

The effect of deep breath relaxation and counterpressure massage on pain reduction during labor

Rahmawati Wahyuni,¹ Supriadi Supriadi,² Dewi Susanti,³ Nursari Abdul Syukur,¹ Rosalin Ariefah Putri¹

¹Department of Midwifery, Politeknik Kesehatan Kemenkes Kalimantan Timur, Samarinda; ²Department of Nursing, Politeknik Kesehatan Kemenkes Kalimantan Timur, Samarinda; ³Applied Midwifery Study Program, Politeknik Kesehatan Kemenkes Kalimantan Timur, Samarinda, Indonesia

Abstract

Labor pain is a manifestation of the contraction (shortening) of the uterine muscles. Non-pharmacological treatment in pain

Correspondence: Rahmawati Wahyuni, Lecturer in the Department of Midwifery, Politeknik Kesehatan Kemenkes Kalimantan Timur, Samarinda, Indonesia.

E-mail: rahmawati_wahyuni@poltekkes-kaltim.ac.id

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management, namely deep breathing relaxation and counterpressure massage is an alternative method and a new trend that can be developed. This study investigated the effectiveness of deep breathing relaxation and Counterpressure massage in alleviating labor pain during active phase I. Employing a quasi-experimental design with a two-group pre-test post-test approach, 30 postpartum mothers from June to July 2021 were consecutively sampled. Deep breathing relaxation (5 times for 3-5 minutes) and counterpressure massage (3 times for 30-90 seconds) served as the independent variables, while pain intensity during the first active phase was the dependent variable. Utilizing the Wilcoxon and Mann Whitney tests at a 5% significance level, significant reductions in pain intensity were observed after both interventions (p-values: 0.002 for deep breathing, 0.046 for counterpressure massage). These non-pharmacological methods, enhancing endorphin release, contribute to relaxation and pain intensity reduction during labor. The findings underscore the potential of integrating deep breathing relaxation and counterpressure massage as effective approaches in non-pharmacological labor pain management.

Introduction

Childbirth is a tense and emotional period for the mother and her family, and it can be a painful and frightening experience for the mother. Generally, pain during labor is intense, with only 2-4% of mothers experiencing mild pain.^{1,2} The combination of pain and fear contributes to stress. According to the Indonesian Hospital Association Data Center, 15% of mothers in Indonesia faced complications during childbirth, with 21% describing their labor as painful due to extreme pain. Surprisingly, 63% of mothers did not receive information about the necessary preparations to alleviate pain during labor.³

During this process, stretching and dilation of the cervix occur due to contractions of the uterine muscles, aiming to push the baby out. Consequently, the mother experiences pain that can disrupt her comfort.⁴ Labor pain is a physiological condition generally encountered by almost all birthing mothers, with the severity of the pain depending on individual sensations.⁵ Pain in labor is a manifestation of uterine contractions and results from both psychological responses and physical reflexes.⁶ This pain has repercussions, including an increase in sympathetic nervous system activity, leading to changes in blood pressure, respiratory rate, skin color, nausea, vomiting, and excessive sweating.⁷ Behavioral changes due to pain are also commonly observed, such as heightened anxiety, narrowed thoughts, moaning, crying, hand movements, and intense muscle tension throughout the body.⁸

Various methods can assist in reducing pain during labor, encompassing both pharmacological (involving drugs) and non-pharmacological approaches. Whenever possible, non-pharmacological therapeutic options for pain management during labor

should be explored before resorting to analgesic drugs.⁹ The utilization of non-pharmacological measures in pain management is a burgeoning trend and presents an alternative method for mothers to mitigate labor pain. These methods can induce relaxation, alleviating both muscle and emotional tension, ultimately reducing the intensity of labor pain.¹⁰ Moreover, non-pharmacological approaches contribute to heightened patient satisfaction during labor, empowering the mother to exert control over her emotions and strength.¹¹ Non-pharmacological techniques such as relaxation, breathing exercises, movement and position changes, massage, hydrotherapy, hot/cold therapy, music, guided imagery, acupressure, and aromatherapy have proven effective in enhancing maternal comfort during childbirth and fostering a positive birthing experience.¹²

Given the aforementioned problem description, it is evident that unresolved labor pain can significantly impact the psychological well-being of the mother during labor. Therefore, this study aimed to investigate the effectiveness of deep breathing relaxation and Counterpressure massage in alleviating labor pain during the active phase I. These non-pharmacological therapies can serve as valuable interventions.

Materials and Methods

Research design

This research was conducted from June 8 to July 10, 2021, in the Maternity Room of a hospital in East Kalimantan, Indonesia. The study employed a quasi-experimental research design with a 2-group research method, consisting of a deep breathing relaxation group and a Counterpressure massage group, utilizing a pre and post-test without control design.

Study participants

The population for this study included all active phase I birth patients in June-July 2021 in Maternity Room 108, with 30 participants each month. Non-Probability Sampling, specifically Consecutive Sampling, was used to select 30 participants, evenly divided into two groups (15 per group). Inclusion criteria comprised mothers in labor in active phase I, cervical dilatation between 4 to 9 cm, and no prior exposure to nonpharmacological therapy.

Variable, instrument and data collection

The independent variables were deep breathing relaxation and counterpressure massage, while the dependent variable was pain intensity during the first active phase. The research instrument employed was an observation sheet. Pain scale during active phase I was measured using a Numeric Rating Scale (NRS). In the intervention group, counterpressure massage was administered three times for 30-90 seconds, and deep breath relaxation techniques were performed three times for 3-5 minutes.

Data analysis

The analysis involved the Wilcoxon test and Mann-Whitney test with a significance level (α) of 5%. The Wilcoxon test measured the average pain before and after deep breath relaxation and massage counterpressure for 30 respondents. The Mann-Whitney Test determined the difference in the effectiveness of the average value, indicating a significant decrease in pain intensity between the deep breath relaxation group and the massage counterpressure group.

Ethical clearance

The research received ethical approval from the Health Research Ethics Commission, Politeknik Kesehatan Kementerian Kesehatan Kalimantan Timur, based on ethical certificate No. LB.02.01/4.3/13566/2021. Throughout the research, the researcher adhered to ethical principles, including informed consent, respect for human rights, beneficence, and non-maleficence.

Results

Respondent characteristics in this research provide basic information about respondents, including age, level of education, parity and gestational age. Based on Table 1, it is evident that almost all respondents were aged between 20-35 years (73.3%). The majority of respondents were not employed (73.3%). A significant portion of respondents had an educational background ranging from elementary to junior high school (40%). The highest parity status among respondents was primipara (40%), and among those with multipara status, there were 12 mothers who gave birth (40%). Almost all respondents had gestational ages exceeding 37 weeks, with 29 mothers giving birth (96.7%). Based on Table 2, it is evident that before the implementation of the breathing relaxation technique, the majority of mothers experienced severe pain during the first active phase, with 9 respondents (60%), and after the intervention, 1 birth mother (6.7%) still experienced severe pain. The Wilcoxon test results for the deep breathing relaxation group, both before and after treatment, yielded a p-value of 0.002, which is ≤ 0.05 . This indicates a significant difference in the effectiveness of reducing the intensity of labor pain before and after the application of deep relaxation techniques. Similarly, Table 2 illustrates that before the massage counterpressure treatment, the majority of mothers experienced severe pain during the first active phase, with 8 respondents (53.3%), and after the intervention, 4 respondents (26.7%) still experienced severe pain. The Wilcoxon test results for the counterpressure massage group yielded a p-value of 0.046, which is also ≤ 0.05 . This suggests a significant difference in the effectiveness of reducing the intensity of labor pain before and after the application of counterpressure massage.

Discussion

Based on the research results from the 30 respondents studied, the majority fell within the age range of 20-35 years (73.3%). It's noteworthy that maternal age below 16 years or above 35 years can make pregnant women more susceptible to complications. This indicates that most respondents are within the healthy reproductive age, physiologically capable of enduring labor pain. The age range of 20-35 years is considered ideal for pregnancy, childbirth, and breastfeeding, allowing mothers to provide optimal care for their children.¹³

Employment is a vital activity, primarily undertaken to sustain one's own life and family. Work can significantly impact a person's economic status. A lower socioeconomic level may lead individuals to pay less attention to health messages, prioritizing more immediate needs.^{14,15} The education level of some research respondents was primary school and junior high school (40%), aligning with previous research suggesting no relationship between education and labor pain.¹⁶ Education is a fundamental need for personal development and intellectual maturity. It also influences one's insight into decision-making and actions.¹⁷⁻¹⁹

The intensity of labor pain is affected by the history of past deliveries. Mothers with childbirth experience understand the pain during labor, while primiparas may experience greater intensity due to the cervix requiring more energy to stretch during the first stage of labor.^{20,21} Based on the study, most gestational ages were >37 weeks (97.7%), falling within the term gestation period of 38 to 42 weeks.

Deep breathing relaxation techniques have a significant impact on the intensity of labor pain when implemented during the active phase of the first stage of labor. This is because labor pain serves as a signal indicating that the mother has entered the stage of the labor process, where the intensity of pain varies.²² Since pain during labor is subjective, each mother will experience and describe her own pain.²³ This research is supported by studies indicating that deep breathing relaxation effectively reduces labor pain in the first active phase.²⁴ Of the 15 respondents, the average pain intensity before receiving a counterpressure massage was reported by 8 respondents, constituting 53.3% experiencing severe pain. Following the counterpressure massage, 11 respondents had a moderate pain intensity (73.3%), while 4 respondents still experienced severe pain, accounting for 26.7%. This indicates that the counterpressure massage technique is relatively effective in reducing labor pain. These findings align with previous research²⁵ that demonstrated a reduction in pain severity after implementing back massage techniques.

The results suggest that massage techniques are effective in alleviating labor pain, as seen in the study where respondents experienced a decrease in pain after the counterpressure massage. The effects of labor pain, including inflammation in the uterus and labor dystocia, can be mitigated through complementary treatments such as effleurage and counterpressure massage.²⁶ This study aimed to analyze the effectiveness of effleurage and counterpressure massages in reducing labor pain during the first stage of active labor phase.²⁷ The research is supported by previous studies conducted by Yulianingsih *et al.* (2019)⁸ affirming the effectiveness of counterpressure massage during the active phase of labor.

While indicating the potential integration of non-pharmacological approaches, such as deep breathing relaxation and counterpressure massage, for alleviating labor pain during the initial active phase, the study acknowledges significant limitations. With a sample size of only 30 postpartum mothers, concerns arise regarding the generalizability of results to a broader population, emphasizing caution in extrapolating findings across diverse demographic groups. Furthermore, the study's temporal scope is limited, as post-intervention assessments occurred immediately after interventions, neglecting an exploration of the long-term effects on labor pain sustainability. Future research should extend assessment periods into the postpartum phase to elucidate the enduring impact of these

non-pharmacological interventions. Recognizing these constraints highlights the imperative for ongoing research and refinement in the application of these methods within the broader context of labor pain management.

Conclusions

Deep breathing relaxation techniques and counterpressure massage can alleviate tension in mothers, relieving stress during labor pain. These techniques promote relaxation of the body and inhibit the production of adrenaline hormones, replacing them with endorphins—pain-relieving hormones that increase endorphin levels. This physiological response induces a state of relaxation, consequently reducing the intensity of labor pain. Subsequent research endeavors may involve observing the reduction in pain intensity within the counterpressure massage treatment group by considering the involvement of both family members and healthcare professionals.

Table 1. Characteristics of respondents (N=30).

Indicator	F	%
Age		
<20 Years	3	10
20-35 Years	22	73.3
>35 Years	5	16.7
Employment		
Work	8	26.7
Doesn't work	22	73.3
Education		
Elementary and junior	12	40
High school		
Senior high school	9	30
College University	9	30
Parity		
Primipara	12	40
Multipara	12	40
Grande multipara	6	20
Gestational Age		
≤37 weeks	1	3.3
>37 weeks	29	96.7
Total	30	100

Table 2. Deep breathing relaxation and massage counter pressure treatments on pain intensity in active phase I labor mothers.

	Pre-test		Post-test		p
	f	%	f	%	
Pain intensity with deep breathing relaxation					0.002
Light	0	0	2	13.3	
Normal	6	40	12	80	
Heavy	9	60	1	6.7	
Pain intensity with massage counterpressure					0.046
Light	0	0	0	0	
Normal	7	46.7	11	73.3	
Heavy	8	53.3	4	26.7	
Total	15	100	15	100	

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