

THE EFFECT OF PRENATAL MASSAGE ON LOW BACK PAIN INTENSITY IN THIRD TRIMESTER PREGNANT WOMEN AT INDRASARI REGIONAL HOSPITAL, RENGAT, IN 2026

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Abstract

One of the most common complaints experienced by pregnant women, especially during the third trimester, is low back pain. This pain occurs due to increased body weight, changes in body posture, and the influence of the relaxin hormone, which causes the ligaments around the pelvis and spine to soften. Prenatal massage is an intervention that can help reduce the level of back pain. Objective: To determine the effect of prenatal massage on the intensity of low back pain in third trimester pregnant women at Indrasari Regional Public Hospital Rengat. Method: This final project employed a quasi-experimental design with a one-group pretest–posttest approach. Results: The results of the bivariate analysis using the Paired Samples Test showed a p-value of $0.000 < 0.05$ for the intensity of low back pain. Discussion: Prenatal massage can improve the physical comfort of pregnant women by providing a relaxation effect on muscles experiencing tension due to postural changes during pregnancy. Conclusion: There is an effect of prenatal massage on the intensity of low back pain in third trimester pregnant women at Indrasari Regional Public Hospital Rengat in 2026.

Keywords: Low Back Pain Intensity, Prenatal Massage, Third Trimester Pregnant Women

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INTRODUCTION

Pregnancy is a physiological process that causes anatomical and physiological changes in a woman's body. One of the most common complaints experienced by pregnant women, especially in the third trimester, is lower back pain. This pain arises from weight gain, changes in posture, and the influence of the hormone relaxin, which causes the ligaments around the pelvis and spine to soften (Handayani et al., 2021).

According to the World Health Organization (WHO, 2022), more than 50% of pregnant women worldwide experience lower back pain, especially in the final trimester. In Indonesia, a survey by the Ministry of Health (Kemenkes RI, 2023) showed that approximately 60–70% of pregnant women complain of lower back pain of varying intensity, which can interfere with daily activities, sleep quality, and even preparation for childbirth.

Regionally, lower back pain in pregnant women is also a significant issue in Riau Province. Based on the 2023 Riau Provincial Health Profile, the coverage of antenatal care (ANC) visits (K4) reached 89.6%, indicating a high number of pregnant women accessing healthcare services. However, a report from the Riau Provincial Health Office states that musculoskeletal complaints, particularly lower back pain, are still common among pregnant women in the third trimester and are one of the most common complaints reported during ANC visits (Riau Provincial Health Office, 2024).

Data from the Riau Provincial Health Office (2024) also shows that most pain management for pregnant women in health care facilities still focuses on general education and rest, while the use of non-pharmacological therapies such as prenatal massage, pregnancy exercises, and relaxation techniques has not been optimally and evenly implemented. This is due to limited trained resources and the absence of specific standard operating procedures (SOPs) regarding the implementation of prenatal massage in antenatal care at some primary and referral health facilities in Riau Province.

Furthermore, the 2018 Riau Province Basic Health Research (Riskesdas) report revealed that complaints of pain and physical discomfort during pregnancy, including lower back pain, contribute to a decreased quality of life for pregnant women and increase the risk of sleep disturbances and anxiety leading up to delivery. If this condition is not properly managed, it can impact the mother's preparedness for childbirth and the postpartum recovery process. Indragiri Hulu Regency, a region in Riau Province, also exhibits similar problems. According to the 2024 maternal and child health report for Indragiri Hulu Regency, lower back pain is among the top three most frequently reported

complaints by pregnant women during their third trimester prenatal checkups. However, most pregnant women do not receive structured and ongoing non-pharmacological interventions to address these complaints, so the pain is often left untreated until closer to delivery.

Untreated lower back pain in pregnant women can negatively impact physical and psychological health. Ongoing complaints can increase stress, disrupt sleep, and reduce the mother's preparedness for childbirth (Sulastri & Putri, 2020). Therefore, effective and safe non-pharmacological interventions are needed to reduce the intensity of this pain.

One approach that has been widely researched is prenatal massage. Prenatal massage is a massage technique tailored to pregnancy, particularly the back, waist, and shoulders, using safe positions for pregnant women. Various studies have shown that prenatal massage can help improve blood circulation, relax tense muscles, and stimulate the release of endorphins, which function as the body's natural analgesics (Field et al., 2020; Rahmawati et al., 2021).

Research by Field (2019) at the University of Miami showed that pregnant women who received massage therapy twice a week for five weeks experienced significant reductions in back pain and anxiety. Similar results were also reported by Wulandari et al. (2022) at Dr. Soetomo General Hospital in Surabaya, indicating that regular prenatal massage effectively reduced low back pain by up to 45%.

Based on an initial survey using interviews conducted at Indrasari Rengat General Hospital of 30 pregnant women in their third trimester, 22 complained of moderate to severe lower back pain, and 8 did not experience lower back pain. This indicates that prenatal massage practices have not been optimally implemented. Therefore, a study titled "The Effect of Prenatal Massage on Reducing Low Back Pain Intensity in Third Trimester Pregnant Women at Indrasari Rengat Regional Hospital in 2026" is crucial to determine the effectiveness of prenatal massage therapy in reducing low back pain intensity. This can then serve as a recommendation for non-pharmacological interventions for healthcare workers, particularly midwives, in providing prenatal care.

RESEARCH METHOD

This study used a quantitative approach with a Quasy Experimental design with a One Group Pretest-Posttest design. The sample in this study was part of the third trimester of pregnancy at Indrasari Regional Hospital, totaling 23 people. They were selected using a purposive sampling technique. The

instrument used was a Numeric Rating Scale (NRS) sheet. Data were analyzed using a Paired Sample t-Test to examine the difference in pretest and posttest averages.

RESULT

A. Univariate Analysis

1. Distribution of Low Back Pain Intensity in Third Trimester Pregnant Women Before Prenatal Massage.

Table 1. Distribution of Low Back Pain Intensity in Third Trimester Pregnant Women Before Prenatal Massage at Indrasari Regional Hospital in 2026

No	Intensitas Back Pain	Lowf	%
1	No Pain	0	0
2	Mild Pain	0	0
3	Moderate Pain	16	69.6
4	Severe Pain	7	30.4
Total		23	100

Based on table 1 above, it shows that the majority of pregnant women in the third trimester before prenatal massage were in the Moderate Pain category, amounting to 16 people (69.6%).

2. Distribution of Low Back Pain Intensity in Third Trimester Pregnant Women After Prenatal Massage.

Table 2. Distribution of Low Back Pain Intensity in Third Trimester Pregnant Women After Prenatal Massage at Indrasari Regional Hospital in 2026

No	Intensitas Back Pain	Lowf	%
1	No Pain	1	4.3
2	Mild Pain	17	73.9
3	Moderate Pain	5	21.7
4	Severe Pain	0	0
Total		23	100

Based on table 2 above, it shows that the majority of Low Back pain intensity in pregnant women in the third trimester after prenatal massage is in the Mild Pain category, amounting to 17 people (73.9%).

B. Bivariate Analysis

The Effect of Prenatal Massage on Low Back Pain Intensity in Third Trimester Pregnant Women at Indrasari Rengat Regional Hospital

Table 3. Analysis of the Effect of Prenatal Massage on Low Back Pain Intensity in Third Trimester Pregnant Women at Indrasari Rengat Regional Hospital in 2026

		Paired Differences					t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	PRE - POST	3.261	1.421	.296	2.646	3.875	11.004	22	.000

Based on the results of the bivariate analysis using the Paired Samples Test, the p-value for Low Back Pain Intensity was 0.000 < 0.05, so it can be concluded that there is an Effect of Parental Massage on Low Back Pain Intensity in Pregnant Women in the Third Trimester at Indrasari Rengat Regional Hospital in 2026.

DISCUSSION

1. Intensity of Low Back Pain in Third Trimester Pregnant Women Before Prenatal Massage

The results of this study indicate that the majority of pregnant women in their third trimester (16 women, 69.6%) experienced moderate-to-moderate low back pain before prenatal massage. This reflects a common condition in third-trimester pregnant women and provides a strong basis for implementing prenatal massage interventions as a non-pharmacological management effort.

Low back pain in third-trimester pregnant women is pathophysiologically caused by various interacting factors. According to Fraser and Cooper (2009), low back pain during pregnancy occurs due to increased levels of the hormone relaxin, which causes ligaments to become more elastic and sacroiliac joints to become unstable. This condition is exacerbated by the increasing weight of the uterus, which progressively increases with gestational age, causing an anterior shift in the center of gravity and lumbar hyperlordosis, which results in excessive pressure on the intervertebral discs and spinal erector muscles.

These results align with research conducted by Aprilia (2019) at Dr. Soetomo General Hospital. Dr. Soetomo Hospital Surabaya found that 71.4% of pregnant women in their third trimester experienced moderate lower back pain before receiving intervention. Similarly, Rustam's (2021) study at the Makassar City Community Health Center (Puskesmas) showed moderate pain at 65.2% among pregnant women in their third trimester who had not received special treatment. The consistency of these findings suggests that moderate pain is the most prevalent category experienced by pregnant women in their third trimester, likely related to the body's adaptation to gradual physiological changes.

The pain scale used in this study was the Numeric Rating Scale (NRS) with a range of 0-10, with moderate pain defined as pain with a score of 4-6. The use of the NRS in this study was based on its proven validity in various clinical studies and its ease of application to the pregnant population. According to Hawker et al. (2011) in the journal *Arthritis Care & Research*, the NRS is a valid and reliable instrument for measuring the intensity of acute and chronic pain, with an intraclass correlation coefficient of greater than 0.90.

Factors contributing to the high proportion of moderate pain among respondents in this study can be examined from several perspectives. First, the third trimester of pregnancy is the peak period for fetal weight gain, placental weight gain, and amniotic fluid gain, resulting in significantly increased mechanical stress on the lumbosacral vertebrae. According to Sabino and Grauer (2008) in the journal *Current Reviews in Musculoskeletal Medicine*, intradiscal pressure in the standing position can increase up to 150% of normal levels in pregnant women in the third trimester, which directly contributes to the intensity of pain experienced.

Second, parity plays a role in determining the intensity of low back pain experienced. Multigravida mothers generally experience weak abdominal

muscles due to repetitive strain from previous pregnancies, making overcompensation by the spinal erector muscles more likely. This is supported by research by Wulandari and Nisa (2020), which found that multigravida mothers have a 1.8 times greater risk of experiencing moderate to severe low back pain than primigravida mothers.

Third, daily physical activity. Respondents are also a factor that cannot be ignored. Prolonged standing, work involving heavy lifting, and non-ergonomic postures during daily activities cumulatively increase the load on the lumbosacral structures. According to Pennick and Liddle (2013) in the Cochrane Database of Systematic Reviews, physical and postural interventions are important components in the management of low back pain during pregnancy.

The finding that 69.6% of respondents reported moderate pain also has important clinical implications. Moderate pain in pregnant women not only disrupts physical comfort but also impacts sleep quality, ability to perform daily activities, and psychological well-being. Research by Mogren and Pohjanen (2005) in the journal *Spine* showed that moderate low back pain during pregnancy was significantly associated with sleep disturbances (OR=3.2, 95% CI: 1.8-5.7) and a measurable decrease in quality of life. This underscores the importance of effective and safe interventions for pregnant women, one of which is prenatal massage.

From a midwifery care perspective, identifying pain intensity before intervention is an essential step in the assessment process. This aligns with the standards of midwifery care stipulated in Regulation of the Minister of Health of the Republic of Indonesia Number 28 of 2017 concerning Licensing and Implementation of Midwifery Practice, which mandates midwives to conduct a comprehensive assessment, including an assessment of the physical complaints of pregnant women. By identifying moderate pain intensity in the majority of respondents, the diagnosis and care plan for pain management through prenatal massage are well-targeted.

The study also demonstrated that discomfort in the third trimester had not been optimally managed prior to the study. Most respondents stated they had never received specific education or interventions to manage lower back pain, and relied solely on rest as a self-management measure. This is consistent with the findings of Klomp et al. (2012), who stated that many pregnant women are unaware of the availability of safe and effective non-pharmacological interventions to reduce lower back pain during pregnancy.

2. Intensity of Low Back Pain in Third Trimester Pregnant Women After Prenatal Massage

The research results showed that the majority of third trimester pregnant women after prenatal massage experienced a reduction in the intensity of Low Back Pain to the Mild Pain category, namely 17 people (73.9%). This reflects the high effectiveness of prenatal massage intervention in relieving low back pain in the population of third trimester pregnant women. Mild pain in this study is defined as pain intensity with a score of 1-3 on the Numeric Rating Scale (NRS), where the respondent can still carry out daily activities comfortably and the pain felt is still very tolerable without requiring additional intervention.

Third trimester pregnant women are a group that is vulnerable to experiencing Low Back Pain due to physiological changes that occur during pregnancy. Significant weight gain, a shift in the body's center of gravity to the anterior, and an increase in the hormone relaxin which causes loosening of the ligaments of the hip and sacroiliac joints are the main factors that contribute to the onset of lower back pain during pregnancy.

In the third trimester, the rapid increase in uterine size forces the mother's body to adopt a more exaggerated lumbar lordosis posture. This posture compensation directly increases pressure on the lumbar vertebrae and paravertebral muscles, causing muscle tension which leads to pain. This condition is worsened by daily activities that require a standing or sitting position for a long time, which is often experienced by third trimester pregnant women in their daily lives (Vermani, Mittal & Weeks, 2010).

Research conducted by Sulistyowati and Wahyuningsih (2021) at the Semarang City Health Center showed that 75.0% of third trimester pregnant women experienced a reduction in pain intensity to the mild category after receiving prenatal massage for three consecutive sessions. Similar results were also reported by Imron and Sugiyanto (2020) at RSU PKU Muhammadiyah Yogyakarta with a proportion of post-intervention mild pain of 70.8%. The harmony of the findings between this research and previous studies strengthens the external validity of the research results and shows the consistency of the effect of prenatal massage on low back pain.

This finding is in line with research conducted by Field et al. (2010) which states that prenatal massage can significantly reduce levels of the hormones cortisol and norepinephrine which are associated with pain and stress responses in pregnant women.

Prenatal massage works through several interrelated physiological mechanisms. First, the tactile stimulation provided during massage activates sensory receptors in the skin and subcutaneous tissue, which then transmit signals through large-diameter afferent nerve fibers (A-beta fibers). These signals compete with pain signals transmitted through C- and A-delta fibers at the spinal cord level, effectively reducing the transmission of pain impulses to the brain. This mechanism is known as the Gate Control Theory, proposed by Melzack and Wall (1965).

Second, prenatal massage has been shown to stimulate the release of endorphins, serotonin, and dopamine, natural neurotransmitters with analgesic properties. Endorphins, in particular, have the ability to bind to opioid receptors in the central and peripheral nervous systems, producing natural pain relief without side effects for both mother and fetus (Morhenn et al., 2012). This makes prenatal massage a safer intervention than conventional pharmacological therapies for managing pain during pregnancy.

Third, massage techniques involving effleurage (gentle stroking), petrissage (kneading), and friction on the lower back muscles contribute to increased local blood circulation, reducing muscle spasms, and improving the flexibility of the soft tissues around the lumbar region. This increased blood flow aids the healing process of tissue ischemia caused by prolonged muscle tension and facilitates the elimination of metabolites responsible for the sensation of pain.

3. The Effect of Prenatal Massage on Low Back Pain Intensity in Third-Trimmed Pregnant Women at Indrasari Rengat Regional Hospital

Based on the results of a bivariate analysis using a Paired Samples T-Test, a p-value of 0.000 (<0.05) was obtained. It can be concluded that prenatal massage significantly affects low back pain intensity in third-trimester pregnant women. The results of this study indicate a decrease in low back pain intensity after prenatal massage intervention. Thus, prenatal massage can be used as an effective non-pharmacological method to reduce discomfort during pregnancy.

Research conducted by Bolbol-Haghighi, Masoumi, and Kazemi (2016) obtained consistent results, where massage intervention in third-trimester pregnant women resulted in a significant decrease in low back pain intensity as measured using a Visual Analogue Scale (VAS), with a p-value <0.05 . A similar study by Wahyuni and Nida (2012) on third-trimester pregnant women

at several community health centers also showed a significant difference in the intensity of lower back pain before and after prenatal massage ($p < 0.05$).

These results also align with research conducted by Field (2021), which found that massage therapy for pregnant women is effective in reducing musculoskeletal pain, improving sleep quality, and reducing stress during pregnancy. Another study by Wahyuni and Prabowo (2022) also showed that prenatal massage can significantly reduce the intensity of lower back pain in third-trimester pregnant women after routine intervention.

Furthermore, research by Fitriani et al. (2023) found that prenatal massage can improve the physical comfort of pregnant women by relaxing muscles that experience tension due to changes in posture during pregnancy. These results support the theory that complementary therapies such as prenatal massage are safe for use as non-pharmacological management in pregnant women when performed with appropriate techniques.

CONCLUSION

1. The results of the study indicate that the majority of low back pain intensity in pregnant women in the third trimester before prenatal massage was in the moderate pain category, with 16 (69.6%).
2. The results of the study indicate that the majority of low back pain intensity in pregnant women in the third trimester after prenatal massage was in the moderate pain category, with 17 (73.9%).
3. The results of the bivariate analysis using the Paired Samples Test obtained a p-value for low back pain intensity of $0.000 < 0.05$. Therefore, it can be concluded that there is an effect of prenatal massage on low back pain intensity in pregnant women in the third trimester at Indrasari Rengat Regional Hospital in 2026. the accuracy of market predictions and support more informed decision-making.

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