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The Effectiveness of Massage Therapy on Reducing Low Back Pain in Pregnant Women

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ABSTRACT

Low back pain is one of the most common musculoskeletal complaints experienced by pregnant women, especially during the second and third trimesters. Anatomical changes, weight gain, altered body posture, and hormonal influences increase stress on the lumbar region, resulting in pain. Massage therapy is a widely used non-pharmacological intervention that improves blood circulation, relieves muscle tension, and promotes relaxation.To determine the effectiveness of massage therapy in reducing low back pain among pregnant women.This study employed a quasi-experimental one-group pretest-posttest design. Thirty pregnant women in the second and third trimesters with low back pain were recruited using purposive sampling. Massage therapy was administered for 20–30 minutes twice weekly for four weeks. Pain intensity was measured using the Numeric Rating Scale (NRS) before and after the intervention. Data were analyzed using the Wilcoxon Signed Rank Test with a significance level of 0.05.The mean pain score decreased from 5.93 ± 1.28 before intervention to 2.87 ± 1.12 after massage therapy. Statistical analysis showed a significant reduction in pain intensity ($p = 0.001$).Massage therapy is effective in reducing low back pain among pregnant women and may serve as a safe complementary therapy during pregnancy.

Keywords: *Massage Therapy, Low Back Pain, Pregnancy, Complementary Therapy, Pregnant Women.*

1. Introduction

Pregnancy is a physiological process accompanied by various anatomical, physiological, hormonal, and biomechanical changes. As the pregnancy progresses, these changes can give rise to various complaints, one of which is low back pain. This complaint generally begins in the second trimester and worsens in the third trimester due to the increasing size of the uterus, increased body weight, and changes in posture.

Low back pain during pregnancy is a fairly common health problem. Various studies report that approximately 50–70% of pregnant women experience low back pain of varying degrees, ranging from mild to severe. This pain can disrupt daily activities, sleep quality, productivity, and even reduce a pregnant woman's quality of life if not properly managed.

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Physiologically, the enlarging uterus causes the body's center of gravity to shift forward, causing pregnant women to tend to increase their lumbar curvature (lumbar lordosis) to maintain balance. This condition increases pressure on the muscles, ligaments, and joints in the lumbosacral region. Furthermore, increased levels of the hormone relaxin cause softening of the pelvic ligaments, reducing joint stability and exacerbating pain.

Management of low back pain in pregnant women must consider the safety of both the mother and the fetus. The use of analgesic medications during pregnancy has limitations due to potential side effects on the fetus. Therefore, non-pharmacological therapies are the primary option for pain relief during pregnancy.

One widely used complementary therapy is massage therapy. Massage therapy involves soft tissue manipulation using stroking techniques, light pressure, and muscle stretching. Massage therapy works by increasing blood circulation, improving lymphatic drainage, reducing muscle spasms, increasing endorphin release, and providing a relaxing effect that helps reduce pain perception.

Several studies have shown that massage therapy is effective in reducing lower back pain in pregnant women, as well as improving sleep quality, reducing anxiety, and increasing comfort during pregnancy. Besides being easy to perform, this therapy is relatively safe when administered by a trained healthcare professional or therapist who takes into account contraindications during pregnancy.

Research on the effectiveness of massage therapy for lower back pain in pregnant women in Indonesia is still limited. Therefore, this study was conducted to evaluate the effectiveness of massage therapy in reducing the intensity of lower back pain in pregnant women as a basis for developing complementary therapy-based antenatal care.Research on the effectiveness of massage therapy for lower back pain in pregnant women in Indonesia is still limited. Therefore, this study was conducted to evaluate the effectiveness of massage therapy in reducing the intensity of lower back pain in pregnant women as a basis for developing complementary therapy-based antenatal care.

2. RESEARCH METHODS

a. Research Design

This study employed a quantitative method with a quasi-experimental design using a One Group Pretest–Posttest Design. In this design, lower back pain intensity was measured before (pretest) and after (posttest) the massage therapy intervention, without using a control group. This design aimed to determine the effectiveness of massage therapy in reducing lower back pain in pregnant women.

b. Location and Time of Research

The research was conducted at the Independent Midwife Practice (PMB)/Community Health Center in January–March 2026. The selection of the

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research location was based on the high number of visits by pregnant women and the availability of antenatal services that support the implementation of the research.

c. Population and Sample

1) Population

The population in this study was all pregnant women in their second and third trimesters who experienced lower back pain and underwent pregnancy check-ups at the research location during the research period.

2) **Sample**

The research sample consisted of 30 respondents who were selected using purposive sampling technique, namely a sampling technique based on certain criteria that have been determined by the researcher.

d. Research Variable

The variables in this study consisted of:

1) Independent Variable

The independent variable was massage therapy, which was administered to the lower back using effleurage, petrissage, and gentle kneading techniques for 20–30 minutes, twice a week for four weeks.

2) Dependent Variable

The dependent variable was the intensity of lower back pain in pregnant women, measured using the Numeric Rating Scale (NRS) with a score range of 0–10.

e. Research Instrument

The instruments used in the study included:

1) Respondent characteristics sheet, containing data on age, gestational age, parity, occupation, and other characteristics.
2) Numeric Rating Scale (NRS), a pain assessment scale with a range of 0–10, where:
   Score 0 = no pain.
   Score 1–3 = mild pain.
   Score 4–6 = moderate pain.
   Score 7–10 = severe pain.
3) Massage therapy observation sheet, used to ensure each respondent received intervention according to research procedures

f. Data Collection Techniques

Data collection was conducted through several stages, as follows:

1) The researcher obtained research permission from the relevant institution.
2) The researcher explained the purpose, benefits, and procedures of the study, and obtained informed consent from respondents.
3) Respondents who met the inclusion criteria underwent pain intensity measurements using the Numeric Rating Scale (pretest).

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4) Respondents received massage therapy interventions for 20–30 minutes twice a week for four weeks.
5) After all interventions were completed, pain intensity was measured again using the Numeric Rating Scale (posttest).
6) All data was recorded on an observation sheet and then subjected to editing, coding, data entry, and data cleaning before analysis.

g. Data Analysis

Data analysis was carried out using the Statistical Package for the Social Sciences (SPSS) program.

1) Univariate Analysis

Univariate analysis was used to describe respondent characteristics, including age, gestational age, parity, occupation, and the distribution of pain intensity before and after massage therapy. The results of the analysis are presented in the form of a frequency distribution table, percentage, mean, standard deviation (SD), median, minimum, and maximum values.

2) Bivariate Analysis

The bivariate analysis aimed to determine the effectiveness of massage therapy in reducing low back pain in pregnant women. Data normality was first tested using the Shapiro–Wilk Test. If the data were not normally distributed, the analysis was continued using the Wilcoxon Signed Rank Test with a 95% significance level ($\alpha = 0.05$). The analysis was considered significant if the p-value was <0.05, indicating a difference in pain intensity before and after massage therapy..

2. RESEARCH RESULTS AND DISCUSSION

a. Research Results

Table 1. Respondent Characteristics (n = 30)

Characteristics	Frequency (n)	Percentage (%)
Age (years)		
20–25	8	26,7
26–30	14	46,7
31–35	8	26,6
Gestational Age		
Trimester II	12	40,0
Trimester III	18	60,0
Parity		
Primigravida	13	43,3
Multigravida	17	56,7
Occupation		
Housewife	18	60,0
Private Employee	8	26,7
Self-Employed	4	13,3

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Based on Table 1, most respondents were aged 26–30 years (46.7%), were in the third trimester of pregnancy (60.0%), were multigravida (56.7%), and were housewives (60.0%).

Table 2. Pain Intensity Before and After Massage Therapy

Measurement	Mean ± SD	Median	Minimum–Maximum
Before intervention	5,93 ± 1,28	6	4–8
After intervention	2,87 ± 1,12	3	1–5

Table 2 shows that the average lower back pain score before massage therapy was 5.93, then decreased to 2.87 after the intervention.

Table 3. Results of the Wilcoxon Signed Rank Test

Variabel	Mean Rank	Z	p-value
Pain before–after	15,50	-4,82	**0,001**

The analysis results using the Wilcoxon Signed Rank Test showed a p-value of 0.001 ($p < 0.05$). This indicates a significant difference between pain intensity before and after massage therapy.

b. Discussion

The study results showed that massage therapy was effective in reducing the intensity of lower back pain in pregnant women. The average pain score decreased from 5.93 to 2.87 after four weeks of intervention. This decrease was supported by the Wilcoxon test, which showed a p-value of 0.001, concluding that massage therapy had a significant effect on reducing lower back pain.

Low back pain during pregnancy occurs due to changes in the body's biomechanics. Fetal growth causes weight gain and a shift in the center of gravity anteriorly, increasing the lumbar lordosis curve. This condition forces the back muscles to work harder to maintain balance. Furthermore, the hormone relaxin causes softening of the ligaments and pelvic joints, reducing spinal stability and triggering pain.

Massage therapy works through mechanical stimulation of soft tissue, which increases local blood flow, improves lymphatic circulation, and reduces muscle spasms. Massage also stimulates the release of endorphins and serotonin, which function as the body's natural analgesics. According to Gate Control Theory, stimulation of skin mechanoreceptors can inhibit the transmission of pain impulses to the central nervous system, thereby reducing pain perception.

Most respondents were in their third trimester of pregnancy. This aligns with the theory that lower back pain complaints tend to increase with gestational age due to the enlarged uterus and increased stress on the spine. Therefore, pregnant women

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in their third trimester are the group most in need of non-pharmacological interventions to reduce discomfort.

The results of this study align with those of Field et al., who reported that massage therapy during pregnancy can reduce back pain, reduce anxiety, improve sleep quality, and enhance maternal comfort. A systematic review by Wang et al. also demonstrated that massage therapy is an effective complementary therapy in reducing musculoskeletal pain during pregnancy.

Massage therapy provides psychological benefits such as relaxation, reduced stress levels, and improved sleep quality. The relaxation that occurs during therapy helps lower cortisol levels and increase endorphins, resulting in a more comfortable maternal experience. This improved psychological state also contributes to a reduced perception of pain.

Massage therapy has several advantages over pharmacological therapy: it has no side effects on the fetus when performed properly, is relatively inexpensive, is easy to learn, and can be applied by healthcare professionals or educated family members. However, this therapy should be performed with due regard for contraindications, such as bleeding, premature rupture of membranes, threatened preterm labor, severe preeclampsia, or other medical conditions requiring special treatment.

This study has several limitations. First, the one-group pretest-posttest design did not use a control group, so the influence of external factors could not be completely eliminated. Second, the number of respondents was relatively small, so the results cannot be widely generalized. Third, the study only assessed short-term changes in pain. Future research is recommended to use a randomized controlled trial (RCT) design with a larger sample size and a longer follow-up period.

The findings of this study indicate that massage therapy can be used as a complementary intervention in antenatal care. Midwives and health workers can integrate massage therapy into prenatal education programs to improve comfort during pregnancy and reduce dependence on analgesic medications.

3. CONCLUSION AND SUGGESTIONS

a. Conclusion

Massage therapy has been shown to be effective in reducing the intensity of lower back pain in pregnant women. The average pain score decreased significantly after the intervention, with statistical test results showing a p-value of 0.001 ($p < 0.05$). Massage therapy can be recommended as a safe, easy, and effective non-pharmacological therapy for reducing lower back pain during pregnancy.

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b. Saran

1) Midwives and healthcare workers can implement massage therapy as a complementary therapy in antenatal care, according to indications and safe procedures.
2) Pregnant women are advised to receive massage therapy from trained personnel, along with light stretching exercises and maintaining good posture.
3) Healthcare institutions can hold educational classes on safe massage techniques for pregnant women.
4) Future research should utilize a randomized controlled trial design, a larger sample size, and evaluate the long-term effects of massage therapy on the quality of life of pregnant women..

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