

# The Effect Of The Use Of Birth Ball On Intensity Of Labor Pain In Active Phase In Primigravida Mothers In Pmb Bekasi City In 2022

Rica Sahara<sup>1</sup>, Febry Mutiariami Dahlan<sup>2</sup>, Cholisah Suralaga<sup>3</sup>

<sup>1</sup>Students of the Undergraduate Program in Applied Midwifery, Faculty of Health Sciences, National University

<sup>2,3</sup>Lecturer of the Applied Undergraduate Midwifery Study Program, Faculty of Health Sciences, National University

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**ABSTRACT**

Childbirth is a natural process. Discomfort, fear and pain is a problem for mothers in labor. Pain in the first stage of the active phase of labor is severe pain with a longer time, therefore it is necessary to pay attention to handling to overcome pain in the first stage of labor. This study aims to determine the effect of the use of birth balls on the intensity of labor pain in the active phase of the first stage of primigravida mothers in PMB Bekasi City 2022. This study uses a quasi-experimental approach. The sample in this study was 30 respondents, namely 15 mothers in the control group and 15 mothers in the intervention group. The instrument used is an observation sheet on the implementation of the use of a birth ball. The analysis used is univariate analysis and bivariate analysis using Independent T test and Paired T - Test. The results of the univariate analysis showed that in the intervention group the average level of pain before the birth ball was done the average pain level was 7.46 and after it was done it was 4.46. The mean level of pain in the control group on examination 1 was 7.06 and on examination 2 was 6.80. The results of the bivariate analysis showed that there was an effect of using a birth ball on the pain of labor in the first stage of the active phase in primigravida mothers with a p value of 0.000. There is no effect of not using a birth ball on the pain of labor in the first stage of the active phase of primigravida mothers with a p value of 3.64. There was a difference in the decrease in pain level in the first stage of the active phase in primigravida mothers in the intervention group and the control group with a p value of 0.000. The results of this study can be concluded that the use of birth balls is effectively used to reduce labor pain in the first stage of the active phase of primigravida mothers.

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**E-mail:**

febrymutia@civitas.unas.id  
Sahararica08@gmail.com  
Cholisah.suralaga@civitas.unas.ac.id

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**1. Introduction**

According to the Indonesian Health Profile (2019), the Maternal Mortality Rate (MMR) is one indicator to see the success of maternal health efforts. AKI is the ratio of maternal deaths during pregnancy, childbirth, and the puerperium caused by pregnancy, childbirth and the postpartum period or its management but not due to other causes such as accidents or incidents in every 100,000 live births. In addition to assessing maternal health programs, this indicator is also able to assess the degree of public health, because of its sensitivity to improving health services, both in

terms of accessibility and quality. In general, there was a decrease in maternal mortality during the period 1991 – 2015 from 390 to 305 per 100,000 live births.

Although there is a tendency to decrease maternal mortality, it has not succeeded in achieving the Millennium Development Goals (MDGs) target that must be achieved, which is 102 per 100,000 live births in 2015. The results of the 2015 SUPAS show that the maternal mortality rate is three times higher than the MDGs target. The target for reducing MMR is determined through the Annual Average Reduction (ARR) model or the average reduction in maternal mortality per year. The Ministry of Health uses a model with an average decline of 5.5% per year as a performance target. Based on this model, it is estimated that in 2024 the MMR in Indonesia will fall to 183/100,000 live births and in 2030 it will decrease to 131 per 100,000 live births (Indonesian Health Profile, 2019).

The number of maternal deaths according to provincial data in Indonesia in 2018 - 2019, there was a decrease from 4,226 per 100,000 live births to 4,221 per 100,000 live births. In 2019, the most common causes of maternal death were bleeding (1,280 cases), hypertension in pregnancy (1,066 cases), infection (207 cases) (Indonesian Health Profile, 2019).

It is hoped that Indonesia will be able to provide responsive, affordable and professional services by skilled health workers. One of the efforts that can be done is to provide normal delivery care. The focus of normal delivery care is to provide clean and safe delivery care and prevent complications in the mother. The purpose of normal delivery care is to maintain survival and provide a high degree of health for mothers and their babies through integrated and complete efforts but with minimal intervention so that the principles of safety and quality of service can be maintained at an optimal level (Kurniarum, 2016).

The process of childbirth is identical to the pain that will be endured. Physiologically, pain occurs when the uterine muscles contract in an effort to open the cervix and push the baby's head toward the pelvis. Pain in the first stage of labor is a physiological process caused by cervical dilatation, uterine muscle hypoxia during contraction, uterine corpus ischemia and stretching of the lower uterine segment and nerve compression in the cervix. Discomfort, fear and pain are problems for mothers in labor and if not addressed will have an impact on delaying the progress of labor. Labor pain can cause stress which causes the release of excessive stress hormones such as catecholamines and steroids. This hormone can cause smooth muscle tension and vasoconstriction of blood vessels resulting in decreased uterine contractions,

Coping strategy is one of pain control. In this method, self-efficacy as a coping method can be done by making women able to tolerate the pain and the experience of childbirth that is felt, this effect may be related to the body and the increase in the patient's feelings. In addition, Birthing Ball is considered as non-invasive used to control pain (Morvarid et al, 2019).

The use of a birth ball during labor can reduce pain levels because it stimulates postural reflexes and keeps the muscles and spine in good condition, thereby reducing anxiety, reducing pain, facilitating the descent of the fetal head, reducing the length of the first stage and increasing maternal satisfaction and well-being. . Research in Taiwan showed that the group of women who performed birth ball exercise experienced a shorter first stage of labor, low use of analgesics and low incidence of sectio caesaria (Kurniawati, 2017).

*Birthing ballis* physical therapy or simple exercises using a ball, where these exercises are applied to pregnant women, mothers giving birth, and postpartum mothers (Kustari et al, 2012). This ball plays a role in helping the mother during the first stage of labor in advancing her labor, besides that it can also be used in various positions, for example by sitting on the ball and rocking to create a sense of comfort and help the progress of labor by using gravity while increasing the release of endorphins due to the elasticity and curvature of the ball. stimulates the hip receptors which are responsible for secreting endorphins (Kurniawati, 2017).

Based on a preliminary study at PMB Bekasi City in June 2022, there were 10 primigravida mothers who did not use birth balls in the first stage to help reduce pain levels. From the questions asked to the mother, that the mother has not heard much about the use of birth balls, one of the benefits of which can reduce pain levels in the first stage of labor and there is no practice of midwives who use birth balls to assist the delivery process.

Based on the above background, the researchers are interested in researching "The Effect of Birth Ball Use on the Intensity of Labor Pain in the First Stage of Active Phase in Primigravida Mothers in PMB Bekasi City in 2022".

## 2. Method

This study uses a quasi-experimental approach. The sample in this study was 30 respondents, namely 15 mothers in the control group and 15 mothers in the intervention group. The instrument used is an observation sheet on the implementation of the use of a birth ball. The analysis used is univariate analysis and bivariate analysis using Independent T test and Paired T - Test.

## 3. Result and Analysis

The average level of pain in the intervention group before and after the birth ball was 3 with the pain level before the birth ball, the average pain level was 7.46 and after it was done it was 4.46. The mean level of pain in the control group on examination 1 and examination 2 has a difference of 0.26 with the average value on examination 1 which is 7.06 and on examination 2 which is 6.80. There is an effect of using a birth ball on the pain of labor in the first stage of the active phase in primigravida mothers (p value 0.000). There was no effect of not using a birth ball on the pain of labor in the first stage of the active phase of primigravida mothers (p value 3.64). There was a difference in the decrease in the level of pain in the first stage of the active phase in primigravida mothers in the intervention group and the control group (p value 0.000).

### 3.1 Discussion

#### a. The effect of using a birth ball on labor pain in the first stage of the active phase in primigravida mothers in the intervention group at PMB Bekasi City

Based on the results of the study, the effect of using a birth ball on labor pain in the first stage of the active phase in primigravida mothers in the intervention group showed that the average value before using the birth ball was 7.46 and the average value after using the birth ball was 4.46. This shows that there is a decrease in the average value before and after the use of birth balls. The results of the paired t test show that the p value is 0.000, meaning that the p value 0.05, it can be concluded that there is an effect of the use of birth balls on the pain of labor in the first stage of the active phase in primigravida mothers.

Pain in the first stage of labor is a physiological process caused by cervical dilatation, uterine muscle hypoxia during contraction, uterine corpus ischemia and stretching of the lower uterine segment and nerve compression in the cervix. Discomfort, fear and pain are problems for maternity mothers and if not addressed will have an impact on delaying the progress of labor (Ferinawati & Zahara, 2021).

The first stage (opening stage) of labor is marked by the discharge of mucus mixed with blood because the cervix begins to open and flatten. The blood comes from the rupture of the capillaries around the cervical canal due to shifts, when the cervix flattens and opens. The first stage of labor starts from the occurrence of uterine contractions and cervical dilatation, until it reaches complete dilatation (10 cm) (Rohani et al, 2014).

The use of a birth ball during labor can reduce pain levels because it stimulates postural reflexes and keeps the muscles and spine in good condition, thereby reducing anxiety, reducing pain, facilitating the descent of the fetal head, reducing the length of the first stage and increasing maternal satisfaction and well-being. . Research in Taiwan showed that the group of women who performed birth ball exercise experienced a shorter first stage of labor, low use of analgesics and low incidence of sectio caesaria (Kurniawati, 2017).

The results showed that there was an effect of using a birth ball on the pain of labor in the first stage of the active phase in primigravida mothers. This is supported by a study conducted by Ferinawati & Zahara (2021) entitled the effect of using a birthing ball on reducing pain levels in women giving birth at BPM Yulia Fonna, A.Md. Keb, SKM Lipah Rayeuk Village, Jeumpa District, Bireuen Regency. The results showed that there was an effect of using birthing balls on reducing pain levels in maternity at BPM Yulia Fonna, A.Md.Keb, SKM, Lipah Rayeuk Village, Jeumpa District, Bireuen Regency with a p value (0.041) < (0.05) so  $H_0$  is rejected and  $H_a$  is accepted. The conclusion is that there is an effect of using Birthing Ball on reducing pain levels in the first stage of the active phase,

According to researchers, giving birth ball interventions is effective for reducing pain in the first active phase in primigravida mothers, because birth ball interventions can provide a sense of comfort, increase relaxation, relax, reduce tension so that it can divert the pain experienced.

**b. The effect of not using a birth ball on labor pain in the first stage of the active phase of primigravida mothers in the control group at PMB Bekasi City**

Based on the results of the study, the effect of not using a birth ball on the pain of labor in the first stage of the active phase of primigravida mothers in the control group showed that on examination 1 the average value was 7.06 and on examination 2 the average value was 6.8. This shows that there is a decrease in the average value of pain levels on examination 1 and examination 2, which is 0.206. The results of the paired t test showed that the p value was 0.364, meaning that the p value > 0.05, it can be concluded that there is no effect of not using a birth ball on the pain of labor in the first stage of the active phase of primigravida mothers.

Pain is an unpleasant sensory and emotional experience resulting from actual or potential tissue damage. While labor pain is a subjective experience of physical sensations associated with uterine contractions, cervical dilatation and effacement, and fetal descent during labor. Physiological responses to pain include increased blood pressure, pulse, respiration, sweating, pupil diameter, and muscle tension (Utami & Fitriahadi, 2019).

Labor pain is pain caused during labor that lasts from the first stage to the third stage of labor. Labor pain is also a subjective experience of the physical sensations associated with uterine contractions, cervical dilatation and effacement, and fetal descent during labour. Physiological responses to pain include increased blood pressure, pulse, respiration, perspiration, pupillary diameter, and muscle tension. Labor pain is characterized by uterine contractions, contractions have actually occurred in the 30th week of pregnancy called Braxton Hicks contractions due to changes in the hormones estrogen and progesterone but are irregular, painless and the strength of the contractions is 5 mmHg,

Pain should receive immediate attention and treatment because when the time to feel pain is longer it can be a triggering factor for stress and fear in the mother and thus make adrenaline secretion which plays a role in the contribution of blood vessels to increase. This of course can cause the blood flowing to the uterus to decrease, make the pain increase and without being followed by an increase in the opening of the cervix, thus making the delivery time longer (Raidanti & Mujianti, 2021).

The results of this study are in line with research conducted by Irawati, et al (2019) entitled reducing labor pain with the birthing ball technique. The results showed that the difference in the average value of pain levels in group respondents between examination 1 and examination 2 was 0.9. Judging from the difference in changes, based on the average control respondents experienced an increase in pain scores between examination 1 and examination 2. The results of the Wilcoxon test analysis in the control group found that the p value was 0.083. So that the p value > 0.05, it is concluded that there is no effect without using a birth ball on the level of pain.

In accordance with the results of the study, the control group experienced a slight decrease in pain in the first stage of the active phase of labor by not using a birth ball with a p value of 0.364. Pain in childbirth should receive serious attention, labor pain can cause stress which causes the release of excessive stress hormones such as catecholamines and steroids. This hormone can cause smooth muscle tension and vasoconstriction of blood vessels resulting in decreased uterine contractions, decreased uteroplacental circulation, reduced blood flow and oxygen to the uterus which makes pain impulses increase.

**c. The difference in the decrease in the level of pain in the first stage of the active phase in primigravida mothers in the intervention group and the control group in PMB in Bekasi 2022**

Based on the results of the study, the difference in the decrease in pain levels in the first stage of the active phase in primigravida mothers in the intervention group and the control group showed that the average value of pain levels in respondents who used birth balls was 4.4 and the average value of respondents who did not use birth balls was 6 ,7. This shows that there are differences in pain levels in the control group and the intervention group. The intervention group had a lower level of pain compared to the group that did not have a birth ball. The results of the independent t test showed that the p value was 0.000, meaning that the p value 0.05, it can be concluded that there was a difference in the decrease in pain levels in the first stage of the active phase in primigravida mothers in the intervention group and the control group.

Pain during labor can be reduced by doing birth ball exercises for 30 minutes with a minimum of 20 movements. When doing the birth ball exercise accompanied by a certified prenatal yoga trainer. Birth ball exercises can also be done for 30 minutes with a frequency of 2 times or a total of

60 minutes (Taavoni et al, 2016). Movement of the mother When sitting on the birthing ball the mother seems to be similar to squatting to help open the pelvis, which aims to speed up the birth of the baby. Gentle movement exercises performed on the birth ball are very effective in reducing the discomfort felt by the mother during contractions (Wulandari & Wahyuni, 2019).

Exercise using the birth ball method is useful during the labor process, which can function in reducing pain during the delivery process. A significant reduction in pain during labor occurs when a birth ball is used at the beginning of labor (Rania & Omar, 2018). Research conducted by Fadmiyanor et al (2017) entitled the effect of giving the birth ball method on the intensity of labor pain in the active phase of the 1st stage at BPM Siti Julaha. The results showed that the average pain intensity before being given the birth ball method was 6.05, the average pain intensity after being given the birth ball method was 4.95. The results showed that there was a difference in the intensity of labor pain before and after being given the birth ball method in the first stage of the active phase with p value = 0.000. Birth Ball is one of the pain reduction methods with distraction techniques, which is to divert the attention of maternity mothers to other things so that they can reduce awareness of pain and even increase the threshold and tolerance for pain.

A literature review on the effects of maternal movement during labor found that it can cause decreased pain, facilitate maternal-fetal circulation, increase the intensity of uterine contractions, reduce labor duration, aid in descent and station of the presenting part of the fetus and decrease rates of perineal trauma and episiotomy. In this context, the use of birth balls allows women to take different positions (Suryani & Hardika, 2020).

The results of this study are in line with research conducted by Kurniawati (2017) entitled The Effectiveness of Birth Ball Exercises on Reducing Labor Pain in the Active Phase I in Primigravida. The results showed that the average labor pain in the group given the birth ball exercise was 4.5 lower than the control group 5.4 with a p-value of 0.01. There is a significant difference in the intensity of labor pain in the first stage of active phase in primigravida mothers who use birth balls and do not use birth balls. The intensity of labor pain in the first stage of active phase in primigravida mothers who used birth balls was lower than those who did not use birth balls.

The results of this study indicate that there is a difference in the reduction in pain levels in the intervention group and the control group with a p value of 0.000. In addition, the level of pain after the birth ball intervention was 4.46 and in the control group the average value on examination 2 was 6.73. This shows that the birth ball intervention is more effective in reducing pain levels compared to the control group respondents.

**Table 1**

The Mean Level Of Pain In The Intervention Group Of Primigravida Maternity Women

Pain level	mean	Standard Deviation	Min-max
Before	7.46	1.18	5-9
After	4.46	1.12	3-7

Source: Primary data 2022

**Table 2**

The mean level of pain in the control group of primigravida mothers in the first stage active phase of examination 1 and examination 2

Pain level	mean	Standard Deviation	Min-max
Check 1	7.06	1.38	5-9
Check 2	6.80	1.26	5-9

Source: Primary data 2022

**Table 3**

The effect of using a birth ball on the pain of the first stage of labor active phase in primigravida mothers in the intervention group

Group	n	mean	SD	SE	p value
Before	15	7.46	1.18	0.30	0.000
After	15	4.46	1.12	0.29	

Source: Primary Data 2022

**Table 4**

The effect of not using a birth ball on the pain of the first stage of labor  
the active phase of primigravida mothers in the control group

Group	N	Mean	SD	SE	p value
Check 1	15	7.06	1.38	0.35	0.364
Check 2	15	6.80	1.26	0.32	

Source: Primary Data 2022

**Table 5**

Differences in the decrease in pain level in the active phase I in  
primigravida mothers intervention group and control group

Group	N	mean	SD	SE	p value
Birth ball	15	1.4	1.12	0.29	0.000
No Birth Ball	15	6.7	1.33	0.34	

Source: Primary Data 2022

#### 4. Conclusion

Based on the results of the study, the effect of using a birth ball on labor pain in the first stage of the active phase in primigravida mothers in the intervention group showed that the average value before using the birth ball was 7.46 and the average value after using the birth ball was 4.46. Based on the results of the study, the effect of not using a birth ball on the pain of labor in the first stage of the active phase of primigravida mothers in the control group showed that on examination 1 the average value was 7.06 and on examination 2 the average value was 6.8. This shows that there is a decrease in the average value of pain levels on examination 1 and examination 2, which is 0.206. Based on the results of the study, the difference in the decrease in pain levels in the first stage of the active phase in primigravida mothers in the intervention group and the control group showed that the average value of pain levels in respondents who used birth balls was 4.4 and the average value of respondents who did not use birth balls was 6,7.

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