BIRTH BALL USAGE ON PAIN IN THE ACTIVE PHASE OF LABOR: EVIDENCE BASED CASE REPORT

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Abstract, **Background :** The labor process is identical to pain. Labor pain is a physiological process but each individual feels a different pain intensity. Labor pain can be caused by uterine muscle contraction factor, pelvic base muscle strain, and psychological factors. Psychologically, excessive pelvic pain and pain will cause anxiety. Anxiety increases the occurrence of stress which affects the body's ability to withstand the pain. Pain can hinder the labor progress, so that the body is unable to adapt that further causes an uncoordinated uterine contractions. This situation can prolong the period of 1st stage labor and increases the risk of fetal distress. One of the non-pharmacological methods that can be used to reduce the pain during the 1st stage labor is birth ball therapy, with the aim to help the labor progress and to reduce the pain. Specifically, birth balls can be used to reduce the labor pains during the active 1st stage of labor
Methods : The Evidence-Based Case Report aims to determine the use of birth balls on the intensity of labor pain. The articles searching regarding to the use of birth balls in PubMed and Google Scholar has obtained several articles, namely, Maria ulfa's article, with a pre-experimental study research method with a one-group pretest-posttest approach and Simin Taavoni, et al's article with the Randomized Controlled Trial research method. Both articles have been thoroughly reviewed and applicable to mothers in the active 1st stage of labor
Results : The intensity measurement the pain intensity by using the Numeric Rating Scale which is conducted before and after the birth ball therapy and the results obtained is a decrease in the intensity of pain in the active 1st stage of labor. The use of birth ball on inpartu mothers of active 1st stage of labor influences the reduction of labor pain intensity.
Conclusion : the birth ball intervention can reduce the pain intensity of active 1st stage labor.

Keywords: Birth Ball, Pain, Active Labor Phase

Background

Labor is a natural process which is started with a genuine labor contraction which is indicated by a progressive cervix change and ended with placenta delivery.(1) The labor process is identical with pain to the mothers, but in case the mother cannot control the pain, it can cause a stress or anxiety, every individual has or feels a various pain intensity. (2) The pain in labor is a problem for labor mothers. That is the biggest issue in labor, if it is not solved it will hinder the labor progress. A labor mother who has difficulty to manage the labor pain will cause an uncoordinated uterine contraction that will cause the prolonged 1st stage labor and it will bother the fetus well-being.(7)

The pain rate of labor is depicted by mothers during the labor process. The pain intensity depends on the severity sensation of the pain itself.(8) The labor pain which is obtained by mothers is caused by uterine contraction. The pain during the labor can cause a fear and stress. If the mother cannot hold the pain, it all can affect badly toward the smoothness of the labor so that it will take longer. It will cause a *distress* on infant and affect the baby after born. The stress on

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mother causes a release of stress hormone such as such as catecholamine and steroid so that it will cause a reduction of a blood stream of the mother to her fetus.(9)

The labor pain can be caused by uterine muscle contraction, muscle base stretch and psychological condition. On psychological condition, the excessive pelvic pain and the pain will cause an anxiety. The anxiety can increase the stress that can influence the body ability in withstanding the pain. Physiologically, the stress can cause an excessive hormone release such as *catecholamine* and *steroid*. Those hormones can cause a pelvic base muscle strain and vasoconstriction of blood vessel so that it causes a reduction of uterine contraction, a reduction of utero placenta circulation, the reduction of blood and oxygen stream to uterus(3) the pain also can hinder the labor progress, in this condition the mother is unable to adapt with the pain that causes an uncoordinated uterine contraction, so that there is an occurrence of prolonged 1st stage of labor and it increases the risk of fetal distress.(4)

One of the non-pharmacological methods that is used to reduce the labor pain is using the *birth ball*. (5) *Birth ball* is a method to help the labor progress and reduce the pain occurrence. Some benefits of the Birth ball use are increasing the blood stream to uterus, placenta and fetus, relaxing the pressure and giving the comfortability and counter pressure on perineum and tight, working with which pushes the reduction of the baby so that it accelerate the labor process. (6) Besides, the birth ball therapy is very good to push stronger the power of mother which is needed during the labor, the body posture position which is straight will support the labor process and help the position of fetus in optimal position so that it eases the labor process normally

Cases

A woman of G3P1A1 with the pregnancy age of 39-40 weeks comes to Puskesmas Garuda on 3 April 2022 at 7.30 WIB with a complaints of a staged and regular heartburn and it also has released a mucus mixed with the blood. The result of anamnesis shows the HPHT of 21 June 2021 and the TP of 28 March 2022.

The result of the examination shows the good condition, TD 120/70 mmHg temperature is 36,2ºC,pulse is 82 x/minute, breath is 23 x/minute. Abdomen test: TFU 29 cm, Leopold 1 buttock touched, leopold 2 on the left part is touched with long and hard and the right part is touched in the small parts, leopold 3 is touched with a head part, leopold 4 is Divergen, 5 areas of 2/5, DJJ is 135 x/minute regularly, TBJ is 2790 gram. Contraction: 3 x 10' for 30 second. The result of the examination in v/v t.a.k, the opening is 4 cm, cervix is thick and soft, amniotic fluid is positive, the crown is small in front part, located in the hodge II, no moulage found. For this case diagnose, it is G3P1A1 with the pregnancy age of 39-40 weeks inpartu of active 1st stage of living single intrauterine. The conducted nurture is explaining the result of the test, conducting the examination, conducting observation of the labor progress, DJJ measures the pain intensity, with the result is medium pain (4-6). The patient is suggested for a *birth ball* therapy and is re-measured for the pain intensity with the result is light pain (1-3).

Problem Formulation

Based on those explanations, the problem formulation in this case will be" How is the impact of *birth ball* use to be able to reduce the pain intensity of the active 1st stage labor?"

PICO

P : inpartu mother of active 1st stage
I : *birth ball*
C : No comparison
O : Show the existence of reduction of labor pain intensity

Methods

The researchers conduct a literature search in PubMed and Google Scholar by using the keywords Birth ball, Inpartu, Labor and Pain Intensity by Boolean operator of "OR" and "AND".

The journal searching on E-Data based, whch is a publication in the last ten years (2012- 2022), full text and the research design is clinical trial in English or in Indonesian language. The article which the complete text is chosen will be analyze/reviewed, which consist of 3 aspects that is a validity of research, the clinical importance of the result, and its applicability or its relevance toward the existing clinical problem.

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The chosen article will also be determined for its evidence strength degree or the level of evidence, which is described in a table, so that in that table will display a precision, consistency, compatibility, and controversy of the result, including which evidence which is the best evidence. The following is a picture of the flow of literature selection:

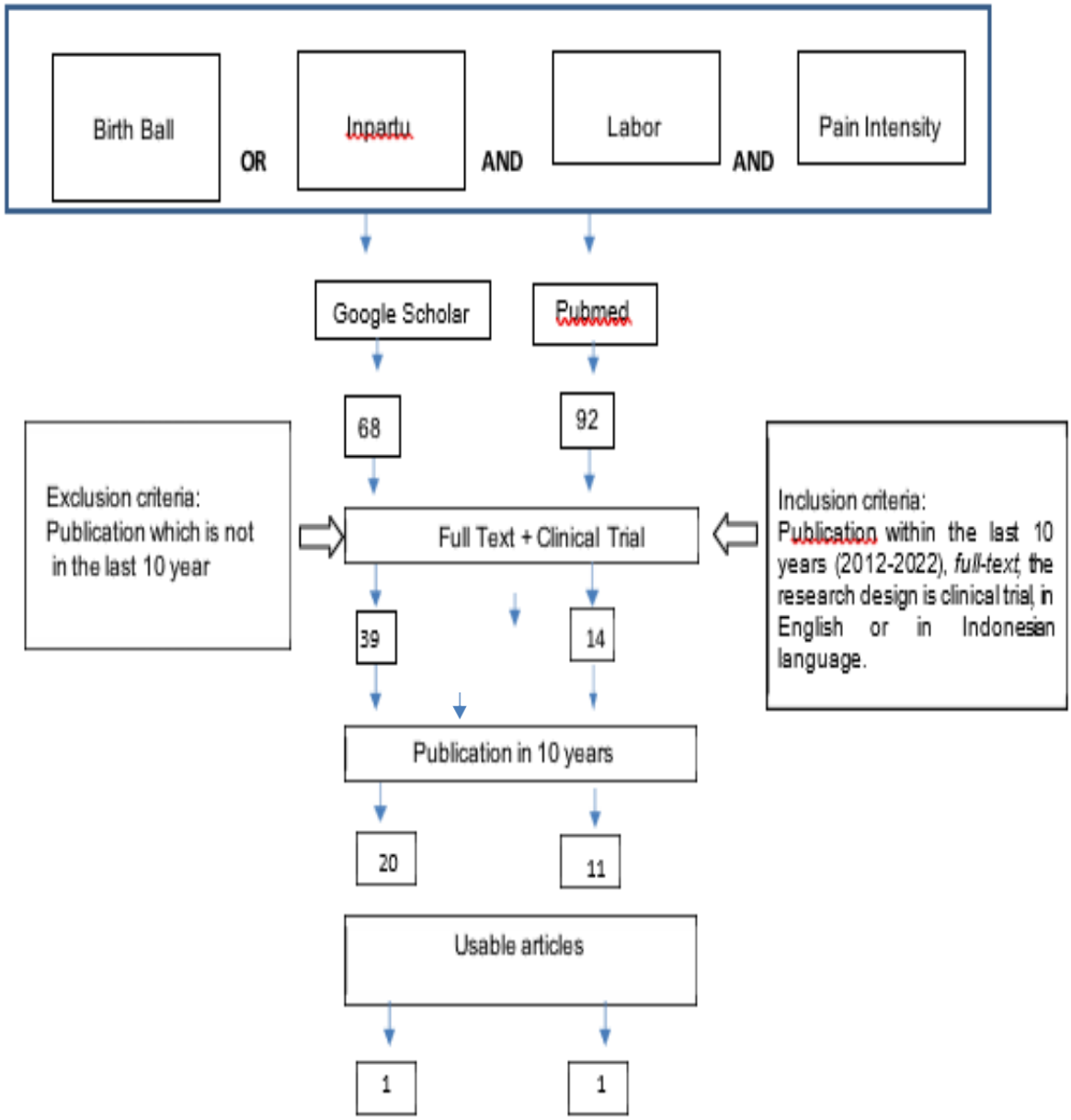

Figure 1. Flow diagram of literature selection

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The following is a critical review table:

Table 1. Critical Review

Article	Research Design	*Level of evidence*	*Validity*	*Importance*	*Applicability*
Maria Ulfa[1]	Pre-Experimental study with one group pretest post-test approach	3 B	The population is all inpartu mothers in active 1st stage, last 6 months at PMB Nuriman Rafida of Jambi city which is 254 respondents. The sample is 40 respondents. The assessment of the pain intensity of mothers are assessed using NRS with the category 0 indicated as "no pain", 1-3 "light pain", 4-6 "medium pain" 7 - 9 "heavy pain", and score 10 (panic).	It is confirmed that the mean score of pain intensity before the birth ball therapy.The P vaue =0,000 meaning that there is an influence of pain intensity before and after the birth ball therapy given.	Birth ball or gymball is a tool that is not strange for many health workers or people in genera. Birth ball is a tool that is easy to be found so that this intervention can be easily given to an inpartu mothers in every health facilities.
Simin Taavoni[1]Fatemeh Sheikhan[2] Somayeh Abdolahian[3] Fatemeh Ghavi[4]	*Randomized Controlled Trial*	1 B	The sampling is conducted toward 90 primipara women who are recruited from the biggest public hospital. the criteria of inclusion which is classified as primipara women, aged between 18- 35 years old with normal pregnancy, the head presentation of, the pregnancy age of 38-40 weeks without infertility record. The anxiety rate is measured by using VAS. In this method, the pain is valued on quantitative score which is measured on analog scale (0 = no pain, 10= severe pain/in tolerated pain)	The pain which is averagely obtained by the heat therapy group is less than what is obtained by the control group (p<0,05) or equal to the intervention. And there is a significant result difference between the group of mothers who obtains birth ball intervention with the control groups.	Birth ball and heat therapy can be used by health workers as the complementary medication to reduce the pain on labor mothers and it is an intervention that is easy to be conducted by all health workers.

Results and Discussion

From both article search results, it is obtained an information that supports the idea to give a *birth ball* intervention on active 1st stage mothers to reduce their pain intensity.The result of the first article search which is the research of Maria Ulfa is conducted for an assessment of pain intensity on mothers which is valued by using *Numeric Rating Scale (NRS).* It is confirmed that the mean score of pain intensity before the *birth ball* therapy is conducted is 2,78 and the mean score of pain intensity after the *birth ball* is conducted is 1,70. The mean score difference of before and after the *birth ball* therapy given is 1,08. The p *value* =0,000 which means that there is an influence of pain intensity of before and after the *birth ball* therapy given. The result of the second article search is from Simin Taavoni (2016) who conducts the research and the author obtains a result: it is confirmed the highest pain intensity on Inpartu mothers before conducting the birth ball therapy is on the severe pain category which is 23 (57,7%) and the lowest pain intensity on inpartu mothers before conducting the birth ball therapy is on the light pain intensity

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category which is 0 (0%).

The Application of Evidence Based Birth Ball toward Inpartu Mothers of Active 1st Stage

The application of *birth ball* is conducted on mothers who have entered the labor period of active 1st stage. Before giving the *birth ball* therapy, there should be an assessment of pain test by using the *NRS* instrument and the result of before giving the therapy, the mother obtains a medium pain. Next, the mother is given for a *birth ball* therapy by positioning the mother on comfortable sit on the *birth ball* surface and then they shake their pelvis or do a small jump on the *birth ball* for 30 minute.
During the intervention, the pain intensity assessment is conducted when there is a uterine contraction. When the contraction occurs, the mother will feel more comfortable and can control the pain they feel in comparative with the condition before they obtain the intervention.

Objectively, the mother can communicate well and they have a pain symptom that is undetectable or a light pain, so that it can be concluded that there is a reduction of pain intensity of before and after the mother is given a *birth ball* intervention.

The Treatment on Pain Reduction that Is Obtained by an Active 1st Stage of Inpartu Mother

This implementation of *Evidence Based Case Report* for the treatment of pain intensity on inpartu mother of active 1st stage is referred on the research conducted by Maria Ulfa (2021). In this research the pain scoring instrument is using NRS (*Numeric Rating Scale*) through giving the birth ball by asking the mother to sit on the *gym ball* and the mother shakes her pelvis or jumps a little on the *gym ball* which is occupied for 30 minutes on the vaginal opening of 4 to 8 cm.

In this case, according to the anamnesis that has been conducted, the mother acknowledges that she feels a heavy in every occurrence of contraction. After a measurement is conducted for the pain rate by using *NRS* (*Numeric Rating Scale*) of 0 – 10, with 0 is indicated as no pain obtained by mother and 10 is indicated as a severe pain that the mother is not able to communicate at all. On the result of intervention before the intervention is given, the mother shows a result which is a score of 4-8 which is indicated as a medium pain, objectively the mother can hiss, grin, can point out the painful area, can describe and follow the instruction well.

The pain in labor is a problem for labor mothers. That is the biggest issue in labor, if it is not solved it will hinder the labor progress. A labor mother who has difficulty to manage the labor pain will cause an uncoordinated uterine contraction that will cause the prolonged 1st stage labor and it will bother the fetus well-being.(7) The pain rate of labor is depicted by mothers during the labor process. The pain intensity depends on the severity sensation of the pain itself.(8) The labor pain which is obtained by mothers is caused by uterine contraction. The pain during the labor can cause a fear and stress. If the mother cannot hold the pain, it all can affect badly toward the smoothness of the labor so that it will take longer. It will cause a *distress* on infant and affect the baby after born. The stress on mother causes a release of stress hormone such as such as catecholamine and steroid so that it will cause a reduction of a blood stream of the mother to her fetus.(9)

The use of *birth ball* therapy which is conducted by labor mother can reduce the pain during the labor. A mother who can do a relaxation which is equal to the occurred uterine contraction, will feel a comfortability during the labor process. Besides, the birth ball therapy is very good to push stronger the power of mother which is needed during the labor, the body posture position which is straight will support the labor process and help the position of fetus in optimal position so that it eases the labor process normally.

During the therapy, the labor mother sits as comfortable as possible and the ball shape which can suits itself to the body shape of the mother will make the mother feel a relaxation, besides, the ligament and the muscle especially the muscle on the pelvis part will be saggy and it reduces the pressure on *sacroiliac* joints, blood vessels around the uterine and the pressure on bladder, back, waist, tail bone including it also reduces the pressure on perineum so that the mother can feel more comfortable.

Mirzakhani et al, stated that the *birth ball* exercise is highly recommended given that it is very important to promote the vaginal

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labor on women, because the birth ball exercise is very useful, *non-pharmacological,* and is a strategy that is not expensive to reduce the surgery rate of Caesarean section.[10] The clinical birth ball exercise implementation can be an effective tool for a mother who is in labor process to reduce their pain .[11] the same thing is also stated by Taavoni, et al who conclude that the *birth ball* exercise can reduce the. It is shown with the research result on an intervention group who obtains an lower average pain rate in comparative with control groups.[12] The use of *birth ball* technique on inpartu mothers on 1st stage can help to reduce the pain scale that is obtained by the mothers, by using this technique, it will give a more relax feeling so that it will reduce the pressure due to the release of *endorphin* hormone which can help to reduce the pain scale. Besides, the relax feeling and calm can change the oxidation rate.[13]

Conclusions

From the result of the critical review, it is concluded that the birth ball intervention can reduce the pain intensity of active 1st stage labor.

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