

## THE RAPID PROGRESS OF THE ACTIVE PHASE OF THE FIRST STAGE OF LABOR IN PRIMIGRAVIDA MOTHERS WITH BIRTHBALL THERAPY

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### ABSTRACT

A birthball is a labor ball that can be used by women during the first stage of labor to help facilitate labor progress. Birthball therapy can stimulate cervical dilatation and widen the pelvic outlet. Sitting upright on the ball allows gravity to assist the fetus or the presenting part in descending into the pelvis more quickly. The purpose of this study was to determine the effect of birthball therapy on the progress of the active phase of the first stage of labor in primigravida mothers. This study used a quasi-experimental method with a purposive sampling technique. The sample consisted of 10 laboring mothers who were divided into two groups: the intervention group, consisting of 5 mothers who received birthball therapy, and the control group, consisting of 5 mothers who performed light walking exercises. Data were analyzed using univariate and bivariate analysis methods. The results showed that the average duration of labor progress in the intervention group was 6 hours and 14 minutes, while the control group had an average duration of 8 hours and 16 minutes. The average difference between the intervention and control groups was 2 hours and 2 minutes. Statistical analysis showed a p-value of 0.026 ( $p < 0.05$ ), indicating a significant effect of birthball therapy on labor progress. In conclusion, birthball therapy is effective in accelerating the progress of the active phase of the first stage of labor in primigravida mothers. The use of a birthball can help facilitate fetal descent, improve maternal comfort, and support a more optimal labor process. Therefore, birthball therapy can be considered as a non-pharmacological intervention in maternity care.

Keywords: Birthball, First Stage of Labor, Labor Progress, Primigravida

### ABSTRAK : KEMAJUAN YANG CEPAT PADA PERSALINAN KALA I FASE AKTIF IBU PRIMIGRAVIDA DENGAN PEMBERIAN TERAPI BIRTHBALL

Birthball memiliki arti bola lahir yang dapat digunakan pada ibu inpartu kala I ke posisi yang biasa membantu kemajuan persalinan. Birthball dapat merangsang dilatasi dan memperlebar outlet panggul. Duduk lurus di atas bola maka gaya gravitasi bumi akan membantu janin atau bagian terendah janin untuk segera turun ke panggul. Tujuan penelitian ini yaitu untuk mengetahui pengaruh terapi birthball terhadap kemajuan persalinan kala I fase aktif pada ibu primigravida. Penelitian ini menggunakan Metode Quasy Eksperiment dengan teknik purposive sampling. Sample sebanyak 10 orang ibu bersalin, dimana sampel dibagi menjadi 2 kelompok, kelompok intervensi melakukan terapi birthball sebanyak 5 orang dan pada kelompok kontrol dengan berjalan ringan sebanyak 5 orang. Analisa Data secara Univariat Dan Bivariat. Hasil penelitian didapatkan bahwa rata-rata kemajuan persalinan pada kelompok yang diberi perlakuan yaitudengan nilai mean 6 jam 14 menit. dengan nilai mean difference 2.02000 dan CI 0.31769. Sedangkan pada responden yang tidak diberikan perlakuan (kontrol) yaitu 8 jam 16 menit dengan nilai mean difference 2.02000 dan CI 3.90533. Rata-rata perbedaan pada kelompok perlakuan dan kelompok kontrol adala 2 jam 02 menit. Hasil uji menunjukkan nilai  $p = 0,026$  ( $p < 0,05$ ). Kesimpulan dari hasil penelitian ini adalah Terapi birthball efektif membantu mempercepat kemajuan persalinan kala I fase aktif pada ibu primigravida. Penggunaan birthball dapat membantu memperlancar penurunan janin, meningkatkan kenyamanan ibu, serta mendukung proses persalinan menjadi lebih optimal. Oleh karena itu, terapi birthball dapat dijadikan salah satu intervensi nonfarmakologis dalam asuhan persalinan.

Kata Kunci: Birthball, Kala I, Kemajuan Persalinan, Primigravida

### INTRODUCTION

Childbirth is the birth of a baby, placenta, and amniotic membranes from the uterus to the outside world. Normal labor occurs at full term

without complications. Labor begins when the uterus contracts, causing changes in the cervix (opening and thinning), and ends with the complete delivery of the placenta (Novitasari et al. 2023).

According to the World Health Organization (WHO) in 2018, the maternal mortality rate (MMR) was 15% due to maternal complications during pregnancy and childbirth, and 85% were normal. Approximately 75% of maternal deaths were caused by severe bleeding, postpartum infections, preeclampsia or eclampsia, prolonged labor, and unsafe abortion. Most complications are unpredictable, requiring 24-hour, high-quality service readiness so that all pregnant or laboring women experiencing complications at any time have access to quality emergency services quickly. Because some complications require emergency services within hours (WHO 2023).

In primigravidas, the first stage of labor lasts longer than in multigravidas due to differences in the cervical dilation process. Primigravidas will experience complete cervical effacement upon entering labor, after which dilation begins. In multigravidas, cervical effacement and dilation occur simultaneously, as the uterus becomes more active (Solichatin and Waroh 2024). The mother will experience discomfort and pain as labor progresses. The longer the first and second stages, the greater the risk of fetal death, necessitating immediate labor, either induction or cesarean section (Dirgahayu, Rustikayanti, and Ilmiya 2022).

Several physiological measures can be taken to accelerate and facilitate cervical dilation, such as walking frequently, emptying the bladder, sitting on a birth ball, stimulating the nipples, engaging in sexual intercourse, relaxing, and consuming fruits that stimulate cervical dilation. One method to prevent prolonged labor is the birth ball method, as sitting on a birth ball stimulates postural reflexes and maintains good spinal posture, thereby facilitating fetal head descent and reducing the duration of the first stage (Paninsari 2021).

According to the theory proposed by Simkin in the book *Pregnancy, Childbirth, and the Newborn*, the use of a birthball during labor can help improve maternal comfort, optimize fetal positioning, and utilize gravity to facilitate fetal descent into the pelvis. Pelvic movements performed while sitting on the birthball also help relax the pelvic muscles and promote cervical dilatation, thereby supporting a more optimal labor progression (Raidanti and Mujianti 2021).

In addition, the theory presented by Varney in *Varney's Midwifery* explains that upright positions and active maternal mobility during labor can increase the effectiveness of uterine contractions, widen the pelvic diameter, and accelerate the active phase of the first stage of labor. Birthball therapy is considered one of the non-pharmacological

methods that supports these physiological mechanisms (Hardjanti 2024).

Furthermore, according to Dick-Read in the theory of natural childbirth, maternal relaxation during labor plays an important role in reducing fear and tension, which may inhibit uterine contractions. The use of a birthball can help mothers feel more relaxed and comfortable, thereby decreasing stress hormone levels such as catecholamines and supporting more effective uterine contractions (Wulan et al. 2023).

Moreover, Zwelling explains that maternal movement and position changes during labor contribute to improved blood circulation, increased oxygen supply to the uterus, and enhanced fetal descent. Therefore, birthball therapy can physiologically support labor progress and reduce the risk of prolonged labor in primigravida mothers (LESTARI 2024).

This research is in line with the research conducted by Dewi Aprilia Ningsih, Suhita Tri Oklaini with the title "The Effect of Birthing Ball on the Length of First Stage of Labor" the results of the study on 36 respondents were obtained from 18 respondents who were given birthing ball treatment, the average length of first stage of labor was 5 hours 34 minutes and the fastest time was 4 hours 05 minutes and the longest time was 7 hours 10 minutes. From 18 respondents in the control group, the average length of first stage of labor was 6 hours 40 minutes and the fastest time was 4 hours 30 minutes and the longest time was 8 hours 15 minutes. There is a significant effect of birthing ball on the length of first stage of labor in mothers (Yanti and Fatmasari 2023).

Research on birthball therapy during labor has been widely conducted; however, most previous studies have primarily focused on reducing labor pain and shortening the duration of labor in general. In addition, studies specifically examining the effect of birthball therapy on the progress of the active phase of the first stage of labor among primigravida mothers are still limited, particularly in independent midwifery practices or primary healthcare settings in the Simalungun Regency area.

The novelty of this study lies in its specific focus on analyzing the effect of birthball therapy on the progress of the active phase of the first stage of labor in primigravida mothers at Sabar Midwifery Practice, Bandar Huluan District, Simalungun Regency. This study also emphasizes the use of a simple, safe, and easily applicable non-pharmacological intervention in midwifery care to

help accelerate the labor process in primigravida mothers.

Based on an initial survey conducted at the Sabar Midwifery Practice in May 2025, there were eight primigravida mothers in labor who had normal deliveries. Of the eight primigravida mothers who had normal deliveries, three stated that this was their first delivery. The mothers expressed worry and anxiety about their current delivery process. They reported experiencing discomfort while waiting for full dilation. Based on the background described above, the researcher was interested and motivated to further explore whether there was any. The Effect of Birthballs on the Progress of First Stage Labor in Women Giving Birth at the Sabar Midwifery Practice, Bandar Hulan District, Simalungun Regency, 2025.

The purpose of this study was to analyze the effect of birthball therapy on the progress of the active phase of the first stage of labor in primigravida mothers by comparing the duration of labor progress between mothers who received birthball therapy and those who did not receive birthball therapy at Sabar Midwifery Practice, Bandar Hulan District, Simalungun Regency, in 2025.

## RESEARCH METHODS

This study used a Quasi-Experimental method with a Two Group Posttest Design, involving two groups consisting of an intervention group and a control group to determine the effect of birthball therapy on the progress of the active phase of the first stage of labor in primigravida mothers. In the intervention group, respondents received birthball therapy by sitting upright on the ball and performing slow pelvic rocking movements forward, backward, and in circular motions. The therapy was conducted for approximately 30 minutes during the active phase of labor and could be repeated according to the mother's condition and comfort throughout the labor process. Meanwhile, respondents in the control group were only encouraged to perform light walking activities in the room according to the standard procedures commonly applied at the practice setting.

This study aimed to determine the effect of birthball therapy on the progress of the active phase of the first stage of labor in primigravida mothers at Sabar Midwifery Practice, Bandar Hulan District, Simalungun Regency, in 2025. The study was conducted from May to August 2025, including the

stages of title submission, literature review, preliminary survey, proposal preparation, data collection, and preparation of the final research report. Therefore, the year of the study should consistently be written as 2025 throughout all sections of the research to avoid inconsistencies in the research data.

The population in this study consisted of all primigravida mothers who underwent normal labor at Sabar Midwifery Practice, Bandar Hulan District, in 2023, with a total population of 10 respondents. The sampling technique used was purposive sampling, which is a sampling technique based on specific criteria determined by the researcher according to the objectives of the study. The research sample consisted of 10 respondents divided into two groups: 5 respondents in the intervention group and 5 respondents in the control group (Setyawanto 2017).

The inclusion criteria in this study included primigravida mothers entering the active phase of the first stage of labor, full-term pregnancy, normal maternal and fetal conditions, willingness to participate as respondents, and the ability to follow the research procedures. Meanwhile, the exclusion criteria included mothers with obstetric complications such as preeclampsia, hemorrhage, premature rupture of membranes, fetal distress, or other conditions that could affect the labor process.

Before conducting data analysis using the Independent T-Test, a normality test was first performed to determine the distribution of the research data. The results of the normality test in the intervention group were 0.977, while in the non-intervention group the result was 0.165. These findings indicated that the data were normally distributed and therefore met the assumptions required for the use of the Independent T-Test to analyze differences in labor progress between the intervention and control groups.

The relatively small sample size was one of the limitations of this study because it could affect the statistical power and the generalizability of the findings to a broader population. Nevertheless, this study is expected to provide preliminary evidence regarding the effectiveness of birthball therapy as a safe, simple, and easily applicable non-pharmacological intervention to help accelerate the progress of the active phase of the first stage of labor in primigravida mothers.

RESEARCH RESULTS

Tabel 1

Respondent Characteristics	Treatment Group		Control Group	
	Frekuensi	Persentase	Frekuensi	Persentase
Age				
< 20 Age	2	40	2	40
20 - 35 Age	3	60	3	60
> 35 Age	0	0	0	0
Education				
Junior high school	2	40	1	20
Senior High School	2	40	3	60
College	1	20	1	20

Based on the table above, it can be seen that there were 5 laboring mothers in the intervention group and 5 laboring mothers in the control group. Respondents aged 20–25 years accounted for 3 people (60%) in both the intervention and control groups. In the intervention group, the majority of respondents had a senior high school and junior high school educational background, with 2 respondents (40%) each. Meanwhile, in the control group, the majority of respondents had a senior high school educational background, accounting for 3 respondents (60%).

**Average Length of the First Active Phase in Primigravida Women Between the Intervention and Control Groups at the Sabar Midwife Practice in Bandar Huluan District, Simalungun Regency, 2025**

Based on the results of the homogeneity test using Levene’s Test, the significance value (p-value) was 0.661 (>0.05). Therefore, it can be concluded that the data variances in the intervention group and the control group were homogeneous. Thus, the data met the assumptions required for conducting the Independent T-Test.

Tabel 2

Treatment	N	Mean	Std. Deviation	Std. Error Mean	Mean Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Labor Progress							
Treatment Group	5	6.1400	.58138	.26000	-2.02000	-3.72231	-.31769
Control Group	5	8.1600	1.54491	.69091	-2.02000	-3.90533	-.13467

Based on the table above, the average labor progress in the treatment group was 6 hours and 14 minutes. Meanwhile, in the untreated (control) group, it was 8 hours and 16 minutes. The average difference between the treatment and control groups was 2 hours and 02 minutes. The average difference between the intervention and control groups was 2 hours and 2 minutes.

The test results showed a p value = 0.026 (p < 0.05) so it can be concluded that there is an Effect of Birthball Therapy on the Progress of Labor in the First Stage of the Active Phase in Primigravida Mothers at the Sabar Midwife Practice, Bandar Huluan District, Simalungun Regency in 2023.

**Bivariate Analysis Results**

The bivariate analysis used the Independent T-Test because the data were normally distributed. The results are shown in the following table:

Tabel 3

Mean	p-value
-2.736	0.026
-2.736	0.040

**DISCUSSION**

The results of this study showed that birthball therapy had an effect on the progress of the active phase of the first stage of labor in primigravida mothers. Mothers who received birthball therapy experienced faster labor progress compared to those who did not receive birthball therapy. This finding indicates that the use of a birthball can be considered an effective non-pharmacological intervention to assist the labor process, particularly in primigravida mothers who generally experience a longer cervical dilatation

process compared to multigravida mothers.

Physiologically, the mechanism of birthball therapy in supporting labor progress occurs through several processes. Sitting upright on the birthball helps mothers maintain proper body posture and utilize the force of gravity to facilitate the descent of the fetal head into the pelvic cavity. Optimal fetal head descent increases pressure on the cervix, thereby stimulating cervical dilatation and effacement more effectively. The pressure of the fetal head on the cervix may also stimulate the release of oxytocin hormones, which help improve the strength and effectiveness of uterine contractions during labor (NURIY 2025).

In addition to the effect of gravity, pelvic rocking movements while using the birthball help increase ligament flexibility and relax the pelvic floor muscles. A more relaxed pelvic muscle condition can widen the pelvic diameter, making fetal descent easier and accelerating the progress of the active phase of the first stage of labor (Salsabila 2024). The pelvic rotation movements performed while using the birthball also help improve fetal positioning, allowing the fetus to adapt more easily to the birth canal (Dewi et al. 2020). This finding is consistent with midwifery theory, which states that active maternal mobility and upright positions during labor can enhance the effectiveness of uterine contractions and accelerate cervical dilatation (Fatriani et al. 2023).

The use of a birthball also provides positive psychological effects for laboring mothers. Mothers feel more comfortable, relaxed, and better able to control labor pain during the childbirth process. A relaxed condition can reduce stress hormones such as catecholamines, which may inhibit uterine contractions (Zulfina, Famayanti, and Hartati 2024). When mothers feel calmer and more comfortable, uterine contractions become more effective, allowing labor progress to occur more optimally. Psychological support and maternal comfort during labor are particularly important for primigravida mothers, who generally experience higher levels of anxiety due to facing childbirth for the first time (Hasyati, Jufri, and Sukri 2024).

According to the researcher's assumption, birthball therapy not only helps accelerate the labor process physiologically but also provides a sense of security and increases maternal self-confidence during labor. Active movements performed while using the birthball help mothers focus more on controlling their body movements and labor pain, making them calmer and more cooperative throughout the labor process. In addition, maintaining an active and comfortable position

while using the birthball helps mothers reduce muscle tension and fear, which may inhibit labor progress. The researcher also assumes that the proper and regular use of a birthball may help reduce the risk of prolonged labor in primigravida mothers (Sinaga et al. 2024).

The findings of this study are consistent with the research conducted by Dewi Aprilia Ningsih and Suhita Tri Oklaini in 2021 regarding the effect of birthing ball therapy on the duration of the first stage of labor. Their study showed that mothers who used a birthing ball experienced a shorter duration of the first stage of labor compared to the control group. The use of a birthing ball also helped mothers feel more comfortable and relaxed during labor (NINGSIH et al. 2023).

In addition, research conducted by Indrayani in 2020 stated that birthball therapy was effective in accelerating cervical dilatation and improving labor progress during the active phase of the first stage of labor. The study demonstrated that active mobilization using a birthball could facilitate fetal head descent and improve the effectiveness of uterine contractions. Another study by Hau et al. in 2012 found that the use of birthball exercises during labor could reduce labor pain, increase maternal comfort, and accelerate the normal labor process. Pelvic movements performed on the birthball helped relax the pelvic muscles and improve fetal positioning, thereby optimizing labor progress (Dina, Altika, and Hastuti 2023).

The findings of this study are also supported by several international journals published within the last five years. Research conducted by Sasmihana et al. in 2025 stated that the use of a birthing ball was effective in accelerating the first stage of labor in primigravida mothers because it helped increase uterine blood flow, widen the pelvic outlet, and facilitate fetal head descent. The study also showed that active positioning during birthball use could support the physiological process of labor more effectively (Sasmitha et al. 2025).

Research by Lamuda in 2024 also demonstrated that birthball techniques had a significant effect on shortening the active phase of labor in primigravida mothers. Pelvic movements and active mobilization performed during the therapy helped improve the effectiveness of uterine contractions and accelerate cervical dilatation. Furthermore, research published in the American Journal of Obstetrics and Gynecology in 2023 explained that the use of a birthing ball could help reduce labor pain and support upright maternal positions during labor. Such positions play an important role in widening the pelvis and

accelerating fetal descent into the birth canal (Lamuda 2024).

Another study by Intiyaswati et al. in 2023 regarding the effectiveness of the Zelisken Ball found that pelvic rocking exercises using a labor ball effectively accelerated the first stage of labor by increasing pelvic muscle relaxation and optimizing fetal positioning during labor (Intiyaswati and Tono 2023). Furthermore, research conducted by Hidayati et al. in 2026 showed that the combination of counterpressure techniques and birthball therapy was able to reduce labor pain during the active phase of the first stage of labor and improve maternal comfort during childbirth. A more relaxed maternal condition contributed to more effective uterine contractions, thereby enhancing labor progress (Hidayati, Palimbo, and Jannah 2026).

Nevertheless, this study has several limitations. The sample size was relatively small, consisting of only 10 respondents, which may have affected the statistical power of the study and limited the generalizability of the findings to a broader population. In addition, there was potential for bias, such as differences in pain tolerance, maternal psychological conditions, and family support during labor, which could not be fully controlled by the researcher. This study was also conducted in only one independent midwifery practice, so the findings may not fully represent conditions in other healthcare facilities. Therefore, further studies with larger sample sizes and broader research settings are needed to obtain stronger and more representative findings.

The findings of this study have important implications for clinical midwifery practice. Birthball therapy can be considered a non-pharmacological intervention in maternity care because it is easy to implement, safe, economical, and capable of improving maternal comfort during labor. Midwives may apply birthball therapy as part of woman-centered maternity care to help accelerate labor progress, reduce maternal anxiety, and support a more optimal normal labor process. With the proper application of birthball therapy, it is expected that the risk of prolonged labor can be reduced, thereby improving maternal and fetal health outcomes.

## CONCLUSIONS

The study concluded that birthball therapy was effective in accelerating the progress of the active phase of the first stage of labor in primigravida mothers at the Sabar Midwife Practice. The use of birthball therapy helped improve maternal comfort, supported fetal descent, and

optimized the labor process. Therefore, birthball therapy can be considered an effective non-pharmacological intervention in midwifery care during labor.

## SUGGESTIONS

It is recommended that midwives apply birthball therapy as a non-pharmacological intervention during labor to improve maternal comfort, support labor progress, and enhance the quality of midwifery care. Maternity healthcare services are also encouraged to provide adequate facilities and training related to birthball techniques so that the intervention can be implemented effectively and safely in clinical practice.

For future research, it is recommended to use a larger sample size, apply a randomized controlled trial (RCT) design, and control potential confounding variables more effectively in order to obtain stronger and more generalizable results. Further studies are also suggested to explore the effectiveness of birthball therapy on labor pain, maternal anxiety, and the duration of the second stage of labor.

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