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Effectiveness of optimising fetal positioning and birthing ball on the incidence of perineal tears in labouring mothers

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Abstract

Background: Perineal tears are one of the complications that often occur in normal childbirth and can cause pain, bleeding, and impaired recovery of postpartum women. Factors that influence the incidence of perineal tears include fetal position, elasticity of perineal tissue, and technique of delivery. Optimising Fetal Positioning (OFP) and the use of Birthing Ball are non-pharmacological interventions that aim to help optimal fetal positioning and improve pelvic mobility during labour.

Purpose: This study aims to determine the effectiveness of Optimizing Fetal Positioning and Birthing Ball on the incidence of perineal tears in labouring women.

Method: The study used a quasi-experimental design with a relational empirical approach. The study sample was 40 normal labouring women who were divided into two groups, 20 intervention group respondents and 20 control group respondents. Data were collected through observation of intervention implementation and examination of perineal conditions after delivery. Data analysis used the Chi-Square test.

Results: The proportion of perineal tears in the intervention group was lower than the control group, but the statistical test results showed no statistically significant relationship ($p\text{-value} > 0.05$). Nevertheless, there was a tendency to decrease the incidence of perineal tears in mothers who received OFP and Birthing Ball interventions.

Conclusion: The combination of Optimising Fetal Positioning and Birthing Ball is not statistically effective in reducing the incidence of perineal tears, but has the potential to provide clinical benefits.

Suggestion: Future research is recommended to use a larger sample size and control for other confounding factors.

Keywords: Birthing Ball; Optimising Fetal Positioning; Perineal Tear.

INTRODUCTION

Perineal rupture/laceration is one of the most common complications of vaginal delivery and has the potential to cause postpartum pain, bleeding, impaired healing, and functional impacts such as sexual dysfunction or incontinence. According to the *World Health Organisation* (WHO), there are 2.7 million cases of perineal rupture in labouring women, and it is expected to reach 6.3 million by 2050. Most women who experience perineal rupture during childbirth, approximately 50-60% of these women require suturing, about 2% of 10,000 women each year. Perineal rupture can cause pain in the perineum

which can affect a woman's ability to mobilise and can lead to complications such as postpartum haemorrhage (Nurhidayah, Hardianti, & Thamrin, 2022).

Many studies have been conducted that aim to determine the factors that cause perineal rupture and efforts that can be made to prevent perineal rupture. The results of other research conducted showed that the factors that most influenced the incidence of perineal rupture were maternal age, parity, and birth spacing while the weight of the baby born and the act of delivery did not show a meaningful relationship

(Sari, (2023). According other research obtained the results that the most degree of perineal rupture is degree 1 and degree 2 and the least degree 3 in labouring women who do kegel exercise (Asiyah, Islami, & Nasriyah, 2021).

One common problem during labor is labor pain, which occurs during the first stage due to myometrial muscle contractions. Of 2,700 women giving birth, 15% experienced mild pain during labor, 35% experienced moderate pain, 30% experienced severe pain, and 20% experienced very severe pain during labor. Labor pain can cause stress, which leads to smooth muscle tension and vasoconstriction of blood vessels, resulting in uterine contractions, decreased uteroplacental circulation, and decreased blood and oxygen flow. One way to reduce labor complications is to help mothers cope with labor pain, especially during the active phase of the first stage (Citrawati, Widiatari, & Dewianti, 2024).

These findings reinforce the importance of monitoring the readiness of perineal tissue and the straining process during labour, especially in mothers with extreme age and primiparas (Sari, 2023). This condition is also corroborated by the conclusion entitled The effect of provocation cough in the fetal expulsion phase on the incidence of perineal laceration: that provocation cough in the fetal expulsion phase, was not proven to be able to prevent perineal laceration than led straining. Factors that can prevent perineal laceration are maternal factors, fetal factors, and labour factors (Asiyah et al., 2021)

Optimal fetal positioning (OFP) is the position and movement of the mother in the last weeks of pregnancy. This position affects the way the foetus moves and adjusting its optimal position can help to make birth easier for both mother and baby. In this position, the baby's head is easily 'flexed', i.e. his chin tucks into his chest, so the smallest part of his head will be applied to the cervix first. The use of a birthing ball can also encourage good positioning, both before and during labour (Aprillia, 2022). Another benefit of using a therapeutic birthing ball is that it can help the mother's position and mobility, widen the pelvic outlet, and increase gravity and movement that supports the lowering of the fetal head. This study was motivated by the need to accelerate the process of childbirth in Stage I and optimise the descent of the fetal head. The study concluded that the use of birth balls for

birthing mothers with active movements (pelvic rocking) has the potential to be an effective intervention to accelerate the descent of the fetal head and the duration of labour (Hendri & Jumiaty, 2024).

Although there were several studies that discuss optimising fetal positioning and several studies on the use of birthing balls, however, studies that specifically examine the effectiveness of these two methods on the incidence of perineal tears were limited. Therefore, this research examines the effectiveness of this combined intervention on the incidence and degree of perineal tears is expected to add insight into science, especially in the field of normal childbirth care, and contribute to the development of theories regarding the prevention of perineal tears through non-pharmacological interventions (trisananda, 2025).

Labor is a physiological process involving uterine contractions to enable the birth of a baby. One common problem during labor is prolonged labor, which can increase the risk of complications for both mother and fetus. Various natural methods can help speed up the labor process, one of which is the use of a birthing ball (Rambe, & Ningsih, 2024).

There are many methods for pain relief, both pharmacologically using analgesics and non-pharmacologically using herbal medicine, acupuncture, deep breathing techniques, relaxation techniques, and warm compresses (Pratiwi, Hadi, Sari, & Okinarum, 2021). Non-pharmacological pain management is a more effective, simple method that does not cause side effects. One non-pharmacological method for pain reduction is the birth ball. This non-pharmacological technique is simple and easy for anyone to perform, thus reducing labor pain (Nursafitri, 2022).

RESEARCH METHOD

This type of research is quasi experimental design with non-equivalent control group design. The research location was in the delivery room of RSUD R.A. Kartini Jepara. The research was conducted in December 2025 - January 2026, after obtaining ethical permission and research administration. The population in this study were all normal mothers who gave birth in the delivery room of RSUD R.A. Kartini Jepara as many as 84. Determination of the sample size using the comparative formula of two proportions

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into 40 maternity respondents who were divided into 20 maternity mothers in the intervention group (OFP + Birthing Ball) and 20 maternity mothers in the control group (without intervention). Samples involved had to fulfil the criteria a) Delivery mothers with full-term pregnancy (≥ 37 weeks), b) Vaginal

(normal) delivery, c) Single fetus with cephalic presentation, d) No medical indication for operative measures. Perineal tears were classified into grade 0 (no tear), grade I, grade II, grade III, and grade IV. Statistical test was chi square test.

RESEARCH RESULTS

Table 1. Results of univariate analysis at RA Kartini Jepara Hospital (n=40)

Variable	Results
Age (Mean$\pm$SD) (Years)	
<20	0/0
20-30	35/87.5
>35	5/12.5
Parity (n/%)	
Primipara	11/27.5
Multipara	29/72.5
Grandemultipara	0/0
Gestational Age (n/%)	
37-38	15/37.5
39-40	19/47.5
>41	6/15.0
Birth Weight (n/%)	
<2500 gr	3/7.5
2500-4000 gr	37/92.5
>4000 gr	0/0

Based on Table 1, the characteristics of the respondents, most of the birth mothers were aged 20-35 years, as many as 35 respondents (87.5%), while 5 respondents (12.5%) were > 35 years old. The majority of respondents were multiparous, namely 29 respondents (72.5%), while primiparous were 11 respondents (27.5%). Most respondents were at the gestational age of 39-40 weeks, namely 19 respondents (47.5%), and the least at the gestational age > 41 weeks, namely as many as 6 respondents (15.0%). Almost all babies were born with a body weight of 2500-4000 grams, namely 37 babies (92.5%), while babies with a body weight < 2500 grams were 3 babies (7.5%).

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Table 2. Incidence of Perineal Tears in Labouring Mothers (n=40)

Study group	Perineal Tear		P-value
	Yes	No	
Intervention	8/40.0	12/60.0	0.110
Control	13/65.0	7/35.0	

Table 2. Chi-Square test results, obtained p-value = 0.110. The p-value is greater than the α value (0.05), so statistically there is no significant relationship between the application of optimising fetal positioning and birthing ball with the incidence of perineal tears in labouring women. However, descriptively, the proportion of perineal tears in the intervention group (40%) was lower than the control group (65%). This indicates that the application of optimising fetal positioning and birthing ball has a tendency to reduce the incidence of perineal tears, but the difference has not shown statistical significance.

DISCUSSION

The results showed that there were 21 respondents (52.5%) who experienced perineal tears and 19 respondents (47.5%) did not experience perineal tears and the incidence of perineal tears was more in the group without intervention, namely 13 respondents (65%), and those who did not experience perineal tears were 7 respondents (35%) compared to the group given the intervention. who experienced perineal tears were 8 respondents (40%), and those who did not experience perineal tears were 12 respondents (60%). These results indicate that the incidence of perineal tears is still quite high in normal labour. This is in accordance with the theory which states that perineal tears are injuries to the perineal tissue due to excessive stretching during the birth of the baby's head (Prawirohardjo, 2014).

Maternal age is one of the factors that can influence the occurrence of perineal tears in labouring women. Maternity mothers aged 20-35 years physiologically have a more elastic perineal tissue condition and better adaptability during the delivery process, potentially reducing the risk of perineal tears. Conversely, at the age of more than 35 years, the elasticity of perineal tissue tends to decrease, which can increase the risk of perineal tears (Intiyaswati & Primiastuti, 2025). This theory is also in accordance with other research which states that the factors that most influence the incidence of perineal rupture include maternal age, parity, and distance of pregnancy. From the results of univariate analysis of this study showed that most respondents were in the age group of 20-35 years (87.5%), while mothers with

more than 35 years of age amounted to 12.5%, and no respondents were found with an age of less than 20 years (Sari, 2023).

Perineal rupture does not only focus on the size of the fetus, but also on the readiness of the perineal tissue and proper straining techniques through appropriate body position training. The study showed that mothers who have stronger pelvic floor muscles tend to have a lower risk of perineal tears (Sari, 2023; Asiyah et al., 2023).

Optimising fetal position can accelerate fetal head rotation and reduce the risk of perineal tears. The mother's active position during labour helps to increase the flexibility of the pelvic muscles and facilitate the delivery process (Rahmi, Lisa, & Andriani, 2023).

The use of a birthing ball, a non-pharmacological method, also helps mobilize the mother during labor. It can widen the pelvic birth canal, increase gravity, and help descend the fetal head. Previous research concluded that the use of a birthing ball has the potential to accelerate the descent of the fetal head and facilitate labor (Hendri & Jumiati, 2024). Other research also shows that the use of a birthing ball is effective in increasing labor progress, especially in mothers with normal reproductive conditions (Rasumawati, 2023).

However, when examining the frequency distribution, there was a clinically significant difference in proportion. The intervention group showed a perineal tear incidence rate of 40%, while the control group was 65%. This difference of 25% indicates a tendency that the application of OFP and

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Birthing Ball can help reduce the risk of perineal tears, although it has not reached the limit of statistical significance.

The strength of the relationship, which is classified as weak and insignificant, may be influenced by the relatively small sample size, so that the ability of *statistical* tests to detect differences is limited (*low statistical power*). In addition, other factors such as the elasticity of perineal tissue, labour attendant technique, baby's weight, and duration of the second stage may also affect the incidence of perineal tears.

When associated with the characteristics of respondents, most mothers are in the safe reproductive age range (20-35 years) and at term gestational age (37-40 weeks), which physiologically has a relatively good perineal tissue condition (Oktarina, 2022). In addition, the distribution of parity shows the presence of primiparas and multiparas, where primiparas theoretically have a higher risk of perineal tears because the perineal tissue has not been stretched before. These factors could potentially be confounding variables that influence the results of the study.

In this study, the distribution of infant weight in the intervention and control groups was relatively homogeneous and mostly in the normal category. This suggests that differences in the incidence of perineal tears between groups were not solely influenced by variations in infant weight. Nevertheless, some cases of tearing still occurred in infants with greater body weight, which confirms that mechanical factors still play a role as a confounding variable (Setiawati & Lase, 2022).

A study in Taiwan found that women who practiced birthing ball exercises experienced faster first-stage labor, lower analgesic use, and fewer Caesarean sections (CS). Results from birth ball use satisfaction studies showed that 84% of women experienced reduced contraction pain, 79% experienced reduced back pain, and 95% reported comfort when using the birth ball (Yuanita & Hartati, 2023).

According to the researchers, the high incidence of perineal tears occurs due to many factors such as large baby weight, larger than average fetal head circumference, rapid labour (*partus precipitatus*), and uncontrolled straining techniques. Therefore, the

intervention and control groups showed no significant difference.

CONCLUSION

In the intervention group that received a combination of Optimising Fetal Positioning (OFP) and Birthing Ball, the incidence of perineal tears occurred in 8 respondents (40%), while in the control group the incidence of perineal tears occurred in 13 respondents (65%). Although proportionally there was a decrease in the number of perineal tears in the intervention group, statistical test results showed that there was no significant relationship between the application of the intervention and the incidence of perineal tears, as indicated by a $p\text{-value} = 0.110$ ($p > 0.05$).

SUGGESTION

It is hoped that future researchers can develop research on the application of Optimising Fetal Positioning and the use of Birthing Ball with a larger sample size and a wider range of research sites. In addition, further research is expected to add other variables that can affect the incidence of perineal tears such as parity, baby weight, maternal age, and elasticity of perineal tissue.

REFERENCE

- Aprillia, Y. (2022). Helping Your Baby Find A Good Position For Birth.
- Asiyah, N., Islami, I., & Nasriyah, N. (2021). Pengaruh Batuk Provokasi Pada Fase Ekspulsi Janin Terhadap Kejadian Laserasi Perineum. *Indonesia Jurnal Kebidanan*, 4(2), 27.
- Citrawati, N. L. P., Widiyanti, K., & Dewianti, N. M. (2024). Pengaruh birthing ball terhadap nyeri persalinan kala I fase aktif di wilayah kerja UPTD Puskesmas I Denpasar Timur. *Jurnal Genta Kebidanan*, 13(2), 12-19.
- Hendri, N. A. W., & Jumiati, J. (2024). Pemanfaatan birth ball dalam kala satu persalinan untuk mempercepat penurunan kepala janin. *Jurnal Anestesi*, 2(3), 240-250.

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- Intiyaswati, I., & Primiastuti, D. (2025). Hubungan Berat Bayi Lahir Dengan Kejadian Rupture Perineum Pada Persalinan Normal Di TPMB Listiani Dwi Rahayu Driyorejo Gresik. *Jurnal Kebidanan*, 14(2), 1-6.
- Nurhidayah, E. S., Hardianti, L., & Thamrin, H. (2022). Asuhan Kebidanan Postpartum pada Ny. M dengan Nyeri Luka Jahitan Perineum. *Window of Midwifery Journal*, 52-60.
- Nursafitri, I. A. (2022). Pengaruh Pemberian Terapi Non Farmakologi terhadap Nyeri Persalinan. *Jurnal Kebidanan*, 12(1), 81-92.
- Oktarina, R. (2022). Hubungan Antara Paritas Dan Usia Ibu Terhadap Robekan Jalan Lahir Pada Ibu Bersalin di Bidan Praktek Mandiri. *Lentera Perawat*, 3(1), 3-8.
- Pratiwi, D., Hadi, S. I., Sari, N., & Okinarum, G. Y. (2021). Asuhan Kebidanan Komplementer dalam mengatasi nyeri persalinan.
- Prawirohardjo, S. (2014). *Ilmu kebidanan*. Jakarta: PT Bina Pustaka Sarwono Prawirohardjo, 982.
- Rahmi, L., Lisa, U. F., & Andriani, F. (2023). Analisis Perilaku Dan Upaya Bidan Dalam Optimalisasi Posisi Janin. *Jurnal Kesehatan Saintika Meditory*, 6(1), 451-455.
- Rambe, R. S., & Ningsih, R. (2024). Pengaruh Birth Ball Terhadap Lama Kala I Fase Aktif Pada Ibu Bersalin. *Jurnal Ilmu Kesehatan & Kebidanan Nusantara*, 1(4), 191-199.
- Rasumawati, R. (2023). Efektifitas Birthing Ball Terhadap Proses Persalinan Pada Ibu Bersalin Di Uptd Puskesmas Pamulang Tahun 2023. *Jurnal Ilmiah Bidan*, 7(2).
- Sari, R. J. (2023). Hubungan Penggunaan Teknik Hypnobirthing Dengan Kejadian Laserasi Perineum Pada Ibu Bersalin Normal. *Innovative: Journal Of Social Science Research*, 3(4), 1488-1499.
- Setiawati, I., & Lase, A. A. (2022). Hubungan Berat Badan Lahir Dengan Ruptur Perineum Persalinan Normal Di Puskesmas Sawo Kecamatan Sawo Kabupaten Nias Utara. *Jurnal Mutiara Kebidanan*, 8(2), 59-64.
- Trisnanda, C. P. (2025). *The Urgency of Research: How to Determine and Cotnoh*. Duniakampus.id.
- Yuanita, F., & Hartati, D. (2023). Pengaruh penggunaan birth ball terhadap intensitas nyeri kala I pada ibu bersalin primigravida di Klinik Kartika Jaya dan Klinik Ramlah Parjib I Kota Samarinda. *Nusantara Journal of Multidisciplinary Science* 1 (3).

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