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Effect of the Use of Birth Balls on the Reduction of Pain and Duration of Labor During the First Stage of Active and Second Stage of Labor in Primigravida Maternity

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ABSTRACT

Labor pain is caused by contracting the uterine muscles pushing the fetus out. Labor mothers find it difficult to adapt to the pain of labor, especially primigravidas, this can cause prolongation of the first stage of labor. There are two ways to reduce labor pain, namely pharmacology and non-pharmacology. One of the non-pharmacological methods is the use of a birth ball. The purpose of this study was to assess the effect of using a birth ball on the reduction of pain during the first stage of active phase and duration of stage I and duration of stage II of labor. This study used an experimental design with a pretest-posttest control group design. The sample consisted of 13 treatment people and 13 controls with the Consecutive Sampling technique. The pain scale was measured by the Faces Pain Rating Scale and the duration of the active phase I and the second stage of labor using a partograph. The difference in pain scores and duration of stage I and duration of II for the treatment and control groups were tested with T-independents if the data were normally distributed and the Mann-Whitney test if the distribution was not normal. There was a difference in the effect of using a birth ball on the reduction of pain in the first stage of the active phase in primigravida with p value = 0,000 and there was also a difference in the effect of using a birth ball on the duration of labor during the active phase in the treatment and control groups with p = 0,000, while for the duration of labor. during the second stage of labor, there was no difference in the effect of using a birth ball with p = 0.160. The use of birth balls is proven to reduce labor pain during the active phase and accelerate the duration of the I stage. Birth balls are recommended to be used as an alternative to reducing labor pain in midwifery services.

1. Introduction

Childbirth is a natural process. Physiologically, in labor, there will be stretching and widening of the cervix, this occurs when the uterine muscles contract, pushing the fetus out so that a lot of energy is expended and this will cause the mother to feel pain and often this pain is perceived as the most painful experience. the mother who gave birth had felt in her life(Zaky, 2016).

Data on primigravida maternity in Indonesia, as many as 54% experienced severe pain, as much as 46% experienced moderate pain and mild pain. Data on multigravida maternity in Indonesia who experience severe pain as much as 37%, moderate pain as much as 63%(Aryani and Wardanis, 2017).

Pain during the first stage of labor is severe pain with a longer time,mothers who are difficult to adapt to the pain of labor can cause prolongation of the first stage of labor. No progress in labor or slow progress in labor is one worrying complication of labor(Taavoni et al, 2011).

The Indonesian Health Demographic Survey (2012) noted that prolonged labor was 38.2% as the main cause of maternal and perinatal death followed by bleeding 35.26% and eclampsia 16.44%. The results of the study by Xaiver (2007) showed that primiparous mothers who experienced long stage II labor were 57% of deliveries performed by SC and 85% of the causes of long II labor were caused by malposition of the fetal head.

Another study conducted by Janni (2002) found that the effect of prolonged labor was more bleeding, namely 1.84 g / dl compared to the duration of normal labor, which was only 0.79 g / dl. Mothers who experience the long second stage are at greater risk of undergoing labor with a vacuum and forceps, anal sphincter injuries, postpartum fever and causing fetal acidosis (pH less than 7.2) so that the baby needs more oxygen assistance. In prolonged labor it can also cause asphyxia, which is the biggest cause of infant mortality in West Sumatra(Destariyani, 2016).

Efforts made by the Government to overcome prolonged active phase of labor are found in the Minister of Health Regulation Number 369 / Menkes / SK / III / 2007 concerning Professional Standards for Midwives, namely that as a professional midwife is required to provide services in midwifery care during the first stage of labor, such as: positioning, hydration, providing moral support, pain reduction without medication, monitoring progress in normal labor and use of partographs and

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Science Midwifery

Journal Homepage: www.midwifery.iocspublisher.org

monitoring the process of fetal descent through the pelvic during labor and delivery (Marwiyah and Pusporini, 2017)

Efforts to relieve labor pain can use pharmacological or non-pharmacological methods. Given the potential for side effects on the mother and the fetus, the use of pharmacological methods in the form of analgesics and anesthetics may not be the first choice for childbirth.(Yeung et al., 2019). Many women in labor wish to avoid pain by minimizing the use of pharmacological methods.Non-pharmacologic pain reduction techniques have the best effect for a short period of time, are inexpensive, and without adverse effects, for example during an invasive procedure or while awaiting labor.(Simkin and Bolding, 2004).

Care for the mother in the first stage must also be given, one of which is to provide relaxation techniques in the first stage, namely by breathing, mother's position and massage. One of the relaxation techniques and non-pharmacological actions in handling pain during childbirth is using a birth ball which is also commonly known in Pilates as a fitball, swiss ball and petzi ball.(Yeung et al, 2019).

*Birth ball*is a physical therapy ball that helps the I stage mother to a position that helps labor progress and can be used in a variety of positions. One of the movements is by sitting on the ball and shaking it to feel comfortable and help labor progress by using gravity while increasing the release of endorphins because the elasticity and curvature of the ball stimulates the receptors in the pelvis that are responsible for secreting endorphins.(Vaijayanthimala and Judie, 2012)

The use of birth balls during childbirth prevents the mother from constantly lying on her back. One of the studies on birth balls conducted by Kwan et al, is the evaluation of the use of birth balls at intrapartum which contributes to increasing the self-efficacy of mothers during labor and reducing pain. 66% reported reduced pain levels after using a birth ball, 8% reported more pain than before, 26% reported no change in their pain levels.(Gau et al., 2011)

Research in Canada shows that in a group of women who have additional equipment for mobility such as a birth ball have a positive experience of giving birth, the first stage of labor is shorter, the use of analgesics is low and the incidence of cesarean section is low. In this case, the birth ball positions the mother's body optimally and the reduction of pain during uterine contractions gives rise to unusual movements. The reason for this is that birth ball exercises can work effectively in labor (V.aijayanthimala and Judie, 2012).

Research conducted by HAU (2012) in terms of usage satisfaction, 84% stated that a birth ball can relieve pain of contractions, 79% can relieve back pain and 95% stated that it is comfortable when using a birth ball. The benefits obtained by using a birth ball during childbirth are reducing pain and anxiety, minimizing the use of petidin, helping the process of lowering the head, reducing the duration of the first stage of labor, increasing the satisfaction and welfare of the mother.

Various literatures have mentioned the various advantages of using a birth ball in reducing labor pain, but in practice it has not been consistently implemented. Research conducted by Grubber (2013) shows that although medical personnel know about birth balls, they are not sure of their effectiveness on pain intensity and are unclear about specific techniques for using birth balls or how to do them.

2. Research methods

2.1 Research design

This research is an experimental research with pre and post test control group design. The group studied was divided into a treatment group and a control group starting with (pre-test) given to both groups, then given treatment and then ending with a post-test of the two groups (Sugyono, 2016).

	Pre-test	Treatment	*Post-test*
E	*O1*	X	*O2*
	Pre-test	Without Treatment	*Post-test*
K	*O3*	-	*O4*

Fig1 Research Design Scheme

Information :

O1 : the treatment group before using a birth ball

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Science Midwifery

Journal Homepage: www.midwifery.iocspublisher.org

X : Treatment using a birth ball for 30 minutes
O2 : The treatment group after using the birt ball
O3 : Control group without using a birth ball
- : Without a birth ball treatment
O4 : Control group without using birt ball

2.2 Place and time of research

This research was conducted at the Independent Practice Midwife (BPM) Yetti Latief Lubuk Alung and BPM Gelisma Mulia Lubuk Alung in October-November 2020.

2.3 Research variable

Independent variable: Use of a birth ball

Dependent Variable : 1. Reduction of pain during the active phase of labor
2. The duration of the active phase of labor
3. Duration of II labor.

2.4 Operasinal Definition

a. Use of the Birth Ball

1) Definition: physical therapy using a ball 55-75 cm by the mother primigravida in dealing with safe and comfortable labor to reduce pain during the first stage of labor
2) How to measure: observation
3) Measuring tool: observation sheet
4) Measurement results:
   a) Used a birth ball
   b) Not used a birth ball
5) Measuring scale: nominal

b. Active Phase I Labor Pain

1) Definition: Maternal response to unpleasant sensory and emotional experiences, both verbally and non-verbally during the active phase of labor
2) How to measure: Obseverasi
3) Measuring instrument: Face Point Rating Scale (FPRS)
   Measurement results: Degree 0 = no pain
   1st degree = very mild pain,
   2nd degree = mild pain,
   Grade 3 = moderate pain
   Grade 4 = severe pain
   Grade 5 = very severe pain
4) Measuring scale: ordinal \

c. Duration of the active phase of labor

1) Definition: the time taken from cervical thinning to complete cervical dilation using hours from 4 to 10 cm cervical dilation.
2) How to measure: partograph
3) Measuring tool: hour
4) Measurement results: expressed in minutes
5) Measuring scale: ratio

d. Long Kala II of Labor

1) Definition: the time taken from complete opening until the baby is born
2) How to measure: partograph
3) Measuring tool: hour
4) Measurement results: expressed in minutes
5) Measuring scale: ratio

2.5 Research Tools and Materials

a. Face Point Rating Scale (FPRS) sheet
b. Partograph sheet
c. Explanation sheet before approval
d. *Informed consent*
e. The ball has a diameter of 55 cm and or 65 cm
f. Hour
g. Mattress

Contents lists available at iocspublisher

Science Midwifery

Journal Homepage: www.midwifery.iocspublisher.org

h. Soft base and pillows
i. Paper and pencil

2.6 Data Processing and Analysis

a. Data processing

1) *Editing*
Re-checking the correctness of the data obtained or collected at the data collection stage.
2) *Coding*
After all the data has been edited or edited, coding is then carried out, namely changing the form of the data in the form of sentences or letters into numeric or numeric data.
3) *Procesing*
After editing and codding the data is processed through computerization
4) *Tabulating*
Processed data are arranged in the form of a frequency distribution table
5) *Cleaning*
The activity of checking the data input is whether there is an error or not to ensure the data is clean from errors and ready to be analyzed.

b. Data analysis

1) Univariate Analysis
Univariate analysis was conducted to describe the characteristics of the mother giving birth, to determine the level of pain before and after using a birth ball and to determine the length of the first and second stage of labor in primigravidas, which were presented in table and narrative form.
2) Bivariate Analysis
The bivariate analysis test used the Mann-Whitney test to assess and analyze the effect of using a birth ball on the reduction of pain in the first stage of the active phase of labor. Assessors and analysis of the effect of using a birth ball on the duration of labor during the first stage of the active phase and stage II using the T-Independents Test.

3. Research Results and Discussion

This research is an experimental research with pre and post test control group design. The group studied was divided into a treatment group and a control group starting with a pre-test given to both groups, then given treatment to the treatment group and then ending with a post-test for the two groups, where each group consisted of 13 mothers. primigravida pregnant. This research was conducted at the Independent Practice Midwife (BPM) Yatti Latief, and BPM Gelisma Mulia Lubuk Alung, in October - November 2020.

3.1 Characteristics of Research Respondents

The characteristics of the respondents in this study in the form of age, education, occupation, and gestational age can be seen in the following table:

Table 1

The frequency distribution of the respondents' characteristics is education, occupation, and gestational age in the treatment and control groups

Characteristics Respondents	Treatment (n = 13)		Control (n = 13)		*p value*
	f	%	f	%	
Respondent Age					
20-25 years	7	53.8	6	46.2	1,000 *
26-30 years	6	46.2	7	53.8	
Education					
Junior High	2	15.4	0	0	0.415 *
High school	9	69.2	9	69.2	
College	2	15.4	4	30.8	
Profession					
Work	8	61.5	4	30.8	0.443 *
Does not work	5	38.5	9	69.2	
Gestational Age					
Week 38	6	46.2	3	23.1	0.316 *

Contents lists available at iocspublisher

Science Midwifery

Journal Homepage: www.midwifery.iocspublisher.org

Characteristics Respondents	Treatment (n = 13)		Control (n = 13)		*p value*
	f	%	f	%	
Respondent Age					
39 Week	5	38.5	7	53.8	
40 Weeks	2	15.4	3	23.1	

*Note: * Homogeneity of varience test*

In Table 1, it can be seen that the ages of the respondents in the treatment and control groups are all still within the reproductive age range with their respective percentages (53.8%) and (46.2%). In the education of respondents in the treatment and control groups at most at SMA level with a percentage (69.2%), then mothers who do not work from the treatment group with a percentage (38.5%) and in the control group with a percentage (69.2%). Most gestational age at 39 weeks was found in the control group with a percentage (53.8%) and in the treatment group there were significant differences between education, occupation, and gestational age between the treatment and control groups with a value (p> 0.05).

3.2 Frequency Distribution of the Pre-Test Value of the Degree of Stage I Labor Pain in the Active Phase in the Treatment Group and the Control Group

The results of the frequency distribution of the pre-test values for the degree of pain in the active phase of labor in the treatment group and the control group can be seen in the following table:

Table 2.

Frequency Distribution of the Pre-Test Value of the Degree of Stage I Labor Pain in the Active Phase in the Treatment Group and the Control Group

Degree of Labor Pain	Pain Level (FPRS)	*Pre-Test* Treatment (n = 13)		Control (n = 13)	
		f	%	f	%
0 degree	No Pain	0	0	0	0
Degree 1	Very Mild Pain	7	53.8	7	53.8
Degree 2	Mild Pain	6	46.2	5	38.5
Degree 3	Moderate Pain	0	0	1	7,7
Degree 4	Severe Pain	0	0	0	0
Degree 5	Very Severe Pain	0	0	0	0

In Table 2, the frequency distribution of the pre-test value of the degree of pain in the active phase of labor in the treatment group and the control group is mostly found in the grade 1 score in the category of very mild pain with a percentage (53.8%). Furthermore, at degree 2 with mild pain category with a percentage (46.2%) in the treatment group and (38.5%) in the control group, grade 3 with the moderate pain category was only found in the control group respondent with a percentage (7.7%).

3.3 Frequency Distribution of Post-Test Values of the Degree of Stage I Labor Pain in the Active Phase in the Treatment Group and the Control Group

The results of the frequency distribution of the post-test scores for the degree of pain in the active phase of labor in the treatment group and the control group can be seen in the following table:

Table 3.

Frequency Distribution of Post-Test Values of the Degree of Stage I Labor Pain in the Active Phase in the Treatment Group and the Control Group

Degree of Labor Pain	Pain Level (FPRS)	*Post-Test* Treatment (n = 13)		Control (n = 13)	
		f	%	f	%
0 degree	No Pain	0	0	0	0
Degree 1	Very Mild Pain	10	76.9	0	0
Degree 2	Mild Pain	3	23.1	0	0
Degree 3	Moderate Pain	0	0	2	15.4
Degree 4	Severe Pain	0	0	8	61.5
Degree 5	Very Severe Pain	0	0	3	23.1

Contents lists available at iocspublisher

Science Midwifery

Journal Homepage: www.midwifery.iocspublisher.org

In Table 3, it is found that the first stage of labor pain in the active phase after using a birth ball in the treatment group is mostly found in grade 1, the pain category is very mild with a percentage (76.9%) and the least experience is grade 2 pain in the mild category with a percentage (23.1%). %). Furthermore, in the control group that did not use a birth ball, there were still many respondents who experienced grade 4 with severe pain category with a percentage (61.5%), grade 3 with moderate pain category (15.4%) and grade 5 with very severe pain category (23.1. %).

3.4 Assessment of the duration of labor for stage I and stage II for the treatment group and control group

The results of the assessment of the duration of labor during the active phase and stage II in the treatment and control groups can be seen in the following table:

Table 4.

Assessment of the length of delivery in the treatment and control groups

Duration of Labor (Minutes)	Treatment (Mean ± SD)	Control (Mean ± SD)
Stage I Active Phase	130.38 ± 39.28	257.85 ± 65.16
Stage II	30.08 ± 11.38	36.85 ± 12.41

In Table 4, it can be seen that the results of the assessment of the duration of labor for the first stage of the active phase in the treatment group are shorter with the results of the length of time of labor, namely (130,38 **±** 39.28) minutes, compared to the control group with the result (257.85 **±** 65.16) minutes. Furthermore, the length of delivery in the second stage of the treatment group was also shorter with the result (30.08**±** 11.38) minutes, compared to the control group (36.85 **±** 12.41) minutes.

3.5 The Effect of the Use of Birth Ball on the Decrease in Stage I Pain in the Active Phase in Primigravida Maternity

The results of assessing the effect of using a birth ball on reducing pain during the active phase I can be seen in the following table:

Table 5.

The effect of using a birth ball on reducing pain during the active phase of the first stage

Degree of Pain	Group		**Δ**	*p value*
	Treatment (Mean ± SD)	Control (Mean ± SD)		
Pre-test	2.46 ± 0.519	1.23 ± 0.439	1.23 ± 0.08	0.861
Post-test	2.54 ± 0.660	4.08 ± 0.641	1.54 ± 0.01	0,000

*Description: * Mann-Whitney test*

In Table 5, it can be seen that the results of the assessment in the treatment group before using the birth ball and the control group as a comparison obtained the mean difference (1.23 ± 0.08). The results of statistical tests using the Mann-Whitney test showed that there was no effect before giving birth ball therapy with a p value of 0.861 (p> 0.05). In the post-test results, the treatment group after using a birth ball and the control group as a comparison without using a birth ball obtained the mean difference (1.54 ± 0.01). The results of statistical tests using the Mann-Whitney test showed that there was an effect after the use of a birth ball on labor pain with a p value of 0.000 (p <0.05).

3.6 Effect of the use of birth balls on the duration of labor during the first stage of the active phase and stage II for the treatment and control groups

The results of the assessment of the effect of using a birth ball on the duration of labor during the active phase and stage II can be seen in the following table:

Table 6

The effect of using a birth ball on the duration of labor during the active phase and stage II

Duration of Labor (Minutes)	**Treatment**	**Control**	***p value***
	Mean ± SD	**Mean ± SD**	
Stage I Active Phase	130.38 ± 39.28	257.85 ± 65.16	0,000 *
Stage II	30.08 ± 11.38	36.85 ± 12.41	0.160 *

*Note: * T-independents test*

Contents lists available at iocspublisher

Science Midwifery

Journal Homepage: www.midwifery.iocspublisher.org

In Table 6, it can be seen that the results of the assessment of the duration of labor during the first stage of the active phase are shorter in the treatment group, namely (130.38 ± 39.28) minutes compared to the control group (257.85 ± 65.16) minutes. Whereas in stage II the length of time for delivery in the treatment group was shorter (30.08 ± 11.38) minutes, compared to the control group (36.85 ± 12.41) minutes. The results of statistical tests using the independent T-test showed that there was an effect of using a birth ball on the duration of labor for the first stage of the active phase in the treatment and control groups with p = 0.000, while in the treatment and control groups the duration of labor for the second stage had no effect on using a birth ball with p = 0.160.

3.7 Discussion

This research is an experimental research. This research was conducted in October-November 2020 at the Independent Practice Midwife (BPM) Yetti Latief Lubuk Alung and BPM Gelisma Mulia Lubuk Alung. The sample in this study were primigravida maternity who met the inclusion and exclusion criteria with a total sample of 26 mothers. The treatment group used a birth ball during the first stage of the active phase for 30 minutes.

a. Distribution of Frequency Distribution of Pre-Test Values Degree of Stage I Labor Pain in the Active Phase in the Treatment Group and the Control Group

In Table 2, the pre-test value of the degree of pain in the active phase of labor in the treatment group and the control group is obtained most found in the score of degree 1 category of very mild pain with a percentage (53.8%). Furthermore, in grade 2 with mild pain category with a percentage (46.2%) in the treatment group and (38.5%) in the control group, grade 3 with the moderate pain category was only found in the control group with a percentage (7.7%).

Labor pain is caused by myometrial contractions, which are physiological processes of different intensity in each individual. In childbirth, the pain that arises is cause for concern and usually creates fear and stress which can lead to reduced maternal-fetal blood flow. Labor pain is caused by stretching of the lower uterine and cervical segments and the presence of uterine muscle ischemia (Andarmoyo, 2013). The intensity of the pain is proportional to the strength of the contraction and the pressure that occurs. Pain increases when the cervix is fully dilated as a result of the baby's pressure on the pelvic structures followed by stretching and tearing of the birth canal. The perception of pain in labor is closely related to the intensity of pain felt by the mother. The factors that influence the perception of pain include emotional, motivation, socio-cultural and self-confidence. as a mother's belief in her ability to deal with pain that is felt so that the mother can control and deal with pain naturally so that the delivery process runs smoothly (Mender, 2003)

One of the factors that influence labor pain is age. Youth tends to be associated with psychological conditions that are still unstable, which triggers anxiety so that the pain you feel becomes more intense. (Andarmoyo, 2013). This is in accordance with Yanti's (2010) theory, namely that if you are too young, it will be difficult to control pain. In this study, there was no age difference between the experimental group and the control group. Age in the experimental and control groups is at the reproductive age which also affects the level of pain that occurs.

Research conducted by Puspita on the factors that influence labor pain in the first stage of labor in the active phase found that the age variable has a relationship with the labor pain variable with a value of 0.021 (p <0.05). This is in accordance with the theory expressed by Judha et al (2012), namely that differences in development will affect pain reactions to childbirth. This development is that physically, the organs at the age less than the reproductive age will not be ready to carry out the reproductive task and the development of psychological maturity causes the reaction to pain that arises to be more severe.

The results of research conducted by Zaky, (2016)shows that P = 0.008, which means there is a difference in the intensity of labor pain during the active phase before and after the birth ball method is given. This research is in line with the research conducted by Taavoni, et al (2011) entitled Effect of Birth Ball Usage on Pain in the Active Phase of Labor: A Randomized Controlled Trial, it was found that the average pain score in the group using the birth ball method was significantly lower when compared with the control group with p value <0.05.

At the time of the study, midwifery care was still given to mothers about pain by rubbing the back of the mother who complained of aches and pains and measuring the level of pain felt by the mother. Midwives, as caregivers in childbirth, have a duty to facilitate mothers during the delivery process by always providing support both physically and psychologically. Physical support is in

Contents lists available at iocspublisher

Science Midwifery

Journal Homepage: www.midwifery.iocspublisher.org

the form of preparing a room where the mother feels comfortable, safe. Meanwhile, for psychological support in the form of giving the family the opportunity to be there during childbirth, the midwife's attitude is empathetic and respects the mother's privacy.

b. Frequency Distribution of Post-Test Values of the Degree of Stage I Labor Pain in the Active Phase in the Treatment Group and the Control Group

In Table 3, it is found that the first stage of labor pain in the active phase after using a birth ball in the treatment group is mostly found in grade 1, the pain category is very mild with a percentage (76.9%) and the least experience is grade 2 pain in the mild category with a percentage (23.1%). %). Furthermore, in the control group that did not use a birth ball, there were still many respondents who experienced grade 4 with severe pain category with a percentage (61.5%), grade 3 with moderate pain category (15.4%) and grade 5 with very severe pain category (23.1. %).

This research is in line with the research conducted byvaijayanthimala and Judie, (2012)There was a high significant difference (p = 0.001) in the use of a birth ball in reducing pain between the study group and the control group. Research conducted byTaavoni et al. (2011), it can be concluded that the use of a birth ball during labor can significantly reduce the pain of labor in the active phase with a value of p <0.05.

Discomfort, fear and pain are a problem for mothers in labor. This is the biggest obstacle in labor and if not addressed will have an impact on the delay in progress of labor(Tian et al., 2013). Maternal who is difficult to adapt to the pain of labor can lead to poorly coordinated uterine contractions which can lead to prolongation of the first stage of labor and impaired fetal well-being(Zaky, 2016). No progress in labor or slow progress in labor is one of the worrying, complicated, and unpredictable complications of labor.(Taavoni et al., 2011).

Pharmacological pain management is more effective than non-pharmacological methods, but pharmacological methods are more expensive and have the potential to cause adverse effects and not all health facilities provide such services. So that there are many non-pharmacological therapies that appear to reduce pain in childbirth where every level of society can do it and health services can facilitate, are cheap, simple, effective and without any adverse effects. One of the non-pharmacological methods that can be used to reduce labor pain is birth ball therapy(Marwiyah and Pusporini, 2017).

Labor pain or pain arises from physical reflexes and psychological responses from the mother. Emotional tension from anxiety to fear can aggravate the perception of pain during labor. The pain that a mother experiences when facing childbirth can stimulate fear, leading to anxiety that ends in panic. This can lead to a physiological response that reduces the ability of the uterus to contract and consequently prolongs labor time(Rowlands and Permezel, 1998). The first stage of labor is severe pain with a longer duration. For this reason, it is necessary to pay attention to handling to deal with pain during the first stage of labor. The fear of tension and anxiety is greatly exacerbated by pain(Taavoni et al, 2011).

The use of birth balls that are carried out by the mother by sitting relaxed and rocking on the ball, hugging the ball during contractions has the benefit of helping the mother to reduce pain during childbirth. A mother who is able to relax in tune with uterine contractions will feel comfortable during the labor process.(Zaky, 2016). In addition, birthballs are very good at encouraging strong maternal energy needed during childbirth, an upright posture will support the birth process and help the fetus position in an optimal position so that it makes it easier to give birth normally.(Leung et al., 2013). During therapy, the mother is sitting as comfortable as possible and the shape of a 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, coccyx and can reduce pressure on the perineum (Mender, 2013).

Researchers assume that after the introduction of birtball during the last K4 visit, the mother understands and understands birthball and wants to do it at the time of delivery later, at stage 1 the active midwife facilitates and provides support and confidence in the mother in childbirth so that there is a response to feedback. The mother's ability to cope with pain, guiding her and accompanying her to birthball is carried out for 30 minutes with 4 movements, so that the mother feels relaxed and can control the pain she feels.

Contents lists available at iocspublisher

Science Midwifery

Journal Homepage: www.midwifery.iocspublisher.org

c. Assessment of the duration of labor for stage I and stage II for the treatment and control groups

In Table 4, it can be seen that the results of the assessment of the duration of labor for the first stage of the active phase in the treatment group are shorter with the results of the length of time of labor, namely (130,38 **±** 39.28) minutes, compared to the control group with the result (257.85 **±** 65.16) minutes. Furthermore, the length of delivery in the second stage of the treatment group was also shorter with the result (30.08**±** 11.38) minutes, compared to the control group (36.85 **±** 12.41) minutes.

Labor pain is caused by contractions that occur regularly with an intensity that is getting stronger and stronger. Various attempts were made to reduce pain during labor, both pharmacologically and non-pharmacologically. The use of a birth ball makes the mother feel safe and comfortable in moving, making it easier for the fetus to move in the pelvis. The same research results are shown by Shirazi et al., (2019), that mothers who received the use of a birth ball during labor during the first stage of the active phase had a shorter duration of labor than the control group. (Gau et al., 2011)which concluded that birthballs can reduce pain and can shorten the length of the first stage of labor. At the time of giving care about a birth ball, it will generate good self-confidence so that the mother quickly accepts directions. Pregnant and childbirth mothers who have received preparation for childbirth in the form of birth ball and psychological exercises, so that they can better prepare themselves for pain and discomfort during the labor process.(HAU et al., 2012).

Yan research conducted by Zaky, (2016)showed an increase in the progress of uterine contractions where the intensity of the uterus was stronger and there was also an increase in the duration of the uterus in the study group that performed pelvic rocking using a birth ball. Research in Taiwan shows that the group of women who do birth ball exercises experience a shorter period of labor, lower use of analgesics and a low incidence of cesarean section.(Mirzakhani et al., 2015), Shirazi et al (2019)proved that the duration of the active phase of labor was 30% shorter and the resistance during the second stage of labor decreased significantly in the exercise group. Another study put forward byHassan Zaky, (2016)shows that the study group that was given a birth ball had a faster opening, namely 60% during the first stage of labor until the opening was complete.

The researcher assumed that after the birth ball was carried out in the mothers in the treatment group the decrease in pain and duration of labor was faster, the treatment group gave birth than in the control group which did not do the birth ball, the respondents were very enthusiastic about doing the birth ball and did it according to what the midwife recommended and were very enthusiastic about it. the birth of the baby so that it helps the birth process to be fast, the assessment is done once for 30 minutes. And on the progress of labor, it affects the birth ball to help mothers give birth to shorten the first stage of the active phase. The mother said that she was comfortable and relaxed in dealing with childbirth because of the help of a birth ball,

d. The Effect of the Use of Birth Ball on the Decrease of Stage I Labor Pain in the Active Phase of Primigravida Maternity

In Table 5, it can be seen that the results of the assessment in the treatment group before using the birth ball and the control group as a comparison obtained the mean difference (1.23 ± 0.08). The results of statistical tests using the Mann-Whitney test showed that there was no effect before using birth ball therapy with a p-value of 0.861 (p> 0.05). At the time of the post test the treatment group after using a birth ball and the control group without using a birth ball as a comparison obtained the mean difference (1.54 ± 0.01). The results of statistical tests using the Mann-Whitney test showed that there was an effect after giving birth ball therapy with a p value of 0.000 (p <0.05).

Labor pain and pain management remain a major concern for women, families, and health care providers. It is important for health care providers to always use non-pharmacological measures to relieve labor pain.(Czech et al., 2018). One of the non-pharmacological actions that can be done to reduce pain is by using a birth ball technique. The use of birth balls in labor has benefits in reducing pain. Birth ball is a convenient tool for women giving birth, which allows them to reach a more comfortable position to increase the progress of labor (Aprillia, 2014). The pain that a mother experiences when facing childbirth can stimulate fear, leading to anxiety that ends in panic. This can cause a physiological response that reduces the ability of the uterus to contract with the consequence of prolonging labor time(Vaijayanthimala and Judie, 2012). Pain during the

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Science Midwifery

Journal Homepage: www.midwifery.iocspublisher.org

first stage of labor is severe pain with a longer time, therefore it is necessary to pay attention to handling pain during the first stage of labor (Tournaire, 2007).

Based on research that has been conducted on primigravida mothers who do birth ball exercises, the measurement is carried out once by looking at the pain scale after 30 minutes of birth ball training by performing 4 movements. The research subjects were divided into 2 groups, namely the treatment group using a birth ball and the control group not. using a birth ball as a comparison.

Researchers found that the use of a birth ball on the respondent's mother gave birth to have benefits in reducing pain, many respondents in the field felt relaxed and the pain was reduced after being treated using a birth ball. This can be seen from the results of the decreased pain scale assessment felt by the mother during the first stage of the active phase. According to respondents and according to observations in the field, the use of a birth ball also reduces tension during the labor process they face. This is because the use of a birth ball can increase the feeling of relaxation and help the process of releasing endorphins which can help reduce the scale of the patient's pain.(Marwiyah and Pusporini, 2017)

Based on the descriptions and conclusions of the results of the research that has been done, it can be explained that with the birth ball technique, mothers who give birth will always get a sense of comfort and relaxation as it is known that one of the factors that influence pain is fatigue, family support, and relaxation methods used so that the mother can adapt. to pain better. Pain during childbirth, in this case is pain of uterine contractions, which can result in increased activity of the sympathetic nervous system, changes in blood pressure, heart rate and respiration (Maryani, 2016).

The results of research conducted by Pilliteri (2010) on respondents of pregnant women in Philadelphia stated that the implementation of birth ball exercises is highly recommended considering the importance of promoting vaginal delivery in women, because birth ball exercises are very useful, non-pharmacological, and an inexpensive strategy to reduce operating figure equal to. The clinical implementation of birth ball exercises can be an effective tool for mothers who give birth to reduce labor pain. The same thing was stated by Taavoni et al (2015) who concluded that birth ball exercises can reduce pain. This is indicated by the results of the study regarding the treatment group which had a lower pain score than the control group.

The results of this study are also in line with research conducted by Mathew (2012) which states that discomfort in childbirth mothers can be overcome by body positions that support gravity and positions that accelerate cervical dilation such as walking, squatting, kneeling, and sitting. The use of a birth ball will support the mother to use this position during the delivery process. This will help the fetus descend into the pelvic cavity and the mother feels less pain. As a pain reliever for labor, birth balls can be used simultaneously with other non-pharmacological methods such as massage, aromatherapy, music therapy and warm or cold compresses.(Simkin and Bolding, 2004).

e. The effect of using birth ball on the duration of labor for stage I, active phase and stage II for the treatment and control groups

In Table 7, it can be seen that the results of the assessment of the duration of labor during the first stage of the active phase are shorter in the treatment group, namely (130.38 **±** 39.28) minutes compared to the control group (257.85 **±** 65.16) minutes with a time difference (127.47 ± 25.88) minutes. Whereas in the second stage the length of time for delivery in the treatment group was shorter, namely (30.08 ± 11.38) minutes, compared to the control group (36.85 ± 12.41) minutes with a time difference (6.77 ± 1.03). minute. The results of statistical tests using the independent T-test showed that there was an effect of using a birth ball on the duration of labor for the first stage of the active phase in the treatment and control groups with p = 0.000, while in the treatment and control groups the duration of labor for the second stage had no effect on the use of a birth ball with p = 0.160

In this study, 4 movements were carried out for 30 minutes, during therapy the mother was sitting as comfortable as possible and the shape of a ball that could adjust to the shape of the mother's body made it easier for the mother to relax, besides that the ligaments and muscles, especially those in the pelvic area, became loose and reduced pressure on them. sacroiliac joint, blood vessels around the uterus and pressure on the bladder, back, waist, coccyx and can reduce pressure on the perineum

According to the observation results of monitoring mothers in the field related to exercise or therapy using a birth ball can strongly encourage the mother's energy needed during childbirth,

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Science Midwifery

Journal Homepage: www.midwifery.iocspublisher.org

an upright posture will support the birth process and help the fetus position in an optimal position so that it makes it easier to give birth normally. In addition, the mother becomes more relaxed so that the flow of oxygen is too difficult, where the availability of this oxygen will affect the activity of uterine contractions, the more oxygen is transferred to the uterine muscles, the more adequate the uterine contractions are so that labor becomes shorter (Mender, 2003). The advantage of using another birth ball can increase the pelvic outlet by 30%,

In addition, according to the results of observations by researchers related to the length of labor, during the first stage there was a significant influence and increase in the time difference between the treatment and control groups after 30 minutes of using a birth ball, this was because the effect was immediately felt by the mother. however this is only done once treatment. During the second stage there is an increase in the acceleration of the delivery time but the effect is not significant. The mother still feels the effects of giving birth ball techniques, but during the second stage, the contractions are getting worse and unbearable. According to the researchers' assumptions, the duration of labor and the perception of pain varies greatly from woman to woman. Some of the factors that can affect the duration of labor and the perception of pain felt by the mother are the environment, personal experiences, family support, culture, and the psychological condition of the mother. It is possible for mothers who do not feel anxious during the labor process to be able to tolerate the pain well so that it will speed up the labor process.(Mender, 2003).

The difference that occurred in the length of labor between the two groups, in the control group, the mother who was in a state of fear and did not know what was happening to her, was not prepared with a birth ball technique and breathing to overcome the contractions, would move uncontrollably even though the contractions were light. Conversely, what happened in the experimental group where they had been prepared to face labor in a relaxed manner showed a process of self-control when there were severe contractions and accelerated labor, although in stage II it had little effect on progress and duration of labor. It is hoped that this birth ball technique is not only given at the time of delivery, but is given during the second trimester of pregnancy when the mother is physically fit and strong.(Mirzakhani et al., 2015).

It is hoped that in Independent Practice Midwives can do birth ball exercises as one of the non-pharmacological techniques in reducing / minimizing the pain of labor during the first stage of the active phase to the birth of the baby. The midwife profession should apply motherly care for the first stage of the active phase by using a birth ball to the mother giving birth so that the pain that the mother feels can be reduced and teach birth attendants to participate in assisting the implementation of birth ball training techniques.

This is supported by research conducted by Jahanshiri (2013) in Iran concluded that exercises carried out at the end of pregnancy, one of which is the use of a birth ball, can reduce the length of the first stage of labor, but in stage II this technique has a slight effect on the acceleration of labor, because this technique is given to when the mother is about to give birth. Maternity women in this study sat on the ball and wobbled it so that the elasticity and curvature of the ball stimulated the receptors in the pelvis that are responsible for secreting endorphins.

The results of the research on the length of the first stage of labor were supported by research conducted by Mathew (2012) on 60 primigravidas in India, namely that there was a significant difference in the duration of the first stage and second stage between the group using birth ball therapy and the control group. among them can reduce the incidence of prolonged stage I, accelerate cervical opening, stimulate uterine contractions, widen the pelvic diameter and accelerate the reduction of the fetal head.

4. Conclusion

a. The result frequency distribution is obtained *pre-test*The degree of pain in the first stage of labor in the active phase of the treatment group and the control group was mostly found in the grade 1 score in the very mild pain category. Furthermore, at degree 2, the category of mild pain in the treatment group and grade 3 with the category of moderate pain was only found in control respondents.

b. Obtained labor pain during the first stage of the active phase after using a birth ball in the treatment group was mostly at grade 1 in the category of very mild pain and at least experiencing pain in grade 2 in the mild category. Furthermore, in the control group that did not use a birth

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Science Midwifery

Journal Homepage: www.midwifery.iocspublisher.org

ball, there were still many respondents who experienced grade 4 with severe pain category, grade 3 for moderate pain category, and grade 5 for very severe pain category.

c. The results of the assessment of the duration of labor in the active phase of the first stage in the treatment group are shorter than the control group and the duration of labor in the second stage of the treatment group is also shorter than the control group.
d. There was no effect of using a birth ball on the reduction of pain in the first stage of the active phase in primigravida maternity in the pre-test results of the treatment and control groups. Meanwhile, the results of the post-test treatment and control groups had an effect on the use of a birth ball.
e. There was an effect of the use of a birth ball on the duration of labor during the first stage of the active phase in the treatment and control groups, while the treatment and control groups had no effect on the use of a birth ball.

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