

THE EFFECT OF PELVIC ROCKING BIRTHBALL AND COLD COMPRESS ON LABOR PROGRESS AND LABOR PAIN IN THE ACTIVE PHASE OF THE FIRST STAGE

Husna Maulida*, Eka Sutrisna, Arista Ardilla, Antika Sari, Merry Agustina

Universitas Bumi Persada

* Corresponding Author: husnamaulida88@gmail.com

ARTICLE INFO

Article history:

Received: July 02, 2026

Revised: July 18, 2026

Accepted: July 27, 2026

Available online: July 31, 2026

Kata Kunci:

Kemajuan Persalinan, Kompres Dingin, Nyeri Persalinan, Partus Lama, Pelvic Rocking Birthball

Keywords:

Cold Compress, Labor Pain, Labor Progress, Pelvic Rocking Birthball, Prolonged Labor

ABSTRAK

Penyebab Kematian ibu salah satunya adalah partus lama, yang disebabkan oleh kelainan kontraksi uterus sehingga memperpanjang waktu persalinan dan nyeri persalinan, sehingga dibutuhkan upaya pencegahan salah satunya melalui terapi *pelvic rocking birthball* dan kompres dingin. *Birthball* merupakan bola terapi fisik yang membantu kemajuan persalinan, sedangkan kompres dingin memiliki efek analgetik untuk mengurangi nyeri persalinan. Tujuan penelitian Pengaruh *Pelvic Rocking Birthball* dan Kompres dingin terhadap kemajuan persalinan dan nyeri persalinan kala I fase Aktif di TPMB Kecamatan Lhoksukon Kab. Aceh Utara. Metode Penelitian Quasy Eksperimental dengan desain Posttest only control group design.

Populasi ibu bersalin di TPMB M Kec. Lhoksukon dengan jumlah sampel 50 sampel yang terdiri dari 25 kelompok perlakuan dan 25 kelompok kontrol, teknik pengambilan sampel *consecutive sampling*. Instrument penelitian menggunakan partograf untuk kemajuan persalinan dan skala wajah (*Wong-Baker face Pain Rating Scale*), Analisa data menggunakan *Independent Samples T-Test*. Hasil penelitian menunjukkan bahwa ada pengaruh pemberian *Pelvic Rocking Birthball* dan Kompres dingin terhadap kemajuan persalinan (P Value 0,000) dan Nyeri Persalinan (P Value 0,000). Dimana rata-rata responden yang melakukan *pelvic Rocking Birthball* memiliki lama kala 1 fase aktif 5 jam 52 menit (cepat) dibandingkan kelompok non perlakuan. Sehingga membuktikan *pelvic rocking birthball* dan kompres dingin efektif dalam meningkatkan kemajuan persalinan dan menurunkan nyeri persalinan.

ABSTRACT

One of the causes of maternal death is prolonged labor, which is caused by abnormal uterine contractions that prolong labor time and labor pain, so that preventive efforts are needed, one of which is through *pelvic rocking birthball* therapy and cold compresses. *Birthball* is a physical therapy ball that helps the progress of labor, while cold compresses have an analgesic effect to reduce labor pain. The purpose of the study was the effect of *Pelvic Rocking Birthball* and Cold Compresses on labor progress and labor pain in the first stage of the active phase in TPMB, Lhoksukon District, North Aceh Regency. The research method was Quasy Experimental with a Posttest only control group design. The population of mothers giving birth in TPMB M, Lhoksukon District with a sample size of 50 samples consisting of 25 treatment groups and 25 control groups, consecutive sampling technique. The research instrument used a partograph for labor progress and a face scale (*Wong-Baker face Pain Rating Scale*), Data analysis used *Independent Samples T-Test*. The results showed that the administration of *Pelvic Rocking Birthballs* and cold compresses had an effect on labor progress (P-value 0.000) and labor pain (P-value 0.000). The average length of the first active phase of labor for respondents who used *Pelvic*

Rocking Birthballs was 5 hours and 52 minutes (faster) compared to the non-treatment group. This proves that pelvic rocking birthballs and cold compresses are effective in increasing labor progress and reducing labor pain.

*This is an open access article under the [CC BY-NC](#) license.
Copyright © 2026 by Author. Published by Universitas Bina Bangsa Getsempena*



INTRODUCTION

Labor and childbirth are normal physiological events; however, healthcare workers play a crucial role in monitoring the process and detecting complications—such as hemorrhage, eclampsia, and other issues—that contribute to maternal mortality in developing countries (Kurniawati, 2022). Prolonged labor is another factor that can lead to maternal and infant mortality; mothers experiencing prolonged labor face increased risks of hemorrhage due to uterine atony, birth canal lacerations, infection, exhaustion, and shock, while the fetus faces heightened risks of severe asphyxia, cerebral trauma, infection, and birth-related injuries (Wulandari Sri, 2019). According to the World Health Organization (WHO), maternal mortality rates were very high in 2017, with approximately 295,000 deaths occurring during pregnancy and childbirth. Africa and South Asia accounted for about 86% (254,000) of all maternal deaths (WHO, 2020). Globally, the direct causes of maternal mortality include hemorrhage, sepsis, hypertension, obstructed or prolonged labor, complications, unsafe abortion, and other factors (Lusy Pratiwi & Bunda, 2021). Data from the Indonesian Ministry of Health (2024) indicate an increase in maternal deaths in Indonesia, rising from 3,572 in 2022 to 4,482 in 2023 (Kemenkes, 2024). Similarly, the Maternal Mortality Ratio (MMR) in North Aceh has risen; the MMR stood at 173 per 100,000 live births in 2023, up from 106 per 100,000 live births in 2022 (Dinkes Utara, 2024). Meanwhile, according to 2019 Indonesian health profile data, it accounted for approximately 4.3% of maternal deaths in Indonesia (Ministry of Health, 2024).

Prolonged labor refers to an extended duration for the delivery of the products of conception, resulting from various underlying factors. Such labor can lead to adverse consequences for both the mother and the fetus. For the mother, risks include intrapartum infection, uterine rupture, fistula formation, and injury to the pelvic floor muscles. For the fetus, complications may include caput succedaneum, fetal head molding, and even asphyxia. Prolonged labor remains a common issue in Indonesia; one of the contributing factors is abnormal uterine contractions—whether inadequate or otherwise dysfunctional. This condition can cause various maternal symptoms, such as fatigue, restlessness, exhaustion, sweating, rapid breathing, discomfort, and anxiety (Prawirohadjo, 2010).

Fatigue can lead to complications during the first stage of labor; as labor drags on, the mother experiences increasing exhaustion, which hinders the progress of labor. Furthermore, uterine contractions during labor cause labor pain (Lusy Pratiwi & Bunda, 2021). This pain intensifies as contractions reach their peak and subsides once the uterus relaxes. Labor pain is a physiological process, though the intensity varies among individuals (Cunningham, 2012).

Pain arises from the mother's physical reflexes and psychological responses. Emotional tension – ranging from anxiety to fear – can exacerbate the perception of pain during labor. The pain experienced during labor can trigger fear, leading to anxiety that may escalate into panic. This can elicit physiological responses that impair the uterus's ability to contract effectively, thereby prolonging the duration of labor. Pain during the first stage of labor is severe and prolonged; therefore, effective pain management strategies for this stage are essential (Kurniawati, 2022). In addition, cold compresses are considered an effective non-pharmacological method for pain reduction. They work by restricting blood flow to a specific area and minimizing edema-related swelling; furthermore, they are believed to produce an analgesic effect by slowing nerve conduction velocity, thereby reducing the number of pain impulses reaching the brain. Various items can be used for cold compresses, such as rubber gloves filled with ice, towels soaked in ice water, and ice gel packs.

Several studies have demonstrated the efficacy of cold compresses in alleviating labor pain. Research by Widiawati et al. (2018) showed that the application of ice gel compresses influenced pain levels during the active phase of the first stage of labor, with a statistical p-value of 0.000 (< 0.05). Similarly, a study by Mardliyana et al. (2022) confirmed the impact of ice gel compresses on pain during the active phase of the first stage of labor, suggesting that this method serves as a viable alternative for pain management during this stage.

A survey conducted at Independent Midwifery Practice (TPMB) M revealed that 65% of the 30 women in labor experienced prolonged labor and required delivery via Cesarean section. Based on this background, the author is interested in conducting a study titled "The Effect of Pelvic Rocking with a Birth Ball and Cold Compresses on Reducing Labor Pain During the Active Phase of the First Stage of Labor at TPMB M, Lhoksukon District, North Aceh Regency, in 2025."

RESEARCH METHODS

This study employed a quasi-experimental method with a post-test-only control group design. It was conducted at Independent Midwifery Practice (TPMB) M in Lhoksukon District, North Aceh Regency, between September and December 2025. The study population consisted of women in labor at the facility, with a sample of 50 respondents divided into two groups: an intervention group (n=25) and a control group (n=25). The intervention group received pelvic rocking exercises using a birth ball and cold compresses, while the control group received standard deep-breathing therapy. Consecutive sampling was used based on inclusion criteria. A partograph was used to monitor the progress of labor, while labor pain intensity was measured using the Wong-Baker Faces Pain Rating Scale by observing the patients' facial expressions. Data analysis was performed using the Independent Sample t-test.

RESULTS AND DISCUSSION

Table 1. Frequency Distribution of the Duration of the Active Phase of the First Stage of Labor among Women in the Active Phase of the First Stage of Labor

Group	n	Mean	Std. Deviation	Std Error Mean
Treatment	25	5,52	1,262	9,85
Control	25	7,36	1,150	9,92

Based on Table 1, it can be seen that the treatment group performing pelvic rocking with a birthball had an average active phase duration of the first stage of labor of 5 hours and 52 minutes, whereas the control group receiving standard deep-breathing relaxation therapy had an average active phase duration of the first stage of labor of 7 hours and 36 minutes.

Table 2. Frequency Distribution of Labor Pain in Women in the Active Phase of the First Stage of Labor

Group	n	Mean	Std. Deviation	Std Error Mean
Treatment	25	5,36	1,411	0,282
Control	25	7,48	1,085	0,217

Based on Table 2, it can be seen that the treatment group performing pelvic rocking with a birth ball had an average pain scale of 5.36, whereas the control group receiving standard deep-breathing relaxation therapy had an average pain scale of 7.48.

Table 3. Normality Test for Labor Progress and Labor Pain in Women in the

Active Phase of the First Stage of Labor		
Group	Kolmogrov Smirnov	Information
Duration of Labor	0,239	Normal
Pain Intensity	0,165	Normal

Based on Table 3, the data normality test for the labor duration category yielded a value of 0.239 on the Kolmogorov-Smirnov test, while the group measured for labor pain intensity showed a value of 0.165 ($p > 0.05$). It can therefore be concluded that the data in each category are normally distributed, allowing for further analysis using the independent samples t-test.

Table 4. Effect of Pelvic Rocking with a Birth Ball on Labor Progress in Women in the Active Phase of the First Stage of Labor

Tui Na Massage	n	Mean	Std.Dev	P-value
Treatment Group	25	5,52	1,262	0,000
Control Group	25	7,36	1,150	

Based on Table 4, it is evident that respondents who underwent pelvic rocking with a birth ball and cold compresses ($n=25$) experienced an average labor progression time of 5 hours and 52 minutes, whereas respondents in the control group—who received standard deep-breathing relaxation therapy—experienced a labor progression time of 7 hours and 36 minutes. Analysis using an independent samples t-test yielded a p-value of 0.000 (< 0.05), indicating that the use of pelvic rocking with a birth ball and cold compresses is effective in enhancing labor progression among women in the active phase of the first stage of labor at TPMB M in Lhoksukon District, North Aceh Regency.

Table 5. Effect of Pelvic Rocking with a Birth Ball on Labor Pain in Women in the Active Phase of the First Stage of Labor

Tui Na Massage	n	Mean	Std.Dev	P-value
Treatment Group	25	5,36	1,411	0,000
Control Group	25	7,48	1,085	

Table 5 shows that the mean difference in pain scale scores for the treatment group was 5.36 (SD = 1.411), whereas for the control group, the mean difference was 7.48 (SD = 1.085). The p-value was 0.000 ($p < 0.05$), indicating a significant difference between the two groups. Thus, the implementation of pelvic rocking with a birth ball and cold compresses proved effective in reducing labor pain during the active phase of the first stage of labor at TPMB M, Lhoksukon District, North Aceh Regency.

The Effect of Birth Ball Pelvic Rocking and Cold Compresses on the Progress of Labor during the Active Phase of the First Stage

The study results indicate that pelvic rocking with a birth ball and cold compresses influence the progression of labor during the active phase of the first stage. The treatment group—respondents who performed pelvic rocking with a birth ball and used cold compresses—had an average active-phase duration of 5 hours and 52 minutes, whereas the control group—respondents receiving standard deep-breathing relaxation therapy—had a duration of 7 hours and 36 minutes. This demonstrates that pelvic rocking with a birth ball and cold compresses significantly shortens the duration of the active phase of the first stage of labor, indicating that this intervention is effective in enhancing labor progression during this phase.

Using a birth ball for pelvic rocking accelerates cervical dilation through several mechanisms. The rocking motion and sitting on the ball induce rhythmic pelvic movement, which increases the flexibility of pelvic ligaments, widens the pelvic diameter, and—aided by gravity—facilitates the descent of the fetal presenting part toward the pelvic floor. These conditions promote more effective uterine contractions, thereby accelerating cervical dilation. Beyond the mechanical effects, sitting on the ball helps the mother feel more relaxed and reduces pain, allowing mothers who might otherwise be tense to lower their stress response. A reduction in stress hormones, such as adrenaline, enhances the release of endogenous oxytocin, which in turn strengthens uterine contractions. Internal factors influencing the technique's effectiveness include the mother's physical and mental condition, education level, and knowledge regarding the labor process, while external factors—such as support from a partner and medical personnel—also play a crucial role.

These findings align with research by Taqiyah et al. (2024), which showed that pelvic rocking with a birth ball influences labor progression, resulting in a progression rate that was, on average, 138.2 minutes faster compared to cases where the therapy was not administered. Pelvic rocking using a birth ball is a method to increase the size of the pelvic cavity by rocking the pelvis on the ball and gently swaying the hips—moving them forward and backward, side to side, and in a circular motion (Rizki & Anggraini, 2020). Sitting and rocking on the ball provides comfort and aids labor progression by utilizing gravity; furthermore, it boosts endorphin release because the ball's elasticity and curvature stimulate pelvic receptors responsible for endorphin secretion (Dasiana Marawita et al., 2024).

This is supported by research from Wahyuni (2021) regarding the effect of pelvic rocking with a birth ball on labor progression among women giving birth at the Titiek

Midwifery Clinic. The results showed that the birth ball group had an average labor progression value of 143, whereas the non-treatment group had an average progression time of 281 minutes; this indicates a significant effect of pelvic rocking with a birth ball on labor progression (Wahyuni, 2021). The study is also supported by Rizki and Anggraini (2020), who stated that there is a relationship between pelvic rocking with a birth ball and labor progression—specifically regarding the shortening of contraction intervals and the increase in the duration and frequency of uterine contractions, cervical dilation, and fetal head descent.

According to the theory proposed by Antia (2020), the first stage of labor varies for every mother. The more relaxed a mother feels and the more she moves, the shorter the time required to reach full dilation (Antia, 2020). Changing positions every thirty minutes to two hours greatly assists the labor process. Mothers can squat or use a birth ball to lean against and rock their pelvis; with the ball placed on the bed, a mother can stand and lean comfortably upon it, pushing and swaying her pelvis to facilitate mobility. Alternatively, with the ball on the floor, she can kneel and lean forward, resting her body weight on the ball while moving and pushing her pelvis; this helps the baby shift into the correct position (occiput-posterior), thereby potentially accelerating the progress of labor (Armini and Yunitasari, 2026).

The Effect of Pelvic Rocking on a Birth Ball and Cold Compresses on Labor Pain During the Active Phase of the First Stage of Labor

The study results indicate that the mean pain scale score in the treatment group was 5.36, while in the control group, it was 7.48. This demonstrates that the mean pain scale score in the treatment group was lower than that of the control group. Statistical analysis yielded a p-value of 0.000 ($p < 0.05$), signifying that the use of pelvic rocking with a birth ball and cold compresses had an effect on reducing labor pain during the active phase of the first stage of labor.

These findings align with the study by Marsilia et al. (2025), which demonstrated the impact of birth ball techniques on pain levels in women during the first stage of labor at TPMB Y in West Cikarang District. The mechanism of pain reduction is explained through the stimulation of sensory receptors in the pelvis, which triggers the release of endorphins, thereby suppressing pain transmission and promoting relaxation (Marsilia et al., 2025).

Pelvic rocking with a birth ball alleviates labor pain by enhancing pelvic flexibility, mobility, and fetal positioning; simultaneously, it improves the woman's psychosocial

well-being and reduces the need for interventions during the birthing process (Raidanti, 2021). Furthermore, it engages endogenous mechanisms and distracts the mother's attention, acting upon the sensory-discriminative and nervous system components of pain; it provides comfort to the spinal region and facilitates the stretching and flexing of the spine and joints (Noviyanti et al., 2020). Additionally, the application of cold compresses absorbs heat from the localized area of labor pain, resulting in a temperature drop. Cold compresses provide therapeutic skin stimulation; this stimulation transmits impulses from the periphery to the hypothalamus, which then processes them as normal body temperature sensations (Potter, Perry, & Stockert, 2016). Cold compresses can block pain transmission, preventing the cerebral cortex from receiving pain signals because the cold stimulus reaches the brain first, effectively blocking the pain (Mander, 2012). This study aligns with research by Mardliyana et al. (2022), which demonstrated the impact of cold compresses on labor pain; specifically, women who received cold compresses were six times more likely to experience moderate pain compared to those who did not. Additionally, a study by Heni S. et al. (2023) examined the effects of ice massage and acupressure on labor pain and prolonged labor; both interventions were found to reduce labor pain and shorten the duration of the first and second stages of labor. Based on the researcher's assessment, the use of a birth ball for pelvic rocking and the application of cold compresses are highly beneficial for alleviating labor pain during the first stage. Therefore, birth ball pelvic rocking can be offered to women in labor to ensure "mother-friendly care" and enhance the mother's comfort.

CONCLUSIONS AND RECOMMENDATIONS

The study results indicate that pelvic rocking using a birth ball influences the progression of labor ($p\text{-value} = 0.000$; $p < 0.05$) and labor pain during the active phase of the first stage of labor ($p\text{-value} = 0.000$; $p < 0.05$). Mothers who performed pelvic rocking on a birth ball had an average active phase duration of 5 hours and 52 minutes, whereas the non-treatment group averaged 7 hours and 36 minutes. Additionally, the average pain scale score was 5.36 in the treatment group compared to 7.48 in the control group. Thus, the use of pelvic rocking with a birth ball and cold compresses proved effective in reducing labor pain during the active phase of the first stage of labor at TPMB M in Lhoksukon District, North Aceh Regency.

REFERENCES

- Antia. (2020). *Modul terapi komplementer: Modul sesi 4 pengobatan tradisional Tionghoa*.
- Cunningham. (2012). *Obstetri Williams* (Vol. 1, Edisi ke-23).
- Kurniawati, et al. (2022). Efektivitas latihan birth ball terhadap penurunan nyeri persalinan kala I fase aktif pada primigravida: Effectiveness of birth ball exercise to decrease labor pain in the active phase of the first stage of labor on the primigravida women. *Jurnal Kebidanan*, 5, 2-3. <http://ejournal.almaata.ac.id/index.php/JNKI>
- Lushinta, L., Suryani, H., & P. R. A. (2023). [Judul artikel tidak tersedia dalam data sumber]. 14(2), 55-61. <https://stikesmus.ac.id/jurnal/index.php/JKebIn/index>
- Mander. (2012). *Nyeri persalinan*. EGC.
- Marawita, D., Soraya, D., & Putri, D. (2024). Pengaruh penggunaan birth ball terhadap penurunan nyeri persalinan kala I fase aktif pada primigravida di Puskesmas Ngesrep Semarang. *Midwifery Science Care Journal*, 3(1), 24-32. <https://doi.org/10.63520/mscj.v3i1.650>
- Mardliyana, N. E., Raden, A., & Hani, U. (2022). Pengaruh pemberian kompres ice gel terhadap nyeri persalinan kala I fase aktif di bidan praktik mandiri wilayah Kota Surabaya. *Naskah Publikasi*, 1-20.
- Marsilia, I. D., Herawati, Y., & Haerunisa, Y. (2025). Pengaruh birth ball exercise terhadap skala nyeri pada ibu bersalin kala I. *Jurnal Akademika Baiturrahim Jambi*, 14(2), 299-306. <https://doi.org/10.36565/jab.v14i2.934>
- Ministry of Health of the Republic of Indonesia. (2024). *Profil kesehatan Indonesia 2024*.
- Noviyanti, N., Nurdahlia, N., Munadya, F., & Gustiana, G. (2020). Kebidanan komplementer: Pengurangan nyeri persalinan dengan latihan birth ball. *Holistik Jurnal Kesehatan*, 14(2), 226-231. <https://doi.org/10.33024/hjk.v14i2.2876>
- Potter, H., Perry, A., & Stockert, P. (2016). *Fundamentals of nursing*.
- Prawirohardjo, S. (2010). *Ilmu kebidanan*.
- Raidanti, M. (2021). *Birthing ball*.
- Rizki, L. K., & Anggraini, F. D. (2020). Efektivitas pelvic rocking exercise terhadap kemajuan persalinan dan kejadian robekan perineum. *Midwifery Journal: Jurnal Kebidanan UM. Mataram*, 5(1), 9. <https://doi.org/10.31764/mj.v5i1.1083>
- Taqiyah, Y., Masnilawati, A., Nabila, N., & Diana, D. (2024). Pengaruh pelvic rocking birth ball terhadap kemajuan persalinan kala I fase laten pada ibu inpartu. *Bina Generasi: Jurnal Kesehatan*, 15(2), 34-40. <https://doi.org/10.35907/bgjk.v15i2.313>
- Utara, D. A. (2024). *Dinas Kesehatan Aceh Utara*.
- Wahyuni, R. F. R. (2021). Efektivitas pemberian metode birth ball terhadap intensitas nyeri persalinan kala I fase aktif di BPM Rokan Hulu. *Maternity and Neonatal: Jurnal Kebidanan*, 9(1), 44-54. <https://journal.upp.ac.id/index.php/jmn/article/view/1035/607>
- Widiawati, I., Legiati, T., Khoirunnisa, F. N., Nurdiantini, I., Prastiwi, S., & Nurmaningsari. (2018). Mengenal nyeri persalinan pada primipara dan multipara. *Jurnal Bimtas: Jurnal Kebidanan Universitas Muhammadiyah Tasikmalaya*, 2(1), 43-48.

- World Health Organization. (2020). *World health statistics 2021: Monitoring health for the SDGs, sustainable development goals*.
<https://www.who.int/publications/i/item/9789240027053>
- Wulandari Sri, R. R. C. L. W. (2019). Efektivitas pelvic rocking exercise pada ibu bersalin kala I terhadap kemajuan dan lama persalinan. *Intan Husada: Jurnal Ilmiah Keperawatan*, 7(1), 67–78. <https://akperinsada.ac.id/e-jurnal/index.php/insada/article/view/139/68>