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The Effectiveness of the Birthing Ball Method on the Intensity of Labor Pain at the Kemayoran Health Center

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Abstract

Labor pain remains a distressing experience that can negatively affect both mothers and babies. According to the Indonesian Ministry of Health (2019), around 15% of mothers in Indonesia experience labor complications accompanied by pain, while 22% report severe pain during childbirth. Excessive labor pain may lead to frustration, anxiety, and emotional distress. One non-pharmacological method considered safe, simple, and comfortable for pain management is the use of a birthing ball. This study aimed to determine the effectiveness of the birthing ball method in reducing labor pain intensity. The study used a quantitative approach with a quasi-experimental one-group pretest–posttest design without a control group. A total of 45 maternity mothers who met the inclusion criteria at the Kemayoran Health Center participated in the study and received a 30-minute birthing ball intervention. Labor pain intensity was measured using the Numerical Rating Scale (NRS). The statistical analysis showed a significant reduction in labor pain intensity after the intervention, with a p-value of <0.001 and a Z-score of -5.798b. These findings indicate that the birthing ball method is effective in reducing labor pain intensity. Therefore, healthcare workers are encouraged to optimize the use of birthing balls as a non-pharmacological pain management method during labor. Proper technique, along with responsive and empathetic support during childbirth, is important to maximize the benefits of this intervention.

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INTRODUCTION

The childbirth process is closely associated with pain experienced during labor and is still considered a frightening event for many mothers. Labor pain is a subjective experience characterized by physical sensations related to uterine contractions, cervical dilation and effacement, as well as fetal descent (1). Childbirth is a natural process as well as an emotional experience that involves physical and psychological mechanisms. Reactions to pain are individual responses, depending on the patient's understanding, family, personality, culture, education, and previous experiences (2).

According to the World Health Organization in 2019, it is stated that the majority of mothers experience labor pain as much as 85-90% and 10-15% of mothers experience painless labor[3]. According to the Indonesian Ministry of Health, data on labor pain in Indonesia in 2019 stated that as many as 15% of mothers in Indonesia experienced labor complications accompanied by pain and 22% stated that labor experienced was painful due to severe pain during childbirth, while 63% did not get information about the preparations that must be made to reduce pain during childbirth (3).

The Indonesian Health Profile reported that among 2,700 mothers, only 15% experienced mild pain, while 35% reported moderate pain, 30% severe pain, and 20% very severe pain during labor (4). Unbearable pain may lead to frustration and hopelessness, causing some mothers to feel unable to endure the labor process. As a result, some choose cesarean section as the quickest and easiest way to relieve the pain. According to Riskesdas data in 2021, in Indonesia the number of births by cesarean method is 17.6% and the highest incidence is in DKI Jakarta, which is 31.3%. This is due to complications of childbirth such as long partus (5). Cesarean delivery must be according to medical indications, because it has a five times greater risk of complications than normal delivery.

Physiologically, the childbirth process requires a lot of energy, if the mother experiences a decrease in physical conditions such as malnutrition and fatigue, it causes an increase in the intensity of labor pain (6). Psychologically, severe labor pain that is not managed properly can lead to stress and even depression in mothers, resulting in the excessive release of hormones such as catecholamines and steroids. These hormones may cause smooth muscle tension and vasoconstriction, leading to decreased uterine contractions, reduced uteroplacental circulation, and diminished blood and oxygen supply to the uterus, which can further increase pain impulses (7).

Birthing ball It is one of the non-pharmacological methods, namely a physical therapy ball that can be used with various positions, moving the pelvis which makes the mother comfortable and with gravity movement will increase the release of endorphinsThis occurs because the elasticity and curved shape of the ball stimulate receptors in the pelvic area, triggering the release of endorphin hormones that help reduce labor pain (8).

Based on preliminary studies, the number of births at the Kemayoran Health Center in 2024 will be 323 mothers with an average monthly delivery of 26-30 mothers. Of the 323 mothers who experienced severe pain, 44% were multiparapara. At the Kemayoran Health Center for pain management, the birthing ball method has never been used.

METHODS

This study employed a quantitative method using a quasi-experimental one-group pretest–posttest design without a control group. The study population consisted of maternity mothers who gave birth at the Kemayoran Health Center and met the inclusion criteria. Samples were selected using accidental sampling, involving 45 mothers. The study was conducted over a two-month period, from February 13 to April 6, 2025. Data were collected using questionnaires and observation sheets based on the Numeric Rating Scale (NRS). The research stage is to take care of research permits, collect data of respondents that are in accordance with inclusion, provide questionnaires and conduct interviews, conduct *Pretest* and *Post test* method *Birthing Ball* data and preparation.

RESULT AND DISCUSSION

Univariate Analysis

1. Frequency Distribution Based on Maternal Characteristics

Table 1. Distribution of Maternity Frequency by Age, Education, Occupation, Parity, and Childbirth Companions at the Kemayoran Health Center in 2025

Characteristics of Maternity Mothers	N	%
Age		
< 20 years old	5	11.1
20 - 35 years old	35	77.8
> 35 years old	5	11.1
Education		
Low	12	26.7
Tall	33	73.3
Work		
Work	13	28.9
Not working	32	71.1
Parity		
Primi para	13	28.9
Multi para	32	71.1
Large multi	0	0
Companion		
Exist	42	93.3
None	3	6.7

Based on table 1, it shows that most of the respondents are 21-35 years old and the majority are in higher education. Most respondents do not work and the majority of parity is multiparameter. Most of the respondents during childbirth have a companion, namely their husbands.

2. Average Difference in Labor Pain Intensity Score Before and After the *Birthing Ball Method*

Table 2. Average Labor Pain Intensity Score Before and After Birthing *Ball Method*

The Intensity of Pai	n	Mean	Median	Min	Max	±SD
Pre-test	45	6.78	7.00	5	9	1.042
Post test	45	4.44	5.00	3	6	1.056

Based on Table 2, the average pain score before the birthing ball intervention was 6.78, with a median of 7.00 and a standard deviation of ±1.042. The highest pain score was 9 (severe pain), while the lowest was 5 (moderate pain). After the birthing ball intervention, the average pain intensity decreased to 4.44, with a median of 5.00 and a standard deviation of ±1.056. The highest pain score after the intervention was 6 (moderate pain), while the lowest was 3 (mild pain).

Bivariate Analysis

1. Normality Test

Table 3. Effectiveness of the *Birthing Ball* Method on the Intensity of Labor Pain

	Sig	Information
Pretest	< 0.001	Not normally distributed
Posttest	< 0.001	Not normally distributed

*Shapiro Wilk Test

Based on Table 3, the data were found to be not normally distributed. Therefore, a non-parametric statistical test, namely the Wilcoxon test, was used for data analysis.

Table 4. Effectiveness of the *Birthing Ball* Method Before and After on the Intensity of Labor Pain

	Negative Ranks	Positive Ranks	Ties	Zscore	Pvalue*
Pretest Post test	0	42	3	-5.798b	< 0.001

*Wilcoxon Test

Based on Table 4, there was a statistically significant difference between the pretest and posttest results, indicating a reduction in pain intensity. The statistical analysis demonstrated the effectiveness of the birthing ball method, with a p-value of <0.001 and a Z-score of -5.798b, showing a significant decrease in pain intensity after the intervention.

1. Respondent Characteristics

Based on the study results, most respondents were in the non-risk age group of 21–35 years. This indicates that the majority of respondents were within a healthy reproductive age range, which physiologically enables mothers to better tolerate labor pain. Younger mothers tend to experience more intense pain sensations than older mothers. In addition, younger age is often associated with unstable psychological conditions and higher anxiety levels, which can intensify the perception of pain (9).

Most respondents had a higher level of education. This finding is consistent with the study by Maryumi et al., which stated that although labor pain is subjective, the level of education is often considered a variable that significantly influences the intensity of labor pain (2). Mothers with higher education will find it easier to obtain education and information from various media sources about labor pain so that they strive to be able to overcome and manage labor pain.

The majority of mothers in labor are not working, according to previous research by Wulandari et all stating that work does not have much effect on the intensity of labor pain, even if the mother does not work or work, she will still feel labor pain (10).

Most of the respondents are multiparapara, In line with Bobak et al.'s research, all stated that previous childbirth experiences can affect the mother's response to pain. In mothers who have had

painful and difficult experiences in previous childbirth, they will have feelings of anxiety and fear so that it will affect their sensitivity to labor pain (11). Mothers who have previously experienced childbirth generally have a better understanding of the pain associated with labor. In contrast, mothers who have never given birth, especially primiparous mothers, may not know what labor pain feels like during their first delivery experience (2).

The majority of birth companions are husbands or families, In line with research conducted by Mutiah, et al who say that the role of companions or husbands during childbirth has a significant influence on reducing pain. This has a psychological effect where mothers who are accompanied by their husbands will feel emotional support so that they can distract the mother and reduce the level of stressors that become pain stimulation so that the intensity of labor pain is reduced (12).

2. Average Labor Pain Intensity Score Before and After Birthing *Ball*

Based on the results of this study, the intensity of pain before using the *Birthing Ball* The majority of the patients are severely ill. In accordance with research by Fadmiyanor et all who said that maternity mothers who experienced labor pain before the birthing ball experienced severe pain and after being given therapy *Birthing Ball* moderate pain so that there is a decrease in pain value to the intervention given (13). Labor pain is a natural and physiological event, caused by pain stimulation derived from uterine contractions resulting in cervical dilatation, pelvic ligament pull and myometrial ischemia. Pain due to cervical dilatation and ischemia in the uterus is visceral pain felt by the mother in the lower abdomen and spreads to the lumbar, back, and thigh area.

If labor pain is not managed properly, it may cause stress in mothers, which can interfere with the labor process. Stress during childbirth triggers the release of stress hormones such as adrenaline and catecholamines. High levels of these hormones can increase pain impulses, reduce blood flow to the placenta, decrease oxygen supply to the fetus, and weaken uterine contractions. As a result, labor may become more painful and prolonged, potentially leading to prolonged labor (14).

From the results of this study, after being given the *Birthing Ball* The majority of respondents experienced a decrease in pain scale from severe pain to mild pain. Method *Birthing Ball* This can reduce labor pain because there are endogenous mechanisms and distraction methods, namely the distraction of the mother's mind and attention. The endogenous mechanism is the balance mechanism, using the application of massage from the painless area to the painful area. The way it works is on the sensory and nervous system discriminating components of pain so as to provide comfort in the spine, expand the bones and joints and help flex. This birthing ball will reduce labor pain due to pressure on the nerve filaments located in the iliosacral joint and its surroundings (15).

3. The Relationship of the *Birthing Ball* Method to the Intensity of Labor Pain

The results of this study stated that there was an effectiveness of the *Birthing Ball* to the intensity of labor pain. In accordance with the research of Nova et al, which stated that the results of bivariate analysis showed that there was an effect of the use of birthing balls with a decrease in pain during the first period of childbirth (16). In line with the research, Aksoy et all stated that there is an effect in the use of birthing balls during the first period of childbirth, which can reduce the level of pain during childbirth and increase labor satisfaction. The duration of the active phase of labor is shorter and cervical dilatation is faster (17).

The birthing ball method can support mobility and upright positioning during the early stage of labor. Performing this method for 30 minutes may help reduce labor pain and discomfort by promoting positions that utilize gravity and facilitate cervical dilatation. Mothers sit on the ball while gently moving and rotating their hips forward, backward, sideways, and in circular motions. Sitting on the ball can reduce pressure on the sacroiliac nerves and relieve lower back pain. These movements also help uterine contractions become more effective, assist fetal descent into the pelvis, relax pelvic ligaments and muscles, widen the pelvic area, and ultimately reduce the intensity of labor pain (18).

The *birthing ball* method greatly affects the intensity of labor pain because the mother feels more comfortable and relaxed, thus giving birth confidence to go through the pain process that the mother feels. Therefore, *birthing balls* prove to be a simple and effective complementary intervention that can be used to manage labor discomfort and also to improve outcomes.

CONCLUSION

The results of this study indicate that the birthing ball method is significantly associated with a reduction in labor pain intensity before and after the intervention. Therefore, healthcare workers are encouraged to optimize the use of birthing balls as a non-pharmacological method for managing labor pain. Mastery of correct techniques as well as responsive and empathetic assistance during the labor process is very important to maximize its benefits, so training is needed to improve the competence and skills of midwives in managing labor pain.

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