

Effectiveness of rebozo and birth ball techniques on labour pain at First stage

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ABSTRACT

Introduction: Labor pain is a natural phenomenon experienced by every mother during birth. Improperly controlled pain will affect the labor process. Rebozo and birth ball procedures are non-pharmacological approaches employed to alleviate labor pain. **Objectives:** The study's aimed to ascertain the differential efficacy of rebozo and birth ball treatments on labor pain during the first stage. **Methods:** This research constitutes a quasi-experiment using a two-group pretest and posttest design. The population comprised 106 everyday birth moms in Purwoharjo Health Centre, Pemalang Regency, from December 2021 to January 2022. Data gathering methods incorporated observational techniques and the NRS scale instruments and employed the Wilcoxon and Mann-Whitney tests. **Results** The rebozo technique can diminish labor pain intensity by 1.72 points, while the birthing ball approach can decrease it by 2.36 points. The Mann-Whitney test results indicated a significant difference in the efficacy of the rebozo and birth ball approaches on first-stage labor pain, with a p-value of 0.023. **Conclusion:** The birth ball technique is more efficacious in alleviating labor pain. Midwives are advised to employ the birth ball technique as a non-pharmacological approach to relieve labor pain.

KEYWORDS: birthing ball, labor pain, initial stage, rebozo

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INTRODUCTION

Labor typically involves pain resulting from uterine contractions. The severity of pain during birth can influence the labor process and the fetus's well-being. Labor pain can induce the release of chemical mediators, including prostaglandins, leukotrienes, thromboxane, histamine, bradykinin, substance P, and serotonin, which trigger stress that leads to the secretion of hormones such as catecholamines and steroids, resulting in vasoconstriction of blood vessels and subsequent weakening of uterine contractions. Excessive hormone secretion will lead to uteroplacental circulation problems, resulting in fetal hypoxia (Astuti & Az-zahroh, 2024; Kartini, 2017). Prolonged and intense labor pain induces anxiety and psychological stress, which can adversely impact the physical condition of the laboring mother, resulting in elevated blood pressure, respiratory rate, and heart rate. Persistent acute pain during delivery may induce maternal tiredness, hence increasing the chance of protracted labor, which poses a threat to both the mother and fetus (Dewi et al., 2024; Rini et al., 2024; Tias et al., 2024).

Discomfort during labor are distinctive physiological experiences encountered by every mother giving birth. Labor pain is intermittent and will resolve spontaneously. Labor discomfort commences during the latent phase. During labor, at 0-3 cm dilation, the discomfort is unpleasant; at 4-7 cm dilation, the pain is described as piercing; and at 7-10 cm dilation, the agony intensifies, becoming more acute and rigid. The discomfort arises from uterine contractions and cervical dilation. (Simbolon & Siburian, 2021). The

pain experienced during labor is more intense than that associated with fractures or toothaches. Many women are unprepared for motherhood due to their anticipation of the discomfort associated with childbirth (Judha & Fauziah, 2012). A mother in labor requires assistance to alleviate pain. Humans employ many methods to alleviate or eradicate pain for diverse purposes. Pharmacological and non-pharmacological therapies, including medications and non-medicinal approaches such as massage, touch, or music, are extensively employed for labor pain management (Dewie & Kaparang, 2020; Rini et al., 2024; Sulistiyowati et al., 2024). Some individuals also reference non-pharmacological therapy, including distraction, relaxation, compresses, and massage (Astuti & Az-zahroh, 2024; Faridah et al., 2017).

Non-pharmacological approaches are extensively employed by birthing moms to alleviate labor pain, ostensibly to mitigate the side effects of pharmaceuticals that may adversely affect both the mother and the infant. Non-pharmacological treatments are purported to be more successful and straightforward. They can be administered by the husband or family of the laboring mother under the supervision of healthcare professionals, with no ill effects (Handayani et al., 2016). The rebozo technique is a recently employed non-pharmacological strategy for alleviating labor discomfort. This rebozo method originates from Latin America. The rebozo technique is a practical, non-invasive method conducted with a woman in a standing, supine, or all-fours position. The technique entails the gentle manipulation of the laboring woman's hips laterally with the use of a specially woven scarf, executed proficiently by a midwife or another support individual (Dewi et al., 2024; Nurpratiwi et al., 2020; Sulistiyowati et al., 2024). The Rebozo Technique offers a distinct advantage by enhancing the comfort of expectant mothers during labor; the appropriate wrapping induces a sensation of being embraced, thereby stimulating the release of oxytocin and endorphins, which facilitates a smoother delivery (Khoiriyah, 2021; Sulistiyowati et al., 2024).

Alongside the rebozo technique, non-pharmacological options for alleviating labor pain include the use of a birth ball. The birth ball is a technique for alleviating labor pain by encouraging the mother to engage in movement, allowing her to concentrate on rhythmic activities that can mitigate discomfort. The birth ball refers to a tool mothers utilize during labor, which aids in alleviating pain and promoting the necessary strength for childbirth. Its use encourages an upright posture, facilitating the birthing process and optimizing fetal positioning to ease delivery under normal conditions (Astuti et al., 2021; Dewi et al., 2024; Sutriningsih et al., 2019; Tias et al., 2024; Wati et al., 2022).

Data from the survey of normal labor at the Purwoharjo Community Health Center, Pemalang Regency, from June 2020 to June 2021, included 263 patients with spontaneous labor. Among these, there were several complications: 67 cases of premature rupture of membranes, 20 cases with a history of cesarean section, 18 cases of positional disorders, 11 cases of post-term labor, 11 cases of prolonged first-stage labor, and 14 cases of prolonged second-stage labor. An initial survey was conducted in early November involving ten patients, of whom nine reported experiencing pain. Among these, two patients had mild pain intensity, 5 had moderate pain, and 2 had severe pain. Treatment at the Purwoharjo Health Center has included encouraging patients to take deep breaths during pain episodes and promoting ambulation when pain is absent. Prolonged labor may pose risks to both the mother and fetus, potentially exacerbated by maternal fatigue resulting from severe pain during delivery. Non-pharmacological procedures such as rebozo and birth ball approaches help mitigate the detrimental effects of pharmaceuticals on both the mother and the infant. The researcher intends to investigate the study titled Effectiveness of Rebozo and Birth Ball Techniques on First Period Labor Pain.

METHODS

Design

This research is a quasy experiment research. The research design used Pre and Post-test with control group design.

Research Questions

Is there a difference in the effectiveness of rebozo and birth ball techniques on labor pain in the first stage?

Sample and Settings

The sampling technique used was purposive sampling. The subjects of this study were mothers who gave birth generally at Purwoharjo Health Center from December 2021 to January 2022, a total of 22 people who were divided into two intervention groups: rebozo (n= 11) and a control group that received Birth Ball (n= 11).

Variables

The independent variables in this study are the rebozo and birth ball techniques, while the dependent variables are first-stage labor pain.

Instruments

This research employed the Numeric Rating Scale (NRS) to assess labor pain during the first stage.

Data Collections

The research was conducted from December 2021 to January 2022 at the Purwoharjo Health Center in Pemalang Regency. The research participants consisted of primiparous and multiparous moms in normal labor during the active phase with cervical dilation of 4 to 8 centimeters.

Data Analysis

The data was analyzed by employing the Wilcoxon and Mann-Whitney Tests, with a significance level of $P < 0.05$ during implementation.

Ethical Consideration

This research has been deemed to have successfully passed the ethical review test administered by the Ethics Committee of Karya Husada Semarang University, which was assigned the Ethical Test Number 0045/KEP/UNKAHA/LPPM/VIII/2021.

RESULTS

Labor pain in the first stage before and after the rebozo technique intervention can be seen in Table 1:

Table 1 Overview of Stage I Labor Pain Before and After Rebozo Technique Intervention

Rebozo Technique Intervention	N	Min	Max	Mean	Median	SD	Mean Rank	ρ value
Before	11	6	7	6.27	6	0.467	6.00	0.003
After	11	3	5	4.55	5	0.688		

The analysis of labor pain during stage I at Purwoharjo Health Center, Pemalang Regency, revealed an average score of 6.27 with a standard deviation of 0.467 before the rebozo

technique intervention and an average score of 4.55 with a standard deviation of 0.688 following the intervention. The statistical analysis utilizing the Wilcoxon test yielded a p value of 0.003 (<0.05), leading to the rejection of H_0 , indicating a substantial effect of the rebozo technique on labor pain during the first stage at the Purwoharjo Health Center, Pemalang Regency. This suggests a variation in the mean intensity of labor pain during the initial stage by 1.72 points.

Labor pain in the first stage before and after the birth ball technique intervention is shown in Table 2 below:

Table 2 Labor Pain in Stage I Before and After Birth Ball Technique Intervention

Birth Ball Technique Intervention	N	Min	Max	Mean	Median	SD	Mean Rank	p value
Before	11	6	7	6.27	6	0.467	6.00	0.002
After	11	3	5	3.91	4	0.701		

The average labor pain at stage I before the implementation of the birth ball technique is 6.27, with a standard deviation of 0.467. Following the intervention, the average pain level decreases to 3.91, with a standard deviation of 0.701. The statistical analysis utilizing the Wilcoxon test yielded a p value of 0.002 (<0.05), leading to the rejection of H_0 , indicating a substantial impact of the birth ball technique on labor pain during the first stage. The application of the birth ball approach resulted in a reduction of pain levels by 2.36 points before and after the intervention.

The difference in effectiveness between rebozo and birth ball techniques on first-stage labor pain is presented in Table 3 below:

Table 3 Differences in Effectiveness between Rebozo and Birth Ball Techniques on First Stage Labor Pain

Intervention	N	Mean Rank	p value
Rebozo Technique	11	8.73	0.023
Birth Ball Technique	11	14.27	

The statistical analysis utilizing the Mann-Whitney test yielded a p value of 0.023 (<0.05), leading to the rejection of H_0 , indicating a significant difference in effectiveness between the rebozo and birth ball techniques on labor pain during the first stage at Puskesmas Purwoharjo Pemalang Regency. The mean rank value in the Birth Ball technique group surpasses that of the rebozo technique group, indicating that the Birth Ball technique is more efficacious in alleviating early-stage labor pain.

DISCUSSION

The investigation of labor pain in the initial stage revealed an average value of 6.27 before the application of the rebozo technique and an average value of 4.55 after the intervention. The rebozo technique intervention resulted in a 1.72-point reduction in labor pain during the first stage. The severity of pain during labor can influence the labor process and the fetus's well-being. Labor pain can induce the release of chemical mediators, including prostaglandins, leukotrienes, thromboxane, histamine, bradykinin, substance P, and serotonin, which trigger stress and subsequently lead to the secretion of hormones such as catecholamines and steroids, resulting in vasoconstriction of blood

vessels and weakening of uterine contractions. Excessive hormone secretion will impede uteroplacental circulation, leading to fetal hypoxia. Prolonged and intense labor pain induces anxiety and psychological stress, which can adversely impact the mother's physical condition, resulting in elevated blood pressure, respiratory rate, and heart rate. Persistent occurrences of intense pain during labor may lead to maternal tiredness, increasing the likelihood of protracted labor, which poses a threat to both the mother and fetus (Alyensi & Arifin, 2018; Dewi et al., 2024; Nurpratiwi et al., 2020).

The statistical analysis employing the Wilcoxon test yielded a p value of 0.003 (<0.05), leading to the rejection of H_0 , indicating a substantial effect of the rebozo technique on labor pain during the first stage. The findings of this study align with those of the investigation conducted by Yuriati and Khoiriyah in Tanjungpinang. The rebozo technique significantly improved labor pain during stage I (Khoiriyah, 2021). According to Table 1, the mean value of labor pain throughout stage I was 6.27 before and 4.55 after the intervention, indicating a considerable reduction in pain levels following the application of the rebozo technique. The rebozo can be utilized during labor to relax the muscles and muscle fibers in the uterine ligament, hence alleviating pain during contractions. Researchers have indicated that the rebozo technique can elicit a beneficial psychological response stemming from the emotional support provided by the birth support team, including midwives, partners, and family members. This technique fosters a psychological and social approach, enabling mothers to experience childbirth in a relaxed state, thereby facilitating harmonious functioning of the uterine muscles, contributing to a smoother, easier, and more comfortable delivery. The rebozo technique can anatomically compress the lumbar to the coccygeal region using a striated cloth or a rebozo. This technique stimulates stretching of the pelvic muscles, releases endorphins into the bloodstream, and aids in regulating contractions while restoring balance during childbirth (Khoiriyah, 2021; Nurpratiwi et al., 2020; Sulistiyowati et al., 2024).

The analysis of labor pain during the initial stage revealed an average score of 6.27 before implementing the birth ball technique and an average score of 3.91 after its application. This indicates a reduction in labor pain intensity during the first stage following the implementation of the birth ball technique by 2.36 points. Stress or worry can biologically exacerbate the perception of pain associated with uterine contractions. During labor, when women encounter stress, the body instinctively responds defensively, prompting the release of stress hormones, specifically catecholamines and adrenaline. High concentrations of catecholamines will be released during labor if the expectant mother cannot alleviate her fear before childbirth.

Consequently, the body's response leads to increased tension in the uterus, resulting in diminished blood and oxygen flow to the uterine muscles due to the constriction of arteries, which inevitably causes pain. Consequently, when the laboring woman is in a pleasant and relaxed state, all uterus muscle layers will function harmoniously as intended. This approach will facilitate labor to proceed efficiently, effortlessly, and comfortably (Simbolon & Siburian, 2021). Prior delivery experiences may influence the mother's pain response. Mothers with prior painful and challenging birthing experiences may have worry and fear that influence their pain sensitivity (Sutriningsih et al., 2019; Tias et al., 2024; Wati et al., 2022).

The statistical analysis utilizing the Wilcoxon test yielded a p value of 0.002 (<0.05), leading to the rejection of H_0 , indicating a substantial effect of the birth ball technique on labor pain during stage I. The findings of this study align with Kartini's 2017 research in Tasikmalaya, which showed a significant impact of the birth ball technique on labor pain during Stage I (Kartini, 2017). While in labor, it is possible to decrease discomfort by adopting body positions that favor gravity and positions that expedite cervical dilatation. Some examples of these positions include walking, squatting, kneeling, and

sitting. Utilizing a birth ball will assist the mother in utilizing various postures while she is in labor. As a result, the mother will experience less discomfort, and the fetus will be able to descend into the pelvic cavity more easily. During the first labor, the usage of the birth ball technique can help reduce the pain scale that the mother experiences. This technique will make the mother more comfortable and relaxed, resulting in a reduction in tension owing to the release of endorphin hormones, which can assist in reducing the pain scale that the patient experiences. Also, the oxidation level can be altered by the sensations of relaxation and calmness that one experiences. The use of a birth ball during labor can reduce pain levels because it stimulates postural reflexes and maintains muscles and maintains spinal posture in good condition, thereby reducing anxiety, using less pethidine, facilitating fetal head reduction, reducing the length of stage 1, and increasing maternal satisfaction and well-being (Astuti et al., 2021; Ferinawati & Zahara, 2022; Tias et al., 2024).

The p value of 0.023 (<0.05) was obtained through statistical analysis using the Mann-Whitney test, resulting in the rejection of H_0 . This rejection indicates that there was a substantial difference in the efficacy of the rebozo and birth ball techniques on labor pain during the initial phase. The findings of this study are inconsistent with the findings of Angraini's 2020 research in Pekanbaru, which demonstrated no significant difference in the efficacy of the rebozo technique and birth ball on active phase I labor pain (p -value = 0.615) (Angraini, 2020). Both the rebozo and birthing ball techniques are effective in alleviating labor discomfort. Nevertheless, the birthing ball technique effectively alleviates labor pain during phase I. This is evident in the fact that the average decline in pain with the birth ball technique is 2.36, which is greater than the average decrease in pain with the rebozo technique, which is 1.72. The birth ball technique is more effective against first-stage labor pain than the rebozo technique group, as evidenced by the higher Mean Rank Value of the Birth Ball Technique. This may be because the birth ball technique offers greater comfort than the rebozo technique.

Swaying on the ball while sitting provides comfort and aids in the progression of labor by utilizing gravity. Additionally, the elasticity and curvature of the ball stimulate receptors in the pelvis responsible for secreting endorphins, thereby increasing endorphin release (Darma, 2021). During therapy, laboring mothers are encouraged to sit as comfortably as possible, and the ball's ability to conform to the mother's shape facilitates relaxation. Additionally, the ligaments and muscles, particularly those in the pelvic region, become loose, alleviating pressure on the sacroiliac joint, blood vessels surrounding the uterus, and the bladder, back, waist, and tailbone. This can also relieve pressure on the perineum (Sutriningsih et al., 2019). The birth ball technique is recommended as a non-pharmacological method to alleviate labor discomfort, as indicated by the findings of this study.

Strengths and Limitations

In addition, the researchers have not implemented any biomarker tests to ascertain whether there is a reduction in prostaglandin hormones and an increase in endorphin hormones when assessing the reduction in pain levels.

Implications for Practice

Future researchers are anticipated to employ complex spiritual, social, and cultural components to conduct more substantial investigations.

CONCLUSIONS

A significant effect of the rebozo technique on labor pain during the first stage. A substantial effect of the birth ball approach on labor pain during the first stage, rejecting.

A significant difference in effectiveness between rebozo and birth ball approaches for labor pain during the initial stage. Both rebozo and birth ball reduce labor discomfort. First-stage labor discomfort is better treated with the birth ball.

Conflict of Interest Statement

None

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