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Effect of Acupressure Techniques and Endorphin Massage on Back Pain Intensity in Third-Trimester Pregnant Women

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Abstract

Back pain in pregnancy is common, especially in the third trimester of pregnancy. In the world of health, alternative methods are being created to reduce pain in mothers during pregnancy and childbirth. Endorphin massage is the best nonpharmacological therapy to deal with these problems. This study aimed to determine the effect of acupressure and endorphin massage techniques on the intensity of back pain in third-trimester pregnant women. This type of research is a pre-experiment with one group pre-test post-test design. Samples were taken from a population that met the inclusion criteria of 20 pregnant women. The sampling technique used an accidental sampling technique. The research instrument used the SOP of acupressure and endorphin massage techniques and the *Numeric Rating Scale* pain observation sheet. The results showed that before acupressure and endorphin massage, almost half (45%) of all pregnant women experienced severe pain. After acupressure and endorphine massage, none of the respondents (0%) experienced severe pain. The results of the Dependent T-test with $\alpha = 0.05$ obtained Asymp.Sig.=0.001, so the p-value <0.05 indicates the effect of acupressure and endorphin massage techniques on the intensity of back pain in pregnant women. The conclusion is that there is an effect of acupressure techniques and endorphin massage on the intensity of back pain in third-trimester pregnant women. It is recommended that health workers improve their competence in the service of acupressure techniques and endorphine massage.

Keywords: Endorphin Massage, Low back pain, pregnancy

Introduction

Pregnancy causes almost the entire female body to undergo changes, especially the organs of the womb and also other organs that support the development and growth of the fetus

(Mochtar, 2016). One of the anatomical changes that occur in pregnant women is in the uterus, namely the increase in weight and enlargement of the uterus, which occurs due to a combination of hypertrophy or an increase in cell size and the mechanical influence of interior pressure on the uterine wall as the fetus develops in the womb (Varney, 2017).

Changes that occur in third-trimester pregnancy, one of which is in the musculoskeletal system, there is weakness of connective tissue and imbalance of joints caused by an increase in progesterone, estrogen and elastin hormones (Dewi et al., 2017). But sometimes complaints arise during pregnancy, one of which is very disturbing is the problem of back pain during pregnancy (Putri et al., 2024). Back pain during pregnancy is usually experienced by women at certain times in their pregnancy, usually often occurring in the third trimester of pregnancy. (Nurbaiti & Sari, 2024) As many as 50% of pregnant women surveyed in the UK and Scandinavia reported suffering from back pain; in Australia, as many as 70%. (Katopis et al, 2018).

Musculoskeletal changes in pregnancy often cause mothers to feel pain in the back area, especially the lower back area. The results of epidemiological research show that back pain is often exacerbated by the occurrence of backache or often referred to as "old back pain". This backache was found in 45% of women when their pregnancy was recorded, increasing to 69% at week 28 (Yosefa, Misrawati & Hasneli, 2015).

Management of back pain during pregnancy is needed to reduce this discomfort, including pharmacological therapy and nonpharmacological therapy (Samsinar & Seman, 2024). It is necessary to pay attention to the side effects when using pharmacological therapy for pregnant women because the use of analgesics is not always effective in reducing back pain, the use of nonsteroidal anti-inflammatories should not be used in the baby's gestational age below 30 weeks, because it risks causing malformations in the process of fetal formation (Muhdiana et al., 2024), while the use of opioids to reduce low back pain risks causing complications such as respiratory depression in the fetus and the effects of opioid dependence on the mother after using it for a long time (Sinclair, 2016). Given the impact caused by pharmacological therapy, nonpharmacological therapy needs to be done to reduce complaints of low back pain experienced by third-trimester pregnant women. (Sari & Nurbaiti, 2024)

A wide variety of complementary techniques that can be applied to the treatment of back pain in pregnancy that have been developed include massage (61.4%), relaxation (42.6%), chiropractic (36.6%), acupuncture (44.6%), yoga (40.6%) and acupressure. Acupressure is a form of physiotherapy that provides massage and stimulation at certain points of the body. It is useful for reducing various aches and pains, tension, fatigue, and various diseases to reactivate the circulation of vital energy. (Niken, 2018)

Endorphin massage is one part of a nonpharmacological technique, a light touch massage that can be given to pregnant women during childbirth (Han et al., 2024). This massage can stimulate the body to release endorphin compounds, which are natural pain relievers, and create a feeling of comfort. (Kuswandi 2016). Based on the research of Dyah Galuh Wulandari (2019) with the title Application of Endorphin Massage to Reduce Back Pain

in Trimester III Pregnant Women at BPM Ismoyowati Mirit, it is proven that endorphin massage can reduce back pain in trimester III pregnant women.

Literature Review

Acupressure Technique

Acupressure is now widely known in Indonesia. The mechanism of action of acupressure is known to be based in China. Acupressure massage is based on the science of acupuncture (acupuncture), which can also be called acupuncture without needles. The massage is performed on acupuncture points in certain body parts to eliminate complaints or diseases (Oka Sukanta, 2020). Acupressure, also known as totok therapy or finger prick, is a form of physiotherapy that provides massage and stimulation at specific points or acupoints on the body. Acupressure is also defined as gradually pressing healing points using fingers, which stimulates the body's ability to heal naturally (Setyowati, 2018).

Acupressure points are located on the skin's surface and have bioelectrically sensitive stimulation of these points, stimulating the release of endorphins pain-reducing hormones (Laksmi, 2023)vv(Laksmi, 2023). As a result, pain is blocked, and blood and oxygen flow to the area of the points is increased. This relaxes the muscles and promotes healing. Acupressure blocks pain signals to the brain through mild stimulation, blocking the sensation of pain through the spinal cord to the brain. Stimulation of acupressure points can not only remove blockages in the meridian pathways but also eliminate the flow of Qi blood and harmonize the yin and yang of the body (Oka Sukanta, 2020).

Understanding Endorphine Massage

Endorphin is derived from the words endogenous and morphine, a protein molecule produced by cells of the nervous system and some parts of the body working with sedative receptors that are useful for reducing stress and relieving pain (Karningsih et al., 2024). Neurons containing beta-endorphin are abundant in the anterior and intermediate lobes of the pituitary and brainstem (nucleus solitarius tractus). These analgesic receptors are produced in the spinal cord and nerve endings. (Aprilia and Ritchmond, 2016). Endorphins work when pain is stimulated by the body (Shenoy, 2019).

In total, there are approximately twenty types of happiness hormones. Although they work differently, their pharmacological effects are the same. Among the many happiness hormones, beta-endorphine is the most potent, working five or six times stronger than anesthetic drugs. Endorphine can be produced naturally when the body performs meditation, deep breathing, eating spicy food, and acupuncture (Aprillia, 2016).

Massage is one way to relieve fatigue, improve blood circulation, stimulate the body to release toxins, and improve mental health. Massage techniques help patients feel more refreshed, relaxed, and comfortable (Sukmaningtyas, 2016).

Endorphin Massage is a light touch/massage therapy that is quite important to be given to pregnant women in the time leading up to childbirth. This is because the massage stimulates the body to release endorphin compounds, which are pain relievers and can create a feeling of comfort. Endorphins have been known to have many benefits (Kuswandi, 2014). The main goal is relaxation. Within 3-10 minutes of massage on the back, it can lower blood pressure, normalize heart rate, increase breathing and stimulate the production of endorphine hormones that relieve pain naturally (Lucia Retnowati et al., 2024). This endorphine massage technique has no side effects on mother and baby and is not expensive. This kind of relaxation technique can help a lot in reducing pain and emotional distress during the birth process without the need to use anesthesia because God has actually prepared everything in the mother's body (Aprillia, 2016).

Endorphin massage can also stimulate the release of the hormone oxytocin, which can stimulate contractions. Endorphin massage is very useful because it can provide comfort, relaxation and calmness to pregnant women and giving birth. In addition, endorphin massage therapy can also restore heart rate and blood pressure to normal. This is what makes this therapy can help smooth the process of labor (Setiyawati, 2019).

The theory of light touch is that the smooth muscle, just below the skin's surface, called the pilus erector, reacts by contracting when stimulated. When this happens, the muscle pulls the hairs on the surface, which tenses up and causes goosebumps. These goose bumps help produce endorphine, a hormone that promotes a sense of well-being and relaxation (Mongan, 2019).

The link between acupressure technique and endorphin massage

Acupressure stimulates the nerves in the superficial skin, which are then transmitted to the brain and the hypothalamus. The descending nervous system releases endogenous opiates such as endorphin hormone. The release of endorphin hormone results in increased levels of endorphin hormone in the body, which will release a sense of comfort and relaxation for pregnant women (Puerto Valencia et al., 2024). The endorphin hormone helps restore the condition of blood vessels to normal vasodilation or as before and keeps the blood flowing smoothly. A sense of relaxation is obtained from the massage technique in the form of rubbing the back area, starting from the iliac to the scapula until finally stopping at the iliac back. So, acupressure and endorphine massage techniques are closely related to each other, with the goal of causing a sense of relaxation and comfort for pregnant women. (Bifano et al., 2024)

Research Method

This type of research is quantitative research. The research design is experimental research. This type of research design is an experiment with *one group pretest-posttest* type. This research was conducted at the Private Midwife in the Lubuk Alung Health Center Region. The research was conducted from August to October 2024. The number of samples was 20 people.

Results

1. Univariate Analysis

Average Intensity of Back Pain in Third Trimester Pregnant Women Before Acupressure and Endorpin Massage.

Table 1 Average Intensity of Back Pain in Trimester III Pregnant Women Before Acupressure and Endorphine Massage

	Average Pain Intensity			
	Mean	N	Std. Deviation	Std. Error Mean
Before	5.55	20	2.212	.495

Based on the description of Table 1 above, it can be seen that on average before the acupressure technique and endorphine massage, the value of back pain intensity of pregnant women in Trimester III is 5.55, which means the category of moderate pain intensity.

Average Intensity of Back Pain in Third Trimester Pregnant Women After Acupressure and Endorpin Massage.

Table 2 Average Intensity of Back Pain in Third Trimester Pregnant Women After Acupressure and Endorpine Massage

	Average Pain Intensity			
	Mean	N	Std. Deviation	Std. Error Mean
After	1.95	20	1.761	.394

After acupressure and endorphine massage, the average value is 1.95, meaning mild pain intensity. This means that there are no more respondents who experience severe pain after acupressure and endorphine massage techniques.

2. Bivariate Analysis

Bivariate analysis was conducted in this study to identify differences in the level of low back pain in third-trimester pregnant women before and after acupressure and endorphine massage.

Table 3 Effect of Acupressure Techniques and Endorphine Massage on Back Pain Intensity in Pregnant Women Third Trimester

Variables	Mean	Asymp.Sig. (2-tailed)	f
Pain Before	5,55	<0,001	20
Pain After	1,95		

Based on Table 3 above, the analysis results using the Dependent Sample T-Test obtained the average low back pain before being given acupressure techniques and endorphin

massage is 5.55 after being given acupressure techniques and endorphin massage 1.95. The significance value of pain before and pain after acupressure and endorphin massage techniques is $p < 0.001$. This shows that the value of $p < \alpha = 0.05$ so that it can be known that Ha is accepted, which means there is a significant difference between the pretest and posttest groups. So it can be concluded that there is an effect of acupressure and endorphin massage techniques on the intensity of back pain in third-trimester pregnant women

Discussion

Intensity of Back Pain in Third Trimester Pregnant Women Before Acupressure and Endorpin Massage

Table 1 shows that before acupressure and endorphin massage, there was an average maternal pain intensity value of 5.55, which means the category of moderate pain intensity. In the third-trimester, pregnant women with a total of 20 respondents, 9 respondents (45%) experienced severe pain, 8 respondents (40%) experienced moderate pain and 3 respondents experienced mild pain (15%). This means that almost half of all pregnant women respondents experienced severe pain, namely 9 respondents (45%).

Back pain is so common in pregnancy that it is described as one of the minor disorders in pregnancy (Varney, 2014). This is also in line with the gradual weight gain during pregnancy, which changes posture so that the body's center of gravity shifts forward. There is a tendency for the back muscles to shorten if the abdominal muscles are stretched, which can cause muscle imbalances around the pelvis, and additional tension can be felt over the ligaments (Bobak, 2014). After acupressure and endorphin massage techniques were obtained, none of the respondents experienced severe pain, and almost half of all pregnant women did not experience pain, namely 6 respondents (30%).

The researcher's assumption here is that many pregnant women experience back pain because mothers do not know how to reduce their back pain besides bed rest. In this study, researchers also taught husbands how to do endorphine massage so that it could be done at home. In this study, the average husband's response when taught endorphine massage was very excited and enthusiastic. Evidently, after being taught endorphine massage by the researcher, the mother informed us that the husband also helped provide endorphine massage at home when the mother felt a little pain.

The obstacles in this study are third-trimester pregnant women who refuse to do endorphine massage. The reason is because they are afraid of risky things happening to the fetus. Here, the researcher tries to explain how acupressure and endorphine massage are very safe to do, especially when researchers are also accompanied by midwives who are experts and have legal legality, as well as telling the mother that the benefits of acupressure and endorphine massage are very much efficient. There is no risk to the fetus.

Average Intensity of Back Pain in Third Trimester Pregnant Women After Acupressure and Endorpin Massage.

In Table 2 the average value of maternal pain intensity is 1.95, which means the category of mild pain intensity. After the acupressure technique and endorphine massage 6 people did not feel pain (30%), who experienced mild pain 9 people (45%) and who experienced moderate pain 5 people (25%). Here it can be seen that no more respondents experience severe pain after the acupressure technique and endorphine massage.

Low back pain in pregnancy is mostly experienced when entering the 6th month. Factors causing low back pain in pregnancy are increased lumbar lordosis/postursway back and an imbalance in the work of the anterior and posterior muscles of the lumbar region (Francis & Theresa, 2018).

During the study, all respondents of third-trimester pregnant women were given endorphin massage; the researcher and husband performed endorphin massage. When the mother feels pain at home, the husband does an endorphin massage and the pain felt by the mother is reduced. The endorphin massage performed by the husband is more active in reducing pain intensity than the endorphin massage performed by the researcher. This is because there is a bond between husband and pregnant women when doing endorphin massage so that the fine hairs on the skin's surface stand up. This technique increases the release of endorphin hormones and reduces the intensity of back pain because it can help relax and minimize the sensation of pain felt (Aprilia, 2020).

According to the researcher's assumption, controlling persistent pain is one of the benefits of endorphin massage, which can be used as a light touch technique to promote relaxation by triggering feelings of well-being through light massaging of the skin surface.

Effect of Acupressure Techniques and Endorpine Massage on Back Pain Intensity in Third-Trimester Pregnant Women

Based on table 2 It is obtained that the average low back pain before being given acupressure and endorphin massage techniques is 5.55, and after being given acupressure and endorphin massage techniques to 1.95. The significance value of pain before and pain after acupressure and endorphin massage techniques is 0.001. So, acupressure techniques and endorphin massage affect the intensity of back pain in third-trimester pregnant women.

The results of this study are in line with research conducted by Setyowati Dewi, 2019 found that most respondents experienced severe pain before Endorphin Massage as much as 70%. After being given, most respondents experienced moderate pain as much as 60%. The results of the calculation using Spearman Rank (Rho) with the level of meaning α (sig. 2-tailed) 0.05 obtained 0.001 <0.05 then H0 is rejected, and H1 is accepted, which means that there is an effect of acupressure and endorphin massage techniques on the intensity of low back pain in third-trimester pregnant women.

Acupressure and Endorphin Massage are gentle and subtle ways to help pregnant women feel more refreshed, relaxed and comfortable during pregnancy. Acupressure and endorphin massage can relieve back pain; in this case, the endorphin compound is a natural pain reliever during pregnancy. Endorphin Massage also makes mothers feel closer to the people who care for them; the touch of people who care about helping is a source of strength when the mother is sick; in doing Endorphin Massage must pay attention to the mother's response, whether the pressure applied is appropriate (Wulandari, 2019).

From the research that has been done, due to time constraints in this study, researchers only provide acupressure and endorphine massage once, namely when the respondent has given a pain intensity value, after which the researcher performs acupressure and endorphine massage techniques to the respondent. It should be more effective to give acupressure 2 times a week, given every 3 times a day. For endorphine massage, 20-30 minutes are given once a week for 4 consecutive weeks.

Here, the researchers did not examine all factors that affect pain perception, such as past experience of pain, culture, psychosocial factors, anxiety, and fear, as well as attention and support from the family, which also affect the pain response in third-trimester pregnant women. In addition, there is no control group as a comparison group to determine the difference between the average value between the group given massage and the group not.

According to the researcher's assumption, many factors can affect back pain in third-trimester pregnancy, so all of these factors should be overcome with methods/actions that have minimal risk to the mother and baby. Pursuing nonpharmacological methods such as acupressure and endorphine massage is one powerful way to reduce back pain in third-trimester pregnant women with very little risk impact if done correctly.

Conclusion

Based on the results of research on the effect of acupressure and endorphine massage techniques, it can be concluded that:

1. The average value before the acupressure technique and endorphine massage was obtained, the value of back pain intensity of pregnant women in Trimester III was 5.55, which means the category of moderate pain intensity
2. The average value after acupressure and endprphine massage is 1.95, which means that the intensity of back pain in third-trimester pregnant women becomes a mild category.
3. There is an effect of acupressure techniques and endorphine massage on the intensity of low back pain in third-trimester pregnant women where the value ($p < 0.001$).

Declaration of conflicting interest

The authors declared no conflict of interest.

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