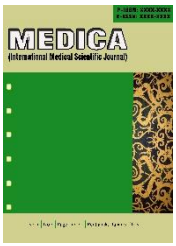
# MEDICA

**(International Medical Scientific Journal)**
Vol.6, No.1, January 2024, pp. 38 – 45
ISSN 2622-660X (Online), ISSN 2622-6596 (Print)
https://journal.ahmareduc.or.id/index.php/medica

## The Effect of the Birth Ball Method on Reducing the Intensity of Labor Pain in the Work Area of the Community Health Center Integrated Care Unit Sei Langkai Batam City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**Info Article**

**Article History:**
***Received:***
*16 December 2023*
***Accepted:***
*15 January 2024*
***Published:***
*31 January 2024*

**Keywords:**
*Labor*
*Birth Ball*
*Pain*



**Abstrak**

The process of labor is synonymous with pain, physiologically pain occurs when the muscles of the uterus contract as an effort to open the cervix and push the baby's head towards the pelvis. Various efforts are made to reduce pain both pharmacologically and non-pharmacologically, which is preferred by laboring mothers is birth ball to reduce physiological labor pain. This study aims to analyze the effect of a birth ball on labor pain in the Working Area of UPT Puskesmas Sei Langkai Batam City Year 2023. This type of research uses Pre Experimental with One Group Pretest Posttest Design. The research sample amounted to 15 laboring mothers. The independent variable is birth ball and the dependent variable is labor pain. The instruments in this study were SOP and observation sheets. The results of this study showed that before the intervention of mothers who experienced moderate pain (86.7%) and after the intervention obtained mild pain (100%). Based on the output test of the paired sample T-test statistical test, the results obtained a significance value of 0.000, smaller than the 5% significance level (p-value = 0.000 <0.05), so the conclusion is that Ha is accepted, which means that there is an effect of giving birth ball therapy on reducing the intensity of labor pain in the working area of UPT Puskesmas Sei Langkai Batam City Year 2023.





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## 1. INTRODUCTION

Labor is the process of opening and thinning the cervix and the fetus descends into the birth canal. Labor is the process of releasing a baby who has had enough in his mother's womb and is followed by the release of the placenta and fetal membranes in the mother's body. Labor and birth are said to be normal if the process of expelling the fetus that occurs in full-term pregnancy (37-42 weeks) (Fitriahadi & Utami, 2019).

Data from the Ministry of Health of the Republic of Indonesia in 2020, the number of mothers giving birth in 2020 was 5,043,078 and those who experienced complications were 23.2% of mothers who gave birth normally. According to Riskesdas 2019 there are several causes of complications that can occur in laboring mothers. Mothers who experience complications such as premature rupture of membranes, prolonged partus, fetal position, umbilical cord entanglement, hypertension, bleeding, and others cause increased mortality and mobility rates in mothers and fetuses (Kemenkes RI., 2020).

The maternal mortality rate reflects the risks faced by mothers during pregnancy until postpartum which are influenced by the nutritional status of the mother, socioeconomic conditions, poor health before pregnancy, the incidence of various complications in pregnancy and birth, the availability and use of health care facilities including prenatal and obstetric services. High maternal mortality rates indicate low socioeconomic conditions and low health care facilities including prenatal and obstetric services (Dinas Kesehatan Kota Batam, 2022).

According to the Batam City Health Office in 2022, the total coverage of health services for mothers in labor showed a total number of deliveries of 37,015. There are three UPT Puskesmas working areas with the highest number of deliveries, namely Puskesmas Sei Langkai with 3,892 deliveries, Baloi Permai Puskesmas Working Area with 3,394 deliveries and Batu Aji Puskesmas Working Area with 2,902 deliveries.

Based on an initial survey conducted by researchers in the Working Area of the UPT Puskesmas Sei Langkai in three independent midwife practice locations during July 2023, namely TPMB H with a total of 9 people giving birth and found that 6 people experienced pain until screaming hysterically and 3 people who experienced pain until crying. At TPMB M, the number of labor was found to be 8 people, 4 of whom experienced pain until hysterical and crying and 4 people hit their husbands. Then at Clinic H there were 7 women in labor, 5 of whom experienced labor pain to screaming while crying and 2 people experienced pain to hitting the bed.

The process of labor is synonymous with pain, physiologically pain occurs when the uterine muscles contract as an effort to open the cervix and push the baby's head towards the pelvis. Pain in the first stage of labor is a physiological process caused by the process of cervical dilatation, hypoxia of the uterine muscles during contraction ischemia of the corpus uteri and stretching of the lower segment of the uterus, and compression of the cervical nerves.

Pain that lasts during labor occurs when uterine muscle contractions occur and is accompanied by a psychological state. Excessive psychological conditions can cause anxiety. A mother who feels anxious during labor causes stress conditions that affect the body's ability to withstand pain. Stressful conditions in laboring women cause excessive release of catecholamine and steroid hormones. These two hormones affect the tension of smooth muscle muscles in the uterus. The uterus will experience vasoconstriction in the blood vessels thus affecting contractions and eventually decline. In addition, these two hormones influence a decrease in uteroplacental circulation and a reduction in blood and oxygen flow to the uterus (Waroh & Andarwulan, 2022).

Fear and anxiety before labor can cause physiological reactions that result in reduced oxygen supply to the fetus being reduced. In a state of excessive worry, the body system produces excessive prostaglandin hormones. This hormone affects smooth

muscle tension and vasoconstriction of blood vessels, causing a decrease in smooth muscle contraction and vasoconstriction of blood vessels and ending with more and more pain. When a mother is in labor, most mothers will find it more difficult to concentrate, sleep uneasily and have difficulty doing activities. The pain of labor makes a laboring mother panic. Mothers who feel pain in the face of labor have a tendency to feel anxiety and end up in panic. This can provide a physiological response that is felt in the form of reduced uterine ability to contract which is one of the causes of prolonged partus (Fitrianingsih & Wandani, 2018).

Overcoming pain in laboring women during the active phase of labor is a crucial role of health workers as part of the maternal care program. Based on a systematic review conducted by Solehati, et al., (2018) in an effort to reduce labor pain, the role of midwives is very important. In the labor care provided, midwives play a key role in managing pain reduction for laboring women using non-pharmacological techniques to provide comfort. This aligns with the primary objectives of midwifery care, which are to save mothers and babies by reducing morbidity and mortality (Solehati et al., 2018).

Various efforts are made to reduce pain into a separate choice in the community. Methods of reducing pain through pharmacological and non-pharmacological treatment. Pharmacological pain management still triggers many pros and cons in its implementation. This is because pharmacological treatment can have negative effects on mothers and babies. Meanwhile, non-pharmacological methods have begun to develop into an alternative in reducing pain. The non-pharmacological methods in question are the use of birth balls, warm compresses, Messages, relaxation, hypnotherapy, aromatherapy, acupuncture, and acupressure (Andarwulan, 2021).

The Birth Ball is a physical therapy ball that is large enough to help women in labor in Stage I into positions that help labor progress and reduce pain. Birth Ball is also specially designed to be non-slip when used on the floor so that it is safe to use in various positions. The advantages of this Birth Ball itself not only provide pain relief effects but also increase blood flow to the uterus, placenta, and baby, increase pelvic outlet by as much as 30%, provide comfort to the knees and ankles, provide counter-pressure on the perineum and thighs, and help open the pelvis which can make it easier for the fetus to descend into the birth canal so as to speed up the labor process.

According to research conducted by Fadmiyanor, et al., (2017) with the title effect of giving the birth ball method on the intensity of labor pain in phase 1 of the active phase at BPM Siti Julaeha obtained the results of a laboring mother who experienced labor pain before therapy had a value of 6.05 and after being given birth ball exercises therapy obtained a value of 4.95 so that it was seen that there was a decrease in pain value for the intervention provided.

Research conducted by Wijayanti (2021) on the effectiveness of birth ball exercise in laboring mothers during stage I on anxiety and pain scale in the delivery room of the Arso health center, Keroom district, Papua province has the best effectiveness because it is seen from the p-value of 0, 000 and the procedures carried out in accordance with Oktifa's theory (2012) which states that the effective time for implementing birth ball actions is 20-30 minutes, and is carried out once every 1 hour with 20 minutes of exercise with movements sitting on the ball, wiggling hips left, right and circular and hugging the ball this is done during contractions lasting between the opening of the cervix 4-10 cm.

Based on an initial survey conducted by researchers at the UPT Puskesmas Sei Langkai Work Area in three (3) midwife independent practice locations during July 2023, namely TPMB H with a total of 9 people giving birth and obtained 6 people experiencing pain until screaming hysterically and 3 people who experienced pain until crying. At TPMB M, the number of labor was found to be 8 people, 4 of whom experienced pain until hysterical and crying and 4 people hit their husbands. Then at clinic H there were 7 women

in labor, 5 of whom experienced labor pain from screaming while crying and 2 people experienced pain from hitting the bed.

This study aims to determine the effect of the birth ball method on decreasing the intensity of labor pain in a period in the work area of UPT Puskesmas Sei Langkai Batam City year 2023".

## 2. METHOD

This study was conducted at the Sei Langkai Health Center Work Area, Batam City, on 16 September - 03 October 2023. The type of research used in this study is a quantitative Pre-experiment research method in one group (one group post-test pre-test). The affordable population in this study is maternity mothers in the working area of UPT Puskesmas Sei Langkai Batam City in 2023. The sampling technique uses a non-probability sampling technique, namely purposive sampling by selecting samples that match the research criteria based on a purpose. The independent variable in this study is the effect of Birth Ball. The dependent variable in this study is Labor Pain Intensity. The analysis used is univariate and bivariate. Univariate analysis was carried out on each variable from the results of the study. In general, univariate analysis only produces the distribution and percentage of each variable, while bivariate analysis is done to determine the relationship between two variables. Furthermore, the statistical test used in this study is the Paired sample T-test test.

## 3. RESULTS AND DISCUSSION

**Table 1.** Characteristics of Respondents Based on Age of Maternity Period I with Pain Scale in the Working Area of Sei Langkai Health Center, Batam City

| **Age** | **n** | **%** |
|---|---|---|
| < 20 years | 1 | 6.7 |
| 20-35 years | 14 | 93.3 |
| Total | 15 | 100.0 |

Based on table 1, it is known that most of the respondents were aged 20-35 with a total of 14 respondents (93.3%).

**Table 2.** Characteristics of Respondents Based on Parity of First Period Maternity with Pain Scale in the Working Area of Sei Langkai Health Center, Batam City

| **Parity** | **n** | **%** |
|---|---|---|
| Primiparity | 7 | 46.7 |
| Multiparity | 8 | 53.3 |
| Total | 15 | 100.0 |

Based on table 2, it is known that most of the respondents' parity is multiparous, namely 8 respondents (53.3%).

**Table 3.** Characteristics of Respondents Based on Education of First-Time Birth Mothers with Pain Scale in the Working Area of Sei Langkai Health Center, Batam City

| **Education** | **n** | **%** |
|---|---|---|
| Medium | 10 | 66.7 |
| Hight | 5 | 33.3 |
| Total | 15 | 100.0 |

Based on table 3 it is known that most respondents with secondary education are 10 respondents (66.7%).

**Table 4.** Characteristics of Respondents Based on Opening in Period I Maternity with Pain Scale in the Working Area of Sei Langkai Health Center, Batam City

| **Labor Introduction** | **n** | **%** |
|---|---|---|
| Latency phase | 1 | 6.7 |
| Accelerated Active Phase | 1 | 6.7 |
| Active Phase of maximal dilatation | 13 | 86.7 |
| Total | 15 | 100.0 |

Based on table 4 it is known that most of the respondents were in the maximum dilation phase, namely 13 respondents (86.7%).

**Table 5.** Characteristics of Respondents Based on Pain Scale Before Intervention of First Period Delivery Mother with Pain Scale in the Working Area of Sei Langkai Health Center, Batam City

| **Pain Scale Before Intervention** | **n** | **%** |
|---|---|---|
| Slight Pain | 2 | 13.3 |
| Medium Pain | 13 | 86.7 |
| Total | 15 | 100.0 |

Based on table 5 it is known that most of the respondents' pain scale before being given the intervention was on a moderate pain scale, namely 13 respondents (86.7%).

**Table 6.** Characteristics of Respondents Based on Pain Scale After Intervention of First Period Maternity with Pain Scale in the Working Area of Sei Langkai Health Center, Batam City

| **Pain Scale After Intervention** | **n** | **%** |
|---|---|---|
| Slight Pain | 15 | 100.0 |

Based on table 6, it is known that most of the respondents after being given the intervention were on a mild pain scale.

**Table 7.** Bivariate Analysis of Pain Scale Reduction Before and After Birth Ball Intervention

| **Variable** | **(n=15)** | | | |
|---|---|---|---|---|
| | **Mean** | **Selisih** | **SD** | ***p-value*** |
| Pain Scale Before Intervention | 1.80 | 0.80 | .352 | 0.000 |
| Pain Scale After Intervention | 1.00 | | 0.000 | |

The average pain scale before the intervention was 1.80, while the average pain scale after the intervention was 0.80. The mean difference in pain scale reduction is 1.00, with a p-value of 0.000. This indicates a significant decrease in the labor pain scale after the Birth Ball intervention.

## DISCUSSION

### Frequency Distribution Before Intervention

The results of the study before being given the intervention of the birth ball method showed that of the 15 respondents, 13 respondents (86.7) felt the level of pain on a moderate pain scale, and 2 respondents (13.3%) felt the level of pain on a mild pain scale.

Pain that occurs during labor makes the mother feel painful, this is often called labor pain. Labor pain is the perception caused by the mother due to the process of labor. Several methods have been applied to reduce labor pain but not all are able to effectively reduce pain. When experiencing stress, including the labor process, it will cause (fear) and release stress hormones, namely catecholamines and adrenaline. This makes the

mother feel more pain during labor. Efforts can be made to make the mother relax or distracted from her pain (King et al., 2019)

An unpleasant childbirth experience will have an impact on subsequent childbirth, while women who are pregnant for the first time, usually before childbirth, will be haunted by images around labor pains and unreasonable fears when making mothers anxious.

The results of this study are in line with research conducted by Murtiyarini, et al (2019). The results showed that most of the pain intensity of laboring women before the study was in the moderate category. After the intervention using birth ball, the majority of laboring mothers' pain intensity was in the mild category (p-value 0.000).

According to the researcher's assumption, when a woman in labor experiences stress, the body will automatically carry out a defensive reaction so that it automatically stimulates the body to release stressor hormones, namely catecholamine hormones and adrenaline hormones, these catecholamines released in high concentrations during labor if the expectant mother cannot get rid of her fear before giving birth, various body responses that arise include the uterus becoming increasingly tense so that blood flow and oxygen into the muscles continue to decrease because the arteries shrink and narrow the result is inevitable pain. High levels of the hormones adrenaline and ketocolamine in the blood also increase pain impulses, reduce blood flow to the placenta so that oxygen supply to the fetus decreases, weaken uterine contractions and result in prolonging the process of labor or long partus.

**Frequency Distribution After the Intervention**

The results of the study after being given birth ball therapy treatment showed that of the 15 respondents, 13 respondents (86.7) felt the pain level on a moderate pain scale, 2 respondents (13.3%) felt the pain level on a mild pain scale. There was a decrease in the level of pain because doing birth ball therapy provides stimulation in the form of strong pressure on the sacrum which can cause a relaxing effect and effectively reduce pain during contractions, which is in the waist and lower back area.

The use of birth balls that support the application of counterpressure techniques performed by laboring mothers by kneeling and hugging the ball during contractions can make a sense of comfort and reduce labor pain, helping labor progress by using gravity while increasing the release of endorphins because the elasticity and curvature of the ball stimulates receptors in the pelvis that are responsible for secreting endorphins. (Kuniawati, et al., 2017).

The results of this study are in line with research conducted by Ulfah, & Rosmaria, (2021). The results showed a decrease in pain intensity between the pre-test and post-test with an average difference of 1.08 with a p-value = 0.000, meaning that there was an effect on pain intensity before and after birth ball therapy.

According to the assumptions of researchers, the Birth Ball Technique can make a sense of comfort and help mothers in the progress of labor. When doing birth ball therapy indirectly increases the release of endorphins due to the elasticity and curvature of the ball which can stimulate receptors in the pelvis and function to secrete endorphins, which is why this birth ball method can provide a sense of comfort and calm when facing labor so as to reduce the pain felt by the mother during the process of opening labor.

**The Effect of Birth Ball on Decreasing Labor Pain Intensity**

Bivariate analysis is used to determine whether there is an effect of birth ball therapy on reducing labor pain in stage 1 with the Independent T-test test because the data is normally distributed. Based on the output of the test statistics obtained the results of a significance value of 0.000, smaller than the 5% significance level (p-value = 0.000 <0.05), then the conclusion is Ha is accepted, which means that there is an effect of giving birth

ball therapy on reducing the intensity of labor pain in the working area of the Sei Langkai Health Center, Batam City in 2023.

In this study, the intervention was carried out on laboring mothers who were mostly in the maximum dilatation phase with an average opening of 4-6 with a moderate pain scale. After the intervention the opening experienced by the mother increased and the pain scale decreased. So that the mother who initially experienced pain with a moderate scale became a mild scale.

During the first stage of labor, Birth Ball exercise by sitting on the ball then slowly swinging and shaking the hips back and forth, right and left sides, and in a circle. This exercise movement is useful to help the uterus contract more effectively and accelerate the baby's descent through the pelvis. The pressure of the baby's head on the cervix remains constant when the laboring mother is in an upright position so that cervical dilatation becomes faster. The pelvic muscle ligament relaxes, and the pelvic area becomes wider, making it easier for the baby to descend to the pelvic floor (Muthoharoh et al., 2019).

The Birth Ball method can make a sense of comfort and help labor progress by using gravity, while increasing endorphin release because the elasticity and curvature of the ball stimulates receptors in the pelvis that are responsible for secreting endorphin. The Birth Ball method is one way that can be applied by pregnant women to gain calmness when facing pregnancy and labor.

The results of this study are in line with research conducted by Fadmiyanor, et al (2020). 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 active phase I stage with p value = 0.000.

The results of this study are also in line with research conducted by Murtiyarini, et al (2022). The results showed that most of the pain intensity of laboring women at the time before the study was conducted was in the severe category. After the intervention using birth ball, the majority of laboring mothers' pain intensity was in the moderate category (p-value 0.000). there is an effect of birth ball therapy on reducing the intensity of labor pain in phase 1 active phase.

The results of this study are also in line with research conducted by Ulfah, & Rosmaria, (2021). The results showed a decrease in pain intensity between the pre-test and post-test with an average difference of 1.08 with a p-value = 0.000, meaning that there was an effect on pain intensity before and after birth ball therapy.

According to the assumption of researchers, the use of a birth ball on labor pain is very influential, this is due to the role and function of the birth ball itself as an alternative pain reliever. Birth Ball is also one of the complements that many laboring mothers like today because it is considered quite interesting and is able to provide a sense of comfort to laboring mothers and indirectly provide pain relief effects. This study shows that the pain scale felt by mothers after being given birth ball therapy is lower than before doing birth ball.

## 4. CONCLUSION

The results of the study of the Effect of the Birth Ball Method on Maternity Mothers in the Work Area of UPT Puskesmas Sei Langkai Batam City Year 2023 can be concluded that, the results of the analysis that have been carried out in the intervention group when before giving the birth ball method, it is found that generally respondents experience moderate pain with a total of 13 respondents (86.7%). The results of the analysis after the

treatment of the birth ball method generally respondents experienced mild pain (100%) This variable was tested with a P-value = 0.000, meaning that there was a reduction in labor pain in the group given Birth Ball. There is an effect of birth ball on laboring mothers in the work area of UPT Puskesmas Sei Langkai Batam City in 2023 with the results of statistical tests the value of P-value = 0.00 (<0.05) means that there is a significant influence between the level of labor pain before and after the intervention is given.

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