



# Effects of Pelvic Rocking and Deep Breathing Relaxation Exercises on the Progression of the Active Phase of the First Stage of Labor

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**Abstract:** Prolonged labor or undeveloped labor is one of the complications in childbirth. Where prolonged labor is labor that lasts more than 24 hours in primi and more than 18 hours in multi. The purpose of this research is for the Influence of Pelvic Rocking Exercise and Slow Deep Breathing Relaxation on the Progress of the First Stage of Labor among mothers giving birth in Indonesia in 2024. Research methods This is a pre experimental quantitative research with a group compilation statistical design. The data analysis used is univariate and bivariate analysis using the Mann Whitney hypothesis test, which is a non-parametric test that measures differences equivalent to the independent T test in parametric measurements. The p-value result was 0.000. This shows that there is a significant influence of pelvic rocking exercise and slow deep breathing relaxation on the progress of the first stage of labor in 2024. This pelvic rocking exercise and slow deep breathing relaxation intervention can be applied by the birthing mother so that the mother can give birth safely, comfortably and in a quicker time than without intervention.

**Keywords:** Kala I; Pelvic roxing exercise; Slow deep relaxation

## Introduction

State Childbirth is a physiological thing where the uterus attempts to expel the products of conception in the form of a baby and placenta from the mother's womb (Prasetyani et al., 2023). When contractions occur, the cervix will widen thereby pushing the baby out, the pubic bone receives strong pressure from the uterus, this causes labor pain and delivery to be very painful for the mother in labor. (Wulandari & Wahyuni, 2019). Prolonged labor or undeveloped labor is one of the complications in childbirth. This is also a problem in Indonesia because we know that 80% of births are still assisted by dukun. Where prolonged labor is labor that lasts more than 24 hours in primi and more than 18 hours in multi (Saifuddin, 2012).

Based on data from the World Health Organization (WHO), every day around 810 women die during

pregnancy or childbirth due to preventable causes. Maternal mortality is still very high today. Around 295 thousand women die before or during childbirth and 86% occur in developing countries such as Sub-Saharan Africa and Southeast Asia (Pratiwi & Hidayati, 2021). In addition, the maternal mortality rate in developing countries is 462 per 1000 live births, while in developed countries the maternal mortality rate is 11 per 1000 live births (WHO, 2024). WHO data in 2018 states that there are types of complications that cause the majority of maternal deaths, around 75%, and one of the birth complications that contributes to the maternal mortality rate is prolonged labor (Mutmainah et al., 2017). Prolonged labor can cause emergencies in the mother and baby, thus contributing to the maternal mortality rate (Siregar, 2023). Mothers with prolonged labor are at greater risk of bleeding due to uterine atony, laceration of the birth canal, infection, fatigue and shock, while for

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fetuses there is an increased risk of severe asphyxia, cerebral trauma, infection and injury due to procedures. Complications in childbirth result in 810 maternal deaths worldwide and the incidence of birth complications is 69,000 (UNICEF Indonesia, 2022).

The maternal mortality rate (MMR) in Indonesia is still considered high when compared to the MMR in other countries. Based on the results of the Indonesian Demographic Health Survey (SDKI) in 2023, it shows a significant increase in MMR, namely 359 per 1,000,000 live births (Indonesian Ministry of Health, 2021). Apart from that, the MMR in DKI Jakarta in 2024 will be recorded at 48/1000 live births with a target of reducing MMR by 80-84% from 1000 live births (DKI Jakarta Provincial Health Service, 2021). The application of pelvic rocking with a gymball during the birthing process is not something new in the field of obstetrics, but in practice, the use of pelvic rocking movements with a gymball is still very rarely found, especially in Malang City, while pelvic rocking exercise with a gymball has the benefit of helping the progress process and speeding things up. the labor process, especially in the active phase I and II (Wulandari & Wahyuni, 2019).

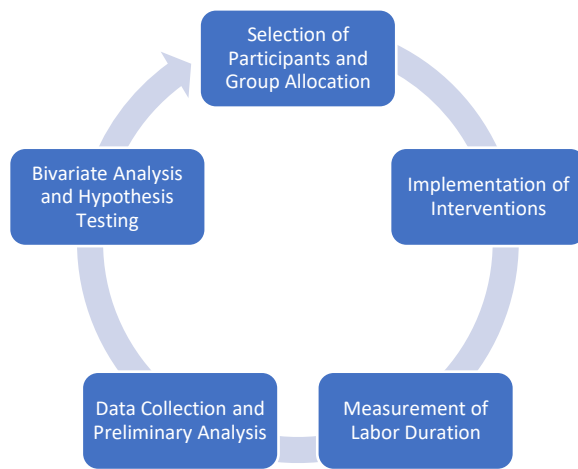
In research conducted by Wulandari & Wahyuni (2019) with the title "Effectiveness of Pelvic Rocking Exercise on Length of Labor in Primiparas at the Banjarnegara Regency Regional Health Center" with a sample size of forty people using the purposive sampling method with the Correlation test shows that Pelvic Rocking Exercise is effective in shortens the length of the first active phase with a p-value of  $0.000 < \alpha 0.05$  and an effect size of 0.6. Pelvic Rocking Exercise is also effective in shortening the length of the second stage with a p-value of  $0.007 < \alpha 0.05$  with an effect size of 0.43. From the research results, it was concluded that the Pelvic Rocking Exercise was effective in shortening the length of the first and second stages of labor in primiparas (Chaerunnisa, 2019). Based on the background above, researchers are interested in conducting research on "The Effect of Pelvic Rocking Exercise and Slow Deep Breathing Relaxation on the Progress of the First Stage of Labor among Mothers in Birth in Indonesia in 2024".

**Method**

This research was conducted to evaluate the effects of Pelvic Rocking Exercise and Slow Deep Breathing Relaxation on the progress of the first stage of labor among mothers giving birth in Indonesia in 2024. The study aims to determine how these two methods influence the duration of the first stage of labor, a critical phase in childbirth. The research involves two types of variables: independent and dependent variables

(Sugiyono & Puspandhani, 2020). The independent variables are the factors that influence or cause changes in the dependent variable. In this study, the independent variables are the Pelvic Rocking Exercise and Slow Deep Breathing Relaxation (Addini et al., 2020). These interventions are implemented to assess their impact on the labor process (Rohmah, 2019). Pelvic Rocking Exercise involves specific movements designed to ease labor, while Slow Deep Breathing Relaxation focuses on calming and relaxing techniques to help manage labor stress (Betan et al., 2021).

On the other hand, the dependent variable is the outcome that is affected by the independent variables. In this research, the dependent variable is the length of time in the first stage of labor (Fela, 2019). This variable represents the duration from the onset of labor contractions to the complete dilation of the cervix (Gemini & Panggayuh, 2019; TD & Masini, 2019). By measuring this time, the study aims to determine whether the interventions (Pelvic Rocking Exercise and Slow Deep Breathing Relaxation) can effectively influence the progress of labor (Ismayani, 2019). The data analysis in this study employs both univariate and bivariate methods (Podudge, 2020). Univariate analysis involves examining individual variables to summarize and describe their characteristics, such as calculating mean values and standard deviations for the duration of labor (Pauziah et al., 2022). This approach helps in understanding the basic trends and central tendencies within the data.



**Figure 1.** Research Flow

Bivariate analysis is used to explore the relationships between the independent and dependent variables (Prawirohardjo, 2016). Specifically, the Mann-Whitney U test is employed as a non-parametric test to assess differences between groups. This test is equivalent to the independent T-test used in parametric

statistics but is suitable for non-normally distributed data (Surtiningsih et al., 2020). It compares the median durations of labor between groups exposed to Pelvic Rocking Exercise and Slow Deep Breathing Relaxation to determine if there are statistically significant differences (Sugiharti & Sukmaningtyas, 2017). Overall, the research aims to provide insights into how these specific exercises and relaxation techniques affect labor duration, potentially offering valuable recommendations for improving labor management practices. See Figure 1.

## Result and Discussion

### Results

#### Univariate Analysis Results

**Table 1.** Frequency Distribution of the Effect of Pelvic Rocking Exercise and Slow Deep Breathing Relaxation on 1st Stage Progress Childbirth in 2024

Intervention	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Pelvic Rocking Exercise	.53	60	.00	.34	60	.00
Slow Deep Breathing Relaxation	.49	60	.00	.49	60	.00

Based on Table 1, it is known that of the 60 respondents who were given pelvic rocking exercise, 54 respondents (90%) experienced rapid labor and 6 respondents (10%) experienced slow labor. Meanwhile, of the 60 respondents who were given the Slow Deep Breathing Exercise, 48 respondents (80%) experienced rapid labor and 12 respondents (20%) experienced slow labor.

#### Data Normality Test

In this study, the Shapiro Wilk test was used to test the normality of the data carried out on the Pelvic Rocking Exercise and Slow Deep Breathing Relaxation variables (Sutisna, 2021). The Shapiro Wilk method is an effective and valid normality test method for use on small samples.

**Table. 2** Normality Test

Intervention	Mean Rank	Sum of Ranks	p-value
Pelvic Rocking Exercise	35.30	2118.00	0.00
Slow Deep Breathing Relaxation	85.70	5142.00	

Based on Table 2 in the Normality test using the Shapiro-Wilk test, the Sig value of the Pelvic Rocking Exercise variable data is 0.000 and the Slow Deep Breathing Relaxation variable data is 0.000. Because the

obtained p value = .00 < 0.05, it can be said that the data is not normally distributed so the data analysis used is the Mann Whitney test.

Based on Table 3, it was found that mothers giving birth using pelvic rocking exercise had a mean of 35.30, while mothers giving birth who only used the slow deep breathing relaxation technique had a mean of 85.70. The p-value result was 0.00. This shows that there is a significant influence of pelvic rocking exercise and slow deep breathing relaxation on the progress of the first stage of labor in 2024.

**Table. 3.** Effects of Pelvic Rocking Exercise and Slow Deep Breathing Relaxation on the Progress of the 1st Stage of Labor in 2024

Bivariate Analysis Results		
Variable	n	%
Pelvic Rocking Exercise		
Rapid Labor	54	90
Slow Labor	6	10
Slow Deep Breathing Relaxation		
Rapid Labor	48	80
Slow Labor	12	20

### Discussion

#### The Effect of Pelvic Rocking and Slow Deep Breathing Relaxation on the Progress of the First Stage of Labor

Based on Table 2, the majority was 58.2%. Based on the research results, it was found that mothers giving birth using pelvic rocking exercise had a mean of 35.30, while mothers giving birth who only used the slow deep breathing relaxation technique had a mean of 85.70. The p-value result was 0.00. This shows that there is a significant influence of pelvic rocking exercise and slow deep breathing relaxation on the progress of the first stage of labor in Indonesia in 2024. The results of this research are in line with research conducted by Ohorella & Rismawati (2023) regarding the influence of pelvic rocking on the length of the first active phase in postpartum mothers at the Batua Community Health Center in 2023 with research results showing that out of 15 people who did pelvic rocking, there were 13 people (86.7%) whose first active phase was normal and 2 people (13.3%) who were abnormal. Meanwhile, 15 people did not do pelvic rocking, there were 3 people (20.0%) during the first active phase who were normal and 12 people (80.0%) who were abnormal. By using the Chi-Square test, it is found that  $p = 0.001$  is smaller than  $\alpha = 0.05$ , this means that  $H_0$  is rejected and  $H_a$  is accepted. Thus there is an influence between pelvic rocking on the length of the first active phase.

Apart from that, other research also states that pelvic rocking with a gym ball can help speed up the labor process, especially in the first stage, and the benefit is that the pressure from the baby's head on the cervix

remains constant when the mother gives birth in an upright position, so that dilatation (opening) of the cervix can occur more quickly (Taqwin, 2020). That the pelvic area is wider, making it easier for the baby's head to descend to the pelvic floor, is in accordance with research results. From the results of statistical tests, it was found that the p value was 0.000, it was found that the p-value was  $< 0.05$ , so it could be concluded that there was a significant relationship between the birthing ball technique and lowering of the lower part of the fetus in primi gravida inpartu mothers during the 1<sup>st</sup> active phase (Yulianti & Wintarsih, 2022).

The results of research conducted by Aprilia & Ritmond (2021) regarding the relationship between the implementation of the Pelvic Rocking Exercise and the birthing ball on the length of the first stage in healthy pregnant women at Griya Mejasem. It was found that of the 30 births that took place, 27 of the mothers carried out the Pelvic Rocking technique with a birthing ball and 3 respondents did not carry out Pelvic Rocking with a birthing ball (Ariesta et al., 2022). The birthing mothers who did Pelvic Rocking with a birthing ball during labor were in the normal category, while the 3 respondents who did not do Pelvic Rocking with a birthing ball were in the long labor category (Wulandari & Wahyuni, 2019). So the theory states that Pelvic Rocking with a birthing ball can help facilitate the labor process, especially during the first stage, and the benefit of Pelvic Rocking is that the pressure from the baby's head on the cervix remains constant when the mother gives birth in an upright position, so that dilatation (opening) of the cervix can occur more quickly (Widianingsih & Simanjuntak, 2023). The wider pelvic area makes it easier for the baby's head to descend to the pelvic floor, which is in accordance with research results.

This is in accordance with the theory that the upright position by sitting on a Birthing ball or what is called the pelvic rocking technique and walking around, standing, are both in an upright position. Both have the effect of speeding up the labor process. However, the position sitting on the ball with pelvic rocking is preferred because the mother is more relaxed and does not get tired easily. By sitting, the mother can still help lower the head with gravity but is not tired because she is not carrying the weight of the stomach. So this position makes the mother last longer in the upright position (Sherwood, 2012).

Increasing the size of the pelvic cavity when doing pelvic rocking relaxes the mother and trains the smooth muscles in the pelvic cavity. The sacrotuberous ligament and the supine sacrospinous ligament which run from the lateral part of the sacrum and coccyx to the ischial spine affect the joints in the pelvic bones (Cunningham, 2010). Meanwhile, based on Yihana's research, the length

of time in the first stage after Slow Deep Breathing Relaxation was carried out by Wahyudi et al. (2023) with fast labor of 11 respondents (73.30%), slow labor of 1 respondent (26.70%) The deep breathing technique will meet the needs of the process oxygenation and the mother has enough energy to face the birthing process. The results of respondents after the slow deep breathing relaxation intervention who had incomplete opening and crossed the alert line in the first stage of progress were 4 respondents (26.70%), complete opening and did not cross the alert line in the first stage of progress were 11 respondents (73.30%).

Based on the chi square test carried out, it was found that the p value was 0.000, which was smaller than the value  $\alpha = 0.05$ . This shows that there is a relationship between the influence of slow deep breathing relaxation on the progress of the first stage of labor. Good relaxation techniques can make blood circulation in the uterus and fetus smooth (Widyastuti, 2021; Parwatiningsih et al., 2021). Calmness in facing the pain of uterine contractions will help the long process of first stage labor. This has been proven where the autonomic nervous system is controlled to reduce the sensation of pain due to the oxygen forces needed by nerve cells in the pelvic area and uterus (Wahyudi et al., 2023). This research is in line with previous research conducted by Meilani & Sukarsih (2021) which found that birth mothers who performed the deep breathing relaxation technique correctly experienced a normal duration of first stage labor, namely 6 people (66.7%) and 3 people (18.8%) who experienced an abnormally long first stage of labor. The majority of mothers did not properly perform the deep breathing relaxation technique, 13 people (81.2%).

## Conclusion

Based on the results of research and analysis regarding "The Effect of Pelvic Rocking Exercise and Slow Deep Breathing Relaxation on the Progress of the First Stage of Labor among Mothers in Indonesia in 2024," researchers obtained several important conclusions. First, the majority of respondents who were given pelvic rocking exercises experienced rapid labor, namely 54 respondents (90%), while 6 respondents (10%) experienced slow labor. Second, after being given Slow Deep Breathing Relaxation exercises, 48 respondents (80%) experienced fast labor and 12 respondents (20%) experienced slow labor. Third, mothers who underwent pelvic rocking exercise had an average (mean) progress score of 35.30, while those who only used the Slow Deep Breathing Relaxation technique had a mean of 85.70. In addition, the p-value of 0.000 shows that there is a significant influence of pelvic



rocking exercise and Slow Deep Breathing Relaxation on the progress of the first stage of labor in multiparous mothers (> 2) with a success percentage of 60.4%. This research confirms that these two interventions play an important role in speeding up the labor process in the active phase of Stage I.

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#### Author Contributions

G.U., L.N., I.S., J.P., L.P. contributed to the data conceptualization, collection process, data processing, article writing.

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#### Conflicts of Interest

The authors declare no conflict of interest.

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