THE EFFECT OF BIRTH BALL ON REDUCING PAIN IN LABOUR EVIDENCE BASED CASE REPORT (EBCR)

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Abstract

Introduction: Labour is a physiological process experienced by a woman. Labour pain occurs due to contractions of the uterine muscles in an effort to open the cervix and push the baby's head towards the pelvis. Excessive pain causes anxiety that can inhibit uterine contractions and result in prolongation of the first stage of labour and impaired fetal well-being. The use of a birth ball during labour has been shown to be effective in reducing labour pain. Birth ball is a special ball designed to be safe for labouring mothers that can be used in various positions so that the mother feels relaxed and helps reduce labour pain.
Objectives: This evidence-based report aims to determine the best application of birth ball to reduce pain in labour in the Garuda Health Center Working Area.
Method: The search for articles on the effectiveness of birth balls in labouring mothers was carried out in the PubMed and Google Schoolar libraries. The keywords used were "Effect", "Birth ball", "AND", "Labour pain". The search for articles was limited by inclusion criteria, namely articles published in the last 10 years,Randomized Control Trial(RCT), in the form of full text articles, and according to clinical questions.
Results: Two research articles using the Randomized Control Trial (RCT) method by Simin, et al and Angelita et al were found that met the inclusion criteria and were screened and critically analyzed. Based on two journals that both show evidence that birth ball has an effect in reducing labour pain. After a critical review, the research was declared valid, important and applicable to patients. Birthball was applied to first-time labouring mothers and the results showed that pain intensity was reduced from NRS scale 6 to scale 2. Birth ball helps position the mother's body optimally and has the effect of reducing pain when the uterus contracts.
Conclusion: The use of a birth ball for mothers in labour has proven to be effective in reducing labour pain in the active phase of the first stage of labour. The use of a birth ball is recommended as an alternative for dealing with pain in birthing mothers.

Keywords: Birth ball, labour pain

INTRODUCTION

Labour and birth are normal physiological events in life. The birth of a baby is also a social event for the mother and family. The role of the mother is to give birth to her baby, while the role of the family is to provide assistance and support to the mother and the baby.(1)The definition of childbirth is the event of the exit of a full-term baby followed by the exit of the placenta and fetal membranes from the mother's body through the birth canal or other ways with the strength of the mother or other assistance.

Labour consists of several processes or commonly referred to as stages. There are 4 stages in the process of labour consisting of stage I, namely opening, stage II fetal

expulsion, stage III placental expulsion, and stage IV time after placental expulsion up to 2 hours of monitoring. Labour is considered normal if the process occurs at full term (after 37 weeks) without any complication. Labour begins when the uterus contracts and causes changes in the cervix (opening and thinning) and ends with the complete birth of the placenta.(2)In this case, the role of health workers is no less important in providing assistance and support to the mother so that the entire series of labour processes takes place safely both for the mother and for the baby who is born.(1)

The labour process is synonymous with pain. Labour pain can arise due to the mother's physical and psychological reflexes. Physiologically, pain occurs when the uterine muscles contract in an effort to open the cervix and push the baby's head towards the pelvis. Pain in the first stage of labour is a physiological process caused by the process of cervical dilatation, hypoxia of the uterine muscles during contractions, ischemia of the corpus uteri and stretching of the lower segment of the uterus and compression of the cervical nerves.(3)In psychological conditions, emotional tension due to anxiety to fear can aggravate the perception of pain during labour. Pain and pain will cause anxiety so that it will increase the onset of stress and panic. As a result, it will cause a physiological response that can reduce the ability of the uterus to contract, causing uncoordinated uterine contractions which can result in prolongation of the first stage of labour and impaired fetal welfare.(4)Each individual has differences in pain perception during labour, among others, due to differences in pain perception responses influenced by many factors such as fear and anxiety in the face of labour, attention that is only focused on pain, personality and exhaustion.(5)

Pain management in the process of labour must be considered by caregivers during labour and can be done pharmacologically using drugs and non-pharmacologically in the form of using birth balls, distraction, music therapy, murotal, acupressure, aromatherapy, relaxation, hypnobirthing and so on. The advantages of using this non-pharmacological method are effective, simple and without adverse effects.(6)

Birth ball is a large ball made of latex. This ball generally has a height of about 65-75 cm. This special ball is designed to be non-slip when used on the floor. It makes the birth ball relatively safe and provides a sense of relaxation in the process of labour. The use of birth ball in labouring mothers in stage I which aims to help the progress of labour which can be used in various positions, the use of birth ball in labouring mothers is beneficial in reducing pain and is a comfortable tool for labouring mothers, one of the movements is to sit on the ball and wiggle which makes a sense of comfort and helps in the progress of labour by using gravity which aims to increase the release of endorphin hormone due to the elasticity and curvature of the ball stimulates the pelvic receptors responsible for secreting endorphin. According to research, the use of birth balls has been shown to have a positive experience in labour, including a shorter first stage, reducing the incidence of sectio caesarea.(7)

CASE SCENARIO

The case presented is the result of midwifery care carried out at the Garuda Health Center as follows. The patient named Mrs.R aged 18 years and her husband Mr.R 18 years old came to the health center with complaints of nausea since 05.00 WIB on 14-03-2023. Contractions that are felt regularly and there is mucus discharge and no water discharge from the birth canal. Fetal movement can still be felt. The patient felt uneasy with the pain felt. This is the first pregnancy and has never miscarried before. The gestational age is 38-39 weeks.

The patient's medical history never felt suffering or had chronic or infectious diseases before or during this pregnancy. During pregnancy the patient has never been hospitalized and has never used contraceptives before.

The patient's general condition was good with composmentis consciousness. Vital signs examination with Blood Pressure 120/80 mmHg, Pulse 84x/minute, Temperature 36.6ºC and Respiration 22x/minute. Physical examination of the face: neither pale nor oedema, eyes conjunctiva pink and sclera white, Palpation of abdomen: Fundal Height: 30 cm head percentage has entered the upper door of the pelvis (Divergent), FHR 142x/minute, contractions 3x/10'/30". Vaginal touche: Portio thick soft, opening 4-5cm, amniotic fluid (+), head percentage, right occiput anterior (ROA), station 0 and moulage negative. Before using birth ball care, the pain scale was measured using the Numeric Rating Scale (NRS) with a scale value of 6 (moderate pain). before done. After care using birth ball with Rotation ball movement for 30 minutes and every contraction. Mom was able to do it well and cooperatively. Then measured again with NRS with a scale value of 2 (mild pain).

The formulation of the clinical question, based on the case is whether there is an effect of birth ball on reducing labour pain in labour time I?

P : Women in labour
I : Birth ball use
C : No intervention and other comparison
O : Decrease in labour pain

METHODS

Literature search was conducted on 08-03-2023 in E-Data based PubMed and Google scholar. The search used Boolean operators with the keywords Birth ball AND pain relief AND labour. The search for articles was limited by inclusion criteria, namely international journals published in the last ten years (2013-2023) the research design was Randomized Controlled Trial in English or Indonesian and in accordance with clinical questions. Exclusion criteria were inappropriate titles and abstracts. Selected articles were then critically reviewed using the VIA (Validity, Importance, and Applicability) method or relevance to the clinical problem.

RESULTS AND DISCUSSION

The search results were obtained from 2 Randomized Control Trial articles. In Simin's research, ddk conducted research on 90 primiparous women who fit the inclusion and exclusion criteria. There were two intervention groups in this study, namely using heat therapy and birth ball. Pain scores were recorded using Visual Analog Scale (VAS). Pain scores were measured in three groups before intervention and then recorded every 30 minutes in three groups until cervical dilatation reached 8 cm. From the results of this study there was a significant difference where the average score of pain severity in the birth ball group was significantly lower than the control group.[8]

Whereas in the research of Angelita, et al, there were 128 women who were used as samples and randomly tested controls according to the inclusion and exclusion criteria. There are three interventions provided, namely warm water hydrotherapy (GA), doing perineal exercises with bith ball (GB), and combining the two (GC). The outcome measures given were to see the results of pain, anxiety, and stress interventions on neuroendocrine during labour. The researcher used Visual Analog Scale (VAS). After being seen from the three applications before and after being given an intervention for 30 minutes, it shows that the provision of birth ball exercise therapy (GB) has a higher effect than other applications.[9]

The application of birth ball were using rotation movement for 30 minutes and used when the contraction occurs. We evaluate the pain using Numeric Rating Scale (NRS),

before and after the application of birth ball. The results showed, there was a decrease in pain scale values from a scale value of 6 (moderate pain) to a scale value of 2 (mild pain). Mom was able to do it well and cooperatively. There are similarities obtained from 2 research articles, namely in the birth ball intervention carried out for 30 minutes. The difference between the 2 articles and the care applied by the author is the pain measurement scale and the absence of a control group as a comparison. But birth ball care is worth applying.

The birth ball method is one method of reducing labour pain that will provide a stimulus to the activities experienced by the mother through movement so that the mother will focus on patterned movement activities that can alleviate pain and anxiety in the face of labour. The causes of labour pain result from various factors such as uterine muscle contractions, pelvic muscle base strain, episiotomy and psychological conditions. In psychological conditions, excessive pain and pain will cause anxiety. Anxiety can increase the onset of stress. Stressful conditions can affect the body's ability to withstand pain, stress causes excessive release of hormones such as catecholamines and steroids. These hormones can cause smooth muscle tension and vasoconstriction of blood vessels resulting in decreased uterine contractions, decreased uterine placental circulation, reduced blood flow and oxygen to the uterus.(10)

With the birth ball method given to mothers in labour during the active phase 1, the pain felt by the mother is reduced due to the distraction of attention to pain and patterned activities undertaken by the mother. However, the occurrence of pain reduction does not result in a lack of his contractions. His contractions experienced by the mother are normal in labouring women so that if his contractions are disturbed most mothers who will give birth experience a long labour.(11)

Birth ball is very good at strongly encouraging the mother's energy needed during childbirth, an upright posture will support the birth process and help the fetal position to be in the optimal position, making it easier to give birth normally. Birth ball therapy sits as comfortably as possible and the shape of the ball that can adjust to the shape of the mother's body makes it easier for the mother to relax, besides that the ligaments and muscles, especially those in the pelvic area, become loose and reduce pressure on the sacroiliac joint, blood vessels around the uterus and pressure on the bladder, back, waist, tailbone and can reduce pressure on the perineum.(3)

The method used to measure pain intensity can include using the Numeric Rating Scale (NRS). Pain intensity will be asked to the patient, then the patient is asked to point to the number according to the degree / level of pain felt. The degree of pain is measured on a scale of 0-10. The level of pain is measured on the basis of: no pain (none: 0), slight pain (mild: 1-3), moderate pain (moderate: 4-6) and severe pain (severe: 7-10).(12)

Based on midwifery care that has been provided by the author to Mrs. R, the author will discuss midwifery care management that has been provided in the form of birthball therapy which was carried out on March 14, 2023 at UPT Puskesmas Garuda. Evaluation of the results of the birth ball intervention, there was a decrease in pain during contractions, where in the intervention carried out by the author against Mrs.R, an examination was carried out at 12.30 WIB with the results of cervical dilatation of 4-5cm and a total NRS pain score of 6 and uterine contractions of 3x10'30" indicating that Mrs.R was in the active phase of labour. Then the author performed midwifery care by giving birt hball for 3 applications with a duration of time for 30 minutes. During the first 30 minutes the mother felt a slight decrease in the pain experienced by the mother. The mother said the pain decreased after being given a birth ball, the mother felt the pain was distracted by doing these movements so that the mother's pain decreased when compared to not using a birth ball.

According to research by Kurniawati, et al 2017 in Yogyakarta the use of birth ball techniques, primigravida mothers will be more relaxed and relaxed so as to reduce tension due to the release of endorphin hormones which can help reduce the patient's pain scale.

The birth ball technique can reduce the pain scale felt by the mother in the first stage of labour. Relaxation and a sense of calm can also change the level of oxidation.(13)

This is in line with research by Kwan et al, namely the use of birth balls in intrapartum contributes to increasing maternal self-efficacy during labour and reducing pain. A total of 66% reported a decrease in pain levels after using the birth ball, 8% reported more pain than before, 26% reported no change in their pain levels.(14)Based on the results of Maryani's research, 2016 in Yogyakarta, it is known that respondents from the treatment group tend to experience a decrease in the intensity of labour pain compared to the control group. The results of the Chi square test obtained niiai X = 7.925 with a significance value, which means that there is a significant relationship between birth ball therapy and a decrease in the intensity of labour pain.(15)

According to Isye, et al (2022) the causes of labour pain result from various factors such as contraction of the uterine muscles, stretching of the pelvic muscle floor, episotomy and psychological conditions. In psychological conditions, excessive pain and pain will cause anxiety. Anxiety can increase the onset of stress. Stressful conditions can affect the body's ability to withstand pain, stress causes excessive release of hormones such as catecholamines and steroids. These hormones 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.(16)

It turns out that in addition to reducing labour pain there are other benefits of birth ball according to Callie, 2017, namely the use of birth ball can enlarge the pelvic outlet up to 30% to help facilitate the birth of the baby; with the help of gravity birt hball can help lower the baby's head; the use of birth ball can accelerate the progress of labour; effective for reducing pain when contractions occur; birth ball can provide counter pressure on the mother's thighs and perineum when occupied.(10)

Based on the review of the journal, it was found that the results of the study were valid, important and applicable to labouring mothers.

Tabel 1 Literatur Result

No	Jurnal	Validity	Importance	Applicablity
1	*Birth ball or heat therapy? A randomized controlled Ptrial to compare the effectiveness of birth ball usage with sacrum-perineal heat therapy in labor pain management* Simin Taavoni, Fatemeh Sheikhan, Somayeh Abdolahian , Fatemeh Ghavi **Journal International Elsevier** 2016 Source: Google Scholar	This journal is a type of research with a Randomized Controlled Trial design. The sample was 90 primiparous women who fit the inclusion criteria. The inclusion criteria were primiparous women aged 18 to 35 years with one pregnancy, head presentation of the baby, gestational age 38-40 weeks, anticipated normal birth and without history of infertility. Exclusion criteria were if there was a need for analgesic drugs or if obstetric complications occurred, participants were immediately referred to obstetricians and other professionals as needed, and were then excluded from the study. First the researcher explained the purpose of the study to participants and they were informed that heat therapy and the use of birth balls were being studied for their effects on their labor pain and whether it provided a satisfying labor experience. a satisfying labor experience. Then consent forms were signed by the subjects and those who were in the first stage of the	The average pain severity score before being given intervention on heat therapy p value = 0.145 birthball therapy p value = 0.128 and both therapies (heat therapy and birthball) p value = 1.00. And after being given an intervention for 30 minutes on heat therapy p value = 0.0556 birthball therapy p value = 0.001 and therapy both (heat therapy and birthball) p value = 1.66. Then after being given an intervention for 60 minutes on Heat therapy p value = 0.008 Birthball therapy p value = 0.00 and both therapies (heat therapy and birthball) p value = 0.074. And after being given an intervention for 90 minutes on heat therapy p value = 0.007 birthball therapy p value = 0.001 and both therapy both (heat therapy and birthball) p value = 0.283. There was a significant difference between the pain scores of women in the birthball group after 30 minutes (P =	This study has more benefits than risks in its application. The characteristics given are also in accordance with the characteristics that will be applied to patients in the health center environment. Birth ball method can be used as an inexpensive and low-risk complementary therapy to reduce pain during labor. This intervention can be done because it is procedurally easy to do and there are no side effects or special training. This therapy has a low risk, the mother's position is not balanced can cause the mother to fall from the gymball. Therefore, accuracy and caution are needed in performing the therapy. Availability of birth ball resources available at the health center. In addition, the application of this intervention does not require much cost.

	active phase with cervical opening between 4 and 8 cm were randomly allocated into two groups intervention (heat therapy and birth ball) and control, while pregnant women in the latent phase were observed until their active phase started. Randomization was assigned by the researcher using a randomization table. To reduce potential bias, researchers were instructed not to provide verbal information about the possible effects of the intervention before and during the subject's participation in the study Also, the individual responsible for data analysis was closed to the purpose of the study to minimize any bias that might arise from knowledge of the study. This assured us that, as far as possible, differences only arose from the effects of the two interventions. Demographic characteristics were analyzed by t-test and chi-square. A P value of less than 0.05 was considered significant. Pain scores were recorded using the visual analog scale (VAS). In this method, pain is quantitatively assessed mapped on a 0 to 10 cm horizontal analog linear scale (0 ¼ no pain, 10 ¼	0.001), 60 minutes (P = 0.001), and 90 minutes intervention (P = 0.001) when compared to the pain scores of women in the control group. The mean pain severity score in the ball birth group was significantly lower compared to the control group. The analysis in this study is important because from the results listed in the journal, the difference is significant enough that the results are different.	

		intolerable pain). Pain scores were measured in three groups before intervention and then recorded every 30 minutes in three groups until cervical dilatation reached 8 cm. The validity of the evidence in this study was good. Due to limiting the inclusion and exclusion criteria, as well as in the study analyzing the data were not informed in the administration of the intervention so as to minimize bias in the study.		
2	*Non-pharmacological interventions during childbirth for pain relief, anxiety, and neuroendocrine stress parameters:* *A randomized controlled trial* Angelita José Henrique RN, MSN, PhD, Assistant Professor Maria Cristina Gabrielloni RN, MSN, PhD, Associate Professor Patricia Rodney RN, MSN, PhD, Associate Professor, Faculty Associate, Research Associate **Wiley International Journal of Nursing Practice 2018** Source : Pubmed	This journal is a research type with Randomized Controlled Trial design. The population in this study was a randomized control trial with 128 women in labor who were hospitalized in Sao Paulo, Brazil from June 2013-February 2014. Interventions were given to 3 groups of 128 women: warm water hydrotherapy (GA), perineal exercises with birth ball (GB), and a combination of both (GC). The outcome measures were to assess the results of the intervention on pain, anxiety, and neuroendocrine stress during labor. laborers who met the inclusion criteria were identified. Nine women were excluded: 3 refused to participate, 3 had	The results of the intervention were different before and after the intervention, there were statistically significant differences between groups for the release of endorphin hormones. In warm water hydrotherapy (GA) before being given the intervention had a score (7.55 ± 1.74) and after being given the intervention for 30 minutes showed a score (8.38 ± 1.79). For the provision of perineal exercises with gymball (GB) before being given the intervention had a score (7.56 ± 1.90) and after being given the intervention for 30 minutes the score changed (8.02 ± 1.83).	The research is similar to the people in my environment and is applicable. This study has more benefits than risks in its application. The characteristics given are also in accordance with the characteristics that will be applied to patients in the health center environment. Birth ball method can be used as an inexpensive and low-risk complementary therapy to reduce pain during labor. This intervention can be done because it is procedurally easy to do and there are no side effects or special training. This therapy has a low risk, the mother's position is

	indications for analgesic. This study was conducted on laboring women in 2 hospitals with inclusion and exclusion criteria. Inclusion criteria: Older than 18 years, single live fetus, head presentation, no clinical or obstetric pathology, cervical dilatation 3-8 cm, full term pregnancy, and pain score 5. Exclusion criteria: Indication for caesarean at admission, analgesia, smoker, mental disorder, caffeine intake equal to or less than 10 hours, drug user, less than 6 prenatal visits, without corticosteroids and analgesics in the past about 6 hours. One hundred and thirty-seven (137) women in labor were assessed for eligibility. Nine women were excluded from this study. As a result, 128 women were randomized to the interventions of warm bath hydrotherapy (GA) (n = 44), perineal exercises with a ball (GB) (n = 45), and a combined intervention of warm bath hydrotherapy with perineal exercises with a ball (GC) (n = 39). At follow-up, 9 participants were excluded. So there were 117 labor patients who met the inclusion criteria were identified. 9 women	This showed that the perineal exercise group using birth ball (GB) had a higher effect on increasing endorphin release during labor (0.2537 ± .08) (P = 0.007). This indicates that the perineal exercise group using birth ball (GB) had a higher effect on reducing pain during labor (0.3588 ± 0.34). While in the combined technique between the two given water hydrotherapy and gym ball (GC) exercises before being given the intervention had a score (7.54 ± 1.71) and after being given the intervention for 30 minutes had a score (8.08 ± 2.19). For anxiety, which decreased in all study groups at post-intervention, the means and SD for the combined intervention (GC) showed that this intervention had a higher effect on reducing anxiety during childbirth (0.020 ± 0.349). It can be seen from the three applications before and after being given a 30-minute intervention that the provision of birth ball exercise therapy (GB) has a	not balanced can cause the mother to fall from the gymball. Therefore, accuracy and caution are needed in performing the therapy. Availability of birth ball resources available at the health center. In addition, the application of this intervention does not require much cost.

	were excluded: 3 refused to participate, 3 had indications for futile analgesics, and 3 had already given birth. Information forms in this study in the form of personal, demographic, and obstetric data were obtained from medical charts and participant interviews. Instrumentation in this study included 1) Personal and obstetric information forms 2) Visual scale for pain and anxiety 3) Measurement of physiological parameters 4) Biological fluid saliva samples The ethical aspects of this study were conducted in accordance with the ethical principles of medical research involving human subjects and were approved by the Ethics Committee of the Federal University of Sao Paulo. Participation was voluntary, consent was obtained, and confidentiality was guaranteed. The validity of the evidence was good. Because it limits the inclusion and exclusion criteria, and in the research conducted guarantees confidentiality so that the data is not notified in the administration of	higher effect than other applications. The analysis in this study is important because from the results listed in the journal the difference is significant enough that the results are different.	

	the intervention so that it can minimize bias in the study.

CONCLUSION

Using a birth ball in a circular motion for 30 minutes during the active phase of the first stage of labor has been proven to be effective in reducing labor pain. The birth ball helps in positioning the mother's body optimally and has the effect of reducing pain when the uterus contracts.It is hoped that health workers can use birth ball as an alternative in overcoming pain in labouring mothers.

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