

Effectiveness of Gym Ball Pelvic Rocking and Breathing Relaxation Techniques in Reducing Labor Pain During the Active Phase of the First Stage at Gandrungmangu II Health Center, Cilacap

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Abstract

Labor pain during the active phase of the first stage of labor is often intense and can lead to maternal exhaustion, stress, and prolonged delivery if not effectively managed. This study aimed to evaluate the effectiveness of pelvic rocking with gymball compared to breathing relaxation techniques in reducing labor pain intensity among mothers at Gandrungmangu II Health Center, Cilacap Regency. A quasi-experimental design with a two-group pretest-posttest method was employed. Forty laboring mothers were selected using purposive sampling and divided equally into two intervention groups. Pain intensity was measured using the Visual Analogue Scale (VAS) before and after the intervention. The pelvic rocking group performed exercises on a gymball, while the control group practiced breathing relaxation during contractions. The results showed a significant decrease in mean pain scores in both groups, with a more substantial reduction in the gymball group (from 8.30 to 3.10) compared to the breathing group (from 8.05 to 6.80). The p-value obtained was 0.000 ($p < 0.05$), indicating a statistically significant difference between the two methods. This study concludes that pelvic rocking with gymball is a more effective non-pharmacological technique for managing labor pain. It is recommended to integrate this method into standard intrapartum care in primary health facilities, supported by structured training and implementation protocols. Further research should explore its impact on labor duration, maternal satisfaction, and neonatal outcomes to enhance maternal health services.

INTRODUCTION

Maternal mortality remains a significant global health challenge, particularly in developing countries such as Indonesia. In recent years, the maternal mortality rate in Indonesia has shown an increasing trend. In 2022, there were 4,005 maternal deaths, which rose to 4,129 in 2023. According to the Maternal Perinatal Death Notification system from the Ministry of Health, Indonesia recorded an estimated maternal mortality ratio of 305 per 100,000 live births in early 2023 (Risksdas, 2019). This figure places Indonesia as the country with the second highest maternal mortality rate among ASEAN members. The national target for 2024 is to reduce this number to 183 per 100,000 live births, in line with the National Medium-Term Development Plan, and to reach fewer than 70 maternal deaths per 100,000 live births by 2030 as part of the Sustainable Development Goals (Manik et al., 2021).

Efforts to reduce maternal mortality involve improving the quality of maternal health services, particularly during labor. Central Java has achieved the national target, recording 183 maternal deaths per 100,000 live births. The percentage of deliveries assisted by skilled health workers in Indonesia has also increased, from 95.69 percent in 2023 to 96.81 percent in 2024. In Cilacap Regency, 100 percent of births in 2023 were assisted by qualified health professionals (Dhani, 2019). Despite this

progress, the management of labor pain, especially during the active phase of the first stage, remains a crucial concern that requires innovative nonpharmacological approaches.

Labor pain arises due to uterine contractions, cervical dilation, and pressure on surrounding pelvic structures (Sari et al., 2018). When unmanaged, it can lead to physical exhaustion, emotional stress, prolonged labor, and complications during delivery. One of the nonpharmacological techniques used to reduce labor pain is pelvic rocking using a gym ball. This technique involves rhythmic pelvic movements that help maintain an upright position, promote optimal fetal positioning, and enhance the opening of the pelvis. Sitting upright on a gym ball utilizes gravity to assist in the descent of the fetus and reduces the intensity of back pain during labor, providing additional comfort for the mother.

Another effective method in managing labor pain is breathing relaxation. This technique allows the mother to regulate her breathing pattern to reduce anxiety, increase oxygen supply, and activate the body's natural relaxation response. A study conducted by Septiani & Agustia (2021) found that deep breathing relaxation significantly reduces the intensity of labor pain and helps mothers remain calm and focused during contractions.

Previous studies have confirmed the effectiveness of both pelvic rocking with a gym ball and breathing relaxation techniques. For example, research conducted in Palu reported a significant reduction in labor pain intensity during the first stage of labor in mothers who practiced pelvic rocking using a birthing ball (Hidayanti et al., 2024). Similarly, breathing relaxation therapy was shown to decrease pain levels and emotional distress during childbirth. However, no study has yet compared the combined effectiveness of these two techniques in the context of Gandrungmangu II Health Center in Cilacap.

A preliminary observation conducted in November and December 2024 at Gandrungmangu II Health Center revealed that among 10 laboring mothers, 7 experienced moderate to severe pain during the active phase of the first stage, while only 3 experienced mild pain. These findings indicate the need for effective, practical interventions to help reduce labor pain and improve maternal comfort during childbirth. Based on this background, the purpose of this study is to evaluate the effectiveness of gym ball pelvic rocking and breathing relaxation techniques in reducing the intensity of labor pain during the active phase of the first stage at Gandrungmangu II Health Center, Cilacap.

METHOD

This study used a quantitative method, which refers to a systematic approach for collecting and analyzing numerical data to test hypotheses and examine relationships between variables (Sugiyono, 2019). The research applied a quasi-experimental design, specifically a Two Group Pretest Posttest Design. This type of design observes two groups before and after the intervention to assess its impact, although the participants are not selected randomly (Machali, 2021). The purpose of this study was to evaluate the effectiveness of two nonpharmacological interventions, meaning pain relief methods that do not involve the use of drugs, namely pelvic rocking using a gym ball and breathing relaxation techniques, in reducing labor pain during the active phase of the first stage of labor. The study was conducted at Gandrungmangu II Health Center in Cilacap Regency, from March to May 2025.

The study population consisted of all mothers in the active phase of the first stage of labor who gave birth at Gandrungmangu II Health Center. A population refers to the entire group of individuals who possess specific characteristics relevant to a research objective (Budiastuti & Bandur, 2018). Based on delivery records from October to December 2024, the total number of individuals in the population was 45. The sample size was determined using Slovin's formula, which is a statistical formula used to calculate sample size based on the desired margin of error. With a margin of error of five percent, the sample totaled 40 respondents. These were divided into two groups, with 20 participants in the experimental group who received pelvic rocking intervention, and 20 in the control group who were given breathing relaxation.

Sampling in this study was conducted using purposive sampling. This is a nonrandom technique in which participants are deliberately chosen based on certain characteristics required in the study. The inclusion criteria, meaning the conditions that participants must meet, included mothers in the active phase of the first stage of labor who were willing to participate, had no history of severe illness or pregnancy complications, and were experiencing labor pain. The exclusion criteria, or the conditions that disqualify a person from participating, included fetal malpresentation which refers to

abnormal positioning of the fetus, and any labor complications that could affect the process or safety of the intervention.

The independent variables in this study were pelvic rocking using a gym ball and breathing relaxation techniques. The dependent variable was the intensity of labor pain. Pain was assessed using the Visual Analogue Scale, which measures pain intensity on a scale from zero to ten. Pain levels were categorized as mild for scores from zero to three, moderate for scores from four to six, and severe for scores from seven to ten. Pretest pain scores were recorded before the intervention, and posttest scores were recorded after the intervention was completed.

The intervention for the experimental group involved performing pelvic rocking exercises on a gym ball for 45 minutes under the guidance of a midwife or support person. The control group practiced deep and slow breathing techniques during contractions for the same duration. Standard operating procedures were followed for both interventions to ensure consistency.

Data collection instruments included the Visual Analogue Scale, observation sheets for demographic data, and procedural checklists for each intervention. Pain intensity data were collected through direct observation and documented before and after the interventions.

Data analysis was performed using SPSS. Univariate analysis was used to describe the characteristics of participants and the distribution of labor pain levels. Bivariate analysis was used to test the effectiveness of the interventions. A normality test was conducted to determine the appropriate statistical test. If the data were normally distributed, an independent sample t test was applied. If the data were not normally distributed, the Mann Whitney U test was used. The significance level was set at p less than or equal to 0.05 to determine whether the differences between the two groups were statistically significant.

RESULTS AND DISCUSSION

This study aimed to examine the effectiveness of pelvic rocking with gymball and breathing relaxation techniques in reducing labor pain intensity during the active phase of the first stage of labor. Based on the results of the statistical analysis using the Independent Sample t-Test, a significant difference was found in pain intensity between the two intervention groups. The p -value obtained was 0.000 ($p < 0.05$), indicating that the null hypothesis is rejected and the alternative hypothesis is accepted. This means that there is a statistically significant difference in the reduction of labor pain intensity between the group receiving pelvic rocking with gymball and the group receiving breathing relaxation techniques.

More specifically, in the pelvic rocking with gymball group, the mean pain score before the intervention was 8.30 and decreased to 3.10 after the intervention. In contrast, the breathing relaxation technique group had a pretest mean of 8.05, which only decreased to 6.80 post-intervention. These results clearly demonstrate that pelvic rocking with gymball was more effective in reducing labor pain intensity during the active phase of the first stage of labor compared to breathing relaxation.

This finding is supported by the research of Ulfa, (2021), which stated that pelvic rocking using a birthing ball can close the pain gate, preventing pain signals from reaching the medulla spinalis and brain. The pressure exerted during the exercise also stimulates the release of endorphins, which inhibit pain transmission and result in a significant decrease in labor pain intensity.

Similarly, the quasi-experimental study by Anandita et al. (2023) revealed a significant effect of birthing ball therapy on pain reduction during the first stage of labor, with a p -value of 0.019. Their research emphasized that movements on the birthing ball promote cervical dilation and enhance uterine contractions, thereby facilitating labor and reducing pain.

Andarwulan et al. (2024) also found that pelvic rocking using a birthing ball helps regulate uterine contractions, improves cervical dilation, and assists in fetal descent. These mechanisms collectively contribute to reduced pain perception and a more positive birthing experience.

From the researcher's observation, pelvic rocking with gymball helped mothers adapt to labor discomfort and reduced the duration of the active phase. Several respondents who received the intervention reported increased comfort and expressed enthusiasm after understanding the technique. The psychological suggestion that the intervention would reduce pain also played a role in enhancing its effectiveness. Positive self-suggestion can induce relaxation and acceptance, which are crucial in managing labor pain (Kunang & Sulistianingsih, 2023).

In contrast, the breathing relaxation technique group also showed a reduction in pain, but to a lesser extent. Before the intervention, 75 percent of respondents experienced severe pain, which decreased slightly after the intervention. This supports the study by Septiani & Agustia (2021), which showed that deep breathing relaxation significantly reduced labor pain intensity during the active phase. Similarly, Susilawati et al. (2023) found a p-value of 0.000, confirming the effectiveness of deep breathing in labor pain reduction.

Breathing relaxation works by increasing oxygen intake, calming the nervous system, and stabilizing emotions, leading to a sense of calmness (Yelni, 2025). However, the magnitude of pain reduction is still lower compared to the pelvic rocking with gymball. Overall, this study confirms that both interventions have a positive effect, but pelvic rocking with gymball is significantly more effective in reducing labor pain during the active phase. These findings support the use of physical interventions that not only offer pain relief but also empower mothers during childbirth.

Future studies are recommended to explore other factors influencing labor pain such as maternal anxiety, environmental comfort, and support from health personnel or family, which may contribute to the overall effectiveness of the interventions.

In conclusion, pelvic rocking with gymball is a more effective non-pharmacological intervention than breathing relaxation techniques for reducing labor pain intensity. The physical movement combined with endorphin stimulation provides both physiological and psychological benefits, helping mothers undergo labor with greater comfort and confidence.

CONCLUSIONS AND RECOMMENDATIONS

This study concludes that pelvic rocking with gymball is significantly more effective than breathing relaxation techniques in reducing the intensity of labor pain during the active phase of the first stage of labor. The average pain score in the pelvic rocking group decreased from 8.30 to 3.10, while in the breathing relaxation group it only decreased from 8.05 to 6.80. The p-value obtained was 0.000 ($p < 0.05$), indicating a statistically significant difference between the two interventions. These findings support the use of pelvic rocking with gymball as a non-pharmacological approach to labor pain management.

Based on these results, it is recommended that pelvic rocking with gymball be implemented as part of standard care practices for laboring mothers, particularly in primary healthcare facilities such as community health centers. Midwives and birth attendants are encouraged to receive adequate training on this technique to improve its implementation. Future research is suggested to explore the effects of pelvic rocking on labor duration, maternal satisfaction, and neonatal outcomes. Additionally, combining pelvic rocking with other supportive techniques, such as partner support or aromatherapy, could be investigated to further enhance labor comfort.

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To enhance the implementation of non-pharmacological labor pain management, especially pelvic rocking with gymball, collaboration between healthcare providers and maternity care institutions should be strengthened. It is important to integrate evidence-based practices such as pelvic rocking into antenatal class curricula and routine intrapartum care protocols.

Establishing a continuous education system for midwives and healthcare workers regarding non-pharmacological interventions will improve both the quality and consistency of maternal care. Local health authorities are encouraged to support the dissemination of this method through training programs, materials, and clinical guidelines. Regular monitoring and evaluation should be conducted to assess the outcomes of such interventions and ensure sustainable maternal health improvements.

REFERENCES

- Anandita, M. Y. R., Anggraeni, L., & K, A. (2023). Effectiveness of The Combination Gym Ball and Peanut Ball Techniques on The Duration of Active Phase I Labor in Primigravida. *Jurnal Kebidanan*, 13(1), 71–77. <https://doi.org/10.31983/jkb.v13i1.9557>
- Andarwulan, S., Latifah, A., Qurrota'ayun, S., & Rihardtini, T. (2024). The Effect of Pelvic Rocking and Effleurage Massage on Labor Pain. *EMBRIO: Jurnal Kebidanan*, 16(2). <https://doi.org/10.33024/jkm.v10i7.11852>
- Budiastuti, D., & Bandur, A. (2018). Metode Penelitian Pendidikan Matematika. In *Metode Penelitian*

Pendidikan Matematika. Mitra Wacana Media.

- Dhani. (2019). Pelvic Rocking. *Convention Center Di Kota Tegal*, 9(1), 9.
- Hidayanti, Sariaty, & Suheti. (2024). Pengaruh Birth ball Terhadap Nyeri Persalinan di Praktik Mandiri Bidan Wilayah Bandung Raya. *Jurnal Penelitian Sains Dan Kesehatan Avicenna*, 3(3), 242–248.
- Kunang, A., & Sulistianingsih, A. (2023). *BUKU AJAR ASUHAN PERSALINAN DAN BAYI BARU LAHIR DENGAN EVIDANCE BASED MIDWIFERY*.
- Machali, I. (2021). Metode Penelitian Kuantitatif (Panduan Praktis Merencanakan, Melaksanakan dan Analisis dalam Penelitian Kuantitatif). In *Laboratorium Penelitian dan Pengembangan FARMAKA TROPIS Fakultas Farmasi Universitas Mualawarman, Samarinda, Kalimantan Timur* (Issue April). [https://digilib.uin-suka.ac.id/id/eprint/50344/1/Metode Penelitian Kuantitatif %28Panduan Praktis Merencanakan%2C Melaksa.pdf](https://digilib.uin-suka.ac.id/id/eprint/50344/1/Metode%20Penelitian%20Kuantitatif%20Panduan%20Praktis%20Merencanakan%2C%20Melaksa.pdf)
- Manik, H., Triyoga, R. S., Siregar, M. F. G., Rochadi, R. K., & Poddar, S. (2021). Sustainability in Transformation of Maternal Mortality by Interaction Based Approach in Dairi, Indonesia. *Journal of Public Health Research*, 10(2_suppl). <https://doi.org/10.4081/jphr.2021.2707>
- Riset Kesehatan Dasar (Riskesdas). (2019). Laporan Riskesdas 2018. In *Kementrian Kesehatan Republik Indonesia* (p. hal 156). [https://repository.badankebijakan.kemkes.go.id/id/eprint/3514/1/Laporan Riskesdas 2018 Nasional.pdf](https://repository.badankebijakan.kemkes.go.id/id/eprint/3514/1/Laporan%20Riskesdas%202018%20Nasional.pdf)
- Sari, D. P., Rufaida, Z., & Lestari, S. W. P. (2018). Nyeri persalinan. In E. D. Kartiningrum (Ed.), *Stikes Majapahit Mojokerto*. STIKes Majapahit Mojokerto Redaksi:
- Septiani, & Agustia. (2021). Pengaruh Teknik Relaksasi Napas Dalam Terhadap Penurunan Nyeri Persalinan Kala I Fase Aktif di PMB Desita, S.SIT Desa Pulo Ara Kecamatan Kota Juang Kabupaten Bireuen. *Journal of Healthcare Technology and Medicine*, 7(2), 975–984.
- Sugiyono. (2019). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. Alfabeta.
- Susilawati, Utari Kartaatmadja, F. S., & Suherman, R. (2023). Pengaruh Teknik Relaksasi Nafas Dalam Terhadap Intensitas Nyeri Pasien Post Partum Sectio Caesarea Di Ruang Rawat Nifas Rsud Sekarwangi Sukabumi. *Media Informasi*, 19(1), 13–19. <https://doi.org/10.37160/bmi.v19i1.53>
- Ulfa, R. M. (2021). Effect of the use of birth balls on the reduction of pain and duration of labor during the first stage of active and second stage of labor in primigravida maternity. *Science Midwifery*, 9(2), 418–430.
- Yelni, A. (2025). Pengaruh Teknik Relaksasi Nafas Dalam Terhadap Penurunan Nyeri Persalinan Kala I Fase Aktif di Klinik Alisah Tahun 2022. *Jurnal Multidisiplin Dehasen*, 4(1), 59–62.