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Effects of Combined Rebozo Technique and Lavender Aromatherapy on Second-Stage Labor Duration: A Pilot Quasi-Experimental Study

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Abstract

Background: Prolonged labor is a major contributor to maternal and neonatal complications. Non-pharmacological interventions, including the Rebozo technique and lavender aromatherapy, have demonstrated potential to accelerate labor. However, aim this research is evaluating the combined effectiveness of these interventions is limited.

Methods: A pilot quasi-experimental posttest-only design without a control group was utilized. Thirty-two laboring mothers were recruited through purposive sampling at PMB Restu Bunda Indonesia. All participants received a combined intervention of the Rebozo technique and lavender aromatherapy during labor. Data collection involved observation sheets, and analyses were conducted using descriptive statistics and Fisher's Exact test due to the small sample size and sparse contingency tables.

Results: All participants who received the complete intervention had shorter second-stage labor durations than the theoretical standard. Fisher's Exact test indicated a statistically significant association between intervention completeness and second-stage labor duration (p=0.044). However, the confidence interval crossed 1, suggesting that the strength of the association should be interpreted with caution.

Conclusion: However, causal inferences cannot be drawn due to the lack of a control group, small sample size, and potential confounding variables. Further research employing randomized controlled designs and larger sample sizes is recommended.single-use plastic use and improving proper waste management practices are strongly recommended.

Keywords: Aromatherapy, Labor, Lavender, Rebozo

BACKGROUND

Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR) remain important indicators for assessing the quality of maternal healthcare services. According to the World Health Organization (WHO), prolonged labor contributes substantially to maternal and neonatal morbidity and mortality, particularly in developing countries. Prolonged labor may increase the risk of postpartum hemorrhage, maternal exhaustion, infection, fetal distress and neonatal complications. In 2021 reported that the global MMR was 211 per 100,000 live births. At the same time, the MMR in Southeast Asia was 152 per 100,000 live births. Notably, Indonesia ranks third as the country with the highest MMR in Southeast Asia, after Myanmar and Laos, with 177 per 100,000 live births(1, 2).

According to the Health Profile of the Central Java Province in 2020, the MMR remains a significant problem in Central Java. Data from the Ministry of Health in 2020 reported that the MMR was 98.6 per 100,000 live births, or 530 cases. In Kebumen Regency, the MMR in 2023 was 92.26 per 100,000 live births, or 15 cases. The direct causes of these deaths were hemorrhage (25%), sepsis (15%), hypertension in pregnancy (12%), prolonged labor (8%), complications from unsafe abortion (13%), and other causes (8%) (3, 4)

Prolonged labor is a condition in which the labor process lasts longer than the normal standard. In primigravida mothers, prolonged labor can last for more than 24 hours, while in multigravida mothers, it lasts more than 18 hours. This extended duration of labor can cause maternal fatigue and increase the risk of complications for both mother and baby(5). The WHO reports that the incidence of prolonged labor globally is 289 per 100,000 live births. In ASEAN, Indonesia has the highest incidence with 359 cases per 100,000 live birth. Prolonged labor can provide adverse effects for both the mother and fetus, leading to complications such as intrauterine infection, postpartum hemorrhage, postpartum infection, birth canal trauma or injury, and fetal distress due to oxygen deficiency (6-8).

Prolonged labor can be prevented using non-pharmacological therapies, such as the rebozo technique and lavender aromatherapy. The rebozo technique is a non-invasive method originating from Latin American culture and is commonly used during labor. It involves gently rocking the mother's hips with a specially woven scarf, with various positions, such as standing, lying down, or resting on hands and knees (5). This technique provides many benefits, such as relaxing pelvic muscles and ligaments, reducing tension, and facilitating the descent of the baby's head. It also benefits to optimize the baby's position in the uterus, reduces labor pain, enhances maternal relaxation, and increases the uterine contraction efficiency. Additionally, the rebozo technique offers psychological benefits by promoting maternal comfort through the support of a birthing companion (9, 6).

Prior research by Faidah, et al 2024, which compared the effectiveness of the rebozo technique and the birth ball technique in shortening the duration of the active phase of the first stage of labor, revealed a p-value of 0.000. It indicates that the rebozo technique was more effective in reducing labor duration than the birth ball technique. A similar study was also conducted by (10, 11).

In addition to the rebozo technique, aromatherapy is also an effective method that can be used to accelerate the labor process by using specific essential oils. Aromatherapy creates a calm and comfortable atmosphere for the mother, which can reduce stress and pain while supporting a smoother delivery (9,10, 12).Intense and prolonged labor pain can trigger anxiety, fear, tension, and stress, which may stimulate excessive release of hormones such as adrenaline, catecholamines, and steroids. The release of these hormones causes smooth muscle tension and vasoconstriction, thereby reducing blood flow and oxygen supply to the uterus. It may result in uterine ischemia, fetal hypoxia, and worsening pain. Furthermore, elevated catecholamine levels also disturb the strength of uterine contractions, potentially leading to uterine inertia and prolonged labor (13, 14).

Lavender aromatherapy has been proven effective in improving both physical and psychological conditions of mothers during labor. Physically, it can help decrease pain, while psychologically, it

relaxes the mind, reduces tension and anxiety, and provides a sense of calm. The main components of lavender include linalyl acetate, linalool, camphene, terpinene, and 1,8-cineol, which provide various therapeutic benefits. Research indicates that linalyl acetate and linalool play a significant role in activating the parasympathetic system, thus promoting the body to be more relaxed. Linalyl acetate is known to have sedative and calming effects (15, 6). According to a prior study by (7) the Mann-Whitney posttest analysis of differences in pain intensity between the control group and the intervention group at Lira Medika Hospital-Karawang showed a p-value of 0.000 ($\alpha < 0.05$). It suggests a significant difference in pain relief between the control group and the intervention group receiving lavender aromatherapy (16).

Several studies have been conducted to examine the effects of the Rebozo technique and lavender aromatherapy on the duration of the second stage of labor separately. However, to date, no research has investigated the effectiveness of the combined application of these two interventions. Therefore, the present study aimed to determine whether there is a significant correlation between the combination of the Rebozo technique and lavender aromatherapy and the duration of the second stage of labor.

Although previous studies have separately investigated the rebozo technique and lavender aromatherapy, evidence regarding their combined application remains limited. Furthermore, little is known about whether the completeness of intervention implementation may influence labor outcomes.

Therefore, this pilot quasi-experimental study was conducted to provide preliminary evidence regarding the potential effects of combined Rebozo technique and lavender aromatherapy on second-stage labor duration.

METHODS

Study Design

This study employed a pilot quasi-experimental posttest-only design without a control group to explore the association between the completeness of the combined Rebozo technique and lavender aromatherapy intervention and second-stage labor duration. The study was not intended to establish causality but rather to provide preliminary evidence regarding possible associations between intervention implementation and labor outcomes. The study followed the TREND (Transparent Reporting of Evaluations with Nonrandomized Designs) guideline from the EQUATOR network for reporting quasi-experimental studies.

Setting and Participants

A purposive sampling technique was used to recruit participants. The study included 32 women who gave birth at PMB Restu Bunda, with a purposive sample of 32. Inclusion criteria were full-term pregnancies, spontaneous labor, singleton pregnancy, no obstetric complications, and willingness to participate. Exclusion criteria were women with contraindications to the Rebozo technique (bleeding, unstable fetal heart rate, anterior placental presentation, breech presentation); women with contraindications to lavender aromatherapy (allergies or hypersensitivity, emergency obstetric conditions: asthma or respiratory disorders, hypertension or preeclampsia, use of certain medications); and refusal to participate.

Intervention

Participants received a combined intervention consisting of the Rebozo technique and lavender aromatherapy during labor. The Rebozo technique was performed using standardized procedures involving pelvic relaxation and rhythmic movement. Lavender aromatherapy was administered using a room diffuser during labor. The intervention was categorized as: complete intervention if all intervention procedures were implemented according to SOP, incomplete intervention if one or more procedures were not fully completed.

Data Collecting and Setting

Data collection took place at PMB Restu Bunda from March to April 2025. The recorded variables included maternal age, parity, hemoglobin levels, uterine contractions, completeness of intervention, and the duration of the second stage of labor. The duration of the second stage was classified as either shorter or longer than established theoretical standards. Participants were selected according to predefined inclusion and exclusion criteria, and informed consent was obtained via signed consent forms. The combined intervention, consisting of the Rebozo technique and lavender aromatherapy, was administered upon confirmation that the participant had entered the first stage of labor. The Rebozo technique was implemented in three sessions, each separated by a 1-hour interval, using a sarong and employing the shake-the-apple, shifting, and lying-down methods. Lavender aromatherapy was delivered via a room diffuser. Data regarding intervention quality (complete or incomplete) and second-stage labor duration were documented using an observation sheet. The intervention was deemed complete if all procedures were performed correctly in accordance with the standard operating procedures (SOPs) for both the Rebozo technique and lavender aromatherapy. It was classified as incomplete if any step was omitted or performed incorrectly in accordance with SOP guidelines. All interventions were conducted by researchers under the supervision of a certified complementary midwife.

The study was conducted at *PMB Restu Bunda*, a private midwifery practice in Kebumen, Indonesia. This facility offers comprehensive maternal and child health services, including antenatal care, childbirth assistance, postpartum care, family planning, and complementary midwifery interventions. Indonesia operates a mixed healthcare system comprising both public and private sectors. Maternal health services are available through community health centers, hospitals, and independent midwifery practices (*PMB*). Midwives are essential providers of maternal and newborn care, especially within primary healthcare and community-based settings. Universal health coverage through the national insurance program allows women to access maternity services at accredited facilities.

In Indonesia, most births are attended by either midwives or obstetricians, depending on risk level and available resources. Private midwifery practices, including PMB Restu Bunda, often encourage natural and complementary approaches to promote safe, comfortable childbirth. This setting was chosen because it represents typical midwifery practice, in which non-pharmacological interventions, such as the Rebozo technique and lavender aromatherapy, are integrated into routine intrapartum care.

Data Analysis

Data were coded, entered, and analyzed using Stata Statistical Software version 17 (StataCorp LLC, College Station, TX, USA). Descriptive statistics were used to summarize participants' demographic and obstetric characteristics, presented as frequencies and percentages. Due to the small sample size and sparse contingency table with expected cell counts below five, Fisher's Exact Test was used instead of Fisher's Exact Test to examine the association between intervention completeness and second-stage labor duration. Statistical significance was established at $p< 0.05$.

Ethical Considerations

This study received ethical approval from the Ethics Committee of Universitas Muhammadiyah Gombong No 055.6/II.3.AU/F/KEPK/11/2025, and informed consent was obtained voluntarily from all participants after they received a complete explanation about the study.

RESULT AND DISCUSSION

RESULT

Table 1 shows that most participants were within the ideal reproductive age of 20–35 years (24; 75%). The majority were multiparous (21; 65.6%), had normal hemoglobin levels of at least 11 g/dl (25; 78.1%), and nearly all experienced adequate contractions during the second stage of labor (30; 93.8%).

Table 1. Characteristics of Participants

Variable	Frequency	Percentage (%)
Maternal age		
Too young (<20 Tahun)	1	3.1
Ideal (20-35 Tahun)	24	75.0
Too old (> 35 Tahun)	7	21.9
Parity		
Primipara	11	34.4
Multipara	21	65.6
Grandemultipara	0	0.0
Hemoglobin Levels (Hb)		
Anemia (< 11 g/dl)	7	21.9
Normal (≥ 11 g/dl)	25	78.1
Uterine Contractions in the Second Stage of Labor		
Adequate (≥ 3x/10'40")	30	93.8
Inadequate (< 3x/10'40")	2	6.3
Total	32	100

As shown in Table 2, 21 participants (65.6%) successfully underwent the combined rebozo technique and lavender aromatherapy intervention.

Table 2. Frequency Distribution of Intervention Outcomes

Variable	Frequency	Percentage (%)
Complete	21	65,6
Incomplete	11	34,4
Total	32	100

Table 3 shows the duration of the second stage of labor based on the quality of the combined rebozo technique and lavender aromatherapy intervention. Among the 21 participants who received the intervention completely, all (100%) experienced a second stage of labor shorter than the theoretical duration. Meanwhile, of the 11 participants who received the intervention incompletely, 9 (81.8%) had a shorter duration, while 2 (18.2%) had a longer duration than the theoretical standard.

Table 4. Duration of the Second Stage of Labor Based on the Quality of the Combined Rebozo Technique and Lavender Aromatherapy Intervention

		Shorter than the theoretical standard	Longer than the theoretical standard	Total
Intervention Outcomes	Complete	21	0	21
		100.0%	0.0%	100.0%
	Incomplete	9	2	11
		81.8%	18.2%	100.0%
Total		30	2	32
		93.8%	6.3%	100.0%

Table 4. Fisher's Exact Test Association Between the Combination of the Rebozo Technique and Lavender Aromatherapy and the Duration of the Second Stage of Labor

p-value	OR	CI
0.044	1.2	0.925-1.615

Table 4 presents the results of Fisher's Exact Test, which yielded a p-value of 0.044. This value is below the 0.05 threshold, indicating a significant association between the combined use of the rebozo technique and lavender aromatherapy and the duration of the second stage of labor. The test also produced a calculated X^2 value of 4.073, exceeding the critical value of 3.841. Consequently, the null hypothesis (H_0) is rejected, confirming that the combined intervention influences the duration of the second stage of labor. The Odds Ratio (OR) of 1.222 suggests that mothers who received the intervention incompletely had a 1.2-fold higher risk of prolonged second-stage labor than those who received it completely. However, the confidence interval (CI) of 0.925–1.615 includes a lower bound below 1, indicating that the treatment was not a statistically significant risk factor for the duration of the second stage of labor.

DISCUSSION

Characteristic of Participants

Maternal Age

The results showed that 24 participants (75%) were within the ideal age range. Maternal age is one factor that can influence the delivery process. In general, women's reproductive age is divided into three main categories: too young (<20 years), ideal (20–34 years), and too old or advanced reproductive age (>35 years) (16)

For women, the age of 20–35 is considered ideal for pregnancy and childbirth. At this stage, women's reproductive organs have matured, enabling effective uterine contractions during labor. This age range is also associated with better maternal stamina during pushing, thereby facilitating the delivery of the fetus (11, 17)

Meanwhile, maternal age under 20 is categorized as too young, which increases the risk of prolonged labor. At this age, the reproductive organs are not yet fully mature, as the uterus and pelvis have not reached adult size, which can result in cephalopelvic disproportion, a mismatch between the fetal head and the maternal pelvis, thereby heightening the risk of prolonged labor. In addition, the uterine contractions and pushing ability in younger mothers are also less optimal, which further contributes to a longer second stage of labor. Furthermore, psychological factors such as limited mental preparedness and lack of experience also reduce the effectiveness of the labor process. Therefore, being too young is a significant risk factor for prolonged second-stage labor (3, 16).

In women of advanced reproductive age (>35 years), uterine elasticity and perineal muscle tone decrease, resulting in less effective contractions. They also tend to experience reduced stamina, which makes pushing the baby more difficult. Continuous energy loss during pushing may ultimately lead to stagnant labor. They are more susceptible to various medical conditions that can complicate the delivery process. Furthermore, Kurniati reported a p-value of 0.008 ($p \leq 0.05$) with an OR of 2.25, indicating that mothers at risk, those aged <20 or >35, have a 2.25 times higher likelihood of experiencing prolonged labor compared to mothers within the ideal age range (5, 18).

Parity

The majority of participants in this study were multiparous, accounting for 21 women (65.6%). Parity is closely associated with the duration of the second stage of labor. Existing research demonstrates that multiparous mothers generally experience shorter labor durations due to a more elastic birth canal, improved pushing ability, and enhanced physiological readiness (15).

In contrast, primiparous mothers are at increased risk of prolonged labor because pregnancy stretches the uterus for the first time. This initial stretching can reduce the efficiency of contractions and alter the physiological response to labor. Additionally, psychological factors such as elevated stress and anxiety resulting from inexperience with childbirth further contribute to labor difficulties (3, 17).

Similarly, grand multiparous mothers (those with five or more pregnancies) are at elevated risk for prolonged labor, potentially due to diminished uterine function resulting from repeated stretching. This reduction in function leads to less effective contractions. Furthermore, weakening of the uterine ligaments exacerbates this condition, prolonging labor and increasing the risk of complications such as uterine atony, postpartum hemorrhage, and uterine rupture (19, 20).

A previous study by Firdhauzy using Fisher's Exact Test found that prolonged labor was most prevalent among parity 1 (primiparous) and parity 5+ (grand multiparous) mothers. These findings indicate that these groups are at greater risk of prolonged labor compared to multiparous mothers.

Hemoglobin Level

The results of this study indicated that the majority of participants had hemoglobin (Hb) levels within the normal range, with 25 individuals (78.1%) meeting this criterion. Normal Hb levels in pregnant women are defined as ≥11 g/dL. Mild anemia is characterized by Hb levels between 10.0 and 10.9 g/dL, moderate anemia by levels between 7.0 and 9.9 g/dL, and severe anemia by levels below 7.0 g/dL. Hemoglobin is critical for transporting oxygen to the uterine muscles, enabling the myometrium to generate strong, coordinated contractions during labor. Reduced hemoglobin levels result in insufficient oxygen delivery to the myometrium, leading to weak, irregular contractions that are less effective at facilitating fetal passage through the birth canal (13)(21). Sundari and Hanifah reported that Fisher's Exact test yielded a p-value of 0.035, indicating a significant association between anemia severity and prolonged labor.

Uterine Contractions during the Second Stage of Labor

The results indicated that nearly all participants in this study experienced an adequate second stage of labor, defined as uterine contractions occurring three or more times within ten minutes and lasting at least forty seconds, with 30 participants (93.8%). The frequency, duration, and intensity of contractions significantly affect the rate of cervical dilation and fetal descent through the birth canal. In normal labor, effective contractions typically occur at a frequency of three to five per ten minutes and last approximately forty to sixty seconds. Consistent and strong contractions promote cervical dilation and expedite labor progress (1).

Adequate and coordinated contractions are essential for enabling the uterine muscles to efficiently expel the fetus. In contrast, weak or irregular contractions may result in uterine inertia, a condition characterized by the failure of the uterine muscles to generate effective contractions, which can prolong labor and increase the likelihood of obstetric intervention (1). Previous studies have demonstrated a significant association between the adequacy of uterine contractions and labor duration, suggesting that effective contractions contribute to smoother labor progress (9).

Evaluation of the Combined Rebozo Technique and Lavender Aromatherapy Intervention

Data analysis indicated that most participants (21, or 65.6%) received a complete intervention consisting of both the rebozo technique and lavender aromatherapy. Active maternal involvement was a significant factor in the intervention's effectiveness. When all stages of the intervention were followed, optimal benefits were observed. The effectiveness of non-pharmacological techniques was strongly associated with adherence to the standard operating procedure (SOP).

Maternal comfort during the intervention was a key factor influencing the quality of outcomes. Comfort is essential, as it can directly affect the effectiveness of interventions. Increasing contraction intensity may lead to discomfort, reducing focus and hindering effective follow-up of movement instructions.

Additional factors contributing to incomplete intervention included parity or childbirth history. Among the 11 participants who received incomplete intervention, six were multiparous. Multiparous mothers typically experience a faster labor process compared to primiparous mothers. In this study, the second stage of labor was defined as beginning at 10 cm cervical dilation and continuing until birth. Diagnosis of the second stage was established by internal examination, confirming complete dilation and a fetal head visible at the vulva, measuring 5–6 cm in diameter. The second stage duration was 1.5–2 hours for primigravidas and 1–1.5 hours for multigravidas. This difference influenced the implementation of interventions, particularly the Rebozo technique, which was designed to be conducted in three sessions (10).

Duration of the Second Stage of Labor After the Combination of the Rebozo Technique and Lavender Aromatherapy.

The results demonstrated that, following the intervention, nearly all participants (30, 93.8%) experienced a shorter second-stage labor duration than anticipated. Diagnosis of the second stage is established through internal examination, confirming complete cervical dilation and the appearance of the fetal head at the vulva, typically measuring 5 to 6 cm in diameter. The expected duration of the second stage of labor is 1.5 to 2 hours for primigravidas and 1 to 1.5 hours for multigravidas (19, 5).

The findings further suggest that combining the Rebozo technique with lavender aromatherapy has a positive effect on labor duration. The Rebozo technique facilitates mobilization of the lumbosacral and pelvic joints, maintains abdominal muscle tone, and strengthens both abdominal and back muscles. Additionally, it may reduce pain, increase pelvic floor width, promote fetal descent, and correct abnormal fetal positions, thereby accelerating labor (5,16, 6).

Lavender aromatherapy contains active compounds such as linalool and linalyl acetate, which exhibit sedative and relaxant properties. Inhalation of lavender stimulates the limbic system, particularly the amygdala, which is involved in emotional regulation. This stimulation induces a sense of calm and reduces anxiety, a common experience for mothers during labor. Reduced anxiety enables the body to achieve optimal relaxation, decreasing muscle tension in the uterine and pelvic floor muscles. Consequently, the effectiveness of uterine contractions in expelling the fetus is enhanced, thereby accelerating the labor process (6, 7, 16).

Duration of the Second Stage of Labor Based on the Quality of the Combined Rebozo Technique and Lavender Aromatherapy Intervention

This study showed that, according to the Chi-square contingency table analysis, among the 21 participants who received the complete intervention, all (100%) experienced a shorter-than-expected second stage of labor. Meanwhile, among the 11 participants who received the incomplete intervention, 9 (81.8%) reported a shorter second stage of labor, while 2 (18.2%) reported a longer-than-expected second stage.

The quality of the intervention in this study significantly influenced the effectiveness of the combined intervention in accelerating the second stage of labor. These findings indicate that the combination provides meaningful benefits in reducing labor duration. One factor affecting the quality of the intervention was maternal comfort during labor. In this study, some mothers reported discomfort during the Rebozo technique, particularly when pressure was applied to certain areas of the body, such as the abdomen or hips, as labor contractions intensified. As a result, some mothers decided to

discontinue the intervention or decline further sessions. Intense contractions may interfere with the relaxation effects expected from the Rebozo technique and lavender aromatherapy, which decreases the overall effectiveness of the intervention (6,7,16,5).

Relationship between the Combination of the Rebozo Technique and Lavender Aromatherapy and the Duration of the Second Stage of Labor

The data analysis found a p-value of 0.044 ($p<0.05$), showing a clear link between using both the Rebozo technique and lavender aromatherapy and shorter second-stage labor. Fisher's Exact Test also showed a meaningful association between the extent of the intervention and labor duration ($p=0.044$), which exceeds the required threshold ($X^2 = 3.841$), strengthening the link. This means using both methods together is tied to quicker labor. Fisher's Exact Test was used because the group was small and some counts were low.

Building on the results above, participants who received the full intervention usually had shorter second-stage labor than those who received a partial intervention. The Rebozo technique may help labor by making the pelvis move more easily, helping the baby move down, and easing pain. It also moves the lower back and pelvis, keeps the abdominal muscles strong, and builds up abdominal and back muscles. This technique can reduce pain, widen the pelvic floor, allow the baby to move more, lower the baby's position, and correct incorrect baby positions, helping speed up labor (5, 7,16, 3). In this study, which compared oxytocin massage and the Rebozo technique for second-stage labor duration, the p-value was 0.000 (<0.05). So, Ho was rejected, and Ha accepted, indicating that the Rebozo technique worked better than oxytocin massage at speeding up labor.

In addition to the Rebozo technique, lavender aromatherapy may also support labor progress through psychological relaxation.Expanding on the effects described, lavender aromatherapy plays an important role in influencing both the physiological and psychological processes of laboring mothers, which helps reduce the duration of the second stage. The second stage of labor is the phase in which the fetus begins to be pushed out through the birth canal until it is completely delivered. During this stage, effective uterine contractions, proper pushing techniques, and the mother's emotional state are critical factors (16, 7,10). Lavender contains active compounds, such as linalool and linalyl acetate, that have sedative and relaxing effects. When inhaled, these molecules stimulate the limbic system, particularly the amygdala, which regulates emotions. This produces a calming effect and reduces the anxiety commonly experienced during labor. Lower anxiety levels allow the mother to achieve a state of relaxation, reducing tension in the uterine and pelvic floor muscles. As a result, contractions become more effective in expelling the fetus (7,16,12).

Following these findings, in the present study, the OR value of 1.222 indicated that mothers who received an incomplete intervention (Rebozo technique and lavender aromatherapy) had a 1.2 times greater risk of experiencing a prolonged second stage compared to those who received the complete intervention. The confidence interval (CI) ranged from 0.925 to 1.615, with the lower bound below 1, indicating the result is statistically insignificant. This suggests that although incomplete intervention shows a trend toward increased risk of prolonged labor, the effect is not strong enough to establish it as a definitive risk factor. To contextualize these results, it is important to recognize that the labor process is influenced by multiple interrelated factors. The first is power, or the force that expels the fetus, consisting of uterine contractions, abdominal wall contractions, pelvic diaphragm contractions, pushing force, and tension in the round ligament(22-(24). The second is the passage, or birth canal, including the pelvic bones (os coxae, os sacrum, os coccyx) and the soft tissues of the birth canal, such as the cervix, vagina, muscles, connective tissues, and supporting ligaments. The third is the passenger, namely the fetus and placenta. The fourth is the mother's position during labor, and the fifth is maternal psychological conditions, including acceptance of pregnancy, involvement in antenatal care, readiness

for delivery, ability to cooperate with caregivers, and adaptive response to labor pain. The last is the role of the birth attendant, whose skill, composure, and empathy influence the smoothness and safety of labor. Other maternal factors, such as age, hemoglobin levels, and parity, also affect the length of the second stage (25,16,7).

So, using Rebozo and lavender aromatherapy should not be seen as the only way to shorten labor. Instead, this research shows these methods might help labor progress and can be part of care during birth. Both techniques helped labor using Fisher's Exact Test. Always remember that labor depends on many factors, not just these methods (7,6, 16).

Acknowledging these multifactorial influences, the numerous factors impacting the second stage also highlight the limitations of this study. Not all participants remained cooperative throughout the intervention, potentially affecting its quality and outcomes. The absence of a control group limited the ability to assess effectiveness comparably. Additionally, time constraints and adjustments to clinical conditions further led to inconsistencies in implementation. Other variables, such as maternal age, parity, hemoglobin levels, and contraction strength, acted as confounding factors in analyzing the relationship between interventions and outcomes.

CONCLUSION

This pilot quasi-experimental study demonstrated a statistically significant association between the completeness of the combined Rebozo technique and lavender aromatherapy intervention and the duration of the second stage of labor, as determined by Fisher's Exact Test ($p = 0.044$). Mothers who received complete intervention tended to experience a shorter duration of second-stage labor compared with those who received incomplete intervention.

However, the Odds Ratio 22, with a 95% confidence interval of 0.925–1.615, indicates that the association should be interpreted cautiously, as the confidence interval crosses 1, and the findings cannot establish incomplete intervention as a definitive risk factor for prolonged second-stage labor.

The findings of this study provide preliminary evidence that combining the zo technique with lavender aromatherapy may support physiological labor progress as part of complementary intrapartum care. Nevertheless, labor outcomes are influenced by multiple maternal and obstetric factors; therefore, the intervention should not be interpreted as the sole determinant of labor duration.

Healthcare providers may consider applying this combined non-pharmacological intervention in accordance with standardized operating procedures (SOPs) to support maternal comfort and labor progress. Future studies with larger sample sizes, control groups, randomized designs, and adjustment for potential confounding variables are recommended to provide stronger evidence regarding the effectiveness of this intervention.

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AUTHOR'S CONTRIBUTION STATEMENT

ADP:Conceptualization, Writing-Original Draft, Review & Editing. S,PF,AD,AL :Conceptualization, Methodology, Manuscript review. ADP: Formal analysis, Writing -Original draft, Manuscript review. S,PF,AD,AL: Manuscript review.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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