



## **The Effect Of Prenatal Exercise On Back Pain Among Third-Trimester Pregnant Women In The Working Area Of Teras Terunjam Health Center, Mukomuko Regency, Bengkulu Province In 2025**

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**Abstract.** Back pain is one of the most common complaints experienced by pregnant women in their third trimester due to physiological changes, posture, and weight gain during pregnancy. One non-pharmacological measure that can be taken to reduce back pain is prenatal exercise. This study aims to determine the effect of prenatal exercise on back pain among third trimester pregnant women in the Working Area of Teras Terunjam Health Center. This study used a quantitative method with a quasi-experimental design using a one-group pretest and posttest design. The population in this study consisted of all pregnant women in their third trimester with a gestational age of 28–30 weeks in the working area of Teras Terunjam Health Center, with a sample size of 32 respondents selected using total sampling technique. The research instrument used was the Numeric Rating Scale (NRS) to measure the level of back pain before and after performing pregnancy exercises. Pregnancy exercises were performed twice a week for two weeks. Data analysis was performed using the Paired Sample T-Test because the data was normally distributed with a significance level of  $\alpha = 0.05$ . Based on the results of the study, before the pregnancy exercises were carried out, half of the pregnant respondents experienced moderate back pain, namely 16 people (50%). After the pregnancy exercises were carried out, most of the respondents experienced mild back pain, namely 22 people (68.8%). The statistical test results showed a p-value of 0.000 ( $p < 0.05$ ), which means that there is a significant effect of pregnancy exercises on reducing back pain in third trimester pregnant women. The conclusion of this study is that pregnancy exercises have a significant effect on reducing back pain in third trimester pregnant women. Health workers are advised to increase education and implementation of prenatal exercises on a regular basis as an effort to improve the comfort and health of pregnant women.

**Keywords:** *Prenatal Exercises, Back Pain, Third Trimester Pregnant Women.*

### **INTRODUCTION**

Back pain occurs due to hormonal changes that lead to alterations in the supporting and connective soft tissues, resulting in decreased muscle elasticity and flexibility. Back pain that is not promptly managed can lead to long-term back pain, increase postpartum back pain, and develop into chronic back pain, which is more difficult to treat or cure (Ministry of Health, 2024). The impact of lower back pain complaints during the third trimester of pregnancy includes discomfort in performing daily activities. This condition occurs due to postural changes, increased load on the spine caused by the growing fetus, and excessive lordosis, which places physical stress on the spinal joints and leads to dysfunction. When the pain radiates to the pelvic and lumbar areas, it can cause difficulty in walking (Pangesti et al., 2022).

One of the efforts that can be undertaken to reduce discomfort, particularly lower back pain in pregnant women during the third trimester, is through pharmacological and non-

pharmacological methods. Pharmacological treatment is generally more effective than non-pharmacological methods; however, it is more expensive and has the potential to cause side effects that may affect both the mother and the fetus. In contrast, non-pharmacological methods are considered more beneficial because they are non-invasive, simple, effective, free from side effects, and provide a sense of satisfaction for the mother. These non-pharmacological approaches include various techniques such as massage, heat and cold application, acupuncture, relaxation exercises, guided imagery, meditation, hypnosis, aromatherapy, yoga, pregnancy exercise, and reflexology (Pangesti et al., 2022).

Pregnancy exercise is a form of physical activity consisting of specific movements designed to improve the health of pregnant women. It is part of antenatal class activities and functions to strengthen and maintain the flexibility of the abdominal wall and pelvic floor muscles, which can facilitate the childbirth process. Pregnancy exercise is a movement-based exercise provided to pregnant women and can be initiated at 24 weeks of gestation and performed regularly, once a week (Fasiha et al., 2022).

The effectiveness of pregnancy exercise therapy in reducing back pain among third-trimester pregnant women has been demonstrated in a study conducted by Nurlitawati (2022) at Ciawi Regional Hospital in 2021. The results of the paired sample t-test showed a significant value of  $0.002 < 0.05$ , indicating a significant difference in back pain levels before and after pregnancy exercise among third-trimester pregnant women.

A study conducted by Dewi et al. (2022) examined the effect of pregnancy exercise on back pain among third-trimester pregnant women at PMB Gianyar, Bali. The results showed that pregnancy exercise had an effect on reducing back pain. The average pain score before the intervention was 5.85 with a standard deviation of 0.671, which decreased to 0.05 with a standard deviation of 1 after the intervention. The statistical test results showed a p-value of 0.000, indicating a significant effect of pregnancy exercise on back pain reduction (Dewi, 2022).

Research conducted by Suciyanti (2024) showed that back pain in pregnant women during the second and third trimesters decreased after pregnancy exercise was performed twice. Most respondents experienced a reduction in back pain. The study concluded that pregnancy exercise had a significant effect on reducing back pain in pregnant women (Suciyanti et al., 2024).

Based on a preliminary survey conducted by the researcher at Teras Terunjam Health Center, data were obtained from 10 pregnant women in their third trimester of pregnancy (28–37 weeks). Unstructured interviews revealed that all 10 pregnant women reported experiencing lower back pain. When asked about participation in pregnancy exercise activities, 4 women (40%) stated that they had participated but not regularly, while 6 women (60%) reported that they had never participated in pregnancy exercise. Although pregnancy exercise programs had previously been implemented, many pregnant women did not participate in these programs. Even those who participated still complained of lower back pain. This condition was caused by the irregularity of pregnant women in performing pregnancy exercise. Based on this background, the researcher is interested in conducting a study entitled “The Effect of Pregnancy Exercise on Back Pain in Third-Trimester Pregnant Women in the Teras Terunjam Health Center Area in 2025..

## **LITERATURE REVIEW**

Pregnancy is a natural and physiological process. Every woman who has healthy reproductive organs, has experienced menstruation, and has engaged in sexual intercourse with a healthy man has the potential to become pregnant. The period of pregnancy is a process

that begins with conception and ends with the birth of the baby, typically lasting 280 days or 40 weeks, calculated from the first day of the last menstrual period.

Low back pain during pregnancy is a common condition experienced by pregnant women, particularly in the second and third trimesters. The World Health Organization (WHO) states that pregnancy is associated with a high prevalence of back pain. Increased levels of the hormone relaxin cause loosening of the ligaments around the pelvic bones. In addition, pregnancy increases pressure on the spine, which further exacerbates low back pain (Batista et al., 2024). Low back pain is one of the most common complaints during pregnancy, including in Indonesia. A report from the Indonesian Ministry of Health in 2023 noted that 50–70% of pregnant women in Indonesia experience low back pain, particularly after the pregnancy reaches more than 20 weeks of gestation. This condition is caused by changes in the center of gravity due to uterine enlargement and is worsened by poor posture and inappropriate sleeping positions (Ministry of Health, 2023).

Pregnancy exercise is a form of physical activity consisting of specific movements designed to improve the health of pregnant women. It is part of antenatal class activities and aims to strengthen and maintain the flexibility of the abdominal wall and pelvic floor muscles, which will subsequently facilitate the childbirth process. Pregnancy exercise is a structured movement program provided to pregnant women, which can be initiated at 24 weeks of gestation and performed regularly once a week to prepare women physically and mentally so that the labor process can proceed normally (Fasiha et al., 2022).

## **METHODS**

### **Univariate Analysis**

Univariate analysis was conducted to describe the frequency distribution of each variable studied, including knowledge of breastfeeding techniques before and after pregnancy exercise was provided in the working area of Teras Terunjam Public Health Center, Mukomuko Regency, expressed as percentages (%).

$$P = \frac{f}{n} \times 100\%$$

#### **Description:**

P = Percentage

f = Frequency of the observed variable

n = Sample size

Data interpretation according to Notoatmodjo (2018):

- 0%–25% = a small proportion of respondents
- 26%–49% = nearly half of respondents
- 50% = half of respondents
- 51%–75% = the majority of respondents
- 76%–79% = almost all respondents
- 100% = all respondents

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### **Bivariate Analysis**

Bivariate analysis is an analysis conducted on two variables that are suspected to be related or correlated. Based on the results of statistical testing, it can be concluded whether the relationship between the two variables is statistically significant or not (Notoatmodjo, 2018). In this study, bivariate analysis was performed to determine whether there was an effect of the independent variable (pregnancy exercise) on the dependent variable (low back pain in third-trimester pregnant women). With a significance level of  $\alpha < 0.05$  and a 95% confidence interval

(CI), a statistically significant effect is indicated when the  $p$ -value  $\leq \alpha$ . Conversely, if the  $p$ -value  $> \alpha$ , there is no significant effect between the independent and dependent variables (Notoatmodjo, 2018). The hypothesis testing used was the Paired Sample  $t$ -Test, as the data were normally distributed, and the analysis was conducted using the SPSS version 27 software.

## RESULTS

### Univariate Analysis

**Table 1. Frequency Distribution of Low Back Pain in Pregnant Women Before Pregnancy Exercise**

Level of Pain	Frequency	Percentage (%)
Mild Pain	14	43.8
Moderate Pain	16	50.0
Severe Pain	2	6.3
<b>Total</b>	<b>32</b>	<b>100</b>

**Table 2. Frequency Distribution of Low Back Pain in Pregnant Women After Pregnancy Exercise**

Level of Pain	Frequency	Percentage (%)
No Pain	17	53.1
Mild Pain	13	40.6
Moderate Pain	2	6.3
<b>Total</b>	<b>32</b>	<b>100</b>

### Bivariate Analysis

**Table 3. Results of the Data Normality Test**

	Shapiro Wilk		
	Statistic	df	Sig.
Pretest	0,941	32	0,082
Posttest	0,953	33	0,171

**Table 4. The Effect of Pregnancy Exercise on Low Back Pain in Third-Trimester Pregnant Women in the Service Area of Teras Terunjam Public Health Center, Mukomuko Regency, Bengkulu Province, 2025**

Low Back Pain	N	Mean	SD	p-value
Before Pregnancy Exercise	32	3.66	1.558	0.000
After Pregnancy Exercise	32	1.00	1.344	

## **DISCUSSION**

### **Description of Low Back Pain Before Pregnancy Exercise**

The results of the study showed that before the pregnancy exercise intervention was implemented, most third-trimester pregnant women in the working area of Teras Terunjam Public Health Center, Mukomuko Regency, experienced low back pain. Based on Table 5.1, prior to pregnancy exercise, half of the respondents reported moderate low back pain (pain scale 4–6), totaling 16 respondents (50%).

Low back pain is one of the most common discomforts experienced during pregnancy. Approaching the seventh month of pregnancy, many women experience lower back pain, and some also report pain in the upper back. Pregnant women may experience varying degrees of back pain. As gestational age increases, postural changes occur to compensate for the growing uterine weight. The shoulders are drawn backward due to the protruding abdomen, and to maintain balance, the inward curvature of the spine becomes exaggerated. Relaxation of the sacroiliac joints accompanying postural changes causes varying degrees of back pain following excessive strain, fatigue, stooped posture, or lifting.

The high incidence of low back pain among third-trimester pregnant women is associated with physiological and biomechanical changes during pregnancy. Uterine enlargement shifts the body's center of gravity forward, increasing lumbar lordosis and placing additional stress on the muscles and ligaments of the lower back. Furthermore, increased levels of the hormone relaxin lead to ligament laxity in the pelvis and spine, contributing to the development of low back pain during pregnancy (Batista et al., 2022).

The predominance of moderate low back pain in this study indicates that most pregnant women were still able to perform daily activities, although with limitations due to pain. This condition may negatively affect quality of life, including sleep disturbances, fatigue, and reduced comfort in daily activities. If not properly managed, pregnancy-related low back pain may persist into the postpartum period and develop into chronic low back pain (Suciyanti et al., 2024).

These findings are consistent with previous studies. Dewi et al. (2022) reported that prior to pregnancy exercise, most third-trimester pregnant women experienced moderate to severe low back pain. Similar findings were reported by Anggraini et al. (2023), who found that more than half of third-trimester pregnant women experienced moderate low back pain before intervention. According to the researcher's assumption, low back pain before pregnancy exercise is mainly caused by postural changes during pregnancy, including backward shoulder displacement due to abdominal enlargement and excessive inward spinal curvature to maintain balance.

### **Description of Low Back Pain After Pregnancy Exercise**

The results after the pregnancy exercise intervention demonstrated a reduction in low back pain levels among third-trimester pregnant women in the working area of Teras Terunjam Public Health Center, Mukomuko Regency. Based on Table 5.2, after pregnancy exercise, most respondents reported no low back pain (pain scale 0), totaling 17 respondents (53.1%).

Regular pregnancy exercise is believed to reduce low back pain. Pregnancy exercise is a form of physical training aimed at improving muscle and ligament elasticity in the pelvic region, correcting posture, regulating contraction and relaxation, and improving breathing techniques. During pregnancy exercise, endogenous opioids such as  $\beta$ -endorphins are released, which are captured by receptors in the hypothalamus and limbic system that regulate emotional responses. Increased  $\beta$ -endorphin levels are closely associated with pain reduction, improved memory, appetite, sexual function, blood pressure regulation, and respiration (Rahmawati et al., 2022).

The decrease in low back pain following pregnancy exercise is related to the physiological benefits of controlled physical activity during pregnancy. Pregnancy exercise strengthens the

back, abdominal, and pelvic floor muscles, improves flexibility and posture, enhances blood circulation, and stimulates endorphin release as a natural analgesic, thereby reducing pain perception (Batista et al., 2022).

The absence of severe pain after the intervention indicates that pregnancy exercise is effective in reducing low back pain to a milder level or eliminating it altogether. This finding aligns with non-pharmacological pain management theories that emphasize regular physical activity in reducing muscle tension and spinal pressure, particularly in late pregnancy (Rahmawati et al., 2022).

### **Effect of Pregnancy Exercise on Low Back Pain in Third-Trimester Pregnant Women**

The study results indicate that pregnancy exercise has a significant effect on reducing low back pain among third-trimester pregnant women in the working area of Teras Terunjam Public Health Center, Mukomuko Regency, Bengkulu Province, in 2025. Based on Table 5.4, the mean low back pain score before pregnancy exercise was 3.66 (SD = 1.558). After the intervention, the mean pain score decreased to 1.00, indicating a substantial reduction in pain intensity. Statistical analysis using the paired sample t-test (with normally distributed data) yielded a p-value of 0.000, indicating that pregnancy exercise significantly reduced low back pain in pregnant women.

This reduction reflects not only statistical significance but also clinical relevance. Pregnancy exercise effectively reduces pain intensity from moderate to mild or no pain, thereby improving daily functioning, sleep quality, and overall comfort during late pregnancy. These findings are consistent with previous studies, including Dewi et al. (2022), Nurlitawati et al. (2022), and Suciyanti et al. (2024), all of which confirmed the effectiveness of pregnancy exercise in reducing low back pain during pregnancy.

Overall, this study supports the implementation of pregnancy exercise as a routine program in maternal health services, particularly for third-trimester pregnant women experiencing low back pain. Regular pregnancy exercise can improve maternal quality of life, reduce reliance on pharmacological therapy, and support physical and mental preparation for childbirth.

### **CONCLUSION**

Half of the pregnant women experienced moderate low back pain (pain scale 4–6), totaling 16 respondents (50%), before the pregnancy exercise intervention was implemented. Most of the pregnant women reported no low back pain (pain scale 0), totaling 17 respondents (53.1%), after the pregnancy exercise intervention. There was a significant effect of pregnancy exercise on low back pain among third-trimester pregnant women (p-value = 0.000).

### **LIMITATION**

Future researchers are expected to use this study as a reference and to further develop the research by employing a broader study design, a larger sample size, or different research methods in order to obtain more comprehensive and generalizable results.

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