

THE EFFECTIVENESS OF COUNTERPRESSURE MASSAGE TECHNIQUE AND DEEP BREATHING RELAXATION TECHNIQUE ON PAIN INTENSITY OF WOMEN IN THE FIRST STAGE OF ACTIVE LABOR

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ABSTRAK

Nyeri persalinan adalah nyeri yang timbul akibat fisiologi proses persalinan, ketidaknyamanan dapat dirasakan oleh ibu. Namun dapat ditangani dengan intervensi massage counter pressure dan teknik relaksasi nafas dalam. Jika nyeri tidak ditangani dengan baik, dapat menyebabkan kecemasan, ketegangan, dan stres, yang pada gilirannya dapat meningkatkan intensitas nyeri yang dialami. Penelitian ini bertujuan untuk mengetahui efektivitas kedua teknik tersebut terhadap intensitas nyeri ibu bersalin kala I fase aktif di RSIA Siti Khadijah Kota Gorontalo. Penelitian ini menggunakan metode kuasi eksperimen dengan desain two group pretest-posttest. Sampel berjumlah 38 ibu bersalin yang dipilih melalui purposive sampling sesuai kriteria inklusi dan eksklusi. Subjek dibagi menjadi dua kelompok: kelompok A diberikan teknik massage counter pressure dan kelompok B diberikan teknik relaksasi napas dalam. Pengukuran nyeri dilakukan menggunakan skala NRS sebelum dan sesudah intervensi. Data dianalisis menggunakan uji statistik wilcoxon Hasil menunjukkan adanya penurunan signifikan intensitas nyeri pada kedua kelompok. Namun, massage counter pressure lebih efektif dibandingkan teknik relaksasi napas dalam dalam mengurangi nyeri ($p < 0,05$). Maka dapat disimpulkan kedua teknik efektif menurunkan intensitas nyeri kala I fase aktif, dengan massage counter pressure menunjukkan hasil yang lebih baik.

Kata kunci : kala I fase aktif, *massage counter pressure*, nyeri persalinan, relaksasi napas dalam,

ABSTRACT

Labor pain that arises due to the physiology of the labor process. The discomfort can be felt by the mother. However, it can be managed with counter-pressure massage and deep breathing relaxation techniques. If pain is not managed properly, it can cause anxiety, tension and stress, which in turn can increase the intensity of the pain experienced. This study aims to determine the effectiveness of these two techniques on pain intensity in the active phase of the first stage of labor at Siti Khadijah Hospital, Gorontalo City. This study used a quasi-experimental method with a two-group pretest-posttest design. The sample consisted of 38 mothers selected through purposive sampling method based on inclusion and exclusion criteria. Subjects were divided into two groups: group A was given counter-pressure massage techniques and group B was given deep breathing relaxation techniques. Pain was measured using the NRS scale before and after the intervention. Data were analyzed using the Wilcoxon statistical test. Results showed a significant pain reduction intensity in both groups. However, counter-pressure massage was more effective than deep breathing relaxation techniques in reducing pain ($p < 0.05$). Therefore, it can be concluded that both techniques are effective in reducing pain intensity in the active phase of the first stage of labor, with counter-pressure massage showing better results.

Keywords : labor pain, counter-pressure massage, deep breathing relaxation, active phase of the first stage of labor

INTRODUCTION

Childbirth is a natural physiological process. However, it is often accompanied by complex and multidimensional intense pain. Labour pain, particularly during the active phase of the first stage, arises from increasingly strong uterine contractions, cervical dilatation, and

fetal pressure on the pelvic structures and lower back. This pain affects not only the physical dimension, but also the psychological, emotional, and spiritual dimensions of the woman giving birth (Caroline A. Smith *et al.*, 2018; Yunika, Ulya and Herlina, 2025). When pain is not managed adequately, it may lead to serious consequences such as increased catecholamine levels, uteroplacental vasoconstriction, fetal hypoxia, maternal fatigue, and prolongation of the duration of labour (Caroline A Smith *et al.*, 2018). In the long term, unmanaged painful experiences may result in psychological trauma, fear of subsequent pregnancies, and decreased satisfaction with the childbirth experience.

In response to this complexity, labour pain management has become one of the main focuses in evidence-based midwifery care. The primary aim is not to eliminate pain completely, but to reduce its intensity and enhance women's ability to control and give meaning to their pain. According to WHO (2018), pain management must be holistic, safe, and respectful of women's autonomy. Pain management approaches are broadly divided into two main categories: pharmacological and non-pharmacological. Pharmacological approaches, such as the use of opioid analgesics, epidural anaesthesia, or nitrous oxide, are indeed effective in reducing pain, but they have side effects such as hypotension, impaired mobility, neonatal respiratory depression, and limited availability in primary healthcare facilities (Koyyalamudi *et al.*, 2016). Consequently, non-pharmacological approaches have become the preferred option in modern midwifery practice because they are safer, promote active participation of women, and strengthen a positive childbirth experience (Zuarez-Easton *et al.*, 2023).

Various non-pharmacological methods such as massage techniques, heat/cold therapy, transcutaneous electrical nerve stimulation (TENS), aromatherapy, and breathing relaxation have been shown to be effective in reducing pain intensity and maternal anxiety during labour. Among these methods, the counterpressure massage technique and deep breathing relaxation stand out because their combination can simultaneously reduce pain perception both physiologically and psychologically. Counterpressure massage is performed by applying firm pressure to the sacral area during contractions, thereby activating A-beta nerve fibres and inhibiting pain transmission through the gate control mechanism. Beyond its physiological effects, this technique also enhances comfort, relaxes the lower back muscles, and strengthens emotional support from the labour companion. Meanwhile, deep breathing relaxation stimulates the parasympathetic nervous system to reduce adrenaline levels and increase the secretion of natural endorphins, thereby decreasing pain perception, stabilising blood pressure, and improving oxygenation for both mother and fetus (Baljon *et al.*, 2022; Wahyuni *et al.*, 2024).

These two techniques are in line with the principles of Women-Centred Care (WCC), in which women are actively involved in regulating their bodies and breathing rhythm while also receiving physical and emotional support from companions or midwives. (Heim and Makuch, 2023) concluded that a combination of physiological and psychological interventions such as massage and breathing relaxation can reduce pain intensity by up to 40%, decrease anxiety, and increase satisfaction with the childbirth process. Considering their effectiveness, safety, and cultural relevance, counterpressure massage and deep breathing relaxation were selected as complementary interventions in this study because they are inexpensive, easy to apply, non-invasive, and strengthen the active role of women and their families in achieving a more comfortable, positive, and humane birth process.

According to a study in Indonesia, around 50% of births in private hospitals are carried out by caesarean section, which is often chosen because it is considered to be a less painful method. According to WHO (World Health Organization), it is estimated that there are approximately 210 million pregnancies worldwide, with 20 million mothers experiencing pain during labor (Devy *et al.*, 2024; Zahroh *et al.*, 2024). Of these, 15% experience mild pain,

35% experience moderate pain, 30% experience severe pain, and 20% experience very severe pain. In Indonesia, Murray reported that of 2,700 mothers giving birth, 15% experienced mild pain, 35% experienced moderate pain, 30% experienced severe pain, and 20% experienced very severe pain (Kementerian Kesehatan Republik Indonesia, 2023).

Based on the 2024 maternal health report data from the Gorontalo provincial health office, it was found that the number of mothers giving birth in Gorontalo city was 3,414, for the district area, it was 6,205, the Boalemo district area was 2,539, the Pohuwato district the number of mothers giving birth reached 2,473, Bonebolango district had 1,291 mothers giving birth, and North Gorontalo district had 1,973 mothers giving birth. Based on data collection and initial observations on January 3, 2025, at the Siti Khadijah Women's and Children's Hospital (RSIA) in Gorontalo City, there were 172 women giving birth in the last three months of 2024. Interviews with the head of the delivery room revealed that they had not been exposed to non-pharmacological methods such as the counter pressure massage technique related to reducing labor pain. Meanwhile, during interviews with two postpartum mothers, they said they felt pain before giving birth and that no massage was performed by health workers during delivery, but only deep breathing relaxation techniques. Furthermore, two postpartum mothers with their first child said they did not use deep breathing relaxation techniques during delivery and that the pain arose because of fear and anxiety.

The research conducted entitled "The Effect of Counter Pressure and Deep Breathing Relaxation Techniques on Labor Pain in Women Giving Birth in the First Stage of the Active Phase at Dr. Hafiz Hospital, Cianjur" showed the test results is significant with a 2-tailed value of 0.000 (<0.005), which means there is a significant influence on the level of labor pain in mothers giving birth before and after the procedure of counter pressure and deep breathing relaxation techniques is carried out (Nurul Hidayah Mulyati, Rina Afrina and Siti Kamilah, 2024).

METHODS

The research method employed in this study was a quasi-experimental design with a two-group pretest–posttest approach (Hidayat, 2021). The rationale for using a two-group pretest–posttest design is that this study involved two groups that both received treatment, but with different types of interventions. The two variables, namely the counterpressure massage technique and the deep breathing relaxation technique, constituted the interventions administered when the mother experienced pain during the active phase of the first stage of labour. Observations were conducted before and after the subjects received the interventions. In this study, pain during the active phase of the first stage of labour was first assessed at baseline (pretest), followed by the administration of the counterpressure massage and deep breathing relaxation techniques, after which pain in women in the active phase of the first stage of labour was reassessed (posttest). The study was conducted from May 14 to June 20, 2025.

The sampling technique used in this study was purposive sampling, in which the researcher deliberately selected participants based on predefined inclusion and exclusion criteria, with the sample size determined using Slovin's formula. The inclusion criteria in this study were: (1) women in the active phase of the first stage of labour; (2) willingness to follow the research procedures and provide informed consent; (3) not receiving any analgesic drugs; and (4) cervical dilatation of 4 to 7 cm. The exclusion criteria were: (1) women with medical complications (for example, preeclampsia, eclampsia, or heart disease); (2) labour with medical indications for further intervention (such as caesarean section); and (3) inability to perform the counterpressure massage technique and/or deep breathing relaxation technique. In this study, bivariate analysis was used to examine the effectiveness of the Counterpressure

Massage Technique and Deep Breathing Relaxation Technique on the intensity of pain in women in the active phase of the first stage of labour. The choice of statistical test depended on the results of the normality test. If the data were normally distributed, analysis was conducted using the paired t-test to determine the effect before and after the counterpressure massage and deep breathing relaxation interventions. If the data were not normally distributed, the Wilcoxon test was used to examine changes in pain intensity in women in the active phase of the first stage of labour.

RESULTS

Respondent Frequency Distribution

Table 1. Frequency Distribution of Respondent Characteristics

No.	Respondent Characteristics	Number (n)	Percentage (%)
Age (Years)			
1.	<20	2	5,4
2.	20-35	33	89,2
3.	>35	2	5,4
Education			
1.	JUNIOR HIGH SCHOOL	3	8,1
2.	SMA	30	81,1
3.	S1	3	8,1
4.	S2	1	2,7
Parity			
1.	Primipara	18	48,6
2.	Multipara	19	51,4
Gestational Age			
1.	8 Months	3	8,1
2.	9 Months	34	91,9
Total		37	100

Based on table 1, it is found that the majority of pregnant women were aged between 20 and 35 years, namely 33 pregnant women (89.2%). In terms of education, 30 pregnant women (81.1%) were high school graduates, the highest number of graduates. Meanwhile, in terms of parity, the highest number were multiparous, namely 19 pregnant women (51.4%). As for gestational age, the most pregnant women were 9 months pregnant which accumulated to 34 pregnant women (91.9%).

Technician Massase Counter Pressure Observation I

Table 2. Frequency Distribution Massage Counter Pressure

No.	Pain Scale	Number (n)	Percentage (%)
Pretest			
1.	Medium Scale	10	55,6
2.	Weight Scale	8	44,4
Posttest			
1.	Medium Scale	18	100,0
2.	Weight Scale	0	0,0
Total		18	100

Based on table 2, it was found that before the counter pressure massage technique was given in the first observation, 10 pregnant women (55.6%) experienced moderate pain and 8 pregnant women (42.1%) experienced severe pain. After being given the counter pressure massage technique, all pregnant women experienced pain of moderate intensity and no pregnant women experienced pain with severe intensity.

Observation II

Table 3. Frequency Distribution of Counter Pressure Massage

No.	Pain Scale	Number (n)	Percentage (%)
Pretest			
1.	Medium Scale	1	5,6
2.	Weight Scale	17	94,4
Posttest			
1.	Medium Scale	13	72,2
2.	Weight Scale	5	27,8
Total		18	100

Based on table 3, it was found that before the technique was given counter pressure massage In the second observation, there was 1 pregnant woman (5.6%) who experienced moderate pain and 17 pregnant women (94.4%) experienced severe pain. After being given the counter pressure massage, there were 13 pregnant women (72.2%) who experienced pain with moderate intensity and the remaining 5 pregnant women (27.8%) experienced pain with severe intensity.

Observation III

Table 4. Frequency Distribution of Counter Pressure Massage

No.	Pain Scale	Number (n)	Percentage (%)
Pretest			
1.	Medium Scale	0	0,0
2.	Weight Scale	18	100,0
Posttest			
1.	Medium Scale	14	77,8
2.	Weight Scale	4	22,2
Total		18	100

Based on table 4, it was found that all pregnant women experienced pain with severe intensity before being given the counter pressure massage technique in the third observation. After being given the counter pressure massage, there were 14 pregnant women (77.8%) who experienced moderate intensity pain and the remaining 4 pregnant women (22.2%) experienced severe intensity pain.

Deep Breathing Relaxation Technique

Table 5. Frequency Distribution of Nasal Relaxation Techniques

No.	Pain Scale	Number (n)	Percentage (%)
Pretest			
1.	Medium Scale	4	21,1
2.	Weight Scale	15	78,9
Posttest			
1.	Medium Scale	17	89,5

2.	Weight Scale	2	10,5
	Total	19	100

Based on table 5, it was found that before being given the deep breathing relaxation technique, there were 4 pregnant women (21.1%) who experienced moderate pain and 15 pregnant women (78.9%) experienced severe pain. Meanwhile, after being given the deep breathing relaxation technique, there were 17 pregnant women (89.5%) who experienced moderate pain and the remaining 2 pregnant women (10.5%) experienced severe pain.

Bivariate Analysis

Counter Pressure Massage Technique

Table 6. Effectiveness of Counter Pressure Massage Technique

No.	Pain Scale	mean±SD	Difference	Min-Max	P-value
Observation I					
1.	Pretest	6,39 ± 0,78	1,11	5-8	0,000
2.	Posttest	5,28 ± 0,67		4-6	
Observation II					
1.	Pretest	7,17 ± 0,71	0,95	5-8	0,000
2.	Posttest	6,22 ± 0,55		5-7	
Observation III					
1.	Pretest	7,44 ± 0,51	1,27	7-8	0,000
2.	Posttest	6,17 ± 0,51		5-7	

Based on table 6, the largest difference in pain scale among pregnant women occurred in the third observation, decreasing by 1.27. Meanwhile, the differences in the first and second observations also decreased by 1.11 and 0.95, respectively. From table 6, the value obtained from statistical Wilcoxon tests where results of the three observations were 0.000. This shows that there is a significant difference between the pain scale of pregnant women before and after being given the counter pressure massage technique. In the three observations, the p-value<0.05. Therefore, it can be concluded that there is an influence or effectiveness of the massage counter pressure technique on the intensity of pain in pregnant women during the first stage.

Deep Breathing Relaxation Techniques

Table 7. Deep Breathing Relaxation Techniques

No.	Pain Scale	Rerata \pm SD	Difference	Min-Max	P-value
1.	Pretest	6,95 \pm 0,62	1,00	6-8	0,000
2.	Posttest	5,95 \pm 0,52		5-7	

Based on table 7, it was found that the pain scale in pregnant women before being given deep breathing relaxation techniques was 6.95 with a minimum scale of 6 and a maximum of 8. Meanwhile, the pain scale in pregnant women after being given deep breathing relaxation techniques was 5.95 with a minimum scale of 5 and a maximum of 7. The difference in the pain scale between the two groups was 1.00 (decreased). From table 7, the value obtained from statistical Wilcoxon tests is 0.000. This shows that there is a significant difference between the pain scale in pregnant women before and after being given deep breathing relaxation techniques (p-value<0.05). Therefore, it can be concluded that there is an influence of deep breathing relaxation techniques on the intensity of pain in pregnant women in the first stage.

DISCUSSION

Labor Pain in Women Giving Birth in the First Stage of the Active Phase Before and After the Technique is Given Massage Counter Pressure

Labor pain experienced by pregnant women in the V.K. room of Sitti Kadidjah Hospital, Gorontalo, where before technical intervention was given counter pressure massage in the first observation, there were the largest number, namely 10 pregnant women with moderate pain, and pregnant women who experienced severe pain was 8 pregnant women. After being given the counter pressure massage technique, all pregnant women experienced pain of moderate intensity and no pregnant women experienced pain of severe intensity. Gate control theory explains that nerve fibres transmit pain to the spinal cord, which can then be modified at the spinal cord level before being transmitted to the brain. Synapses in the dorsal horn act as gates that can close to block pain impulses or open to allow them to travel up into the brain (Ropero Peláez and Taniguchi, 2016). This theory states that during labor, pain impulses from the uterus travel through large nerve fibers to the substantia gelatinosa in the spinal cord, where transmission cells send pain messages to the brain. Stimulation such as vibration, rubbing, or massage can send conflicting messages, closing the gates in the substantia gelatinosa, and blocking pain messages so the brain doesn't receive them.

As for the analysis of the research results on the two before the researcher carried out the technical intervention massage counter pressure One pregnant woman experienced moderate pain and 17 pregnant women experienced severe pain. After being given the technique, massage counter pressure, there were 13 pregnant women who experienced pain with moderate intensity and the remaining 5 pregnant women experienced pain with severe intensity. In the third observation, it was found that all pregnant women experienced pain with severe intensity before being given the technique, massage counter pressure. As for after being given the technique, massage counter pressure Fourteen pregnant women experienced moderate pain, while the remaining four experienced severe pain. Labor pain begins during the latent phase, when the cervix dilates to 3 cm, and during the active phase, when the cervix dilates to 4-10 cm. The active phase shows the peak of opening, there is an increase in the intensity and frequency of contractions.

Based on the research results before the technique was carried out massage counter pressure by researchers the average level of pain from observations one, two and three experienced by mothers is at number 6 on a moderate pain scale, this pain is felt to be disturbing and requires effort to hold back such as holding an object when this pain is felt the mother's condition becomes sweaty, while some respondents experience pain with a pain level of number 8 or severe pain where the pain felt is very disturbing and cannot be tolerated, grimacing, screaming and even shouting. The location of the pain felt by mothers in various parts of the body such as the stomach, waist, back and even spreading to the spine. As for Complaints from mothers include the level of pain experienced being difficult to tolerate, especially during the first stage of labor.

Counter pressure massage is a massage technique which has a big contribution in reducing labor pain in the first active phase. This can happen with several possibilities, including the truth of the theory (Sriyuningtyas and Galaupa, 2022). Gate Control which states that during labor, pain impulses travel from the uterus along large nerve fibers toward the uterus to the substantia gelatinosa in the spinal column, where the transmitter cells project pain messages to the brain. Stimulation (such as vibration, rubbing, or massage) results in an opposing message that is stronger and faster and travels along the smaller nerve fibers. This opposing message closes the substantia gelatinosa, blocking the pain message so that the brain does not register it (Octavia and Handayani, 2023)

Labor Pain in Women Giving Birth in the First Stage of Active Phase Before and After Deep Breathing Relaxation Techniques

The analysis of the above study shows that deep breathing relaxation techniques have a significant effect on reducing pain intensity in pregnant women. Before the intervention, most pregnant women (15%) experienced severe pain, and only a small number experienced moderate pain. This indicates that deep breathing relaxation is an effective non-pharmacological method in helping reduce pain in pregnant women, especially during labor, by helping the body become more relaxed and increasing control over the pain felt (Baljon *et al.*, 2022; Wahyuni *et al.*, 2024). According to previous research, the results of this study indicate the influence of deep breathing relaxation techniques on the intensity of pain in first-stage inpartu patients in the delivery room, with the result of a decrease in the average pain score of first-stage birthing mothers from 7.37 before the deep breathing relaxation technique was carried out to an average of 5.77 after the deep breathing technique was carried out with a p-value of 0.0001 (Wahyuni *et al.*, 2024).

Bivariate Analysis

The Effect of Providing Counter Pressure Massage Techniques in Reducing the Intensity of Labor Pain in the First Stage of Active Phase at Sitti Khadidjah Hospital for Women and Children in Gorontalo City

The table above shows that the largest difference in the average pain scale for pregnant women occurred in the third observation, decreasing by 1.27. Meanwhile, the differences in the first and second observations also decreased by 1.11 and 0.95, respectively. From the table above, the p-value of the statistical test is also obtained. In the three observation results, the Wilcoxon was 0.000. This shows that there is a significant average difference between the pain scale in pregnant women before and after being given the counter pressure massage technique in all three observations (p-value <0.05). Therefore, it can be concluded that there is an influence or effectiveness of the counter pressure massage technique on the intensity of pain in pregnant women in the first stage. Therefore, it can be concluded that there is an influence or the alternative hypothesis (H_a) is accepted on the effectiveness of the counter pressure massage technique on the intensity of pain in pregnant women during the first stage.

Before the technique is performed, counter pressure massage, according to researchers, the level of pain from observations one, two and three experienced by the mother was at number 6 on the moderate pain scale. This pain was felt to be disturbing and required effort to hold it, such as holding an object. When this pain was felt, the mother became sweaty, while some respondents experienced pain with a pain level of number 8 or severe pain where the pain felt was screaming. Another study by Natalia in 2020 found that the reduction in pain during the first stage of labor in the control group was less than the reduction in pain in the intervention group, namely -0.93 (1.46): -2.00 (1.23). The study found that counter pressure massage techniques an effectively reduce the intensity of pain in the first stage during the active phase of labor. Counterpressure massage has been shown to be effective as a non-pharmacological intervention to reduce labor pain through gate control, muscle relaxation, distraction, and endorphin release.

The Effect of Giving Deep Breathing Relaxation Techniques On Reducing the Intensity of Labor Pain in the First Stage of Active Phase at Sitti Khadidjah Hospital for Women and Children in Gorontalo City

Based on the results of statistical tests, it was found that the average pain scale in pregnant women before being given deep breathing relaxation techniques was 6.95 with a minimum scale of 6 and a maximum of 8. Meanwhile, the average pain scale in pregnant women after being given deep breathing relaxation techniques was 5.95 with a minimum scale of 5 and a

maximum of 7. The difference in pain scale between the two groups was 1.00 (decreased). From the table above, the value obtained from Wilcoxon statistical tests with p-value is 0.000. This shows that there is a significant average difference between the pain scale in pregnant women before and after being given deep breathing relaxation techniques ($p\text{-value} < 0.05$). Therefore, it can be concluded that there is an influence or effectiveness of deep breathing relaxation techniques on the intensity of pain in pregnant women in the first stage. This is in line with other researchers Heim and Makuch in 2023. The results of the T-test showed a significance value of $p = 0.000$ ($p < 0.05$), which indicates a significant difference in the level of pain before and after the treatment. Thus, the relaxation technique is said to have a significant effect in reducing the level of pain in the active phase of labor, so that the hypothesis of this study is accepted (Heim and Makuch, 2023).

CONCLUSION

Based on the research results, it can be concluded that counter-pressure massage and deep breathing relaxation techniques are effective in reducing pain intensity in mothers in the active phase of the first stage of labor. These two techniques can be an alternative non-pharmacological pain management that is safe, easy to perform, and without side effects. It is recommended that the Sitti Khadidjah Hospital and Women's Hospital in Gorontalo City utilize the results of this study as a reference in improving midwifery services, especially in labor pain management. In addition, educational institutions are expected to use these findings to add knowledge for midwifery students about labor pain management. For future researchers, the results of this study can be used as a reference to develop research by comparing other non-pharmacological techniques, such as oxytocin massage or different relaxation methods, to find the best strategy in reducing labor pain.

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