70.0
	Employed	6	30.0
	Total	20	100

Based on the respondents' characteristics, most participants were in their second pregnancy (45%). In terms of age, the majority were in the early adulthood category (70%). Regarding occupation, most respondents were housewives (70%). This indicates that the respondents in this study were predominantly pregnant women with second pregnancy experience, in early adulthood, and not formally employed.

B. Distribution of Pain Pretest and Posttest

Table 2. Distribution of Pain Pretest and Posttest

Variable	Category	n	%
Pretest Pain	Moderate	12	60.0
	Severe	8	40.0
	Total	20	100
Posttest Pain	No pain	1	5.0
	Mild	10	50.0
	Moderate	9	45.0
	Total	20	100

Based on the study results, before the intervention (pretest), most respondents experienced moderate pain (60%), while 40% experienced severe pain. After the intervention (posttest), there was a decrease in pain levels, with most respondents experiencing mild pain (50%), followed by moderate pain (45%), and 5% reporting no pain. This indicates a reduction in pain levels after the intervention was administered.

C. Normality Test

Table 3. Normality Test Results

Variable	Shapiro-Wilk (Sig.)	Interpretation
Pretest	0.025	Not normal
Posttest	0.038	Not normal

Based on the Shapiro-Wilk normality test, the significance values for the pretest and posttest data were 0.025 and 0.038, respectively. Since both values are less than 0.05 ($p < 0.05$), it can be concluded that the data are not normally distributed. Therefore, the analysis was continued using a non-parametric test, namely the Wilcoxon Signed Rank Test.

Wilcoxon Signed Rank Test

Table 4. Wilcoxon Signed Rank Test Results

Variable	Value
Z	-4.379
Asymp. Sig (2-tailed)	0.000

Based on the Wilcoxon Signed Rank Test, a Z-value of -4.379 was obtained with a significance value (p-value) of 0.000 ($p < 0.05$). This indicates a significant difference between pain levels before and after the warm compress and effleurage massage intervention. Therefore, it can be concluded that the intervention was effective in reducing lower back pain in pregnant women in the third trimester.

Based on the study, it was found that the majority of respondents were pregnant for their second time (9 women (45%), followed by pregnant for their first time (6 women (30%), and pregnant for their third time (5 women (25%), thus the majority of respondents were classified as multigravida. Theoretically, the number of pregnancies (gravida) is associated with changes in spinal biomechanics and an increased risk of back pain due to repeated stretching of the musculoskeletal structure. This is supported by the study "Obstetric-related lower back pain" (2024), which explains that the greater the number of pregnancies, the greater the risk of chronic back pain and spinal degeneration.[8]. In addition, the Global prevalence of low back pain in pregnancy study (2023) stated that factors such as previous pregnancy history and increasing number of pregnancies are one of the main causes of back pain in pregnant women.[9]. Another study Low back pain during pregnancy and delivery outcomes (2022) also found that pain intensity increased with increasing pregnancy experience. [10]. Therefore, the researchers believe that the predominance of multigravida in this study contributed to the high incidence of low back pain among respondents.

Based on the results, the majority of respondents were in the early adulthood category (26–35 years old) (14 respondents (70%), while 6 respondents were in their late teens (30%), so most were of healthy reproductive age. In theory, 20–35 years is the optimal age for pregnancy because physical condition and

reproductive organs are at a mature stage. However, physiological changes can still cause back pain. This is supported by the study "Low back pain and kinesiophobia in pregnant women" (2024), which states that back pain in pregnant women can occur regardless of age, but rather due to mechanical and hormonal factors.[11]. Anatomical changes and the center of gravity during pregnancy cause pressure on the spine, which can trigger pain. [12] Another study, the Low back pain in pregnancy prevalence study (2025), also showed that most pregnant women who experienced pain were of productive age. [13]. Therefore, researchers believe that even though respondents were of healthy reproductive age, back pain still occurred as a result of physiological changes during the third trimester of pregnancy.

Based on the study results, the majority of respondents were housewives (14 women (70%), while 6 women (30%) were employed. In theory, physical activity is closely linked to the onset of back pain, especially activities involving prolonged standing, bending, or repetitive workloads. This is supported by the study "Decreased Risk of Low Back Pain with Manual Therapy" (2022), which explains that physical activity and workload can increase the risk of back pain during pregnancy[14]. In addition, research on Risk factors of low back pain (2023) states that work and activity factors are the main causes of musculoskeletal disorders. [15]. Everyday physical stress, including household activities, contributes to increased pain complaints. [9]. Therefore, the researchers believe that the predominance of respondents as housewives in this study influenced the emergence of back pain due to repetitive domestic activities.

Based on the research results, it was found that before the intervention (pretest), most respondents experienced moderate to severe pain. However, after the intervention in the form of warm compresses and effleurage massage (posttest), the pain level decreased to mild or even no pain. Furthermore, the Wilcoxon test results showed a significance value of $p < 0.05$, indicating a significant difference between before and after the intervention. In theory, back pain in pregnant women in the third trimester occurs due to physiological changes such as increased relaxin hormone levels, changes in the body's center of gravity, and tension in the back muscles. Non-pharmacological interventions such as warm compresses and effleurage massage work by increasing blood circulation, relaxing muscles, and stimulating the release of endorphins, the body's natural analgesic. As explained in the study "Effleurage massage for back pain" (2025), which stated that effleurage massage is effective in reducing pain through muscle relaxation and increased comfort.[16]. This is also supported by research on the Effect of effleurage massage on back pain (2024) which showed a significant decrease in the pain scale after intervention with a p value = 0.000.[17]. In addition, the Prenatal massage effectiveness study (2023) stated that prenatal massage therapy significantly reduced back pain with the Wilcoxon test ($p = 0.001$).[18]. Another study, Combination of effleurage and endorphin massage (2023), also found that the combination of massage techniques had a greater effect in reducing pain than ordinary relaxation techniques.[19]. Furthermore, the Effleurage massage quasi-experimental study (2025) showed that there was a significant difference before and after the intervention with $p = 0.000$, thus strengthening the effectiveness of this therapy.[20]. Effleurage therapy has been proven effective in reducing back pain in pregnant women in the third trimester through a pretest-posttest design. The combination of effleurage therapy and massage reduces pain by stimulating

sensory nerve fibers to inhibit pain signals from reaching the brain through the Gate Control Theory mechanism. In addition to closing the pain "gate," this stroking and massage technique stimulates the release of endorphins, a natural pain reliever, while also reducing the stress hormone cortisol. This soft tissue manipulation also effectively increases blood circulation to relax the musculoskeletal tension often experienced by pregnant women.[21]. Therefore, the researcher believes that the reduction in pain that occurred in respondents in this study was caused by the effectiveness of the combination of warm compresses and effleurage massage which worked physiologically in increasing muscle relaxation and reducing pain perception, so that the results of statistical tests showed a significant difference between before and after the intervention.

CONCLUSION

Based on the research results, respondents were predominantly multigravida pregnant women, in early adulthood, and mostly housewives. Before the intervention, the level of lower back pain was mostly moderate to severe. After warm compresses and effleurage massage, pain levels decreased to mild or even no pain. The Wilcoxon test showed a significant difference between before and after the intervention, thus concluding that warm compresses and effleurage massage are effective in reducing lower back pain in pregnant women in the third trimester.

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