Effectiveness of Pelvic Rocking Exercise with Birth Ball on the Duration of Third Stage of Labor

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Abstract

The method involving pelvic rocking exercises using a birth ball combined with acupressure represents a strategy in midwifery aimed at easing tension in the pelvic muscles, beneficial for shortening the length of labor, particularly in its third stage. This approach significantly enhances uterine contractions by prompting the pituitary gland to release oxytocin, thereby aiding in the swift expulsion of the placenta. The objective of this study is to evaluate the comparative effectiveness of pelvic rocking exercises with a birth ball and SP6 acupressure on shortening the third stage of labor. The Research design was Quasi-Experimental with Two Group Comparison, and the research was conducted in a maternity clinic in East Jakarta. The Respondents of this study were women in the active phase of the first stage of Labor. Participants and Sampling Technique: The total sample size was 64 respondents, divided into two groups of 32 each. The initial group underwent an intervention involving pelvic rocking exercises using a birth ball, whereas the second group was treated with SP6 acupressure. The method of selection used was purposive sampling, enabling the investigators to choose subjects according to predefined eligibility criteria. The Results were analyzed using bivariate analysis with the Mann-Whitney U test, as all variables were found to have non-normal distributions. The study findings indicated a statistically significant difference in the duration of the third stage of labor between the group that received the pelvic rocking exercise with a birth ball and the group that underwent the Acupressure SP6 intervention, as shown by a p-value of 0.005 (< 0.05). The data analysis demonstrated that the group participating in the pelvic rocking exercise with a birth ball experienced a quicker third stage of labor, with an average rank of 26.38, in contrast to the acupressure SP6 group, which had an average rank of 38.63. Therefore, it can be concluded that employing the pelvic rocking exercise with a birth ball is an effective method for reducing the length of the third stage of labor, proving to be a safe option for expecting mothers.

Keywords: *Pelvic Rocking Exercise, Acupressure SP6, Birth Ball, Third Stage of Labor.*

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A. INTRODUCTION

Childbirth holds significant meaning in a woman's life because the quality of this experience can have both short-term and long-term effects on them. Negative experiences during childbirth can lead to emotional, mental, and sexual disturbances during the postpartum period and can dramatically affect the emotional bond between the mother and the newborn baby (Avşar et al., 2021). Anxiety during childbirth can result in increased interventions, including cesarean section. Anxiety stemming from the fear of lengthy Labor can be replaced with a more pleasant experience; therefore, a natural intervention that makes pregnant mothers comfortable during childbirth is necessary. It will reduce complications during

childbirth, including prolonged Labor, which can impact maternal mortality rates (O'Connell et al., 2021).

The Maternal Mortality Ratio (MMR) in Indonesia is still the highest in Southeast Asia, with Indonesia ranking second. Indonesia's MMR in 2020 was 97.61 deaths per 100,000 live births. This MMR figure has yet to reach the global SDGs (Sustainable Development Goals) target of reducing MMR to 70 per 100,000 live births by 2030. According to data from the Ministry of Health in 2020, the number of maternal deaths in 2020 was 4,627, which indicates an increase compared to 2019, when there were 4,221 deaths. Most provinces in Indonesia still need to meet the three SDGs targets, which aim for an MMR of 70 per 100,000 live births. This situation is also far from the MMR in Malaysia, which is at 20 per 100,000 live births.

The number of maternal deaths in DKI Jakarta has increased from 2018 to 2020. In 2018, 98 per 100,000 live births, with the highest number of deaths occurring postpartum, totaling 53. In 2019, it increased to 100 maternal deaths. The number of maternal deaths in DKI Jakarta in 2020 increased to 117. According to population mortality reports, the highest number of maternal deaths occurred in East Jakarta, accounting for 29.2% of the six regions in DKI Jakarta.

Some causes of maternal deaths during pregnancy, childbirth, and the postpartum period include hemorrhage, preeclampsia/hypertension, infection, circulatory system problems, metabolic problems, and others (such as prolonged Labor) (Chang et al., 2023). Based on AKI data and causes according to the health profile in DKI Jakarta, an effective, safe, and comfortable effort is needed in childbirth to minimize invasive procedures, such as natural childbirth.

Several studies on non-pharmacological techniques have demonstrated their effectiveness in reducing the length of labor across its first, second, and third stages. The pelvic rocking exercise using a birth ball is one effective approach for relaxing the lower body, especially around the pelvic region. This method includes softly rocking the pelvis on the ball and delicately swinging the hips forwards and backwards, as well as side to side and in circular motions.

Acupressure SP6, a traditional Chinese therapy, involves the manual stimulation of specific points on the body at acupuncture sites, with SP6 points being directly associated with childbirth. Research findings indicate a marked decrease in labor duration ($p < 0.001$) among participants who received acupressure treatment. Thus, acupressure SP6 has been proven to significantly shorten the length of labor.

According to a study, utilizing Pelvic Rocking exercises with a birth ball, and Acupressure SP6 can decrease the length of the initial and subsequent stages of Labor. It aids in promoting a natural delivery by enhancing the efficiency of contractions in the uterus by stimulating oxytocin release from the pituitary gland. Notably, this approach poses no drawbacks or adverse effects for the mother. Due to its straightforward and easy-to-implement nature, midwives, nurses, or partners can readily perform it during the active phase of the first stage of labor (Karningsih et al., 2022).

B. LITERATURE REVIEW

1. Pelvic Rocking Exercise

Pelvic Rocking Exercise is a form of exercise specifically designed to strengthen and increase the flexibility of the muscles around the pelvic area, including the abdominal muscles, lower back and hips. This exercise is often recommended for pregnant women in preparation for childbirth, but it is also beneficial for other individuals, especially to relieve tension and pain in the lower back area (Kim & Yim, 2020). The concept of the Pelvic Rocking Exercise is to carry out slow and controlled swinging or rotating movements of the pelvis, whether in a standing, sitting or lying position, with the main aim of increasing blood circulation in the pelvic area, reducing discomfort and improving body posture (Wang et al., 2023).

In practice, the Pelvic Rocking Exercise involves coordination between breathing and movement, where the individual is invited to inhale when the pelvis is tilted forward and exhale when the pelvis is tilted backwards, or vice versa, depending on the exercise variation. This exercise not only focuses on pelvic movements, but also involves activation of the core muscles, including the transversus abdominis muscle, which plays an important role in supporting the structure of the spine and internal organs. Thus, Pelvic Rocking Exercise helps in strengthening the core muscles, which are key to overall body stability and strength (Tang et al., 2022).

Apart from that, Pelvic Rocking Exercise also has a role in improving body balance and coordination. Through rhythmic and controlled movements, this exercise teaches individuals to be more sensitive to the position and movement of their body, thereby reducing the risk of injury due to incorrect posture or inappropriate movements. With regular exercise, individuals can experience improvements in flexibility and range of motion in the pelvic area, which in turn can facilitate labor for pregnant women or improve athletic performance and general well-being for other individuals (Clayton et al., 2023).

Pelvic Rocking Exercise is also believed to have a relaxing effect and reduce stress levels. Gentle, rhythmic movements, combined with controlled breathing, can stimulate a relaxation response in the body, reduce muscle tension and calm the mind. This makes the practice not only beneficial from a physical perspective, but also from a mental and emotional perspective (Roberts et al., 2022). In the context of rehabilitation, Pelvic Rocking Exercise is often integrated into recovery programs after injury or surgery in the pelvic, lower back or hip area. This exercise is considered an effective method for speeding up the healing process, increasing mobility, and preventing stiffness or adhesions in injured tissue. However, it is important for individuals to consult with a health professional before starting any exercise program, especially if they have certain health conditions or are recovering from an injury (Selman et al., 2022).

Overall, Pelvic Rocking Exercise offers a wide range of benefits for a variety of individuals, from increased strength and flexibility, improved posture and balance, to reduced stress and muscle tension. With consistent practice and performed correctly

under professional direction, these exercises can become an important part of a person's health and fitness routine (Vincent et al., 2022).

Furthermore, Pelvic Rocking Exercise plays an important role in the world of obstetrics and gynecology, especially in helping pregnant women reduce pain and discomfort during pregnancy and prepare the body for the birth process. Regular and gentle pelvic movements during this exercise can help reduce pressure on the spine, reduce pain in the lower back, and help reduce tension in the abdominal area which is often a complaint during the second and third trimesters of pregnancy (Michaeli, 2020). In addition, by strengthening the core muscles and increasing pelvic flexibility, Pelvic Rocking Exercise has the potential to facilitate the course of labor, whether it is a normal birth or a birth with medical assistance, because a more flexible pelvis and strong muscles can facilitate a smoother birth and reduce the risk of complications (Zhu et al., 2022).

In the psychological aspect, involvement in Pelvic Rocking Exercise can provide emotional benefits for individuals, especially pregnant women, who often experience mood fluctuations and stress during pregnancy. This practice, with its combination of controlled breathing and calming movements, can function as an active meditation that helps calm the mind and reduce stress levels. This practice is not only beneficial for physical health but also for mental wellbeing, helping pregnant women feel more-calm, in control and ready to face the birthing process. Thus, the Pelvic Rocking Exercise is a holistic exercise that supports physical and mental health (Wu et al., 2023).

2. Birth Ball

Birth balls are one way to help mothers deal with pain during labor and delivery. In other words, it can speed up the progress of labor and widen the pelvis. Childbirth is considered a major event in many women's lives while the effect of pain on this event cannot be denied. So, thoughts about pain and how to deal with it have caught the attention of women, their families, and health care providers. Although the effects of giving birth have been proven to be considered an unforgettable experience in a woman's life, many women describe that they are happier after giving birth because their pain is reduced (Anwar et al., 2023).

Birth ball is physical therapy or simple exercises using a ball, where these exercises are applied to pregnant women, giving birth mothers, and post-natal mothers. This ball plays a role in helping the mother during the first stage of labor in advancing her labor. Apart from that, it can also be used in various positions, for example by sitting on the ball and rocking back and forth to make it feel comfortable and help the progress of labor by using gravity while increasing the release of endorphins because the elasticity and curvature of the ball stimulates the receptors in the pelvis which are responsible for secreting endorphins (Barakat, 2021).

According to Penny Simpin and Katie Rohs, Birth balls are large balls, also known as sports or yoga balls, made from strong polyethylene which are widely used by people, both pregnant and non-pregnant, to improve body balance problems,

reduces health problems in the back, builds strength, flexibility, and facilitates relaxation (Mazzarino et al., 2021).

According to Leung, one non-pharmacological pain relief method that can help mothers during the birthing process is by using a birth ball. Fitball or Swiss ball is a large ball which generally has a diameter of 55 cm or 65 cm. The birth ball has a soft surface and is very suitable for pregnant women to sit or lean on while doing birth ball exercises. Birth ball exercises can directly relieve a woman's physical pain by improving pelvic dimensions, mobility and fetal position (de Souza Ferraz et al., 2023)

The birth ball is a therapy ball / physical therapy tool that can help speed up the progress of labor when the mother is in the first stage of labor and can be used in various positions. Sitting upright on the ball and moving the ball can help speed up the progress of labor. Birth balls can also be used in various positions (Wu et al., 2022).

A birth ball is also known as a ball that is quite large in shape and resembles a gym ball, which differentiates its size. The birth ball is much larger, reaching approximately 65-75 cm in height after being pumped. Birth balls are specially designed so that they are not slippery when used on the floor, this is what makes Birth balls safe for use by pregnant women, even during the birth process, however using Birth balls will be much better if you use a mattress or pad underneath (Shah et al., 2021).

C. METHOD

This investigation utilized a quasi-experimental framework, adopting a two-group comparative design. It took place in a maternity clinic located in the Cipayung district of East Jakarta, spanning from February to August 2023. The study's subjects were mothers in the active phase of the first stage of labor. The research juxtaposed two sets of interventions: one group, consisting of 32 participants, engaged in pelvic rocking exercises using a birth ball, while the other group, also with 32 participants, underwent SP6 acupressure treatment. Purposive sampling, guided by specific inclusion criteria, was the method used for participant selection.

D. RESULT AND DISCUSSION

1. Types of treatment given to research respondents

Collecting data regarding the duration of the third stage of labor in postpartum mothers who underwent treatment with pelvic rocking exercises using a birth ball and administering acupressure at the SP6 point showed variations in results between the two treatment groups. More detailed information regarding research conducted at the East Jakarta Maternity Clinic in 2023 can be seen in the following table.

Table 1. The Impact of Pelvic Rocking Exercises with a Birth Ball and SP6 Acupressure on the Length of the Third Stage of Labor among Postpartum Women at a Maternity Clinic in East Jakarta 2023

Treatment	f	%
Pelvic Rocking Exercise with birth ball	**32**	**50**

Acupressure SP6	**32**	**50**
Total	**64**	**100**

The analysis of the results from table 1 shows that the interventions administered to the participants had an identical success rate of 50% for both groups: those who underwent the pelvic rocking exercise with a birth ball and those who received the SP6 acupressure treatment, in terms of decreasing the length of the third stage of labor and the severity of perineal tears.

2. Characteristics Of the Respondents

The next stage is to look at the characteristics of the respondents. The following table presents the characteristics of respondents who have participated in pelvic rocking exercise treatment with a birth ball and acupressure at point SP6 at the East Jakarta Maternity Clinic in 2023. The data collected includes demographics, medical history, and other details relevant to the study, providing a comprehensive picture of the profile of the participants involved in the study.

Table 2. Profile of Participants Undergoing Pelvic Rocking Exercise with a Birth Ball and SP6 Acupressure at a Maternity Clinic in East Jakarta 2023

Characteristics	**Treatment**			
	Pelvic Rocking Exercise* with *Birth Ball		***Acupressure SP6***	
	f	**%**	**f**	**%**
Age :				
1. Non-Risk Age Group (20 – 35 years)	30	93.75	31	96.88
2. Risk Age Group (<20 years and >35 years)	2	6.25	1	3.12
Total	**32**	**100**	**32**	**100**
Education :				
1. Higher	30	93.75	30	93.75
2. Low	2	6.25	2	6.25
Total	**32**	**100**	**32**	**100**
Work :				
1. Employee	15	46.88	20	62.5
2. Not Employee	17	53.12	12	37.5
Total	**32**	**100**	**32**	**100**
Ethnicity				
1. Betawi	8	25	5	15.63
2. Javanese	12	37.5	15	46.87
3. Sundanese	6	18.74	6	18.75
4. Padang	4	12.5	6	18.75
5. Malay	1	3.13	0	0
6. Bali	1	3,13	0	0

Total	**32**	**100**	**32**	**100**
Parity :				
1. Multipara	16	50	15	46.88
2. Primipara	16	50	17	53.12
Total	**32**	**100**	**32**	**100**

Data Ananlysis of table 2, it provides more than 95% of respondents were in the non-risk category (20-35 years), 93.75% were highly educated, more than 54% of respondents were employed, the majority of respondents were Javanese, more than 40% and most respondents had more than one parity.

3. The Length of the Third Stage of Labor Following Treatment with Pelvic Rocking Exercise Using a Birth Ball and SP6 Acupressure

The data Collection result on the duration of the third stage labor of each treatment gave different results in each treatment group. The following can be seen in table 3.

Table 3. The Duration of The Third Stage Labor with The Treatment of Pelvic Rocking Exercise Technique with Birth Ball and Acupressure SP6 In a Maternity Clinic in East Jakarta 2023

The Duration of The Third Stage Labor	**Treatment**			
	Pelvic Rocking Exercise with Birth Ball		***Acupressure SP6***	
(Minute)	**f**	**%**	**f**	**%**
2	1	3.13	0	0
3	1	3.13	0	0
4	2	6.25	0	0
5	18	56.24	13	40.62
6	3	9.37	3	9.37
7	2	6.25	2	6.25
8	1	3.13	0	0
10	3	9.37	12	37.5
14	0	0	1	3.13
15	1	13.3	1	3.13
Total	**32**	**100**	**32**	**100**

The analysis of the data in table 3 offers a summary indicating that the majority of participants completed the third stage of labor within 5 minutes, specifically 56.24% of those who were treated with Pelvic Rocking Exercise using a birth ball and 40.62% of those who received the Acupressure SP6 treatment.

4. Variations in the Length of the Third Stage of Labor Among Participants Treated with Pelvic Rocking Exercise Using a Birth Ball Versus Those Who Underwent SP6 Acupressure Treatment

To determine the next statistical test, the researcher conducted a normality test on the data using the Kolmogorov-Smirnov test. The results of the test indicated that all variables showed non-normally distributed data. Therefore, the statistical test used is the non-parametric Mann-Whitney U test to assess whether there is a difference in the duration of Third stage Of Labor between the Pelvic Rocking Exercise with a birth ball treatment and the Acupressure SP6 treatment. The Mann-Whitney U test analysis results can be seen in the following table.

Table 4. Differences in the Duration of the third Stage of labor in Respondents Receiving the Pelvic Rocking Exercise with a Birth Ball Treatment and the Acupressure SP6 Treatment in a maternity clinic in East Jakarta 2023

Treatment	n	Mean Rank	Sum of Rank	*p-value*
Pelvic Rocking Exercise with birth ball	32	26.38	844.00	0.005
Acupressure SP6	32	38.63	1236.00	
Total	64			

The analysis of the data in table 4 indicates that the results of the statistical test produced a p-value of 0.005, which falls below the threshold of 0.05 (leading to the rejection of the null hypothesis, Ho). Consequently, this demonstrates a significant difference in the duration of the third stage of labor between treatments involving Pelvic Rocking Exercise with a birth ball and SP6 Acupressure.

The analysis of the data reveals that among the 32 participants who underwent Pelvic Rocking Exercise with a birth ball, the average rank was 26.38. Conversely, the 32 participants who were treated with Acupressure SP6 had an average rank of 38.63. With the lower mean rank being 26.38, it illustrates that, on average, the duration of the third stage of labor was shorter for participants who received the Pelvic Rocking Exercise with a birth ball treatment compared to those who underwent the Acupressure SP6 treatment.

Based on the results of the study, it is evident that the average duration of the of The Third stage of Labor is shorter with the Pelvic Rocking Exercise with a birth ball treatment because it has a mean rank value of 26.38, which is lower than the respondents who received the Acupressure SP6 treatment with a mean rank value of 38.63. This suggests that the technique of Pelvic Rocking Exercise with a birth ball is more efficient at shortening the duration of the third stage of labor, likely because it induces stronger uterine muscle contractions. These enhanced contractions facilitate the more effortless and spontaneous delivery of the placenta. Furthermore, the method assists mothers in effectively managing the pain associated with contractions, resulting in an expanded birth canal. This dilation makes it simpler for the baby's head to descend into the pelvic floor.

The study conducted by Wulandari and Wahyuni (2019), which included 14 participants in the control group and 14 in the treatment group, found a notable correlation between the use of pelvic rocking exercise with a birth ball and the reduction in labor duration. This outcome aligns with the findings of the present study, where the third stage of labor was observed to be shorter for participants who

underwent the pelvic rocking exercise with a birth ball compared to those who received the acupressure SP6 treatment. Despite the difference in the size of the participant groups, the results consistently show that the pelvic rocking exercise with a birth ball technique is more effective in decreasing the duration of the third stage of labor.

The pelvic rocking exercise with a birth ball technique is an effective alternative to prevent prolonged Labor and placental retention, thus speeding up the duration of the Third stage of Labor. It occurs because the technique is highly effective in increasing uterine contractions by stimulating the release of oxytocin from the pituitary gland, allowing the placenta to be delivered quickly (Rizki & Anggraini, 2020).

The analysis of the research on the group that received pelvic rocking exercise with a birth ball treatment shows it to be highly effective in alleviating pain and shortening the duration of the third stage of labor. This efficacy is attributed to the way the pelvic rocking exercise with a birth ball enhances the elasticity and relaxation of the pelvic floor muscles, contributing to increased comfort and relaxation for the mother. This, in turn, facilitates a normal and comparatively quicker delivery of the placenta. The technique is straightforward for mothers to perform and has been shown to reduce the average duration of the third stage of labor to less than 5 minutes, thereby minimizing the risk of placental retention.

Reducing the length of the third stage of labor enhances the comfort and safety of the delivering mother. Anxiety can be significantly reduced through the use of pelvic rocking exercise therapy with a birth ball, which also aids in relaxing the mother. This relaxation contributes to the softening and easy dilation of the cervical muscles, facilitated by adequate contractions, thereby accelerating the progression of the third stage of labor. It aligns with research findings, which prove that the average duration of The Third Stage of Labor is at most 5 minutes (Grenvik et al., 2021).

To effectively shorten the duration of the third stage of labor using the pelvic rocking exercise with a birth ball, it's important for the mother to select a ball that matches her height, ensuring its use is proportionate and effective. The size of the birth ball is adjusted to the patient's height to reduce childbirth morbidity and provide a positive experience for mothers, especially during The Third Stage of Labor, placental birth. Therefore, midwives working in PMB should have various ball sizes suitable for pelvic rocking exercises with a birth ball treatment (TD, 2019).

Acupressure SP6 facilitates the labor process by increasing the effectiveness of uterine contractions. Acupressure SP6 also helps produce endorphins, which relax the pelvic muscles. This method has no side effects or disadvantages for patients and can be performed by midwives, nurses, or the husband during Labor. It aligns with the findings of this study, as respondents who received the acupressure SP6 treatment became relaxed and calm and could adapt to the perceived labor process. However, the final results of this study indicate that the pelvic rocking exercise with a birth ball technique provided to the respondent group is more effective than acupressure SP6.

Acupressure SP6, aimed at inducing labor, targets massaging the inner area of the lower limbs. It's believed to prompt the pituitary gland to release oxytocin, thereby triggering uterine contractions that not only facilitate the labor process but also help manage labor pain. This technique contributes to the comfort of the delivering mother, minimizes anxiety, and helps avert the risks associated with prolonged labor. Additionally, the findings of this study highlight that acupressure SP6 can shorten the duration of the active phase in the first stage of labor. Nevertheless, the conclusive evidence from this research indicates that the intervention involving pelvic rocking exercises with a birth ball is superior in reducing the length of the active phase in labor compared to the acupressure SP6 treatment.

According to past studies, both the pelvic rocking exercise with a birth ball and acupressure SP6 techniques are effective in reducing the duration of the third stage of labor, each offering distinct advantages. Nonetheless, when comparing the two, it has been observed that the pelvic rocking exercise with a birth ball method shortens the duration of the third stage of labor more rapidly than the acupressure SP6 technique. The analysis implies that the faster reduction in labor duration with the pelvic rocking exercise is attributed to its involvement of physical activity. Meanwhile, the acupressure SP6 method is more passive, focusing solely on massage at the SP6 point on the lower limbs.

Both the pelvic rocking exercise with a birth ball and the acupressure SP6 share the benefit of offering comfort and relaxation, which in turn stimulates the release of endorphins and naturally encourages the secretion of oxytocin. This effect can hasten the duration of the third stage of labor and help in preventing placental retention, as highlighted in the study by Ulfa (2021).

E. CONCLUSION

Participants who underwent the pelvic rocking exercise with a birth ball reported a quicker completion of the third stage of labor compared to those who received the acupressure SP6 treatment. This finding is supported by statistical analysis, which showed a significant difference with a p-value of 0.005 (< 0.05). Specifically, the mean rank for the group receiving the pelvic rocking exercise with a birth ball was 26.38, lower than the 38.63 mean rank observed in the acupressure SP6 group. Despite this, both methods are effective in facilitating the progression of the third stage of labor. Midwives are capable of applying both the pelvic rocking exercise with a birth ball and the acupressure SP6, each contributing to a reduction in the duration of the third stage of labor. Nevertheless, the pelvic rocking exercise with a birth ball has been identified as more efficient than acupressure SP6 in achieving this goal when both are employed over the same timeframe. Pelvic rocking exercise with a birth ball is easy for midwives to perform and does not require specialized skills, making it a convenient intervention. Using more effective methods will reduce the duration of Labor, making delivering mothers more comfortable and less anxious during childbirth.

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