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Research Article

The Effect of Prenatal Massage Therapy on Pregnant Women in the Third Trimester on Back Pain Complaints at Primary Health Care Bulango

Karmila Daud[1], Widia Shofa Ilmiah[2*], Anik Sri Purwanti[3]

[1] Sekolah Dasar Bulango; Indonesia, Email : karmilad713@gmail.com

[2,3] Institut Teknologi, Sains, dan Kesehatan RS Dr. Soepraoen Kesdam V/BRW, Indonesia ; e-mail: widiashofailmiah@itsk-soepraoen.ac.id

***** Correspondinging Author : **Karmila Daud**

Abstract: Back pain is one of the most common complaints experienced by pregnant women, especially during the third trimester of pregnancy. This discomfort is generally caused by physiological and biomechanical changes in the body, such as an increase in body weight, a shift in the center of gravity, and hormonal changes that affect muscle and joint flexibility. If not managed properly, back pain can reduce mobility, interfere with daily activities, and impact the quality of life of pregnant women. One safe and non-pharmacological method to reduce back pain is prenatal massage therapy. This study aimed to determine the effect of prenatal massage on reducing back pain among pregnant women in the third trimester at Primary Health Care (PHC) Bulango. This research used a pre-experimental design with a one-group pretest–posttest approach. The sample consisted of 30 pregnant women in their third trimester who were selected through purposive sampling. Data collection was carried out using observation and interviews with a numerical pain rating scale administered before and after the prenatal massage intervention. The massage sessions were performed following standardized prenatal massage procedures focusing on the lower back area. Data were analyzed using the paired t-test with the assistance of SPSS software. The results showed a statistically significant difference in back pain scores before and after the intervention, with a p-value of 0.000 ($p < 0.05$). This finding indicates that prenatal massage effectively reduces back pain in third-trimester pregnant women. Based on these results, prenatal massage can be recommended as a safe, non-invasive, and beneficial complementary therapy to improve maternal comfort during pregnancy. Incorporating prenatal massage into routine antenatal care could enhance the overall well-being and quality of life of expectant mothers.

Keywords: Back, Massage, Pain, Prenatal, Trimester

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1. Introduction

Pregnancy is a physiological process experienced by women, which also involves various physical and psychological changes. In the 3rd trimester, pregnant women may experience anxiety, depression, disappointment, or even feelings of rejection. These emotional changes are influenced by hormonal fluctuations that affect mood. Meanwhile, common physiological changes in the 3rd trimester include softening and loosening of connective tissue, which can cause back pain.(Pagesti et al., 2022). During pregnancy, pregnant women experience various physical and psychological changes that can cause discomfort, especially in the 2nd and 3rd trimester. Some complaints that often arise include shortness of breath (dyspnea), difficulty sleeping (insomnia), gingivitis and gum swelling (epulsion), frequent urination, pressure and discomfort in the perineum area, back pain, constipation, varicose veins, fatigue, Braxton Hicks contractions, leg cramps, ankle swelling

(non-pitting edema), mood swings, and increased anxiety(Faraswati & Silvia, 2024). Pregnancy lasts about 10 lunar months, or 9 calendar months, or 40 weeks, or 280 days, counted from the first day of the last menstrual period. Pregnancy begins with the meeting of the egg and sperm (conception), which is then followed by physiological and psychological changes. A pregnancy that lasts for 40 weeks is called a mature pregnancy (full term), while a pregnancy that lasts between 23 and 35 weeks is called a premature pregnancy.(Wulandari et al., 2020).

Back pain during pregnancy occurs because the growth of the fetus makes the uterus bigger, so that the center of gravity of the body shifts forward. To maintain balance, pregnant women naturally adjust their posture by pulling their backs. As a result, the curvature of the lower spine (lordosis) increases, and the muscles around the spine become shorter.(Dewiani et al., 2022). This condition occurs due to changes in body posture, increased load on the spine as the fetus grows, and excessive lordosis that puts pressure on the spinal joints and can cause dysfunction. One of the complementary and alternative medicine methods to improve health and well-being is massage. Massage can also help reduce levels of the stress hormone cortisol.(Baljon et al., 2020). Back pain usually peaks at 36 weeks of gestation and will decrease thereafter. Usually, this condition will improve significantly within 3 months after delivery. Continued back pain can be experienced by women with lower back and pelvic pain, back pain in early pregnancy, weakness of the back extensor muscles, older women, and those who are dissatisfied with their jobs. During pregnancy, women experience physiological changes that are influenced by the anatomical and functional needs of the body. These changes affect the musculoskeletal system and often cause pain, including lower back pain.(Purnamasari, 2019)

The prevalence of lower back pain (LBP) is more variation by region. Research conducted in the United States, Europe, and parts of Africa shows that around 30%-78% of pregnant women experience LBP. This condition is influenced by factors such as gestational age, heavy activity, and lifestyle.(Rahayu et al., 2024).About 50% of women experience lower back pain, and 10% of them experience chronic lower back pain that begins to appear during pregnancy (Hafid et al., 2022). The incidence of LBP in Indonesia at pregnant women ranges from 20-90% and continues to increase every year along with population growth. Lower back pain usually begins to be felt at 22 weeks of pregnancy and peaks in the final trimester(Lestaluhu, 2022).

Factors that affect back pain in pregnant women include activities during pregnancy, parity, maternal age. Back pain in the 3rd trimester can cause discomfort in activities, changes in body structure, and prolonged pain. This condition can also increase the risk of postpartum back pain and venous thrombosis (Maryati et al., 2024). Treatment of LBP during pregnancy is divided into two types, namely pharmacological and non-pharmacological therapy. One effective non-pharmacological method is prenatal massage, which aims to reduce pain intensity, stimulate relaxation, and improve blood circulation. Prenatal massage is done by applying hand pressure to soft tissue, tendons, or ligaments without changing the position of the joints. However, midwives must have been understand the contraindications for prenatal massage so that this procedure can be carried out safely and effectively(Rismayanti & Wintarsih, 2020).

Prenatal massage is a method to overcome sleep quality disorders in pregnant women in the 3rd trimester, by performing massage regularly twice a week for five weeks by a licensed and experienced midwife. Prenatal massage can be a solution for pregnant women who

experience sleep problems, because it can prevent premature birth, low birth weight babies, and reduce anxiety in pregnant women who will face the labor process(Astuti et al., 2021). Prenatal massage can cause side effects and risks if done without proper preparation, such as pain, allergies, bruising, and swelling. Therefore, health workers, especially midwives, need to pay attention to contraindications before performing prenatal massage. This is important so that the procedure can achieve its goal, which is to reduce back pain in pregnant women in the 3rd trimester (Hidayati et al., 2023).

Providing information about prenatal massage to pregnant women is important to increase their interest in using this method as an effort to reduce various complaints that are often experienced during pregnancy (Andriyalni & Palryono, 2023). Therefore, researchers are interested in studying Prenatal Massage Therapy in Pregnant Women in the 3rd Trimester Against Back Pain Complaints at PHC Bulango

2. Preliminaries or Related Work or Literature Review

Back pain is one of the most frequent musculoskeletal complaints experienced by pregnant women, particularly in the 3rd trimester. This discomfort significantly impacts a woman's quality of life and can interfere with her daily activities, emotional well-being, and preparation for labor(Anggita & Fitriahadi, 2024). Pregnancy-related lower back pain (LBP) occurs due to physiological, anatomical, and hormonal changes that affect the musculoskeletal system. The World Health Organization (WHO) and various clinical guidelines increasingly emphasize the importance of non-pharmacological interventions for managing pain in pregnancy due to the risks associated with medication use during gestation. One of the promising non-invasive interventions is prenatal massage therapy(Fitriyani et al., 2025).

Several recent studies have demonstrated the efficacy of prenatal massage in reducing pregnancy-related pain, improving blood circulation, enhancing sleep quality, and lowering anxiety and stress levels. However, while many of these studies focus on general well-being or labor outcomes, relatively few investigate the specific impact of prenatal massage on LBP during the 3rd trimester. This study contributes to the literature by assessing changes in pain levels before and after massage therapy in a controlled pretest-posttest design. It emphasizes the role of prenatal massage as a safe, cost-effective, and accessible form of complementary therapy that can be integrated into maternal care services, particularly in primary healthcare settings such as PHC Bulango.

Lower Back Pain in the 3rd Trimester of Pregnancy

Lower back pain in pregnancy is widely recognized as a multifactorial condition, often peaking in the 3rd trimester due to rapid fetal growth and maternal weight gain. Physiologically, the shift in the center of gravity, increased lumbar lordosis, and loosening of pelvic ligaments under the influence of relaxin and progesterone are the primary contributors to the pain(Sulastri et al., 2022). The consequences of unaddressed LBP extend beyond discomfort. Studies have shown correlations between persistent pregnancy-related LBP and postpartum depression, poor sleep, reduced physical activity, and even increased risk of

cesarean delivery (Malryalti et al., 2024). Therefore, managing LBP is not only a matter of comfort but also of maternal health and obstetric outcomes(Fitriana et al., 2024).

Based on research data, the effectiveness of prenatal massage in reducing back pain in pregnant women in the 3rd trimester can be explained through several physiological mechanisms. Increased body weight during pregnancy causes biomechanical changes that lead to increased lumbar lordosis curvature, which is one of the main causes of lower back pain. Prenatal massage contributes to solving this problem by:

a. Improving Blood Circulation

   Prenatal massage increases blood flow to areas of muscle tension, helping to reduce inflammation and speed up the tissue healing process.

b. Reducing Muscle Tension

   Tense back muscles due to changes in posture will become more relaxed after receiving a massage performed with the right technique. This reduces pressure on the spine and increases comfort for pregnant women.

c. Increasing Endorphin Hormone Production

   Prenatal massage stimulates the release of endorphins, which are known as natural pain-relieving hormones, thus helping to reduce discomfort and improve the well-being of pregnant women.

d. Improving Sleep Quality and Reducing Stress

   Back pain often causes sleep disturbances in pregnant women. With regular prenatal massage, relaxation levels increase, stress is reduced, and sleep quality improves.

   These results strengthen previous research by(Rahayu et al., 2024) who found that non-pharmacological therapies such as prenatal massage have a positive impact on reducing musculoskeletal pain during pregnancy. Therefore, prenatal massage can be a safe and effective complementary therapy option for pregnant women who experience 3rd-trimester back pain.

Prenatal Massage as a Therapeutic Intervention

Prenatal massage is defined as the application of manual techniques to the body of a pregnant woman, aimed at alleviating discomfort and improving overall health. Unlike general massage, prenatal massage requires specialized knowledge of pregnancy anatomy, pressure point sensitivity, and contraindications to ensure maternal and fetal safety. Techniques often include gentle kneading, circular stroking, and acupressure to promote circulation and relax muscle tension, especially in the back, shoulders, and lower limbs.(Pagesti et al., 2022)

Research has shown that prenatal massage has positive physiological and psychological effects.(Anggraini & Hidayah, 2022)conducted a randomized controlled trial and reported that massage significantly reduced cortisol levels and labor anxiety in primigravida women.(Oktavia & Larasati, 2024)observed that regular massage sessions improved maternal sleep quality and reduced the severity of lower back and pelvic pain.(Anggriani Harahap,

2024)noted that prenatal massage, when delivered by trained midwives, not only decreased pain levels but also enhanced maternal satisfaction with antenatal care.

Despite these benefits, challenges remain. Not all healthcare providers are trained in safe massage techniques, and awareness about its benefits is still limited, especially in rural or low-resource settings. This study responds to that gap by presenting empirical evidence from PHC Bulango, showing that prenatal massage can be an effective intervention for reducing LBP in 3rd-trimester pregnant women. It is hoped that this research will encourage broader adoption of massage therapy in antenatal care protocols, particularly in Indonesia.

3. Proposed Method

The method was used a pre-experimental one group pretest-posttest design. The population in this study were all pregnant women in the 3rd trimester who experienced back pain at PHC Bulango. The sampling technique used was total sampling with a total of 30 respondents. The data analyze using a paired t-test to see the difference in pain levels before and after prenatal massage intervention.

4. Results and Discussion

Distribution of Respondent Characteristics

Table 1. Age Frequency Distribution

Age (y.o)	Frequency	Percentage (%)
<20	1	3.3%
20-35	28	93.3%
>35	1	3.3%
Total	30	100%

Based on Table 1, it can be seen that the majority of respondents were in the age range of 20–35 years, with a total of 28 individuals (93.3%). This age range is considered the most productive period for women during pregnancy and childbirth. Meanwhile, there was only 1 respondent (3.3%) under the age of 20 years and 1 respondent (3.3%) over the age of 35 years, indicating that extreme maternal age ranges were relatively uncommon in this study.

Table 2. Frequency Distribution of Gravida

Pregnancy	Frequency	Percentage (%)
Primigravida	10	33.3%
Multigravida	19	63.3%
Grandmulti	1	3.3%
Total	30	100%

Based on Table 2, most respondents were multigravida, accounting for 19 individuals (63.3%). This indicates that the majority of participants had experienced more than one pregnancy. Meanwhile, 10 respondents (33.3%) were primigravida, experiencing their first pregnancy, and only 1 respondent (3.3%) was classified as grand multigravida, indicating a history of more than four pregnancies.

Table 3. Frequency Distribution Before Prenatal Massage

LBP	Frequency	Percentage (%)
Moderate pain	28	93.3%
Severe pain	2	6.7%
Total	30	100%

Based on Table 3, it is shown that before undergoing prenatal massage, most respondents experienced moderate lower back pain, totaling 28 individuals (93.3%). Only 2 respondents (6.7%) reported experiencing severe pain. This suggests that moderate pain was the dominant level of discomfort experienced by 3rd-trimester pregnant women in this study before the intervention**.**

Table 4. Frequency Distribution After Prenatal Massage

LBP	Frequency	Percentage (%)
Mild pain	25	83.3%
Moderate pain	5	16.7%
Total	30	100%

Based on Table 4, it can be seen that after undergoing prenatal massage, most respondents experienced mild lower back pain, totaling 25 individuals (83.3%). Meanwhile, 5 respondents (16.7%) reported moderate pain. This result indicates a notable improvement in pain levels following the intervention, with a shift from moderate or severe pain toward milder discomfort.

Table 5. Results of Analysis of the Effect of Prenatal Massage on the LBP in Pregnant Women in the Third Trimester at the PHC Bulango

	Palired Differences			
	Mean	SD	df	p-value
LBP before Prenatal Massage-LBP after Prenatal Massage	-900	.305	.056	.000

Based on Table 5, the results of the analysis show that there is a significant difference between the level of back pain before and after prenatal massage is given to pregnant women in the 3rd trimester. The mean value shows a change of -900, which indicates a decrease in the level of pain after the intervention. The standard deviation (SD) of 0.305 shows a relatively small variation in the data, which means that the results of the study are quite consistent among respondents.

The degree of freedom (df) of 0.056 indicates the sample size used in the analysis. The results of the statistical test showed a p-value of 0.000 ($p < 0.05$), which indicates that the difference before and after prenatal massage is statistically significant. In other words, prenatal massage has been proven effective in reducing back pain in pregnant women in the 3rd trimester.

5. Comparison

The results of this study demonstrate that prenatal massage therapy has a significant effect on reducing low back pain in pregnant women during the 3rd trimester, as indicated by a p-value of 0.000 ($p < 0.05$). These findings are consistent with previous studies that prenatal massage have an impact on musculoskeletal discomfort during pregnancy. Before the intervention, the majority of pregnant women experienced moderate back pain and after receiving prenatal massage, most of respondent of pregnant women experienced a decrease in mild pain.

These results are in line with research conducted by (Hidalyalti et al., 2023) which shows that prenatal massage can stimulate the release of endorphins, which play a role in reducing pain and increasing relaxation.(Balljon et al., 2020)also explains that prenatal massage helps improve blood circulation, relieve muscle tension, and lower levels of stress hormones such as cortisol.

Prenatal massage works by applying gentle pressure to soft tissues, helping to reduce muscle spasms and improve posture, which changes due to increased fetal weight. In addition, this therapy also helps to increase joint flexibility, thereby reducing excess pressure on the lower back area. Therefore, prenatal massage can be used as an effective non-pharmacological intervention to address complaints of back pain in pregnant women in the 3rd trimester.

Previous studies, such as those conducted by(Oktavia & Larasati, 2024), similarly reported that prenatal massage significantly reduces lower back pain, particularly when performed regularly by trained health professionals. Likewise,(Anggraini & Hidayah, 2022)found a reduction in both anxiety and physical discomfort among primigravida women who received structured massage therapy within a community health framework and which emphasized the physiological benefits of prenatal massage such as improved circulation, reduced cortisol levels, and enhanced maternal comfort and relaxation. These outcomes contribute not only to pain relief but also to better sleep quality and emotional well-being, which were also indirectly observed in the current study.

Unlike previous studies that have explored alternative interventions such as prenatal yoga, pregnancy exercise, or pharmacological pain management, this study adds to the evidence supporting the use of massage as a low-cost, non-invasive, and easily implemented method that can be integrated into routine antenatal care. The results reinforce the growing consensus that non-pharmacological approaches can be both safe and effective in addressing common pregnancy-related complaints. Importantly, this study also contributes local insights by demonstrating the successful implementation of prenatal massage at a primary health care facility (PHC Bulango). It highlights the feasibility of adopting such interventions even in resource-limited settings, and underscores the need for greater training and empowerment of midwives and maternal health providers in the application of safe complementary therapies.

6. Conclusions

The prenatal massage has a significant effect to reduce the level of LBP in pregnant women in the 3rd trimester. Before the intervention, the majority of pregnant women experienced moderate to severe pain, while after prenatal massage, most respondents experienced a decrease in pain to mild.

The prenatal massage can be attributed to increased blood circulation, decreased muscle tension, increased release of endorphins, and improved sleep quality. These results support the use of prenatal massage as a safe and beneficial non-pharmacological method in improving the well-being of pregnant women in the 3rd trimester. As an implication, midwives and health workers are advised to be more active in providing education to pregnant women about the benefits of prenatal massage as an effort to reduce complaints of back pain. In addition, further research can be conducted by considering additional variables such as duration and specific techniques that are most effective in implementing prenatal massage

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