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# The Difference Of Endorphin Massage And Effleurage Massage On The Back Pain Of Pregnant Women In The Third Trimester In The Working Area Of The Kembiritan Banyuwangi Health Center

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**ABSTRACT**

*Back pain is a common issue among women in their third trimester of pregnancy. This discomfort tends to become more pronounced as the pregnancy progresses. Without prompt intervention, this condition can lead to persistent pain until postpartum. Endorphin massage and effleurage massage are alternatives to help alleviate back pain in pregnant women during their third trimester. This study aimed to explore the effectiveness of endorphin massage and effleurage massage in alleviating back pain among women in their third trimester of pregnancy in the working area of the Kembiritan Banyuwangi Health Center in 2023. This study utilizes a pre-experimental methodology, employing a two-group pretest-posttest design. It targets the entire population of third trimester pregnant women suffering from back pain, totaling 99 individuals. The sampling technique uses purposive sampling and resulting in a total of 60 pregnant women who are then divided into two treatment groups, namely group 1 endorphin massage and group 2 effleurage massage then will be tested using the Wilcoxon test and Mann Whitney test. The findings of the study determined using the Wilcoxon test showed a pvalue of < 0.05 both in endorphin massage and effleurage massage which means there is a decrease in pain scales before and after treatment. The Mann Whitney test result found a pvalue of < 0.018 in endorphin massage and a pvalue of < 0.00 in effleurage massage, thus it can be deduced that a difference exists in the reduction of pain levels, and effleurage massage proves to be more efficacious in alleviating back pain among pregnant women in their third trimester. than endorphin massage. Advice for health workers to practice and teach effleurage massage for pregnant women in their third trimester who are dealing with back pain.*

## Introduction

Pregnancy is a physiological process that almost always occurs in every woman. During pregnancy, several body systems experience changes resulting from fetal development and cause discomfort. A common discomfort that occurs in the third trimester of pregnancy is back pain (Hidayat, 2020), because the growth of the uterus resulting in an increase in the mobility of the body's joints which affects changes in the posture of pregnant women and may lead to discomfort in the back (Fraser, 2020)

The back pain incidence in England is 50%, In Scandinavia, nearly 70% of pregnant women report experiencing significant back pain, in Australia, the figure stands at approximately 16% and 36% experience moderate back pain (Brawshaw, 2020). In 2020, Indonesia had approximately 5,221,784 pregnant women, among whom there was a prevalence of back pain during pregnancy ranging from 20-90% (Kemenkes RI, 2021). The East Java Health Office data in Fitriyah H.'s research (2020), In 2020, approximately 574,193 pregnant women were reported in the East Java and with projections indicating that about 65% experienced back pain (Fithriyah et

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al., 2020). 5 Data on pregnant women in Banyuwangi Regency in 2020 reached around 17,305 people. 6 A preliminary study was conducted in July 2023 at the Kembiritan Community Health Center on 17 pregnant women in the third trimester through interviews. The findings showed that 10 people (59%) experienced moderate back pain, while 7 people (41%) experienced mild back pain. According to the survey findings mentioned above, the total of pregnant women suffering from back pain is still quite high so that it interferes with and reduces their daily activities.

Several factors can lead to back pain in pregnant women during their third trimester, such as the expansion of uterus resulting in postural adjustments, increased body weight, the effect of the relaxing hormone loosening ligaments, a history of back pain in past pregnancies, the number of times a woman has been pregnant, and physical activity levels ((Wulandari & Wantini, 2021)). The growth of the uterus in line with the development of pregnancy causes the ligaments to stretch like a stabbing spasm. In line with continued weight gain during pregnancy, body posture changes which results in the body's center of gravity shifting forward, causing the back muscles to potentially shorten as the abdominal muscles stretch. This can lead to an imbalance of muscles around the pelvis, and additional strain may be experienced on these ligaments (Fraser, 2020). Back pain during pregnancy that is not resolved can have an impact on increasing the likelihood of postpartum back pain and chronic back pain (Fraser, 2020)

Handling back pain using pharmacological and non-pharmacological methods can minimize the discomfort in the third trimester of pregnancy. Pharmacological treatment is by giving calcium supplements or anti-pain medication by health workers. Non-pharmacological treatments, which can be administered by healthcare professionals or by family members, include the use of massage techniques such as endorphin massage and effleurage massage (Brawshaw, 2020). The endorphin massage technique is applied to stimulate endorphin hormones which make the body feel calm, comfortable and with minimal pain (Karuniawati, 2020). Light massage with endorphin massage starts from the neck using the fingertips to form a V towards the outside of the rib cage then down and back, namely from thoracic 10 to lumbar 1 (Munir et al., 2022). The effleurage massage technique involves applying long, slow, smooth and continuous strokes starting from the lumbar vertebrae, moving up to the thoracic vertebrae, and reaching up to the clavicle before descending back through the thoracic vertebrae, apply pressure ranging from light to medium and then back to light (Fitriana & Vidayanti, 2019). This technique has a relaxing effect because it stimulates the natural release of endorphin hormones in the 12th and 10th thorax (Fajarwati et al., 2021).

At the Kembiritan Community Health Center, the treatment of back pain during the third trimester of pregnancy is limited to pharmacology by providing calcium supplements of 30 tablets per month at a dose of 1 tablet per day. While Non-pharmacological treatment using massage therapy has never been done and midwives should be able to apply complementary care to women in their third trimester of pregnancy experiencing back pain issues, one of which is by means of endorphin massage and effleurage massage. Based on this fact, researchers are keen on exploring the comparative effects of endorphin massage and effleurage massage on alleviating back pain among third trimester pregnant women in the working area of the Kembiritan Public Health Center Banyuwangi in 2023.

## Methods

This study is a pre-experimental investigation that utilizes a two-group pre-test and post-test design. It involves 60 participants selected through purposive sampling methods which was divided into 2 treatment groups, Endorphin Massage and Effleurage Massage, with 30 respondents each, in accordance with the inclusion criteria: 1). Gestational age 28-40 weeks, 2)

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experiencing back pain and 3). Willing to be a respondent. Meanwhile, the exclusion criteria: having skin diseases at the massage site, for example boils, infectious diseases that arise due to inflammation, festering wounds, tumors, bruises, thrombophlebitis and hyperanaesthesia. The instrument uses NRS to measure the pain scale before and after administering Endorpine Massage and Effleurage Massage, observation sheets, and Standard Operating Procedures for administering Endorpine Massage and Effleurage Massage. Data collection was carried out by : 1). Request permission to collect data from the head of the Kembiritan Community Health Center, 2). After meeting with respondents who met the inclusion criteria, the researcher explained to the mother about the aims and benefits of the research and continued by making informed consent for the research to be carried out with the respondents, 3). Researchers measured the back pain levels in women in their third trimester of pregnancy using NRS, 4). The first 30 respondents are grouped into one group to be given Endorpin Massage once with a duration of 10 minutes, 5). The second 30 respondents were grouped into one group to be given Effleurage Massage once with a duration of 10 minutes, 6). After both groups were given intervention, their back pain scale was observed. Before conducting the data analysis, a normality test was performed using the Shapiro-Wilk method and a homogeneity test using the Levene test. The findings indicated the data did not follow a normal distribution, so it was decided to use the Wilcoxon test for bivariate analysis. To see the effect of giving endorphin and effleurage massage using the Mann Whitney test. The homogeneity test results show that the Levene Statistics value is > 0.05, so it can be said that the data variations are homogeneous.

## Results

**Table 1 Respondent Characteristics**

| **Parity** | **Frequency** ***Endorphin Massage*** | **f** | **Frequency** ***Effleurage Massage*** | **F** |
|---|---|---|---|---|
| Primipara | 8 | 27% | 9 | 30% |
| Multipara | 19 | 63% | 18 | 60% |
| Grandemultipara | 3 | 10% | 3 | 10% |
| **Work** | **Frequency** ***Endorphin Massage*** | **f** | **Frequency** ***Effleurage Massage*** | **F** |
| Doesn't work | 22 | 73% | 20 | 67% |
| Teacher | 1 | 3% | 1 | 3% |
| Analyst | 1 | 3% | 0 | 0% |
| Self-employed | 4 | 13% | 5 | 17% |
| Private Sector Employee | 2 | 7% | 4 | 13% |
| **Education** | **Frequency** ***Endorphin Massage*** | **f** | **Frequency** ***Effleurage Massage*** | **F** |
| Low | 6 | 20% | 2 | 7% |
| Intermediate | 20 | 66% | 23 | 76% |
| High | 4 | 13% | 5 | 17% |

Table 1 explains that the group treated with endorphin massage was mostly multipara with 19 respondents (63%), 22 respondents (73%) not working and 20 respondents (66%) with secondary education. Meanwhile, in the Effleurage Massage treatment group, 18 respondents (60%) were multipara, 20 respondents (67%0) did not work and 23 respondents (76%) had secondary education.

Table 2. Data Normality Test

| | Statistic | Df | Sig. |
|---|---|---|---|

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| | | | |
|---|---|---|---|
| *Endorphin Massage* | 0,940 | 60 | 0,005 |
| *Effleurage Massage* | 0,936 | 60 | 0,004 |

Referring to Table 2, it is apparent that each endorphin massage and effleurage massage group showed a significance test result (p-value) < 0.05, so the data not follow a normal distribution, thus allowing for further analysis in subsequent tests, namely the Wilcoxon test.

Table 3. Wilcoxon Tets In The Endorphin Massage Group

| | | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| Pre – Post *Endorphin Massage* | Post < Pre | 26 | 13,50 | 351,00 |
| | Post > Pre | 0 | ,00 | ,00 |
| | Post = Pre | 4 | | |
| | Total | 30 | | |

The Wilcoxon test results for the group giving endorphin massage have a significance value of 0.00 because 0.00 < 0.05, there is a conclusion there is a difference in the pain scale before and after the administration of endorphin massage.

Table 4. Wilcoxon Tets In The Effleurage Massage Group

| | | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| Pre - Post *Effleurage Massage* | Post < Pre | 30 | 15,50 | 465,00 |
| | Post > Pre | 0 | ,00 | ,00 |
| | Post = Pre | 0 | | |
| | Total | 30 | | |

The Wilcoxon test results for the group that gave effleurage massage have a significance value of 0.00 because 0.00 < 0.05, there is a conclusion that there is a difference in the pain scale before and after the administration of effleurage massage.

Table 5. Difference Between Endorphin Massage and Effleurage Massage

| | | Mean Rank | Sum of Ranks | Z | *p-Value* |
|---|---|---|---|---|---|
| *Endorphin Massage* | Pre | 35,72 | 1071,50 | | |
| | Post | 25,28 | 758,50 | -2,366 | 0,018 |
| *Effleurage Massage* | Pre | 40,23 | 1207,00 | | |
| | Post | 20,77 | 623,00 | -4,440 | 0,00 |

Based on table 5, it was found that endorphin massage had an average value of 35.72 before the treatment was given and an average value of 25.28 after the treatment was given, while effleurage massage had an average value of 40.23 before the treatment was given and an average value of 20.77. after being given treatment. The Z value of endorphin massage is -2.366 and the Z value of effleurage massage is -4.440. The results of the Mann-Whitney test analysis using SPSS with a significance level of α = 0.05 (5%) obtained a p value < 0.018 for endorphin massage and a p value < 0.00 for effleurage massage. With a smaller p value and Z value for effleurage massage than for endorphin massage, this means that effleurage massage proves to be more efficient in alleviating back pain than endorphin massage.

## Discussion

### Back Pain Scale for Pregnant Women in the Third Trimester Before and After Giving Endorphin Massage

The primary focus of antepartum care is the alleviation of pregnancy-related discomfort. Pain management during this period can be broadly categorized into pharmacological and non-pharmacological methods. Non-pharmacological strategies for managing pain are favored for their straightforwardness and ease of implementation, as well as for the empowerment women

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experience by actively participating in their own pain management. Moreover, these methods are associated with minimal to no significant adverse effects. Among the most important tasks for midwives who provide midwifery care is to assist women throughout their pregnancy and help decrease the level of pain or discomfort experienced during this time (Ali & Mirkhan Ahmed, 2018). For alleviating pain during pregnancy, several non-pharmacology methods have been suggested, including massage, altering one's posture, acupuncture, listening to music, taking warm baths, practicing relaxation techniques, and engaging in aromatherapy, etc. This method is often simple and safe, having relatively few side effects cheap, and usable. Therapeutic massage utilizes the sense of touch to encourage relaxation and alleviate pain. It aids in pain relief by boosting the body's production of endorphins. Endorphins lessen the transmission of pain signals between nerve cells, thereby reducing the sensation of pain. Moreover, massage serves as a distraction from discomfort (Riska Ayu et al., 2023). This research discovered that back massage serves as an effective non-pharmacology strategy in reducing the perception of pregnancy pain. Compared to pharmacology-based approaches, massage emerged as one of the techniques that enhances pain control while producing minimal side effects (Ali & Mirkhan Ahmed, 2018).

Back pain manifests in the lumbosacral region and intensifies with advancing gestational age due to the effects of gravitational force that will pull weight forward and down, pressing on the lower back muscles and making it painful (Devi et al., 2021). There are numerous factors that can influence the scale of back pain namely parity, gestational age, and physical activity. The greater the mother's parity, the greater the pain felt. This is because multiparous or grandemultiparous pregnant women often suffer from weakened abdominal muscles, while primiparous pregnant women typically possess strong abdominal muscles due to these muscles have never been stretched before (Varney, 2017). The study findings demonstrated that participants who experienced back pain on a scale of 6 and 7 were all multiparous and grandemultiparous, This aligns with the findings from a study conducted by (Elkhapi et al., 2023) where out of 55 respondents of pregnant women with primiparous parity who experienced severe pain as many as 6 respondents (37.5%) while in multiparous and grandemultiparous parity, 39 respondents (82.5%) experienced severe pain. The chi-square statistical test results between parity and the occurrence of low back pain in pregnant women (p value 0.001 < 0.05), it was concluded there was a significant positive influence between the parity variable on low back pain n expectant mothers. The gestational age also influences the pain level in pregnant women. With the progression of pregnancy, adjustments in a woman's posture occur to manage the additional weight from the expanding uterus. This leads to the shoulders being drawn backward due to the abdomen sticking out further, and to keep equilibrium, there is an increased inward curve of the spine. Changes in posture cause increased back pain and affect daily life activities (Simbung et al., 2022)

Respondents in this study who experienced back pain on scale 6, mostly 6 people (60%) were pregnant women who did not work or housewives with quite busy household activities and those who experienced back pain on scale 7 worked as entrepreneurs and at home as mothers. household. Improper physical activity such as lifting too much, bending, lack of balance will increase the risk of painful musculoskeletal injuries including the vertebral area which will cause back pain or spinal pain (Siul et al., 2023). Researchers believe that there is a link between housewives' activities and back pain considering that housewives' work is mostly related to lifting things such as clotheslines and also bending, such as mopping, sweeping and ironing. Back pain is related to work, supporting previous study by (Amin, 2023) where it was found that 63 respondents from pregnant women who did not work (59.4%) or housewives experienced more severe back pain.

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The research findings indicated that nearly most of the participants after endorphin massage treatment had a pain scale of 5 as many as 10 respondents (33%). This suggests a reduction in the pain levels felt before and after the treatment with endorphin massage. It was proven that the number of respondents who experienced pain was 6. Previously there were 10 respondents, but after the endorphin massage there were only 3 respondents and the number of respondents who experienced pain was 7. Previously there were 2 respondents, but after the endorphin massage there were no more.

According to the Indonesian Hypnobirthing Team, giving endorphin massage for 10 minutes can help relax and reduce the pain scale by enhancing the circulation of blood to the area experiencing pain, controlling persistent or persistent pain, reducing physical discomfort, increasing the production of endorphin hormones which are useful for the mother and fetus, and increasing the mother's ability to rest or sleep comfortably (Sulistiyaningsih & Sari, 2023). A light endorphin massage or gentle touch in third trimester pregnant women triggers the release of endorphin hormones which function to provide calm and comfort (Amir et al., 2022). Researchers concluded that endorphin massage could reduce the scale measuring back pain in pregnant women during their third trimester in the Kembiritan Community Health Center work area because 26 respondents (87%) experienced areduction in the pain scale by 1 level and there were 4 respondents (13%) whose pain scale remained at scale 2. 3,4 and 6. Of the four respondents who had a constant pain scale before and after endorphin massage treatment, half were primiparas with a gestational age between 29 - 30 weeks. There are still 4 respondents who have constant pain. This can occur because each person's perception of pain is different, apart from that, each person will have their own way of interpreting the pain they feel and a person's reaction to pain stems from their various experiences of pain. experienced during their vulnerable lives (Rahareng et al., 2022).

Gentle strokes with endorphin massage can make pregnant women feel calm and comfortable, thereby reducing the scale of back pain they are experiencing. The decrease in the pain scale in this study is the same or supports the previous research results by (Munir et al., 2022). The results obtained in 15 experimental group respondents were that there was a decrease in pain or there was a difference in pain before and pain after endorphin massage treatment, where during pre- test, most of them experienced severe pain, namely 8 respondents (53%), in the experimental group during the post-test the majority experienced mild pain, namely 9 respondents (60%). The Mann-Whitney test results yielded a Z-score of -4.237 and a p-value of 0.000 (p-value < 0.05), indicating that endorphin massage significantly impacts reducing back pain among pregnant women in their third trimester.

**Back Pain Scale for Pregnant Women in the Third Trimester Before and After Giving Effleurage Massage**

Almost half of the respondents after the effleurage massage treatment had a pain scale of 3 as many as 14 respondents (47%). This indicates a reduction in the pain scale before and after receiving effleurage massage therapy. Evidence shows that the count of participants reporting a pain level of 5 decreased from 9 respondents initially, but after effleurage massage there were only 2 respondents left and the number of respondents who experienced pain scale of 6 and 7 after effleurage massage was no longer there. According to (Sari & Farida, 2021) effleurage massage is a massage technique on the back or sacrum area using the base of the palm characterized by gentle, slow, and either prolonged or uninterrupted strokes which can have a relaxing effect. This massage is carried out for 10 minutes with emphasis on points which are believed to reduce the back pain scale in the third trimester (Fitriana & Vidayanti, 2019).

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Researchers believe that effleurage massage can reduce the back pain scale among pregnant women in their third trimester in the Kembiritan Community Health Center working area because all 30 respondents experienced a decrease in the scale of pain after the procedure. The pain scale decreased by 3 scales for 2 respondents (7%), decreased by 2 scales for 16 respondents (53%) and decreased by 1 scale for 12 respondents (40%). The results of this study are in line with previous research conducted by (Fitriani & Silviani, 2023) on 13 respondents, there were differences in the pain scale before and after effleurage massage, where before treatment almost all third trimester pregnant women complained of back pain as many as 12 respondents (92%) experienced moderate pain and after treatment almost half as many as 6 respondents (46%) experienced mild pain and the test results obtained a Z value = -3.115 with p-value = 0.002 < 0.05 which is significant. This indicates that administering effleurage massage to pregnant women in their third trimester can effectively lower their pain levels (Kurniyati & Bakara, 2021).

Respondents who had a pain scale of 5 to 7 were 16 pregnant women (53%), most of whom were at 35-40 weeks of gestation, namely 11 pregnant women (69%). As the uterus grows, it exerts pressure on the spinal muscles and joints, leading to lower back pain. Advancing pregnancy can alter a woman's posture by shifting her center of gravity forward. This shift, especially if the abdominal muscles are not strong, can lead to a curvature in the lumbar spine, causing back pain (Varney, 2017). Researchers determined that one of the contributing factors to lower back pain is gestational age, since an increase in gestational age correlates with an increase in the uterus's size and weight.

Respondents in the study who experienced back pain on a scale of 7 were 4 pregnant women (13%) and those who experienced pain on a scale of 6 were 3 pregnant women (10%) of which 6 pregnant women (86%) did not work or were housewives. Housewife work can cause stress and fatigue. Fatigue can indirectly increase the pain scale. Fatigue can also cause increased pain and stress can increase the response to pain (Varney, 2017). Researchers believe that housewives are more at risk of experiencing the back pain scale among pregnant women in their third trimester because they have a lot of repetitive work, such as sweeping, mopping, washing, cooking and taking care of children. This supports the literature review conducted by Melati Nur Arummega in 2022 with the title factors that influence third trimester pregnant women's back pain in 9 national articles and 15 international articles which stated that the activities of housewives will increase the scale of third trimester pregnant women's back pain (Arummega et al., 2022).

**Differences between Endorphin Massage and Effleurage Massage in Reducing the Scale of Back Pain in Pregnant Women in the Third Trimester**

The Mann Whitney (Z) test results were -2.366 for endorphin massage and -4.440 for effleurage massage, while the pValue was 0.018 for endorphin massage and pValue was 0.000 for effleurae massage, which means there is a difference between endorphin mand effleurage massage in alleviating back pain among pregnant women. third trimester in the Kembiritan Community Health Center working area. Based on the analysis, it can be seen that effleurage massage provides more significant results than endorphin massage.

Researchers are of the opinion that effleurage massage contributes more to lowering the back pain scale among pregnant women in their third trimester than endorphin massage because the massage technique used, namely in effleurage massage, the massage technique used is more diverse than endorphin massage which only involves gentle stroking with one movement. This is aligns with study by (Pratiwi et al., 2023) there is a difference in the effect of endorphin and effleurage massage on the reduction of lower back pain levels in pregnant women. Based on the

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analysis, it can also be seen that the effleurage massage technique produces an average difference in pain reduction of 31.66 in the no pain category, this is greater than the endorphin massage technique which produces an average difference in pain reduction of 29.18 in the mild pain category. These results indicate that the effleurage massage technique has a greater contribution in reducing lower back pain in pregnant women.

It can be concluded based on the explanation above that there is a difference between endorphin massage and effleurage massage in reducing back pain for third trimester pregnant women in the Kembiritan Community Health Center working area. Based on the analysis carried out, it shows that effleurage massage has a greater contribution than endorphin massage in reducing back pain for pregnant women in the third trimester in the Kembiritan Community Health Center working area in 2023.

## Conclusion

The analysis results used the Mann-Whitney test there is a difference between endorphin massage and effleurage massage for back pain in third trimester pregnant women and effleurage massage is more effective in reducing back pain than endorphin massage for pregnant women in the third trimester in the working area of the Kembiritan Community Health Center, Banyuwangi Regency in 2023.

## Ethics approval and consent to participate

This study has undergone and received approval from an ethical review board by the STIKES Banyuwangi Health Research Ethics Commission with No. 039/01/KEPK-STIKESBWI/XI/2023.

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