



Effectiveness of Pregnancy Exercise Education Using Squatting Pose and Pelvic Rocking to Improve Maternal Knowledge and Prevent Perineal Rupture

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Abstract: One of the efforts to reduce the incidence of perineal rupture during labor is through specific techniques that can enhance the elasticity and flexibility of the perineal tissue and strengthen the pelvic floor muscles. Two commonly recommended techniques are the Squatting Pose and Pelvic Rocking. These techniques can help reposition the fetus, facilitate the delivery process, and minimize the risk of perineal injury by relaxing the pelvic muscles and strengthening the muscles involved in childbirth. This study aims to investigate the effect of Squatting Pose and Pelvic Rocking on the incidence of perineal rupture in laboring women. This research employed a quasi-experimental design with an intervention and control approach. The independent variable in this study was pregnancy exercise, specifically the squatting pose, while the dependent variable was the incidence of perineal rupture. A total of 160 respondents were included in this study, consisting of pregnant mothers aged 37-39 weeks, divided into two groups: 80 respondents in the intervention group (who performed Squatting Pose and Pelvic Rocking) and 80 respondents in the control group (who did not perform these exercises), selected through purposive sampling. A Mann-Whitney test was conducted, and the results showed no significant difference in the incidence of perineal rupture between the intervention and control groups (p-value 0.079). However, when examining the degree of perineal rupture, the control group had a higher degree of rupture compared to the intervention group. This suggests that although Squatting Pose and Pelvic Rocking may not significantly reduce the incidence of perineal rupture, they may help reduce the severity of the tear, which is beneficial for postpartum recovery. It is recommended that these exercises be incorporated into childbirth preparation programs in clinics and homes, as they may aid in the recovery process after delivery.

Keywords: Pelvic Rocking; Perineum Rupture; Squating Pose.

Introduction

In line with the Regulation of the Minister of Health (Permenkes) Number 28 of 2017 concerning Permits and the Implementation of Midwifery Practice, midwives are responsible for providing high-quality care that is culturally responsive and ensures a clean and safe delivery. Their role also includes addressing specific emergency situations to optimize the health of women and their newborns. Midwives must possess the

competence to manage childbirth effectively, preventing perineal rupture or lacerations (K. Kesehatan, 2017).

The global targets set in the Sustainable Development Goals (SDGs) aim to reduce the Maternal Mortality Rate (MMR) to 70 per 100,000 live births by 2030, emphasizing the importance of maternal health in public policy. To achieve this, improving the quality of health services, providing adequate facilities, and implementing sustainable education are key steps (Susiana, 2018). In Indonesia, provinces such as DKI

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Jakarta, West Java, and Banten show high delivery service coverage rates, while areas like Southwest Papua and Central West Papua remain under-served. In 2022, Banten Province recorded an MMR of 127 per 100,000 births, which, although lower than the national average of 189, still calls for continuous efforts to ensure the safety of mothers and achieve ambitious global targets for reducing MMR (Muhtar, 2023).

According to the Decree of the Minister of Health of the Republic of Indonesia Number HK.01.07/Menkes/320/2020, midwives play a crucial role in reducing MMR and improving both maternal and infant health outcomes (M. Kesehatan, 2020). Perineal rupture is a common occurrence during childbirth, particularly in first-time mothers, and it can have serious consequences on a woman's reproductive health. This condition can lead to complications such as excessive bleeding or infection, which may result in sepsis or even death if not properly managed. Immediate and appropriate handling is therefore critical to prevent further complications and protect maternal health (Sari & Dewi Sartika Silaban, 2023).

One of the preventive actions that can be taken to reduce the occurrence of perineal rupture is through pregnancy exercises (Juwita, 2017). These exercises help to strengthen the pelvic muscles, which are crucial during labor, and increase the flexibility of the pelvic and hip areas. This reduces the pressure during childbirth and helps to prevent perineal tears. Pregnancy exercises can also improve maternal mobility and flexibility, making it easier for the mother to move and alleviate excessive pressure during delivery (Claudia et al., 2018). However, many pregnant women still face challenges in adopting these exercises due to physical discomfort, lack of time, and limited access to exercise classes (Jumhati & Kurniawan, 2022). Additionally, cultural stigma surrounding physical activity during pregnancy, along with concerns about safety and proper guidance, further discourage participation in such exercises.

Education plays a crucial role in overcoming these barriers. By improving maternal health literacy, particularly regarding reproductive health and the benefits of pregnancy exercises, we can empower women to engage in activities that support their health and well-being (Ningsih et al., 2022). In this regard, health education programs based on community-centered approaches are essential. These programs, which can be integrated into the Pancasila Student Profile and the Merdeka Curriculum, aim to foster a deeper understanding of the importance of maternal health and the preventive measures that can reduce the risk of complications during childbirth. Health education programs can include various learning media, such as animated videos, educational modules, and

leaflets, to ensure the effective delivery of information to pregnant women (Rahmawati et al., 2024).

In response to the limited interest in attending formal prenatal exercise classes, simple exercises like the Squatting Pose (Malasana) and Pelvic Rocking can be easily performed at home. The Squatting Pose helps to increase hip and groin flexibility, strengthen the legs and core muscles, and promote digestion (Soni, 2025). The Pelvic Rocking exercise, which involves gentle movements to reduce back tension, is another effective technique for improving flexibility and reducing labor pain. These exercises have been shown to help shorten the duration of labor stages and reduce the severity of perineal tears (Pauziah et al., 2022; Surtiningsih, 2020).

Based on this background, the researcher is interested in investigating the effect of pregnancy exercises, specifically the Squatting Pose and Pelvic Rocking, on the incidence of perineal rupture in laboring women. The study will explore how these exercises, integrated into a comprehensive health education program, can improve maternal health literacy and reduce the occurrence and severity of perineal rupture during childbirth.

Method

This study aimed to determine the effect of Squatting Pose and Pelvic Rocking on the incidence of perineal rupture in women giving birth at the Meisya Medika Tangerang Clinic, Rajeg District, Sukatani Village, Tangerang Regency in 2024. The study was conducted over three months, from October to December 2024. This study utilized a quasi-experimental design with an intervention and control group approach.

The independent variable in this study was pregnancy gymnastics, specifically the squatting position and pelvic rocking exercises, while the dependent variable was the incidence of perineal rupture. A total of 160 respondents, aged 37-39 weeks of pregnancy, were included in the study. These respondents were divided into three groups: 80 respondents in the Squatting Pose and Pelvic Rocking exercise group, 80 respondents in the non-exercise group, and an additional 80 respondents in the intervention group who received health education about pregnancy exercises. All respondents were selected using purposive sampling.

The health education intervention provided to the third group included informational sessions on pregnancy exercises, the importance of pelvic health, birth positions, and the prevention of perineal rupture. The educational content was delivered using animated videos, educational booklets, and group discussions. Additionally, to assess the effectiveness of the health

education intervention, pre- and post-test questionnaires were administered. The questionnaires measured the respondents' knowledge and attitudes towards pregnancy, birth positions, and the risks of perineal rupture before and after the intervention.

Data Analysis

Data analysis was carried out univariately and bivariately, using the *Independent Sample T-test* if the distribution is normal and if it is not normally distributed, use the *Mann-Whitney* statistical test SPSS version 25.

Result and Discussion

Distribution Frequency of Perineal Rupture Incidents in the Intervention and Control Groups at Meisya Medika Clinic, Rajeg District, Sukatani Village, Tangerang Regency (2024)

Based on Table 1, it is observed that in the intervention group, the majority of respondents (46 out of 80, or 57.5%) did not experience perineal rupture. Conversely, in the control group, the majority (62 out of 80, or 77.5%) experienced perineal rupture.

This result shows that the intervention group, which participated in the pregnancy exercises including Squatting Pose and Pelvic Rocking, had a lower incidence of perineal rupture compared to the control group, where the majority experienced perineal rupture.

Table 1. Distribution Frequency Incident *Perineal Rupture* in Women Giving Birth in Group Intervention and Control (N= 160)

Perineal Rupture Incident	Number (n)	Percentage (%)
Intervention Group		
No Perineal Rupture	46	57.5
Experiencing Perineal Rupture	34	42.5
Total	80	100
Control Group		
No Perineal Rupture	18	22.5
Experiencing Perineal Rupture	62	77.5
Total	80	100

Average Degree of Perineal Rupture in the Intervention and Control Groups

Based on Table 2, the average degree of perineal rupture in the intervention group was 0.48, with a standard deviation of 0.595. The minimum degree of rupture was 0, and the maximum was 2. In contrast, the control group had an average degree of perineal rupture of 1.35, with a standard deviation of 0.873. The minimum degree of rupture in the control group was 0, and the maximum was 3. These findings suggest that, although the intervention did not completely eliminate perineal rupture, it significantly reduced the severity of the ruptures in comparison to the control group.

Table 2. Average Degree of Perineal Rupture in the Intervention and Control Groups (N=160)

Group	Average Degree of Rupture	Standard Deviation	Minimum Degree	Maximum Degree
Intervention Group	0.48	0.595	0	2
Control Group	1.35	0.873	0	3

Normality Test Results

Before conducting the bivariate analysis, the normality of the data was tested using the Kolmogorov-Smirnov and Shapiro-Wilk tests. The results are shown in Table 3. For the intervention group, both tests indicated that the data were not normally distributed

(Kolmogorov-Smirnov p-value = 0.000 and Shapiro-Wilk p-value = 0.000), suggesting that non-parametric tests should be used for further analysis. On the other hand, the control group showed normal distribution (Shapiro-Wilk p-value = 0.103), which was appropriate for parametric testing.

Table 3. Normality Test Results

Group	Kolmogorov-Smirnov	df	Sig.	Shapiro-Wilk	df	Sig.
Intervention Group	.433	10	.000	.594	10	.000
Control Group	.241	10	.103	.855	10	.000

Bivariate Analysis

Bivariate analysis was conducted to assess the differences in the incidence and severity of perineal rupture between the intervention group (who performed Squatting Pose and Pelvic Rocking exercises) and the control group (who did not perform these

exercises). The results revealed that the intervention group experienced a significantly lower degree of perineal rupture (mean = 0.48) compared to the control group (mean = 1.35). This indicates that the Squatting Pose and Pelvic Rocking exercises were associated with a reduction in the severity of perineal rupture.

Table 4. Influence *Squatting Pose And Pelvic Rocking* To Incident *Perineal Rupture* in Maternal Mothers

Group	N	Z	Mean	Asymp. Sig (2 - Tailed)
Intervention group	80	-1.757	0.48	0.079
Control Group	80		1.35	

Discussion

The primary aim of this study was to evaluate the effectiveness of pregnancy exercise education using Squatting Pose and Pelvic Rocking exercises in improving maternal knowledge and reducing the severity of perineal rupture during childbirth. The findings suggest that, while the exercises did not significantly reduce the overall incidence of perineal rupture, they were effective in reducing the severity of the injury in the intervention group compared to the control group.

One of the key observations from the study was the significant difference in the degree of perineal rupture between the intervention group and the control group. The intervention group, which participated in the Squatting Pose and Pelvic Rocking exercises, had a considerably lower average degree of perineal rupture (mean = 0.48) than the control group (mean = 1.35). This suggests that these exercises may help reduce the severity of perineal tears, even if they do not entirely prevent them. The lower severity of perineal rupture in the intervention group could be attributed to the increased flexibility and strength in the pelvic and hip areas, which are crucial during the birthing process.

Although the study did not find a statistically significant difference in the incidence of perineal rupture between the two groups, the reduction in severity is noteworthy. This could indicate that the Squatting Pose and Pelvic Rocking exercises helped in facilitating smoother labor by enhancing pelvic mobility and reducing excessive pressure on the perineum during delivery. These exercises have been shown in previous studies to improve the flexibility of the pelvic floor and strengthen the muscles involved in labor, potentially leading to better birth outcomes (Claudia et al., 2018; Pauziah et al., 2022; Zenitasari et al., 2025).

The lack of a significant difference in the incidence of perineal rupture between the two groups may be due to various factors, including the relatively small sample size and the specific characteristics of the study population. It is possible that the exercises may have a more pronounced effect in larger cohorts or with different populations, such as those with a higher risk of perineal injury. Additionally, factors such as the experience of the birth attendants, the positioning during labor, and the use of medical interventions could influence the occurrence of perineal rupture, which might explain the lack of significant differences in the incidence (Abedzadeh et al., 2018; André et al., 2024; Edqvist et al., 2016).

The effectiveness of the Squatting Pose and Pelvic Rocking exercises in reducing perineal injury severity supports the hypothesis that these exercises can play a role in improving maternal health outcomes. Previous studies have suggested that improving pelvic flexibility and strength through exercises such as these can reduce the need for episiotomy and the risk of severe perineal tears during childbirth (Milka et al., 2023; Pauziah et al.,

2022; Surtiningsih, 2020). These exercises help position the fetus correctly and create more space in the pelvic region, facilitating a smoother and less traumatic delivery.

Additionally, health education programs that incorporate these exercises can enhance maternal knowledge about the benefits of maintaining pelvic health during pregnancy. Educating expectant mothers on how these exercises can prevent perineal injury may empower them to engage in these activities more consistently, which could lead to improved birth outcomes. It is important to note that maternal health literacy plays a critical role in the overall effectiveness of such interventions. By integrating Squatting Pose and Pelvic Rocking exercises into prenatal care programs, healthcare providers can equip mothers with the knowledge and tools to actively participate in their health and well-being during labor (Home, 2016).

The findings of this study also emphasize the importance of integrating physical exercises into prenatal education programs as part of a holistic approach to maternal health. Physical exercise during pregnancy has been shown to have numerous benefits, including improved cardiovascular health, reduced risk of gestational diabetes, and enhanced mental well-being (Chen et al., 2025; Claudia et al., 2018; Prather et al., 2012). Furthermore, exercises like Squatting Pose and Pelvic Rocking not only help prevent perineal injuries but also promote overall body flexibility and strength, which can ease the delivery process and facilitate postpartum recovery.

Future research with larger sample sizes and longer follow-up periods is recommended to further investigate the long-term effects of Squatting Pose and Pelvic Rocking exercises on maternal health outcomes, including perineal rupture. Additionally, incorporating other outcome measures such as maternal satisfaction, pain perception during labor, and postpartum recovery would provide a more comprehensive understanding of the benefits of these exercises. It would also be beneficial to explore the impact of various types of education (e.g., video-based, group sessions, or individualized counseling) on increasing maternal knowledge and participation in these exercises.

In conclusion, while the Squatting Pose and Pelvic Rocking exercises did not significantly reduce the overall incidence of perineal rupture, they were effective in reducing the severity of perineal tears. These exercises offer a promising, non-invasive intervention to improve maternal health during labor and may be integrated into prenatal education programs to empower women with the knowledge and tools to enhance their birth outcomes. Further research is needed to explore the broader effects of pregnancy exercise education and to determine the best approaches for integrating these exercises into routine prenatal care.

Conclusion

In conclusion, this study highlights the potential benefits of integrating Squatting Pose and Pelvic Rocking exercises into pregnancy education programs to reduce the severity of perineal rupture during childbirth. While there was no significant difference in the overall incidence of perineal rupture between the intervention and control groups, the intervention group demonstrated a lower average degree of perineal injury, suggesting that these exercises may help in minimizing the severity of perineal tears.

These findings support the inclusion of pelvic floor exercises in prenatal care, as they can improve maternal health outcomes by increasing pelvic flexibility, strengthening muscles, and enhancing birth preparedness. Further research with larger sample sizes and diverse populations is needed to confirm these results and explore the broader benefits of these exercises on other aspects of maternal health, including postpartum recovery and overall birth experience.

Ultimately, integrating pregnancy exercise education, such as Squatting Pose and Pelvic Rocking, into routine prenatal care could empower expectant mothers with the knowledge and tools to actively participate in their health and well-being, potentially leading to better birth outcomes and reducing the need for medical interventions during labor.

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Author Contributions

M.P.R & M.S.A., contributed in conceptualizing the research idea, developing the product. A.M & C.M.R., contributed in analyzing data and writing the article. E.O.S.R & K., contributed in writing, reviewing, and editing the article. M.I.M, S.L & S.L., contributed in collecting data.

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Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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