

Comparing Warm Compress and Effleurage Massage to Reduce Back Pain in Third-Trimester Pregnant Women in the Working Area of Maracang Health Center, Purwakarta Regency

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KEYWORDS

Back pain; massage effleurage; warm compresses; third trimester pregnant women; non-pharmacological interventions

ABSTRACT

Anatomical and hormonal changes cause the appearance of back pain complaints in pregnant women in the third trimester. The prevalence of back pain in Indonesia is 18%. Non-pharmacological methods such as *effleurage* massage and warm compresses can provide benefits in reducing back pain. This study aims to compare the effectiveness of warm water compresses with *effleurage* massage in reducing the intensity of back pain in pregnant women in the third trimester within the working area of the Maracang Health Center, Purwakarta Regency. This quantitative research employs a quasi-experimental design with a pre- and post-test two-group approach. The research sample consisted of 32 pregnant women in the third trimester, divided into two groups: the *effleurage* massage group and the warm compress group, with 16 respondents in each. Pain intensity was measured using the Numeric Rating Scale (NRS). Data were analyzed using an independent samples t-test. The results of the independent samples t-test showed a p-value of 0.444, indicating that there was no significant difference between warm compresses and *effleurage* massage in reducing the scale of back pain in pregnant women in the third trimester; thus, both warm compresses and *effleurage* massage are equally effective in reducing back pain in pregnant women in the third trimester.

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INTRODUCTION

Pregnancy is a period that starts from conception to the birth of the fetus, lasting approximately 280 days (40 weeks). Pregnancy is divided into three trimesters (*trimester*), namely the first trimester from 0–12 weeks of gestation, the second trimester from 12–28 weeks of gestation, and the third trimester from 28–40 weeks of gestation (Eweis et al., 2021; Gasiorowska et al., 2019; Hao et al., 2016; la Cour Freiesleben et al., 2021; Wu et al., 2021). Pregnancy causes almost the entire female body to undergo changes, one of which is a change in the musculoskeletal system. This can result in pain, *baal*, and weakness in the upper extremities because the body undergoes a gradual change in posture that leads to abdominal distension, causing the hips to lean forward, a decrease in abdominal muscle tone, and increased weight (Aquino et al., 2018; Dzomeku et al., 2020; Sheferaw et al., 2016; Sudhinaraset et al., 2021). Anatomical and hormonal changes cause the appearance of complaints in pregnant women, especially those in the third trimester, such as low back pain, frequent urination, lack of sleep or insomnia, swelling, and leg cramps. Back pain in pregnant women is caused by breast enlargement which can trigger muscle tension, weight gain, and fatigue (Bakilan, 2020).

Data obtained from the American Pregnancy Organization show that the incidence of back pain during pregnancy ranges from 48% to 90%. Approximately 50% of pregnant women surveyed in the UK and Scandinavia reported suffering from back pain, in Australia as many as 70%, and about 20% of patients with acute low back pain will continue to experience chronic symptoms (Carvalho et al., 2017; Dunn et al., 2019; Liddle & Pennick, 2015). The number of pregnant women in Indonesia in 2019, according to the Indonesian Ministry of Health, reached 5,256,483 people (Ministry of Health of the Republic of Indonesia, 2020). The prevalence of low back pain in Indonesia is 18% (Fitriana, 2018).

Back pain in pregnancy should be treated immediately, as it can result in long-term back pain, increasing the tendency for postpartum back pain and chronic back pain that will be more difficult to treat or cure. Pain causes fear and anxiety, which can increase stress and cause drastic physiological changes during pregnancy (Carvalho et al., 2017). Non-pharmacological methods that can reduce pain include warm compresses, which provide benefits such as comfort, reduction or prevention of muscle spasms, and warmth (Ardiana, 2016). In addition to warm compresses, another non-pharmacological method for treating low back pain in pregnant women is *massage effleurage*. *Massage effleurage* is a touch therapy or light massage that can stimulate the body to release endorphin compounds which act as pain relievers and create a feeling of comfort (Lowdermilk, 2016).

Previous research has demonstrated the effectiveness of each intervention individually. A study by Tri (2018) showed a significant reduction in back pain intensity after the application of warm compresses. Similarly, research by Handayani (2016) indicated that *effleurage* massage effectively reduced back pain in third-trimester pregnant women. However, a direct comparison between the effectiveness of warm compresses and *effleurage* massage in the same population and setting, particularly in the working area of the Maracang Health Center, remains limited. This study aims to fill that gap by providing a comparative analysis.

Based on a preliminary study conducted among 20 pregnant women in the third trimester, 15 (75%) complained of back pain. The pregnant women reported that the back pain they experienced sometimes made them uncomfortable and worried about their condition. Based on this description, this study aims to determine the comparison of warm water compresses with *effleurage* massage on reducing the intensity of back pain in pregnant women in the third trimester in the working area of the Maracang Health Center, Purwakarta Regency.

This research is expected to provide significant benefits. For pregnant women, the findings can serve as a reference for choosing a simple, safe, and effective non-pharmacological therapy to alleviate back pain, thereby improving their comfort and quality of life during the third trimester. For healthcare providers, especially midwives at the Maracang Health Center and similar facilities, this study can contribute to the evidence base for non-pharmacological pain management, potentially enriching the standard of care provided. Furthermore, for the scientific community, this research adds to the existing body of knowledge comparing the efficacy of two common interventions, which can inform future studies and clinical practice guidelines.

METHOD

This research is a type of quantitative study with a quasi-experimental design using a pretest-posttest control group design. The research was conducted in the working area of the Maracang Health Center, Purwakarta Regency, during the period of November 2024 to February 2025. The target population in this study comprised all pregnant women in the third trimester who experienced back pain in the working area of the Maracang Health Center, Purwakarta Regency, totaling 32 individuals. The sampling technique used was total sampling, a method in which the number of samples is equal to the population. The research sample

consisted of 32 participants divided into two groups: the *massage effleurage* group and the warm compress group, with 16 participants in each.

The inclusion criteria were: (1) pregnant women experiencing back pain without other comorbidities, (2) pregnant women in the third trimester, (3) normal *DJJ* of 120–160 times/min, and (4) willingness to be respondents. The exclusion criteria were: (1) mothers who do not live in Haurwangi District, (2) pregnant women who do not experience complaints of back pain, (3) pregnant women with other disease complications, and (4) mothers who were unwilling to be respondents.

The research instrument used an observation sheet containing the pain level measured by the Numeric Rating Scale (NRS). The independent variables, namely warm compresses and *massage effleurage*, were applied according to Standard Operating Procedures (SOPs). The collected data were processed through editing, coding, processing, and cleaning stages, and then analyzed using univariate and bivariate analysis. The normality test was performed using the Shapiro-Wilk test. Bivariate analysis employed an independent samples t-test to determine the difference in the effectiveness of the two interventions.

RESULTS AND DISCUSSION

Respondent Characteristics

This study involved 32 respondents of pregnant women in the third trimester who were divided into two intervention groups. Based on the characteristics of gestational age, as many as 13 respondents (40.6%) had preterm gestational age and 19 respondents (59.4%) had a term gestational age. In terms of maternal age, as many as 4 respondents (12.5%) were in the risk category (<20 years and >35 years) and 28 respondents (87.5%) were not at risk (20–35 years). Based on parity, 13 respondents (40.6%) were primipara, 14 respondents (43.8%) were multipara, and 5 respondents (15.6%) were grandemultipara.

Univariate Analysis

Table 1. Description of Average Intensity of Back Pain Before and After Intervention

Group	Time	n	Mean	Min	Max	Std. Deviation
Warm Compress	Before	16	5,75	4	7	0,683
	After	16	4,56	2	6	1,263
Massage Effleurage	Before	16	5,75	4	7	0,775
	After	16	4,25	2	6	1,000

Based on Table 1, in the warm compress group, there was a decrease in the average pain intensity from 5.75 to 4.56. Meanwhile, in the massage effleurage group, there was a decrease in the average pain intensity from 5.75 to 4.25.

Bivariate Analysis

Data Normality Test

The results of the normality test using Shapiro-Wilk showed that the data of the warm compress group had a p-value of 0.061 ($p > 0.05$) and the data of the massage effleurage group had a p-value of 0.094 ($p > 0.05$), meaning that all data were normally distributed so that they could be continued with parametric tests.

Comparison of the Effectiveness of the Two Interventions

Table 2. The Difference Between Warm Water Compress and Effleurage Massage on Reducing the Scale of Back Pain

Pain Intensity	N	Average Difference	p-value
Warm Compress	16	1,19	0,444

Massage Effleurage	16	1,50
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Based on Table 2, the mean difference in pain intensity in the warm compress group was 1.19, while the mean difference in pain intensity in the massage effleurage group was 1.50. The results of the independent sample t-test obtained a p-value of 0.444 ($p > 0.05$), meaning that there was no significant difference between warm compresses and massage effleurage on the reduction of the scale of back pain in pregnant women in the third trimester.

Characteristic Relationship with Pain Intensity

Table 3. Intensity of Back Pain based on Respondent Characteristics

Characteristic	Category	moderate pain	Severe Pain	Total	p-value
Gestational Age	Preterm	11 (84,6%)	2 (15,4%)	13 (100%)	0,552
	Stuttgart	18 (94,7%)	1 (5,3%)	19 (100%)	
Mother's Age	Risky	2 (50,0%)	2 (50,0%)	4 (100%)	0,035
	No Risk	27 (96,4%)	1 (3,6%)	28 (100%)	
Parity	Primipara	11 (84,6%)	2 (15,4%)	13 (100%)	0,562
	Multipara	13 (92,9%)	1 (7,1%)	14 (100%)	
	Largemultipara	5 (100%)	0 (0%)	5 (100%)	

The results of the analysis showed that only maternal age characteristics had a significant relationship with back pain intensity ($p=0.035$), while gestational age ($p=0.552$) and parity ($p=0.562$) showed no significant relationship.

Discussion

The results of the study showed that both warm compresses and massage effleurage were equally effective in reducing the intensity of back pain in third trimester pregnant women. This is in line with Tri's (2018) research which showed that there was a significant difference between pain intensity before and after being given warm compresses with a reduction in pain scale of 3.30. Research by Aulia et al. (2018) also stated that there was a decrease in back pain in pregnant women in the third trimester who were given warm compresses.

The decrease in pain levels between before and after being given massage effleurage and warm compresses is due to the movement of massage effleurage and warm compresses acting slowly in rhythm with breathing during pain to distract the mother's mind, so that the mother does not focus her attention on the pain so that it causes a sense of comfort and relaxation and is able to reduce pain (Handayani, 2016).

Warm compresses can provide benefits in the form of physical effects, chemical effects, and biological effects. Heat can cause dilatation of blood vessels resulting in increased blood circulation, decreased blood viscosity, decreased muscle tension, increased tissue metabolism and increased capillary permeability (Berman et al., 2021).

Effleurage massage is a massage technique that is easy to do, safe, does not require many tools, without side effects with the main action of the application of the Gate Control theory which can "close the gate" to inhibit the travel of pain stimuli to the higher centers of the central nervous system (Rahma, 2017).

Based on the characteristics of the respondents, this study found that the mother's age had a significant relationship with the intensity of back pain ($p=0.035$). This is in line with the research of Sukma and Sari (2020) which states that physiologically with age, the ability of body organs naturally decreases. Pregnant women with risk age groups (<20 years and >35 years) have 2 times the risk of pregnancy and childbirth compared to reproductive age (20-35 years).

The study did not find a significant association between gestational age and parity with back pain intensity. This is in contrast to some previous studies that showed a significant

relationship. These differences in results may be due to different sample characteristics and other factors that were not studied in this study.

CONCLUSION

Based on the results of the study, it can be concluded that there is no significant difference between warm water compresses and *effleurage* massage in reducing the intensity of back pain in pregnant women in the third trimester in the working area of the Maracang Health Center, Purwakarta Regency (p-value 0.444). Both interventions were equally effective in reducing back pain in pregnant women in the third trimester, with an average reduction in pain intensity of 1.19 for warm compresses and 1.50 for *massage effleurage*, respectively. Maternal age characteristics had a significant relationship with back pain intensity ($p = 0.035$), while gestational age and parity showed no significant relationship. Suggestions: (1) apply warm compresses ($\pm 40-45^{\circ}\text{C}$, 15–20 minutes, 1–2×/day) and *effleurage* massage (5–10 minutes) as standard options during ANC visits and pregnant women's classes, with pre- and post-NRS recording; (2) prepare Standard Operating Procedures (SOPs), conduct short training for health workers and cadres, and ensure the availability of simple tools; (3) conduct at-risk age screening as well as provide education on ergonomics, light stretching, and proper sleeping positions; (4) for follow-up research, use a multi-centre randomized controlled trial (RCT) design with a larger sample, control of confounding factors, standardization of intervention dose and frequency, and secondary outcomes such as sleep quality, daily function, satisfaction, and cost-effectiveness; (5) encourage self-care by mothers and couples at home, as well as timely referrals if pain worsens or is accompanied by other symptoms.

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