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A COMPARISON OF THE EFFECTIVENESS OF THE TERA GYMNASTICS BREATHING TECHNIQUE WITH DEEP BREATHING TECHNIQUES ON REDUCING LABOR PAIN

Ryka Juaeriah[1], Yuliana[2], Gemilang Rahma Annisa[2]

[1]Midwifery Professional Study Program, STIKes Budi Luhur Cimahi, Indonesia
[2]Diploma Midwifery Study Program, STIKes Budi Luhur Cimahi, Indonesia

ABSTRACT

The most common problem that arises in maternity mothers is labor pain. Pain during labor accompanied by fear will slow down the labor process. Labor pain will cause hyperventilation, increase oxygen consumption, cause respiratory alkalosis, vasoconstriction of blood vessels in the uterus and acidosis in the fetus. Increasing noradrenaline will lower blood to the placenta and decrease uterine contractions, thereby interfering with the safety of the mother and fetus and the success of vaginal partus. Tera gymnastics can stimulate the heart's ability to pump blood to meet oxygen needs so that the heart works with relaxation, resting pulse, and blood pressure becomes stable. The purpose of this study was to determine the comparison of the effectiveness of deep breathing and tera gymnastics breathing techniques on pain reduction during the first childbirth. This study uses a quasi-experimental design with two groups pretest-posttest design. The research was carried out at TPMB "P" Cimahi City which was carried out in February – September 2024. The sample in this study is maternity mothers during the active phase 1 who meet the inclusion and exclusion criteria. The sampling technique used was non-random sampling by purposive sampling totaling 40 mothers. The sample in this study was divided into 2 groups, namely the intervention group and the comparison group. Data analysis using the Mann-Whitney test. Based on the findings from the pain scale measurements, the tera gymnastics breathing technique demonstrated a greater reduction in pain with a delta value of 4.4, compared to 2.8 in the deep breathing technique. This indicates that tera gymnastics breathing is more effective in alleviating pain among laboring women during the active phase of the first stage of labor. It is recommended that expectant mothers and healthcare providers implement tera gymnastics and deep breathing techniques during labor to help ease pain and enhance maternal comfort.

Keywords: Tera Gymnastics Breathing Technique; Deep Breathing; Period I Labor Pain

Correspondence:
Ryka Juaeriah
STIKes Budi Luhur Cimahi
Jl. Kerkoff no 243, Cimahi, Jawa Barat
ryka.juaeriah@gmail.com

INTRODUCTION

Labor is a natural process marked by the opening and thinning of the cervix, followed by the fetus descending into the birth canal and ultimately resulting in the delivery of a full-term or near-term baby capable of surviving outside the womb. Labor officially begins when uterine contractions initiate cervical changes—specifically dilation and effacement—and ends with the complete expulsion of the placenta (Mutmainah, A. U., Johan, H., & Llyod, S. S., 2017). One of the most common issues faced by laboring mothers is the pain associated with this process.

Pain is experienced in approximately 90% of all births. Labor pain is a natural response that reflects the interplay between physical changes and emotional states experienced by mothers. This pain often leads to feelings of frustration or hopelessness, and some women may even doubt their ability to complete the labor process. According to a study by Gondo (2011) involving 2,700 laboring women, 15% reported mild pain, 35% moderate pain, 30% severe pain, and 20% experienced very severe pain.

Pain acts as a protective mechanism, prompting individuals to respond in ways that minimize the discomfort. During pregnancy and labor, this pain serves as a biological signal alerting the mother that the delivery process is underway. It is caused by contractions of the uterine muscles which aim to open the cervix and push the baby down into the birth canal (Marlina, 2018). These contractions typically generate pain in the lower back and abdomen and often radiate down toward the thighs, as they promote cervical dilation (Lailiyana, Daiyah, & Susanti, 2012).

When labor pain is not properly managed, it can trigger anxiety, fear, and psychological stress, all of which can intensify the pain experience. Fear-related labor pain can prolong the labor process and has physiological repercussions such as hyperventilation, increased oxygen consumption, respiratory alkalosis, and vasoconstriction in uterine blood vessels, potentially resulting in fetal acidosis. Elevated levels of noradrenaline can also reduce placental blood flow and uterine contractions, putting both maternal and fetal well-being at risk and complicating vaginal delivery (Heni Setyowati, E. R., Kp, S., & Kes, M., 2018).

Labor pain management generally falls into two categories: pharmacological and non-pharmacological. Non-pharmacological approaches include relaxation techniques, controlled breathing, and various comfort measures or positions, all of which have been shown to effectively reduce pain and stress during childbirth. These strategies not only assist in managing discomfort but also support labor progression and empower women to feel more in control of their childbirth experience (Simkin, P., Whalley, J., & Keppler, A., 2010). Relaxation techniques are especially valuable in creating a sense of comfort for the mother (Damayanti, I. P., Maita, L., Triana, A., & Afni, R., 2012). Psychologically, successful relaxation can produce feelings of calm, well-being, and confidence while lowering tension and anxiety. Physiologically, it leads to reductions in blood pressure, heart rate, and respiratory rate (Saleh, L. M., 2019).

Engaging in gymnastics during pregnancy, such as Tera exercise, can help reduce maternal stress and anxiety as the body prepares for labor. This form of exercise is known to increase norepinephrine levels in the brain, which boosts energy and reduces physical tension (Maryunani, 2011). The relaxation effects also help reduce fear, promote mental and physical calm, and serve as a preparatory tool for labor and childbirth (Aliyah, 2016). Sukartini & Nursalam (2009) also found that Tera exercise improves cardiovascular function, stabilizes the heart rate and blood pressure, and contributes to emotional balance, confidence, and reduced anxiety.

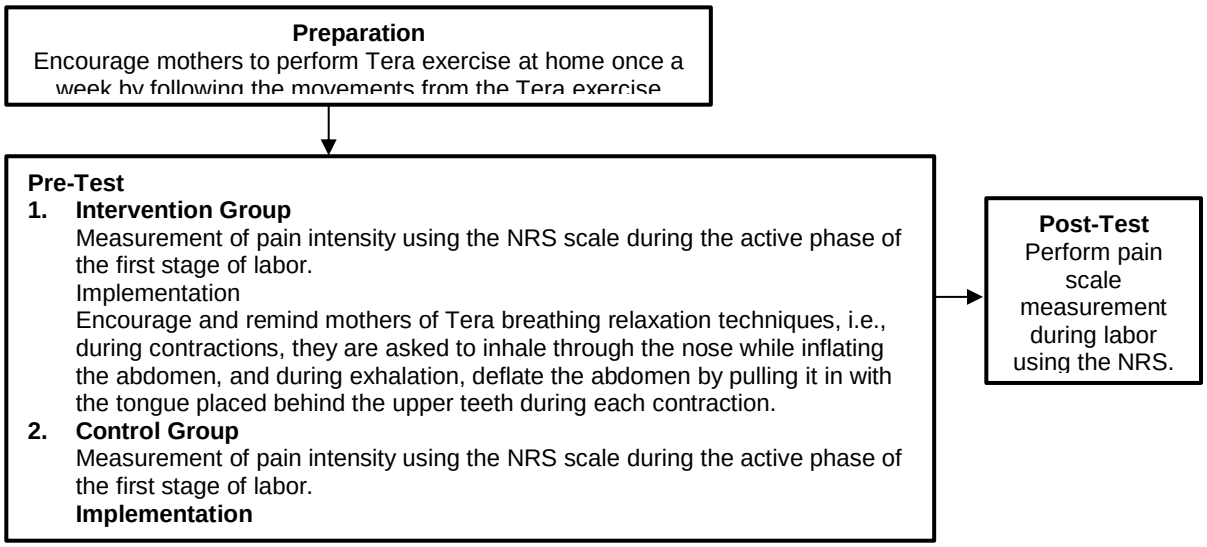
Tera gymnastics is believed to contribute positively to pregnancy outcomes and is particularly helpful in reducing stress and pain during labor. The central focus of Tera gymnastics is on breathing exercises, which help mothers relax and remain composed during delivery. The exercises not only benefit the mother but also enhance fetal health. As the baby begins to breathe independently, oxygen is delivered from the mother's bloodstream through the placenta. Regular Tera practice can optimize

maternal oxygen levels, ensuring smooth oxygen transfer to the fetus.

To be effective, Tera gymnastics should be performed consistently—at least once a week starting in the third trimester. With regular and intensive practice, this exercise can support both maternal and fetal health. Based on these considerations, the research team is motivated to conduct a study titled: "Comparison of Effectiveness Between Tera Gymnastics Breathing Techniques and Deep Breathing Relaxation in Reducing Pain During the First Stage of Labor."

METHOD

This study uses a quasi-experimental design with two groups pretest-posttest design. The research was carried out at TPMB "P" Cimahi City which was carried out in February – September 2024. The sample in this study was maternity mothers during the active phase 1 who met the inclusion and exclusion criteria, and were willing to become respondents after being given an explanation and signing the informed consent sheet provided by the researcher. The sampling technique used was non-random sampling by purposive sampling with a total of 40 mothers giving birth. The sample in this study was divided into 2 groups, namely the intervention group and the comparison group. The intervention group, previously the mother was given an explanation about the breathing exercise video and encouraged the mother to do tera gymnastics at home once every 1 week by following the movement of the tera gymnastics video and it was confirmed that the mother had done the tera gymnastics at least 3 times, if it did not meet the criteria, the mother would be excluded from the intervention group. When the research sample entered the first phase of active phase childbirth, pain scale measurement (Pretest) was carried out using the Numeric Rating Scale (NRS) pain scale. Furthermore, maternity mothers are encouraged and reminded to do respiratory relaxation techniques of tera gymnastics, namely when the mother's contractions are asked to when inhaling, the stomach is inflated and when exhaling, the stomach is deflated with the tongue under the upper teeth every time there is a contraction. Next, a re-measurement (posttest) of the pain scale of the first maternal mother was carried out using the NRS pain scale. In the previous comparison group, the mother was measured on the pain scale using NRS, then the mother was encouraged to do deep breathing by pulling the breath from the nose and excreting from the mouth slowly every time there was a contraction and after that the pain scale was checked again using the NRS scale. The following is the research flow in this study :



The results of the normality test were obtained with abnormal distribution, so the data analysis used the mann-whitney test. This research has received an ethics review pass letter from the Ethics Committee of STIKes Budi Luhur Cimahi with No. 010/D/KEPK-STIKes/I/2024.

RESULT

Based on the results of a study conducted at TPMB "P" Cimahi City in February – September 2024 to find out the comparison of the effectiveness of tera gymnastics breathing techniques and breathing techniques to reduce labor pain during the first period, the following results were obtained:

Table 1 Frequency Distribution of Respondent Characteristics

Variables	F	%
Intervention Group		
Age		
• No Risk	19	95
• Risk	1	5
Education		
• Low education	3	15
• Medium education	10	50
• Higher education	7	35
Jobs		
• Not working	17	85
• Work	3	15
Parity		
• Primiparous	6	30
• Multiparous	11	55
• Grandemulti	20	15
Total	20	100
Control Group		
Age		
• No Risk	17	85
• Risk	3	15
Education		
• Low education	5	25
• Medium education	13	65
• Higher education	2	10
•		
Jobs		
• Not working	10	50
• Work	10	50
Parity		
• Primiparous	7	35
• Multiparous	10	50
• Grandemulti	3	15
Total	20	100

Table 1 illustrates that in the intervention group, the majority of respondents (95% or 19 individuals) were within the non-risk age category. Half of them (50% or 10 people) had attained either junior or senior high school education. Most respondents (85% or 17 individuals) were unemployed or homemakers, and more than half (55% or 11 people) were multiparous. In comparison, the control group consisted of 85% (17 respondents) who were also within the non-risk age range. A higher proportion (65% or 13 individuals) had a junior or senior high school education, while half (50% or 10 individuals) were unemployed or housewives, and an equal percentage (50% or 10 individuals) were multiparous.

Table 2 Average Pain Scale of Active Phase I Labor Before Performing Breathing Techniques of Tera Gymnastics and Deep Breathing

	N	Mean	SD	Min	Max
Tera Gymnastics Breathing Technique	20	7.75	1.30	6.13	9.6
Deep Breathing Technique	20	8.80	2.30	8.20	9.8

Table 2 obtained the average results of the active phase I labor pain scale before the tera gymnastics breathing technique was 7.75, while before being given the deep breathing technique was 8.80.

Table 3 Average Pain Scale of Active Phase I Labor after Performing Tera Gymnastics and Deep Breathing Techniques

	N	Mean	SD	Min	Max
Tera Gymnastics Breathing Technique	20	3.35	1.41	2.20	5.10
Deep Breathing Technique	20	6.00	1.78	5.50	8.20

Table 3 shows that the average scale of labor pain during the active phase I after being given the tera gymnastics breathing technique is 3.35, and after being given the deep breathing technique is 6.00.

Table 4 Effectiveness of Tera Gymnastics and Deep Breathing Techniques on Active Phase I Labor Pain

	N	Mean Before	Mean After	Delta	P-value
Tera Gymnastics Breathing Technique	20	7.75	3.35	4.4	0.00
Deep Breathing Technique	20	8.80	6.00	2.8	0.00

Table 4 obtained the results of pain scale measurements in the tera gymnastic breathing technique with a delta value of 4.4 and in the deep breathing technique with a delta value of 2.8 So it can be concluded that the tera gymnastic breathing technique is more effective in reducing pain in laboring women in the first phase of active compared to the deep breathing technique. The P value of 0.00 in the breathing technique of tera gymnastics and deep breathing can be concluded that the two techniques are effective for reducing pain in laboring women in the first phase of active labor.

DISCUSSION

The results of the research shows that the average scale of labor pain during the active phase I before the tera gymnastics breathing technique is 7.75, while before being given the deep breathing technique is 8.80. The difference in pain intensity can be attributed to individual physiological characteristics, where myometrium contractions as part of the labor process provide pain stimulus with varying intensity. The cause of pain in labor, especially in the first stage, involves complex physiological processes. First stage labor pain originates from internal organs located in the thorax, abdomen, and cranium. At this early stage, uterine contractions spread out, creating a cramping sensation in the abdomen. Pain in the first stage is mainly triggered by the stretching of the uterus and the effacement and dilatation of the cervix (Nurachmania and Jayatmi, 2019).

Pain in labor has a major impact on the cardiovascular and respiratory systems. The increased concentration of catecholamines in plasma that occurs during labor pain can increase maternal cardiac output and feripheral vascular resistance. This can lead to decreased uteroplacental perfusion. Periodic pain due to uterine contractions can also stimulate the respiratory system and cause periods of hyperventilation. In the absence of adequate oxygen delivery, periods of compensatory hypoventilation between contractions can lead to maternal and fetal hypoxemia. Unmanaged labor pain will cause decompensation in the mother and fetus. Severe and unaddressed labor pain can have psychological consequences, including depression and negative thoughts about increased contractions (Rehatta NM, et al. 2019).

The pain intensity of each laboring mother is different. Pain can be influenced by the characteristics of each mother such as age, parity, birth experience and labor induction. Therefore, the results of measuring the pain scale of respondents in the study were also different. Table 3 shows that the average scale of labor pain during the active phase I after being given the tera gymnastics breathing technique is 3.35, and after being given the deep breathing technique is 6.00. Diversion techniques or pain management is one of the non-pharmacological measures that really needs to be done by medical personnel to help reduce pain or pain that arises during the labor process, especially in the phase 1 of labor. Many techniques can be done in reducing pain, one of which is by applying breathing techniques and deep breathing, by adjusting breathing patterns in such a way that will reduce the pain caused by cervical dilatation in the context of the labor process.

The procedure for the tera gymnastics breathing technique performed is that the patient is arranged in a comfortable position lying in bed, sitting, or standing. Encourage the mother to concentrate and make the mother comfortable and tell the mother every contraction feels like there are waves - waves of love and affection for the mother and baby-to-be, keep the condition relaxed, make sure the mother's back position does not tilt left / right. Ask to relax the abdominal muscles and two hands of the patient on the abdomen under the ribs, take a deep breath through the nose, mouth closed, tongue under the upper teeth, while inflating the abdomen. Then exhale slowly through the mouth while deflating the abdomen. In the deep breathing technique by taking a strong breath through the nose within 3-5 seconds by deflating the abdominal cavity, then exhaling 3-5 seconds, during uterine contractions, then the patient breathes normally when there is no contraction.

The researcher assumes that the difference in the average pain scale following the interventions is influenced by each mother's perception of pain and her ability to manage it during labor. Mothers who are unable to control the pain they experience during labor tend to struggle with coping, likely due to a lack of adaptation in pain management techniques such as deep

breathing. Additionally, cervical dilation contributes to pain intensity—pain increases progressively with the advancement of cervical opening.

The respondents' ability to apply breathing relaxation techniques was supported by midwives offering positive suggestions, which served as a distraction and helped reduce anxiety and pain intensity. This allowed the respondents to feel more at ease during labor. This is in line with Maryunani (2010), who stated that deep breathing relaxation is a non-pharmacological method to manage labor pain. Essentially, this technique helps reduce maternal tension during labor by minimizing the activity of the sympathetic nervous system within the autonomic nervous system. This leads to a lower perception of pain and helps the mother regulate her response to discomfort. As stress-related hormones like adrenaline and cortisol decrease, mothers can focus more easily and feel calmer, making it easier to control their breathing.

Table 4 shows that the pain scale reduction (delta value) using the tera gymnastics breathing technique was 4.4, while the deep breathing technique showed a delta of 2.8. This suggests that tera gymnastics breathing is more effective in reducing pain during the active phase of the first stage of labor compared to deep breathing. The p-value of 0.00 for both techniques indicates statistical significance, confirming that both are effective for labor pain relief during this stage.

These findings highlight the potential of tera breathing exercises as a useful pain management method that supports women during labor. Tera breathing not only helps women cope with pain but also empowers them with effective breathing strategies. Mastering these techniques is crucial in reducing labor pain. Proper breathing optimizes oxygen flow throughout the body, relieves muscle tension, and reduces stress—factors that together significantly lessen the intensity of pain in the early phase of labor.

According to Brunner and Suddarth (2002) in Setyoadi (2011:127), abdominal relaxation breathing performed slowly, rhythmically, and comfortably with closed eyes is a relaxation technique aimed at releasing tension. In addition to reducing pain intensity, deep breathing relaxation techniques enhance lung ventilation and increase blood oxygenation. Diaphragmatic breathing—where the diaphragm flattens during inhalation—creates movement in the upper abdomen due to air intake, typically practiced over 30 minutes (Juwita S., 2019).

Many of the respondents in this study revealed that they felt comfortable when doing the tera exercise breathing technique. This is not surprising as performing the tera gymnastics breathing technique allows laboring mothers to feel more relaxed. This technique involves a breathing pattern where the abdomen is inflated when inhaling and the abdomen is deflated when exhaling. Through the application of the correct breathing technique, the mother can experience a greater feeling of freshness, relaxation, and comfort during labor in the first stage. The importance of proper breathing technique lies in its ability to help the body respond in a relaxed manner. When the body is in a relaxed state, it releases endorphine compounds, which are natural substances in the body that act as pain relievers. This endorphine provides an analgesic effect that can help reduce the pain felt during labor naturally.

Therefore, respondents' positive experiences of feeling comfortable while performing the tera gymnastics breathing technique not only reflects physical comfort, but also illustrates its positive impact on the psychological well-being of laboring mothers. By reducing stress levels, increasing a sense of relaxation, as well as decreasing pain levels, the tera gymnastics breathing technique makes an important contribution in helping laboring women face the labor process more calmly and more mentally prepared.

According to Suryati et al (2013) to overcome labor pain can use continuous labor support methods or non-pharmacological methods. Non-pharmacological methods such as the presence

of someone who can support labor, positioning, relaxation and breathing exercises. Tera gymnastics prioritizes breathing exercises, where the movements are harmonized in meridian patterns with health points according to acupuncture theory. According to research conducted by (Septiani and Agustia, 2021) regarding the most effective relaxation technique in reducing labor pain in stage 1, the results obtained from four types of relaxation techniques including respiratory relaxation, motor thought, visualization, the most effective relaxation technique is respiratory relaxation. Tera gymnastics is beneficial for mothers in childbirth, so that mothers master breathing techniques. This breathing technique is trained so that the mother is better prepared dealing with labor pain. Through good breathing techniques, the breathing pattern in maternity mothers becomes better and more regular so that it can provide a feeling of relaxation.

Relaxation is a management that is very easy to do. Breathing with inhalation (inhale) and exhalation (exhale) techniques carried out regularly and deeply will produce a good effect, namely producing sufficient oxygen. Oxygen that enters optimally into the body can relax muscle tension and calm the mind, reduce stress both physically and emotionally so that it can reduce pain intensity and reduce anxiety in laboring mothers.

Relaxation breathing techniques should be practiced as early as before labor. Hormonal imbalances in labor can lead to physical tension which results in increased contractions and pain during labor. Good psychological conditions and thoughts will give a good response to the body so that the body works optimally to produce the hormones oxytocin and endorphin. Oxytocin is needed during labor because its function can increase contractions and endorphin can cause feelings of pleasure and reduce natural pain in the body. Although easy to do, relaxation requires practice. Relaxation that is practiced in the lead-up to labor makes the mother more prepared. Vice versa, relaxation that is done immediately when the laboring mother has entered the first phase of active labor makes it difficult for the mother's body to coordinate properly, so the success rate will be low.

CONCLUSION

Based on the findings from the pain scale measurements, the tera gymnastics breathing technique demonstrated a greater reduction in pain with a delta value of 4.4, compared to 2.8 in the deep breathing technique. This indicates that tera gymnastics breathing is more effective in alleviating pain among laboring women during the active phase of the first stage of labor. With a statistically significant p-value of 0.00, the study confirms that both breathing techniques are effective in reducing labor pain, but the tera gymnastics method proves to be more impactful in minimizing discomfort during this critical stage.

RECOMMENDATION

This study highlights the value of incorporating tera gymnastics breathing as a non-pharmacological method to enhance maternal comfort during the first stage of labor. It is recommended that midwives adopt this technique as part of routine midwifery care, offering it as an option to help mothers better manage labor pain effectively and naturally.

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