

# Effectiveness Of *Endorphin Massage* On Back Pain Intensity In Pregnant Women In The Thirty-Three Trimester At Pati I Public Health Center Pati Regency

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**Abstract.** Around 60-80% of pregnant women in Indonesia experience back pain during pregnancy, with the intensity of pain increasing as the uterus enlarges. *Endorphin massage* is a massage technique that stimulates the release of *endorphins*, the body's natural hormones that act as pain relievers and relaxants. It has no side effects on the mother and baby, and is inexpensive. This study aims to determine the effectiveness of *endorphin massage* on the intensity of back pain in pregnant women in the third trimester at the Pati I Community Health Center, Pati Regency. This study used a *pre-experimental method with a One Group* research design. *Pretest-Posttest The design* and technique of *purposive sampling*. The population in this study were 48 pregnant women in their third trimester at Pati I Community Health Center with a sample of 43 respondents. The level of pain before *endorphine massage* was 100% experiencing moderate pain with a mean value of 5.2105 and after *endorphine massage* 100% experienced moderate pain with a mean value of 5.2105. *massage* is 68.42% experienced moderate pain and 31.58% experienced mild pain with a mean value of 3.8421. The results of the *Wilcoxon test* showed a sig value (-2 tailed) *P value* <0.001 <0.05 indicating that there was a difference in the intensity of back pain in pregnant women in the third trimester before and after *endorphine massage* at the Pati I Community Health Center, Pati Regency, which means that *endorphin massage* is effective in reducing the intensity of back pain in pregnant women in the third trimester. It is recommended that education and the application of *endorphin massage* be provided as a non-pharmacological alternative to improve the quality of obstetric services and address back pain in pregnant women.

**Keywords :** *Endorphine Massage*, Back Pain, Pregnant Women

## INTRODUCTION

During pregnancy, pregnant women face various physical changes that can cause discomfort. Some common discomforts during this trimester include frequent urination, leg cramps, sleep disturbances (insomnia), swelling (edema), difficulty breathing, hemorrhoids, and back pain (Efendi et al., 2022). Approximately 60-80% of pregnant women in various regions in Indonesia experience back pain during pregnancy, with the intensity of the pain tending to increase as the uterus enlarges (Ernawati dkk., 2022). According to Hidayah & Nisak (2018), complaints of back pain in clients often require the use of pain relievers, which can raise anxiety about the potential side effects of these treatments. The use of pain relievers can provide faster pain relief, although there are concerns regarding the potential negative impacts on the mother and fetus (Diana, 2019).

Back pain in pregnant women is caused by the enlargement of the uterus, which affects the position of the body's center of gravity, so that when standing, the lower part of the spine tends to curve forward. Sacroiliac joint instability and increased lumbar lordosis contribute to pain. Furthermore, improper posture can lead to fatigue due to unnatural stretching of the back muscles, which in turn can contribute to back pain (Purnamasari & Widyawati, 2019).

Back pain is often felt in the lumbosacral area as discomfort or pain that increases with advancing pregnancy. This condition is caused by a shift in the body's center of gravity and changes in overall body shape. These changes in posture can affect a pregnant woman's activities, especially during strenuous activities, such as prolonged walking, lifting heavy objects, or maintaining a highly bent posture.(Puspasari, 2019). Pain levels can be categorized into mild, moderate, and severe pain based on the intensity scale felt (Mubarak & Chayatin, 2019).

Mild pain with a score of 1-3 does not significantly interfere with activities, while moderate pain with a score of 4-6 begins to interfere with activities and may require treatment. Severe pain with a score of 7-10 can seriously interfere with activities and requires further medical treatment. When back pain is not immediately treated, this condition has the potential to develop into persistent back pain that can continue after delivery, even at risk of becoming chronic back pain that is difficult to recover from. This can interfere with various daily activities, such as walking, getting up from a sitting position, or bending over (Suryanti dkk., 2021).

Pharmacological treatment of back pain often raises concerns about side effects for the mother and fetus, necessitating safe and effective non-pharmacological alternatives, one of which is *endorphin massage* (Hidayah & Nisak, 2018). Non-pharmacological approaches can help mothers feel more relaxed and manage pain in a controlled manner. Furthermore, this treatment method can be administered by healthcare professionals or family members.

*Endorphin massage* is a massage technique that stimulates the release of endorphins, the body's natural hormones that function as pain relievers and promote relaxation (Aprilia, 2017). *Endorphin massage* is a light touch/massage therapy that is quite important for pregnant women, in the period leading up to and after delivery. This is because massage stimulates the body to release *endorphins*, which act as pain relievers and can create a feeling of comfort. *Endorphins have long been known to have many benefits* (Kuswandi, in Tanjung 2019). *This endorphin massage technique has no side effects on the mother or baby, and is not expensive* (Harianto, in Tanjung 2019).

Research shows that this intervention can reduce back pain intensity by up to 40% and has positive psychological effects for pregnant women (Suriani et al., 2019). A study in Central Java by Muawanah (2023) also supports the effectiveness of this technique, where pregnant women who underwent *endorphin massage* experienced a decrease in pain from a 6 to a 3 in just one week.

A preliminary study conducted in January 2025 at the Pati I Community Health Center in Pati Regency found that 10 pregnant women in their third trimester complained of lower back pain. Interviews with the 10 women revealed that 8 experienced mild back pain and 2 experienced moderate back pain. Pregnant women experiencing back pain can often manage this by simply resting, lying on their left side, and adjusting their sitting position. However, these solutions are not effective, so more appropriate interventions are needed. Therefore, researchers are interested in conducting research on "The Effectiveness of *Endorphin Massage* on Back Pain Intensity" For pregnant women in the third trimester in the working area of the Pati I Community Health Center, Pati Regency."

## METHODS

This type of research is quantitative research using the *Pre-experimental research method with a One Group Pretest-Posttest Design* research design . The independent variable in this study was *endorphin massage* , and the dependent variable was back pain intensity. The study was conducted at the Pati I Community Health Center, Pati Regency. The population consisted of 48 respondents, and the sample consisted of 43 respondents, selected using a *purposive sampling technique* . The measuring instruments used in this study were the *endorphin massage standard* operating procedure (SOP) and a pain measurement sheet with a *Numeric Rating Scale (NRS)*.

## RESULTS AND DISCUSSION

### 1. Respondent Characteristics

Respondent characteristics include age, parity and intensity of back pain as follows:

**Table 1** Characteristics of Respondents Experiencing Back Pain in Pregnant Women  
Third trimester at Pati I Community Health Center, Pati Regency

| Characteristics | Category    | Amount    | Percentage (%) |
|-----------------|-------------|-----------|----------------|
| Age             | < 20 years  | 0         | 0              |
|                 | 20-35 years | 43        | 100            |
|                 | >35 years   | 0         | 0              |
| <b>Amount</b>   |             | <b>43</b> | <b>100</b>     |
| Parity          | First       | 28        | 65.12          |
|                 | 2-4         | 15        | 34.88          |
|                 | > 5         | 0         | 0              |
| <b>Amount</b>   |             | <b>43</b> | <b>100</b>     |

Based on Table 1, it is known that pregnant women in the third trimester who experienced back pain at the Pati I Community Health Center are as follows: the number of characteristics based on age is 20-35 years (100%). Characteristics based on parity are first (65.12%), 2-4 (34.88%) and > 5 (0%).

### 2. Univariate Analysis

#### a. Back Pain Intensity Before *Endorphine Massage Intervention*

**Table 2.** Back Pain Intensity Before *Endorphin Massage Intervention*  
at Pati I Health Center

| Back Pain Levels | Frequency | Percentage (%) |
|------------------|-----------|----------------|
| No pain          | 0         | 0              |
| Mild pain        | 38        | 88.37          |
| Moderate pain    | 5         | 11.63          |
| Severe pain      | 0         | 0              |
| <b>Amount</b>    | <b>43</b> | <b>100</b>     |

Based on table 2 above, it is known that the level of back pain in pregnant women in the third trimester at the Pati I Community Health Center, Pati Regency before the *endorphine massage intervention* was 38 respondents (88.37%) experiencing mild pain and 5 respondents (11.63%) experiencing moderate pain.

#### b. Back Pain Intensity After *Endorphine Massage Intervention*

**Table 3.** Back Pain Intensity After *Endorphin Massage Intervention*  
at Pati Community Health Center

| Back Pain Levels | Frequency | Percentage (%) |
|------------------|-----------|----------------|
| No pain          | 3         | 6.98           |
| Mild pain        | 40        | 93.02          |
| Moderate pain    | 0         | 0              |
| Severe pain      | 0         | 0              |
| <b>Amount</b>    | <b>43</b> | <b>100</b>     |

Based on table 3 above, it is known that the level of back pain in pregnant women in the third trimester at the Pati I Community Health Center, Pati Regency after the *endorphin massage intervention* was 40 respondents (93.02%) experienced mild pain and 3 respondents (6.98%) experienced mild pain.

c. Average Back Pain Intensity Before and After *Endorphine Massage Intervention*

**Table 4.** Average Back Pain Level Before and After *Endorphine Massage Intervention* at Pati I Community Health Center, Pati Regency

| Back Pain Levels                              | Mean   | Elementary School | Min – Max |
|-----------------------------------------------|--------|-------------------|-----------|
| Before <i>Endorphine Massage Intervention</i> | 2.8605 | 0.60085           | 2 – 4     |
| After <i>Endorphine Massage Intervention</i>  | 1.4651 | 0.70200           | 0 – 3     |

Based on table 4 above, it is known that the average level of back pain before *endorphin intervention massage* at Pati I Community Health Center, Pati Regency was 2,8605 with the highest pain level being 4 and the lowest pain level being 2 and the average pain level after *endorphine massage intervention* was 1,4651 with the highest pain level being 3 (mild pain level) and the lowest pain level being 0 (no pain level).

3. Bivariate Analysis

a. *Shapiro Wilk* Normality Test

**Table 5.** *Shapiro Wilk* Normality Test of *Endorphin Massage* Effectiveness

| Variables                       | Sig. A | N  | A    | Information                      |
|---------------------------------|--------|----|------|----------------------------------|
| Before <i>Endorphin Massage</i> | 0.001  | 43 | 0.05 | Data is not normally distributed |
| After <i>Endorphin Massage</i>  | 0.001  | 43 | 0.05 | Data is not normally distributed |

Based on table 5 above, it shows that *the p value*  $\leq 0.05$  means the data is not normally distributed, so the test that will be used is the *Wilcoxon test*.

b. *Wilcoxon test*

**Table 6.** Differences in Back Pain Intensity in Pregnant Women in the Third Trimester Before and After *Endorphin Massage*

|                                            |               | N  | Mean Rank | P Value |
|--------------------------------------------|---------------|----|-----------|---------|
| Before and After <i>Endorphine Massage</i> | Negative Rank | 43 | 22.00     | 945.00  |
|                                            | Positive Rank | 0  | 0.00      | 0.00    |
|                                            | Ties          | 0  |           |         |
|                                            | Total         | 43 |           |         |

Based on table 6 above, the *Negative Rank* value of 43 indicates that there is a significant difference specifically between the measurement of back pain intensity before and after *endorphin massage* in pregnant women in the third trimester at the Pati I Community Health Center, Pati Regency. The *Positive Rank* value of 0 indicates that there are 0 pregnant women who experienced an increase in back pain after being given *endorphin massage*. The *Ties value* of 0 indicates that no pregnant women had the same level of back pain before and after being given *endorphin massage*.

## DISCUSSION

### 1. Intensity of Back Pain in Pregnant Women in the Third Trimester Before *Endorphin Massage* at the Pati I Community Health Center, Pati Regency

Based on the results of the research conducted, data obtained showed that respondents experienced mild and moderate back pain before the *endorphin massage intervention*. The level of back pain in pregnant women in the third trimester at the Pati I Community Health Center, Pati Regency before the *endorphin massage* intervention was 38 respondents (88.37%) experiencing mild pain and 5 respondents (11.63%) experiencing moderate pain.

Back pain is defined as pain that occurs in the upper or lower back. Most pregnant women experience back pain of varying severity, and approximately 15% experience severe back pain. This pain can occur in the lumbar, lumbosacral, or neck areas and is generally caused by muscle stretching and pressure on nerve roots (Tharpe and Farley, 2015).

Pregnant women in rural areas tend to have limited access to prenatal education and non-pharmacological pain management. This results in a high number of complaints of back pain that are not optimally managed. Pharmacologically, back pain can be treated with medication. One non-pharmacological way to reduce back pain is through *endorphin massage*. *Endorphin massage* is a non-pharmacological approach that involves massage techniques or gentle touch, aimed at stimulating the release of endorphins, known as natural painkillers. (Girsang dkk., 2023) This massage technique aims to relieve pain while providing a feeling of comfort and calm. (Ekajayanti dkk., 2021).

The results of this study align with research showing that this intervention can reduce back pain intensity by up to 40% and provide positive psychological effects for pregnant women (Suriani et al., 2019). A study in Central Java by Muawanah (2023) also supports the effectiveness of this technique, where pregnant women who underwent *endorphin massage* experienced a decrease in pain from a 6 to a 3 in just one week.

Researchers assume that back pain in pregnant women in the third trimester is due to age, psychological factors, and bone structure, necessitating non-pharmacological interventions such as *endorphin massage*, which can promote relaxation and reduce muscle tension. This intervention can be used as an alternative pain management method without medication.

### 2. Intensity of Back Pain in Pregnant Women in the Third Trimester After *Endorphin Massage* at the Pati I Community Health Center, Pati Regency

The results of this study indicate that the level of back pain in pregnant women in the third trimester at the Pati I Community Health Center, Pati Regency after the *endorphin massage intervention* was 40 respondents (93.02%) experiencing mild pain and 3 respondents (6.98%) experiencing mild pain.

One alternative for reducing back pain is *endorphin massage*. *Endorphin massage* is recommended for individuals experiencing stress and pain, especially in the third trimester of pregnancy. During term pregnancy, this therapy can increase the production of *endorphins* and oxytocin, which play a role in stimulating contractions, reducing pain, as well as providing a relaxing effect and lowering stress levels (Girsang dkk., 2023).

The results of this study are in line with the research of Yuli Astuti et al (2019) on "The Effect of *Endorphin Massage* on Reducing Lower Back Pain and Anxiety in Pregnant Women in the Third Trimester" on 20 respondents in the control group and 20 respondents in the intervention group

with the *Wilcoxon test* showing a significant decrease in lower back pain and anxiety after being given *endorphin massage* ( $p < 0.05$ ).

This study is also in line with the research of Diah Ayu, Sri Mulyani et al (2020) on "The Effect of *Endorphin Massage* on Back Pain in Pregnant Women in the Third Trimester" on 15 respondents in the control group and 15 respondents in the intervention group showed that the results of the *Paired T-Test* showed a significant decrease in the intensity of back pain in the intervention group compared to the control group ( $p < 0.05$ ).

Researchers assume that the decrease in back pain levels after *endorphin massage* from the first day to the third day is due to the effect of *endorphin massage* which can help relax and reduce muscle tension so that it can be used as a non-pharmacological intervention.

### 3. The Effectiveness of *Endorphin Massage* in Reducing Back Pain in Pregnant Women in the Third Trimester

Based on the results of data analysis, it was found that the average intensity of back pain in pregnant women in the third trimester before *endorphin massage* was 2.86 and after *endorphin massage intervention* was 1.46 with a standard deviation of 0.70200. The *Negative Rank* value of 43 indicates that there is a significant difference specifically between the measurement of back pain intensity before and after *endorphin massage* in pregnant women in the third trimester at the Pati I Community Health Center, Pati Regency. *Positive Rank* value of 0 indicates that there are 0 pregnant women who experience an increase in back pain after being given *endorphin massage*. The *Ties value* of 0 indicates that there are no pregnant women whose back pain levels are the same before and after being given *endorphin massage*.

Back pain is a condition characterized by discomfort or pain that can be felt in the lower, middle, or upper back. Lower back pain is a major cause of disability and reduced productivity globally. According to a WHO report, lower back pain is among the top ten leading causes of disability worldwide. In the United States alone, approximately 80% of the population reports experiencing back pain at least once in their lifetime (James, 2023).

*Endorphin massage* is a relaxation technique that reduces the perception of pain by increasing blood flow to the affected area, stimulating the brain, and causing skin changes and holistic effects associated with intimacy. This therapy provides a sense of well-being, improves local circulation, increases endorphin production, reduces endogenous catecholamines, decreases afferent fiber excitability, and blocks stimulation (Anggraini et al., 2023).

*Endorphin massage* is a method used to manage pain and promote relaxation. By applying gentle touch to the spinal column, this therapy can trigger neurogenic reflexes that enhance the function of the parasympathetic nervous system in sending signals to the anterior pituitary gland to produce *endorphins*. This hormone functions as a neurotransmitter in spinal nerve cells, inhibiting the transmission of pain signals. By binding to opiate receptors, endorphins reduce the release of substance P through presynaptic inhibition, preventing pain impulses from reaching the brain, providing a comforting and relaxing effect for the mother (Lanasari et al., 2018).

The results of this study are in line with the research of Yuli Astuti et al (2019) on "The Effect of *Endorphin Massage* on Reducing Lower Back Pain and Anxiety in Pregnant Women in the Third Trimester" on 20 respondents in the control group and 20 respondents in the intervention group with the *Wilcoxon test* showing a significant decrease in lower back pain and anxiety after being given *endorphin massage* ( $p < 0.05$ ).

This research is also in line with the research of Diah Ayu, Sri Mulyani et al (2020) on "The Effect of *Endorphin Massage* on Back Pain in Pregnant Women in the Third Trimester" on 15 respondents in the control group and 15 respondents in the intervention group showed that the results of the *Paired T-Test* showed a significant decrease in the intensity of back pain in the intervention group compared to the control group ( $p < 0.05$ ).

Researchers concluded that *endorphin massage* performed during back pain can help increase *b-endorphin levels*, thereby reducing fluid buildup in the lower back, which causes pain. The researchers recommend that healthcare providers encourage *endorphin massage for pregnant women in their third trimester* when experiencing back pain to help reduce pain.

## CONCLUSION

Based on the results of the study, it can be concluded that the average intensity of back pain in pregnant women in the third trimester before *endorphin massage* was 2.86 and after *endorphin massage intervention* was 1.46 with a standard deviation of 0.70200. The *Negative Rank* value of 43 indicates that there is a significant difference specifically between the measurement of back pain intensity before and after *endorphin massage* in pregnant women in the third trimester at the Pati I Community Health Center, Pati Regency. *Positive Rank* value of 0 indicates that there are 0 pregnant women who experience an increase in back pain after being given *endorphin massage*. The *Ties* value of 0 indicates that there are no pregnant women whose back pain levels are the same before and after being given *endorphin massage*. The results of the *Wilcoxon test* show a sig value (-2 tailed) *P value* <0.001 <0.05 indicating that there is a difference in the intensity of back pain in pregnant women in the third trimester before and after *endorphin massage* at the Pati I Community Health Center, Pati Regency, which means that *endorphin massage* is effective in reducing the intensity of back pain in pregnant women in the third trimester.

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