The Effect Of Effleurage Massage On The Intensity Of Back Pain In Third Trimester Pregnant Women

Eny Pujiati[1*], Vera Fitriana[2]

[1-2]Institut Teknologi Kesehatan Cendekia Utama Kudus, Jawa Tengah - Indonesia

*Corresponding Author: enypujiati886@gmail.com

Abstract. One of the discomforts experienced by pregnant women in the third trimester is lower back pain. In Indonesia, the prevalence of lower back pain in pregnant women reaches 18%, while in various regions, the figure ranges from 60-80%. Effleurage massage is a treatment method that can help reduce pain and increase comfort. The purpose of this study is to determine the effect of effleurage massage on the intensity of lower back pain in third-trimester pregnant women. This research was conducted from February 20 to 27, 2024, in the working area of Mejobo Health Center, Mejobo Subdistrict, Kudus Regency. Methods: This experimental study uses a pre-experimental pretest-posttest one-group design. The population in this study includes all pregnant women in the working area of the Mejobo Health Center, Mejobo Subdistrict, Kudus Regency. The sample was taken using purposive sampling, consisting of 32 pregnant women. Data were collected through observation and using research instruments, including observation sheets and effleurage massage SOPs. Results: The average lower back pain intensity of third-trimester pregnant women before the intervention was4.50 ± 1.317, and after the intervention, it was 3.06 ± 1.340, with p=0.000, indicating a significant difference in the average lower back pain intensity before and after effleurage massage. Conclusion: Effleurage massage can reduce lower back pain.

Key words: Pregnant Women, Third Trimester, Back Pain, Effleurage Massage

INTRODUCTION

Pregnancy is a natural and physiological process that begins with the union of an egg and sperm, known as fertilization, followed by the implantation of the fertilized egg on the uterine wall, specifically on the endometrium layer, which occurs on the sixth and seventh days after conception (Widatiningsih, Sri, & Dewi, C, H, 2017). Pregnancy starts from conception and continues until the birth of the developing embryo, typically lasting around 40 weeks or 280 days. The calculation is determined by measuring the time from the first day of the last menstrual period (LMP) until childbirth, marking the beginning of the antepartum phase (Padila, 2014).

During pregnancy, expectant mothers will experience physiological and psychological changes. These changes are caused by fluctuations in the levels of estrogen and progesterone throughout pregnancy, both anatomically and physiologically. The changes affect all of the mother's organs and occur as the pregnancy progresses (Hatijar, Saleh and Yanti, 2020). Physiological changes can cause discomfort, especially in the third trimester, such as increasingly full and painful breasts, varicose veins, leg cramps, ankle edema, constipation, frequent urination, pressure on the perineum, and back pain. Psychological changes in third-trimester pregnant women include adjustment responses to the new role as a mother, such as fear of childbirth, concern for the fetus's safety, changes in body image, increased anxiety, mood swings, and difficulty sleeping as the pregnancy advances (Rahmawati and Wulandari, 2019). Some adaptations to the physiological and psychological changes include discomfort commonly complained about during the third trimester of pregnancy. Approximately 70% of pregnant women suffer from back pain, characterized by discomfort in the back area from the last rib or thoracic vertebrae, resulting in decreased muscle elasticity and flexibility. The peak of back pain occurs from the 24th to the 28th week, just before the belly growth reaches its maximum point. According to Mayer's study, cited by Yosefa, back pain is often exacerbated by chronic backache. This condition is found in 45% of women during pregnancy, increasing to 69% by the 28th week, and almost remains at that level (Tanjung Rejeki and Fitriani, 2019).

According to the 2020 report by the World Health Organization (WHO), the global prevalence of back pain varies each year, ranging from 15-45%. WHO also mentions that in

developing countries, about 33% of the population suffers from back pain (World Health Organization, 2020). The prevalence of back pain in third-trimester pregnant women is quite high, around 50%, in various regions such as Europe, Australia, China, America, Turkey, the mountainous regions of Taiwan, Africa, and Nigeria (Manyozo, Nesto and Muula, 2019). A study conducted by Sencan, Cuce, Guzel, and Erdem at the prenatal care clinic of the Turkish State Hospital from August 2011 to September 2014 showed that the prevalence of back pain in pregnant women reached 53.93%. Of this number, 17.43% of pregnant women experienced back pain in the first trimester, 36.71% in the second trimester, and 45.86% in the third trimester (Sencan *et al.*, 2018).

According to the 2020 Indonesian Health Data Profile report, the prevalence of back pain in pregnant women in Indonesia reaches 18%, while in various regions, the prevalence ranges between 60-80% (Kementrian Kesehatan RI, 2020). Data from the Central Java Provincial Health Office in 2021 shows that the prevalence of pregnant women is 54%, with nearly 17% of them experiencing back pain (Dinkes Provinsi Jawa Tengah, 2021). Research findings also indicate that among 30 third-trimester pregnant women, 10% experienced mild back pain, 73.33% experienced moderate pain, and 16.67% experienced severe pain (Purnamasari KD, 2019). The 2023 report from the Kudus Regency Health Office recorded a total of 15,045 pregnant women (Kudus Regency Health Office, 2023). Based on a preliminary study at the Mejobo Health Center in Kudus Regency, there are 455 third-trimester pregnant women (Dinkes Kabupaten Kudus, 2023) (Data Primer PWS- KIA, 2023). Meanwhile, interviews with village midwives in Mejobo Village revealed that 1.31% of third-trimester pregnant women in the village, or about 60 pregnant women, suffer from back pain.

The mechanism of back pain in third-trimester pregnant women is due to the growing uterus caused by the fetus's development, which shifts the body's center of gravity forward. This requires pregnant women to adjust their posture to maintain balance. As a result, the body attempts to pull the back more backward, causing the lower spine to curve and the spinal muscles to shorten, leading to tension in the back muscles and ligaments, which often causes back pain experienced at the end of pregnancy (Purnamasari KD, 2019). Back pain in third-trimester pregnant women can also be caused by hormonal changes, including an increase in the hormone relaxin, which causes the pelvic joints to loosen. This condition affects the muscles of the waist, back, and thighs, making them tense and increasing the risk of pain (Irianti B, Hilda EM, Prabandari, 2014).

Pregnant women experiencing back pain in the third trimester, if not promptly addressed, can suffer from long-term back pain. The increase in back pain after childbirth can even develop into chronic pain that is difficult to cure. This condition can also disrupt daily physical activities, cause discomfort, and lead to sleep difficulties, ultimately reducing the quality of life of the pregnant woman (Widatiningsih, Sri, & Dewi, C, H, 2017). Back pain in third-trimester pregnant women can be managed with both pharmacological and non-pharmacological pain management strategies (Yikar and Nazik, 2019).

One non-pharmacological method that can be used to relieve back pain in pregnant women is the effleurage massage technique (Sri Rahayu *et al*., 2022). Effleurage massage involves movements using the entire surface of the palms, which are applied to the parts of the body being massaged. The shape of the palms and fingers always adjusts to the body parts being massaged. The therapeutic effects of effleurage massage help to improve venous blood circulation and the circulation of lymph fluid, enhance the metabolic process, reduce fatigue, help absorb edema caused by inflammation, provide relaxation, and reduce pain (Wiyanto, 2017).

Effleurage massage is an easy-to-perform technique, safe, does not require many tools, and has no side effects, with the primary action being the application of the Gate Control Theory, which can "close the gate" to inhibit the transmission of pain stimuli to the central nervous system (Rahma, Sofiyanti and Nirmasari, 2017). This process occurs because the massage technique applies hand pressure to soft tissues, muscles, tendons, or ligaments, which can decrease the sensation of pain. Effleurage massage induces relaxation by improving circulation, providing tactile stimulation, and creating positive feelings. When done with gentle, attentive, and empathetic touch, it delivers a strong effect in enhancing muscle relaxation, soothing nerve endings, and alleviating pain (Setiawati, 2019).

The research findings of Wulandari and Andryani in 2019 reported that the application of effleurage massage for 5-10 minutes once a day for five consecutive days effectively reduces the intensity of back pain in third-trimester pregnant women (Wulandari and Andryani, 2019).

Similarly, Fitriana and Vidayanti in 2019 stated that there was a decrease in the scale of back pain among 32 third-trimester pregnant women after the application of the effleurage massage technique (Fitriana and Vidayanti, 2019). Likewise, Sri Rejeki et al. reported that there was a significant influence of effleurage massage on back pain in third-trimester pregnant women (Rejeki *et al.*, 2022).

Based on the phenomenon and the results of existing research studies, which indicate the influence of effleurage massage on back pain in third-trimester pregnant women, the researchers are interested in knowing the effect of effleurage massage on the intensity of back pain in third-trimester pregnant women. This study aims to determine the effect of effleurage massage on the intensity of back pain in third-trimester pregnant women in Mejobo Village, Mejobo Subdistrict, Kudus Regency, thereby providing benefits that can be used as therapy for back pain patients wherever they are, especially for third-trimester pregnant women.

METHODS

This quantitative study employs an experimental design using a pre-experimental pretest-posttest one-group design, where measurements are taken before and after the intervention. The difference in measurements before and after the intervention is considered the effect of the treatment. The researcher observed pain levels before and after effleurage massage, conducted from February 20 to 27, 2024. The population in this study includes all third-trimester pregnant women in the working area of Mejobo Health Center, Mejobo Subdistrict, Kudus Regency. The sample consists of 32 third-trimester pregnant women from the same area, selected using purposive sampling. Subjects experiencing third-trimester back pain were asked to rate their pain levels on a 0-10 Numerical Rating Scale (NRS) before the effleurage massage. The intervention, comprising a 15-30minute effleurage massage, was administered once daily for 7 consecutive days by certified professionals. After the treatment, subjects were again asked to rate their pain levels on the NRS. The research instruments used in this study include a questionnaire to identify subject characteristics, an observation sheet for the NRS, and the Standard Operating Procedure (SOP) for effleurage massage. The statistical test used in this study is the paired t-test.

RESULTS AND DISCUSSION

Based on the research findings, the intensity of lower back pain experienced by third-trimester pregnant women before and after effleurage massage can be seen in the table below.

Tabel 1. Characteristics of Subjects (age, occupation, education, and gravida) in the Working Area of Mejobo Health Center, Mejobo Subdistrict, Kudus Regency

Subject Characteristics	F	%
Age		
< 20 years	0	0
20 – 35 years	23	71.9
> 35 years	9	28.1
Total	32	100
Occupation		
Employed	25	78.1
Unemployed	7	21.9
Last Education		
Higher Education	3	9.4
Lower Education	29	90.6
Total	32	100
Gravida		
Primigravida	9	28.1
Multigravida	23	71.9
Total	32	100

Based on Table 1, the research results indicate that 71.9% of pregnant women experiencing back pain fall within the healthy reproductive age category of 20-35 years. The majority of them are

employed (78.1%), have a lower education level (90.6%), and most are multigravida (71.9%).

Table 2. The Effect of Effleurage Massage on the Intensity of Lower Back Pain in Third- Trimester Pregnant Women in the Working Area of Mejobo Health Center, Mejobo Subdistrict, Kudus.

Data	∑	Back Pain Scale in Pregnant Women			
		Mean ± SD	Min	Max	P
Pretest	32	4.50 ±1.317	2.00	7.00	0.000
Posttest	32	3.06 ± 1.340	1.00	5.00	

Based on Table 2, the data shows that the back pain scale in pregnant women before (pretest) receiving effleurage massage had a minimum value of 2.00 and a maximum value of 7.00, with an average (mean) of 4.50. After receiving the effleurage massage, the minimum pain scale was 1.00 and the maximum was 5.00, with a mean of 3.06. The paired t-test results showed a p-value of 0.000, which statistically indicates a significant effect of effleurage massage on reducing back pain in third-trimester pregnant women.

This aligns with the study by Muawanah, which reported a significant effect of effleurage massage on reducing back pain in third-trimester pregnant women (Muawanah S, 2023). Similarly, research by Widatiningsih and Dewi, stated that back pain during pregnancy increases as the pregnancy progresses (Widatiningsih and Dewi, 2017). A woman's posture changes to compensate for the weight of the growing uterus, and she tries to maintain balance by pulling her shoulders back due to the enlarging abdomen. This causes the spine to excessively curve inward, accompanied by relaxation of the sacroiliac joints, which increases back pain.

Back pain is the pain felt in the back area, from the lower angle of the ribs to the lumbosacral region, which is around the tailbone. This pain can also radiate to the upper, lower, and groin areas (Wiarto & Giri, 2017). Stimuli can cause pain that damages tissue, accompanied by nerve fibers that conduct pain impulses. This tissue is known to be sensitive to pain, and the nerve fibers are referred to as pain fibers. The type of pain experienced by pregnant women depends on its intensity. Pain stimulus receptors, or nociceptors, are unmyelinated A delta nerve endings and myelinated C nerve endings located in the subcutaneous tissue, skeletal muscles, and joints. Tissue damage occurs because nociceptors are stimulated by noxious stimuli, which are transmitted to the central nervous system, causing feelings of discomfort and pain (Wiarto & Giri, 2017).

Back pain can occur in both primigravida and multigravida women. Based on data from 32 subjects in this study, 28.1% were primigravida and 71.9% were multigravida. In multigravida women, changes during pregnancy do not fully recover after pregnancy and childbirth, such as the appearance of striae gravidarum and stretched abdominal muscle tone that does not return to its original state. Research by Salam, supports that there is a relationship between parity and the incidence of back pain in third-trimester pregnant women (Salam B, 2016). Weak abdominal muscles can result in failure to support the enlarged uterus, causing the back to curve inward more(Salam B, 2016).

The majority of subjects in this study were aged 20-35 years, while a smaller portion were over 35 years old. Pain perception is influenced by age, with the ability to tolerate pain often increasing with age. Understanding and control of pain typically develop as one gets older. Younger mothers tend to experience more intense pain compared to older mothers. Younger age is often associated with more unstable psychological conditions, which can trigger anxiety and amplify the sensation of pain. Age is also a factor in determining pain tolerance, so as age increases, the ability to control pain also improves.

The application of the effleurage massage technique in pregnant women can reduce back pain by applying pressure to soft tissues such as muscles, tendons, or ligaments, which helps relieve pain and induce relaxation. This technique improves circulation, provides tactile stimulation, and creates a positive feeling from attentive and empathetic touch. This enhances the massage's effect in relaxing muscles, soothing nerve endings, and alleviating pain. According to pain theory, pain impulses are transmitted when the defense mechanism is open and inhibited when it is closed. One way to close this mechanism is by stimulating the secretion of endorphins, which inhibit pain impulses. Research by Marilyn indicates that effleurage massage stimulates tactile fibers in the skin, thereby inhibiting pain signals. Skin stimulation with effleurage sends messages via A-delta fibers,

which quickly transmit pain, causing the pain gate to close, and the cerebral cortex does not receive pain signals, thus reducing pain intensity (Rahmayanti and Oktafia, 2022). Pain intensity is very subjective and influenced by many factors, one of which is attention. A person's level of attention can affect pain perception, where increased attention to pain enhances the pain response, while distraction is associated with a reduced pain response.

The reduction in pain scale after effleurage massage varies for each patient; some experience a decrease from a score of 5 to reaching a score of 1. This depends on the pain condition the patient experienced before the massage, whether it was categorized as mild, moderate, or severe. If the pain was initially severe, the pain intensity after effleurage massage may decrease to reach a score of 1 (mild pain). Patients' responses to effleurage massage are highly positive; they report not only a reduction in pain but also feeling comfortable, with some even feeling drowsy due to the calming effect of the massage. The difference in pain levels before and after effleurage massage occurs because the massage movements are performed slowly and synchronized with the patient's breathing during the pain, aiming to divert the mother's attention from the pain sensation, thus inducing comfort, relaxation, and reducing pain. This is consistent with the findings of Wulandari and Andryani's study in 2019, which showed that effleurage massage lasting 5-10 minutes once daily for five consecutive days resulted in a decrease from a pain scale of 7 or severe to a pain scale of 3 or mild (Wulandari and Andriyani, 2019).

The decrease in pain scale is attributed to the production of endorphins, which are natural pain relievers in the body. Endorphins can be produced during activities such as meditation, massage, or deep breathing. Endorphins function as neurotransmitters or neuromodulators that inhibit the transmission of pain stimuli by binding to opiate receptors in nerves and the spinal cord. This blocks pain signals to higher centers and reduces the sensation of pain (Aryani Y, Masrul, 2015). According to the endogenous opioid theory, opiate receptors in the brain and spinal cord determine the central nervous system (CNS) to activate substances like morphine called endorphins and enkephalins when pain is perceived. These endogenous opioids can be stimulated by skin stimulation through massage or manipulation. Opiate receptors are located on the endings of peripheral sensory nerves, located outside the brain and spinal cord. Pain receptors are transmitted through the segments of the spinal nerves T11 - T12 and the additional lower thoracic nerves as well as the upper lumbar sympathetic nerves. This system runs from the periphery through the spinal cord, brainstem, thalamus, and cerebral cortex (Aryani Y, Masrul, 2015). Massage can activate endorphins, which then block pain transmission at opiate receptors, leading to muscle relaxation and pain reduction.

CONCLUSION

Effleurage massage has been proven to be effective in reducing the intensity of lower back pain in third trimester pregnant women. It is recommended for pregnant women to use these complementary therapies to overcome discomfort during pregnancy, rather than relying on medications that can have adverse effects on pregnancy.

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