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The Use of Birth Ball as A Non-Pharmacological Complementary Therapy in The Reduction of Labor Pain in Phase 1

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KEYWORDS
Birth ball; Labor pain; First stage of Labor

ABSTRACT
Childbirth is the process of expelling the fetus to the placenta, the process of giving birth is identical to pain, while to reduce this pain, non-pharmacological methods are carried out, one of which is the Birth Ball method. This study aims to evaluate the effectiveness of using birth ball as a non-pharmacological complementary therapy in reducing labor pain in the first stage. The method used was a narrative literature review by searching for relevant articles on Google Scholar using keywords such as "Birth ball" and "Labor pain". Inclusion criteria included Indonesian-language articles published between 2021-2023. Of the six studies analyzed, it was found that birth ball use significantly reduced the intensity of labor pain. These studies showed that birth balls can accelerate cervical opening and reduce anxiety of laboring mothers through movements that increase endorphin release. In conclusion, birth balls are effective as an alternative method to reduce labor pain in Stage I, providing the added benefit of increasing maternal comfort and relaxation during the labor process. This study suggests the use of birth ball as part of midwifery practice to reduce labor pain non-pharmacologically.

1. Introduction

Childbirth is the process of releasing the fetus accompanied by contractions in full-term pregnancy (37-42 weeks). Labour is a natural process that begins with regular uterine contractions until the baby and placenta are born (Sutriningsih et al., 2019). Basically, giving birth is a natural thing. Baby, placenta, and amnion exit the mother's womb (Yuanita & Hartati, 2023). The labour process begins with contractions, which are characterized by gradual changes in the cervix until the birth of the placenta (Rufaindah, 2024). Physiologically, the labour passes a period characterized by regular contractions of the uterus accompanied by pain and increased cervical dilation ranging from 5 to 10 cm in the first and subsequent births (Mulyati & Imaniar, 2023).

According to the World Health Organization (WHO), in 2020, as many as 60 million (28.57%) women suffer from pain during pregnancy and childbirth. Maternal deaths occurred as many as 295,000, with the majority (94%) occurring in developing countries. Maternal mortality is mainly caused by postpartum haemorrhage (39%), preeclampsia/eclampsia (23%), infection (17%), prolonged labour (11%), miscarriage (9%), and embolism. (5%) and others (40%) (Nuraini et al., 2023).

Maternal mortality is still a significant problem in Indonesia. The cause of childbirth complications is the increasing maternal and fetal mortality rate, such as long childbirth. Mothers with prolonged childbirth are more likely to experience bleeding due to uterine atonia (33%), birth canal tears (26%), infections (16%), fatigue (15%) and shock (10%). At the same time, it increases the risk of severe fetal asphyxia, brain trauma, and infection (Dirgahayu et al., 2022). The occurrence of prolonged labour is caused by many factors, such as fetal position, pelvic abnormalities, histological abnormalities, birth errors, excessive fetal size, congenital abnormalities, mothers with obesity, and premature rupture of membranes (Nurmaisya & Mulyati, 2022).

Childbirth is synonymous with pain. In the latent phase, the cervix disappears, while in the active phase, the cervix opens and lowers the lowest area of the fetus (Dewi et al., 2020). Mothers experience pain during childbirth in the following proportions: 15% experience mild pain, 35% experience moderate pain, 30% experience severe pain, and 20% experience very severe pain (Sulistianingsih & Wijayanti, 2022). At the time of one delivery, the mother experienced severe pain that lasted for a long time (Ulfa, 2021). Phase I of labour is defined as the time from the start of labour to the complete opening (Anuhgera et al., 2021). If not handled properly, labour will take a long time; long labour can have a bad impact on the mother and fetus, such as uterine infections and the formation of fistulas. The pain of maternal labour must be effectively eliminated.

Rupture can lead to fetal death or placental abruption. Pharmacological and non-pharmacological methods can be used to relieve labour pain (Raidanti & Mujianti, 2021). Non-pharmacological treatments include massage, maternity balls, relaxation, hot and cold compresses, aromatherapy, breathing regulation, posture control, music therapy, hypnotherapy, and acupuncture. However, keep in mind that some mothers are not used to being massaged during childbirth (Gau et al., 2011). Some maternity mothers prefer the birth ball method to reduce pain during childbirth.

A birth ball is a physical therapy ball that can be used in a variety of positions to help mothers facilitate the progress of childbirth. One movement is to sit on the ball and move it using gravity to help the mother feel comfortable and help the labour progress. At the same time, the elasticity and curvature of the ball stimulate the receptors in the pelvis, thereby increasing the release of endorphins (Subagio, 2022). Birth Ball exercises for primipara mothers are carried out for 30 minutes after dilatation of 4 to 7 cm (the first stage of active labour), which can help the delivery process (Irawati et al., 2020). In the first stage of labour, practice using a maternity ball by sitting on it and slowly swinging your hips back and forth, right and left, and in circular motions. This exercise will help the uterus contract more effectively and help the baby descend through the pelvis faster (Anggraeni et al., 2021).

From this, the purpose of this study is to evaluate the effectiveness of the use of birth balls as a non-pharmacological complementary therapy in reducing the intensity of labor pain during the first active phase. This study aims to determine how significantly the birth ball method can reduce labor pain and speed up the cervix opening process, as well as to assess its benefits in improving comfort and reducing maternal anxiety during childbirth. Thus, this study is expected to provide a safe and effective alternative for labor pain management without the use of pharmacological drugs.

2. Materials and Methods

The method used in this study is a literature review in the form of a narrative review. Writing is done by searching for articles using a combination of several keywords in the Google Scholar database. The keywords used in the search are Birth ball, Labor pain, and Period 1 childbirth.

Inclusion criteria for articles taken in the study: 1) publication time range 2021-2023, 2) Indonesian language articles, 3) Research on the use of Birth Ball as a non-pharmacological complementary therapy in the reduction of labour pain in phase I. Exclusion criteria in article selection: 1) all studies that did not meet the inclusion criteria were not included in the writing.

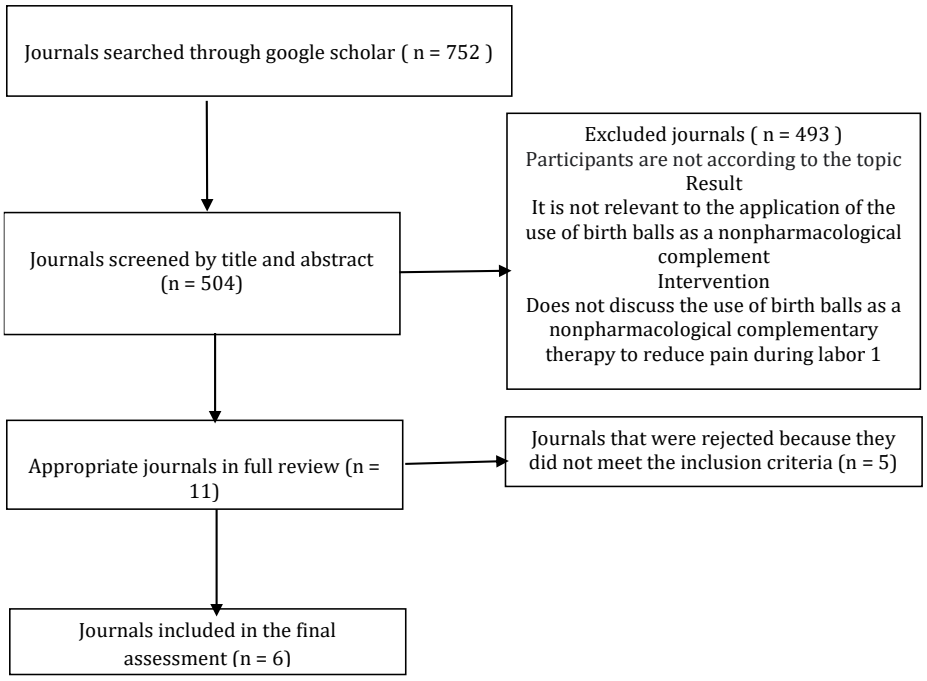

Figure 1 Diagram Flow

3. Result and Discussion

The results of the review of the literature obtained in the search in the database using Digram *Flow* that correspond to the inclusions and exclusions are presented in Table 1. Results obtained from 6 literature (Rahmi mutia ulfa, Ervin Rufaindah & fatimah, Miftakhul Zanah, Oriza Zativa Beru

Barus, Fera Yuanita & Dwi Hartati, dan Nuraini). Discussing the Use of Birth Ball as a Non-Pharmacological Complementary Therapy in Reducing Labor Pain.

Table 2 Literature Search Results

Authors and years	Study design, Sample, Variable, Instrument, Analysis	Outcome of Analysis Factors	Summary of Results
(Rahmi mutia ulfa, 2021)	Design: pre and post-test control group design Sample: 26 people Variable: 2 variables, namely the independet variable using a ball and related variables to reduce labor pain Instrument: Questionnarie Analysis: 2 analyzes, namely univariate and bivariate	describe the characteristics of mothers giving birth and determine the effect of using a ball on labor pain	The birth ball method is one of the alternative methods recommended to reduce pain during childbirth
Rufaindah (2024))	Design: Random control trial Sample: 60 people (30 births and 30 control people) Variable: The use of birth balls and reducing pain in labour Instrument: Questionnaire Analysis: univariate and bivariate	The data management uses intervention, in mothers giving birth while the results are recorded on a partograph	The use of birth balls with complementary therapy is very effective in reducing pain and accelerating the opening of the cervix.
(Miftakhul Zanah, 2023)	Design: one group pretest, posttest design Sample: 31 mothers giving birth Variable: use of birth balls and reduction of pain in labor Instrument: Questionnaire Analysis: univariate and bivariate	Shapiro-Wilk is used to test the normality of the data, if normal it is followed by the Paired T-Test statistical test, if it is abnormal it uses the Wilcoxon hypothesis test as an alternative to the Paired T-Test test.	Using the birth ball method is very effective in reducing labor pain in the 1st active phase

(Oriza Zativa Beru Barus, 2023)	Design: descriptive in the form of a case study Sample: - Variable: use of birth balls and reduction of pain in labor Instrument: medical record Analysis: univariate and bivariate	To measure pain, numerical assessment scales (NRS), verbal assessment scales (VRS), visual analogue scales (VAS) and facial assessment scales are used. and using birth ball therapy	Using the birth ball method accompanied by proper relaxation, is more effective to reduce pain and speed up labor
(Fera Yuanita, Dwi Hartati, 2023)	Design: One group pre-posttest design Sample: 21 mothers giving birth Variable: use of birth balls and reduction of pain in labor Instrument: Questionnaire Analysis: wilcoxon statistics	Maternity mothers experience pain in the first active phase	It is very influential to use birth balls to reduce labor pain. Because of the enthusiasm and enthusiasm of maternity mothers to apply the birth ball method, the uterus can contract optimally
(Nuraini, 2023)	Design: observational analytics Sample: 30 mothers giving birth Variable: The use of birth balls and reducing pain in childbirth Instrument: Kuesioner, partograph Analysis: chi square test.	Birthing balls can activate endorphin compounds so that the transmission of pain messages can be inhibited which can lead to a decrease in pain intensity.	The use of the Birthing Ball method is very influential in reducing the intensity of pain during childbirth

Discussion

The researcher's results, after selecting from several journals using Flow diagrams, obtained 6 journals suitable for the use of birth balls as a non-pharmacological complementary therapy in reducing labour pain in the first period. The birth ball method is very influential in reducing labor pain during active phase I (Adnyani et al., 2022).

The first journal of Rahmi Mutia Ulfa (2021), this study indicated that the use of a Birth Ball significantly affected pain reduction during the first active phase in primigravida women, with a p-value of 0.000. Additionally, there was a significant difference in the duration of active phase labor between the treatment and control groups, also with a p-value of 0.000. However, during the second stage of labor, the use of the Birth Ball did not show a significant effect, with a p-value of 0.160. The use of birthing tools has been demonstrated to alleviate labor pain during the active phase and to shorten the duration of the first stage of labor. The Birth Ball is recommended as an alternative

method for reducing labor pain in midwifery services. This method involves sitting on the ball and rocking, which utilizes gravity to enhance the release of endorphins, while the ball's shape stimulates receptors in the body that promote endorphin secretio (Siregar et al., 2021).

The second journal, Ervin Rufaindah and Fatimah (2023), this study indicates a significant difference in childbirth progress between the two groups, with a p-value of 0.000. It can be concluded that complementary therapy using birth balls has an effect on cervical dilation in pregnant women. It is recommended that expectant mothers engage in complementary therapy exercises while sitting on a birthing ball, as this can be an effective method to enhance labor progress. The movement on the birth ball focuses on diverting attention from pain through physical activity, involving rhythmic movements that promote comfort and relaxation. This approach can also boost the confidence of the expectant mother in managing the pain she experiences, thereby reducing the perceived pain (Noviyanti et al., 2020).

The third journal Miftakhul Zanah (2023), this study demonstrates that the use of birth balls significantly reduces labor pain in pregnant women during the first active phase at BPM Yulinda, Padang Pariaman Regency, with a p-value of less than 0.05. The average Numerical Rating Scale (NRS) score decreased from 6.78 before using the birth ball to 3.54 afterward. Thus, it can be concluded that birth balls effectively reduce pain levels in pregnant women during the first active phase of labor. Birth ball therapy is beneficial for managing, reducing, and alleviating childbirth pain, particularly during the initial phase, as it can be utilized in various positions (Tane et al., 2024).

The fourth journal Oriza Zativa Beru Barus (2023), this study stated that the study subjects had a pain scale of 4-6 (moderate pain) and after using the birth ball for 2 periods with a time of 30 minutes in each period, there was a decrease in the pain scale to 1-3 (mild pain). There is a decrease in pain levels in pregnant women during the first active phase after the use of the birth ball. The effect of the use of Birth balls on reducing pain intensity in pregnant women. The use of a birth ball is very beneficial if accompanied by good relaxation. It can be more effective in reducing pain so as to accelerate head dropping, accelerate cervical opening and reduce the intensity of maternal anxiety (F. M. Lestari, 2021).

The fifth journal of Fera Yuanita, Dwi Hartati (2023), this study is based on the Wilcoxon statistical test with the use of SPSS version 20 with the result of p-value = 0.000 <0.05, so it can be concluded that there is an effect of the period I pain intensity on primigravida mothers before and after the use of the birth ball. The enthusiasm and enthusiasm of the mothers who give birth also greatly help the mother's psychology in processing pain and creating a positive atmosphere for the mother so that the uterus can contract optimally. The pelvic rocking movement with a birth ball carried out by the maternity mother helps the mother adapt to the pain and discomfort she experiences (N. E. A. Lestari et al., 2023).

The sixth journal, Nuraini (2023), this study states that the pain intensity for those who use a birthing ball is an average of mild pain with a standard deviation of 68.8, while those who do not use a birthing ball have an average severe pain with a standard deviation of 71.4. It can be concluded that there is an effect of the use of the Birthing Ball on the intensity of labour pain where the p-value is 0.028 (p-value < 0.05). The birthing of the ball can affect the duration of the first active phase in

primigravida due to the application of an upright position combined with ball movement (Heriyeni & Wiji, 2023).

4. Conclusion

Based on the results and discussions in the literature review, it was found that 6 articles showed the use of Birth Ball as a non-pharmacological complementary therapy to reduce the intensity of labour pain during the first active phase. It has a great effect on maternity mothers; the effects found are reduced pain, relaxation and worry. This literature review is expected to be a source and literature material for further research and support the maximum application of the use of birth balls to maternity mothers.

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