BIRTHING BALL SUPPRESSES THE INTENSITY OF LABOR PAIN IN PHASE 1

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Abstract

Data issued by Directorate of Maternal Health in 2012 showed that maternal death in Indonesia was caused by several collapses. These factors, among others, bleeding (30.1%), hypertension (26.9%), infection (5.6%), old parturient (1.8%), abortion (1.6%) and other causes (34.5%). Based on these data, the old parturient is one of the factors that contributes to maternal mortality in Indonesia even though with a fairly small percentage. The purpose of this study is the effectiveness of Birthing Ball administration of labor pain in 1 phase maternity of active phase in the working area of the Talang Jawa inpatient health center in 2021.

Quasi Experimental Design, with approach using Pretest-Posttest with Control Group Design. The population in this study were 68 mothers with a sample of 30 divided into two groups, 15 groups of intervention groups and 15 mothers of the control group. Purposive sampling technique. Analysis of univariate and bivariate data using independent T-test test.

The results of the study were obtained there was a difference in pain intensity in each treatment group obtained by the results of the distinct value of P Value <0,000. The average labor pain in the group was given Ball before being given intervention with the mean 57.00 and after being given the intervention of the mean value in measurement of 1 62.67 and measurement of 2 68.93. The average labor pain in the group was not given Birthing Ball Pretest with a mean 50.80 value of 1 75.40 and the value of the measurement of 2 88.80.

Keywords : *Birthing Ball, Pain, Labor*

1. Introduction

Maternal mortality rate (MMR) is one indicator of the health status of a country which is one of the most important aspects in describing the level of society. Mortality and morbidity in pregnant and maternity women are major problems in developing countries, the 2017 Indonesian Demographic Health Survey (IDHS) also noted that 42.96% of prolonged labor was the main cause of maternal and perinatal death, followed by 35.26% bleeding and eclampsia. 16.44%. The maternal mortality rate (MMR) in Lampung Province 2017 based on reports in districts/cities was 117.02 live births. The lowest percentage is Metro City, which is 38.91 live births (SDKI, 2018).

Data released by the Directorate of Maternal Health Development in 2012 showed that maternal mortality in Indonesia is caused by several factors. These factors include bleeding (30.1%), hypertension (26.9%), infection (5.6%), prolonged labor (1.8%), abortion (1.6%) and other causes. (34.5%). Based on these data, prolonged labor is one of the contributing factors in contributing to the maternal mortality rate in Indonesia, although with a fairly small percentage. (Kemenkes RI, 2014)

One of the factors that cause prolonged labor is contraction abnormalities, both adequate contractions and inadequate contractions. This causes various complaints experienced by mothers such as anxiety, fatigue, sweating, rapid breathing, discomfort and anxiety (Sarwono, 2010). Childbirth is a natural process. Physiologically, during labor, contractions occur which cause thinning and opening of the cervix. In normal delivery there is pain that comes and goes. Attacks of pain begin when the

contractions reach their peak and disappear after the uterus relaxes. Labor pain is physiological in the labor process with different pain intensity in each individual (Cunningham et al, 2012).

Labor and birth is pain and discomfort during labor has two sources, namely somatic and visceral. Pain in the first stage of labor is caused by distension of the lower uterine segment, stretching of the cervical tissue and the cervix is dilated, and pressure on the surrounding structures and nerves is visceral pain, whereas in the second stage of labor women will experience somatic pain, which is often described as sharp, intense pain. feels hot like being burned and the location is clear (Lowdermilk, 2013).

Pain arises due to physical reflexes and the mother's psychological response. Emotional tension from anxiety to fear can exacerbate the perception of pain during labor. The pain experienced by the mother when facing childbirth can stimulate fear so that anxiety arises which ends in panic. This can cause a physiological response that reduces the ability of the uterus to contract and consequently prolongs labor. Pain in the first stage of labor is severe pain with a longer time, therefore it is necessary to pay attention to handling to overcome pain in the first stage of labor (Kennedy *et al*, 2007; Kurniawati, 2017).

Fear and anxiety can cause the release of large amounts of stress hormones (epinephrine, norepinephrine etc.) (Simkin, P.whaley, J. dan Keepler, A., 2007). Many methods are used to reduce pain in labor, both pharmacologically and non-pharmacologically. Non-pharmacological methods tend to be easier and safer to give to mothers in labor. These methods include massage, the use of birth balls, touch therapy, relaxation, warm compresses and cold compresses, the use of aromatherapy, breath control, positioning, music therapy, hypnotherapy, acupuncture and others. (Henderson dan Jones, 2006).

Birthing ball is a tool used by pregnant and maternity mothers to train mothers during pregnancy and to make mothers stay active during the delivery process. The movements performed by mothers with birthing balls such as pelvic rocking can strengthen the abdominal and waist muscles, reduce pressure on the waist, reduce pressure on the bladder, help the mother relax so as to reduce tension, stimulate the receptors in the pelvis which are responsible for secreting endorphins. By keeping the mother active, it gives the mother the confidence to control pain and reduce negative thoughts and judgments about pain so that a distraction process occurs which makes the mother's focus on pain divert. This makes the mother more comfortable and can control the intensity of the pain felt by the mother during the delivery process (Gau M-L et al, 2011; Kurniawati, 2017). Patterned physical movement with pelvic rocking is also beneficial in increasing the pelvic outlet by up to 30%, facilitating optimal perineal stretching, optimize the flow of oxygen and blood circulation to the fetus and an effective position for fetal descent so that the fetus can descend easily and quickly during the labor process and labor pain will be short (Zaky, N H, 2016: Lailiyana, dkk. 2017).

2. Research Methodology

This type of research uses quantitative, true experimental design research, with an approach using pretest-posttest with control group design (Notoadmojo,2018). The population in this study were 68 mothers who gave birth. Purposive sampling technique. The number of samples was 30 people divided into 15 people in the intervention group and 15 people in the control group. Analysis of univariate and bivariate data using independent t-test.

3. Results And Discussions

Pain measurement in this study using VAS (visual analog scale) is a straight line that represents continuous pain intensity and has a verbal description at each end. (mander, 1977: zakiyah, 2015). Horizontal line 100 mm long where the patient marks in the range of the line indicating the intensity of the pain felt. Recommended vas cut points: no pain (0-4 mm), mild pain (5-44 mm), moderate pain (45-

74), severe pain (75-100 mm) (G.hawker, mian, Kenzerska &frech, 2011; Raimonda,2019)

Table 4.3
Average Characteristics of Respondents in the Work Area of the Talang Jawa Inpatient Health Center in 2021

Variable	Intervention		Mean			value	Control		Mean			value
Age	f	%	Pre	ost 1	ost 2		f	%	Pre	ost 1	ost 2	
20-30 years old	13	86,7	6,62	2,69	8,92	,028	12	0,0	0,58	5,67	88,0	,004
31-35 years old	2	13,3	9,50	2,50	9,00		3	0,0	1,67	4,33	4,67	
Gestational Age	f	%	Pre	ost 1	ost 2	value	f	%	Pre	ost 1	ost 2	value
37-38 Weeks	6	40,0	5,83	2,00	9,00	,000	4	6,7	1,75	5,00	8,25	,000
39-40 Weeks	9	60,0	7,78	3,11	8,89		11	3,3	0,45	5,55	7,00	
Parity	f	%	Pre	ost 1	ost 2	value	f	%	Pre	ost 1	ost 2	value
Primipara	9	60,0	5,89	2,56	8,67	,000	9	0,0	9,89	6,11	8,67	,000
Multipara	6	40,0	8,67	2,83	9,33		6	0,0	4,33	5,33		
IMT	f	%	Pre	ost 1	ost 2	value	f	%	Pre	ost 1	ost 2	value
18,5-24,5	14	93,3	7,14	3,00	9,21	,000	14	3,3	0,29	5,21	7,21	,000
<18,5	1	6,7	5,00	8,00	5,00		1	6,7	8,00	8,00	9,00	
Aperture	f	%	Pre	ost 1	ost 2	value	f	%	Pre	ost 1	ost 2	value
4-5	10	66,7	6,80	2,20	8,20	,000	11	3,3	9,00	4,91	6,35	,000
5-8	5	33,3	7,40	3,60	0,40		4	6,7	5,75	6,75	0,00	
Total	15	100	-	-	-	-	15	00	-	-	-	-

This study is divided into five characteristics; 1) Maternal age, 2) Gestational age, 3) Parity, 4) BMI, and 5) Cervical dilatation. The five characteristics were measured by different tests on the intensity of the pain experienced. The measurement results of all characteristics are not influenced by other characteristics, this can be seen from all p-values (p value < 0.05).

Based on table 4.3, it is known the characteristics of respondents in the intervention group by looking at the highest percentage. Age 20-30 years as many as 13 respondents (86.7%). There were 9 respondents (60.0%). Primipara as many as 9 respondents (60.0%). BMI 18.5-24.5 as many as 14 respondents (93.3%). Opening 4-5 as many as 10 respondents (66.7%).

The intervention group for mothers aged 20-30 years experienced an increase in pain intensity of 12.3 while mothers aged 31-35 experienced an increase in pain intensity of 9.5. This shows that the range of pain in mothers aged 31-35 years is shorter than those aged 20-30 years. Then, mothers at 37-38 weeks of gestation experienced an increase in pain intensity of 13.7 and women aged 39-40 weeks experienced an increase of 11.7. This shows that the range of pain scale in the 39-40 week gestational age group is shorter than the 37-38 week gestational age group. Then the primiparous mothers experienced an increase in pain intensity of 12.7 while multiparas experienced an increase in pain intensity of 10.66. This shows that the range of multiparous pain scales is shorter than that of primiparas. Furthermore, mothers with a BMI of 18.5-24.5 experienced an increase in pain intensity of 12.7 while those with a BMI of 25-30 experienced an increase in pain intensity of 10. This shows that mothers with a BMI of 25-30 have a shorter pain range than mothers with a BMI of 18.5-24.5. And lastly, mothers with an opening of 4-5 cm experienced an increase in pain intensity of 11.4 while mothers with an opening of 5-

8 experienced an increase in pain intensity 13. This shows that mothers with an opening of 4-5 cm had a shorter pain range than mothers with opening 5-8 cm.

Univariate Analysis

Birthing Ball Group

Table 4.4

Average labor pain in the group given the birthing ball in the working area of the Talang Jawa Inpatient Health Center in 2021

Pain	N	Mean±SD	SE	Min	Max
Pretest	15	57,00±2,673	0,690	50	60
Posttest 1	15	62,67±3,266	0,843	58	68
Posttest 2	15	68,93±2,576	0,665	65	74

From table 4.4 above, it can be seen that the average labor pain in the group given the birthing ball in the Work Area of the Talang Jawa Inpatient Health Center in 2021 before being given an intervention with a mean of 57.00 and after being given an intervention the mean value of the 1st measurement was 62.67 and the first measurement was 62.67. to 2 68.93.

Control Group

Table 4.5

Average labor pain in the group given the birthing ball in the working area of the Talang Jawa Inpatient Health Center in 2021

Pain	N	Mean±SD	SE	Min	Max
Pretest	15	50,80±5,609	1,448	42	60
Posttest 1	15	75,40±2,947	0,761	70	80
Posttest 2	15	88,80±2,981	0,770	84	95

From table 4.4 above, it can be seen that after the group that was not given a birthing ball in the Work Area of the Talang Jawa Inpatient Health Center in 2021 the pretest with a mean of 50.80 the mean value of the measurement 1 75.40 and the mean value of the measurement 2 88.80

Bivariate Analysis

Table 4.6

The Effectiveness of Giving Birthing Balls to Labor Pain in Maternity in the Work Area of the Talang Jawa Inpatient Health Center in 2021

Pain	N	Mean±SD		Pvalue	CI-95%
		Birthing Ball	Kontrol		
Posttest 1	30	62,67±3,266	75,40±2,947	0,000	-15,060-10,407
Posttest 2	30	68,93±2,576	88,80±2,981	0,000	-21,951-17,783

From table 4.6, it can be seen that the average labor pain in the group given the birthing ball in the Work Area of the Talang Jawa Inpatient Health Center in 2021 in the first measurement obtained a mean value of 62.67 in the intervention group, while the first measurement in the control group obtained a mean of 75.40. Furthermore, in the second measurement the intervention group obtained a mean of 68.93 and a mean of 88.80 in the control group given the intervention, the mean value of the 1st measurement was 62.67 and the 2nd measurement was 68.93.

From table 4.5 above, it can be seen that the average labor pain in the statistical test results obtained a P-value = 0.000 which means that there is an effectiveness of giving birthing balls to labor pain in maternity mothers in the Work Area of the Talang Jawa Inpatient Health Center in 2021.

Discussion

Univariate Analysis

1. Average labor pain in the group given the birthing ball in the working area of the Talang Jawa Inpatient Health Center in 2021

These results are in line with the theory of Willian & Oxorn (2010). Pain is one of the natural defense mechanisms, namely a warning about danger. In pregnancy, bouts of pain tell the mother that she is having uterine contractions. Painless delivery is as dangerous as a silent coronary thrombosis. In normal delivery, the pain comes and goes (intermittent). Attacks of pain begin when the contractions reach their peak, and disappear after the uterus relaxes. The degree of pain varies from patient to patient, in the same patient in subsequent labors and at different stages in the same labor. In some cases, uterine contractions are painless. According to Cunningham (2011), labor pain as myometrial contractions is a physiological process with different intensities in each individual. (Judha., Sudarti., Fauziah, 2012).

These results are in line with research by Kurniawati (2018) The Effectiveness of Birth Ball Exercise on Reduction of Active Phase I Labor Pain in Primigravida. The results showed that the average labor pain in the group given the birth ball exercise was 4.5 lower than the control group 5.4 with a p-value of 0.01.

According to researchers, the pain experienced by mothers in labor is caused by a physiological reaction to childbirth, such as a baby who continues to push out through the uterus and continues to put pressure on the cervix, and in this situation the feeling of pain will be increasingly unbearable. In line with Asri's opinion (2012; Afritayeni, 2017) The active phase of labor is the frequency and duration of uterine contractions generally increasing (contractions are considered adequate if they occur three or more times in 10 minutes and last 40 seconds or more), the cervix dilates from 4 to 10 cm, usually at a rate of 1 cm or more. per hour until complete dilatation (10 cm), there is a decrease in the lowest part of the fetus. So it is very necessary to do therapy to reduce labor pain, one of which is birthing ball massage.

Birthing balls can speed up the delivery of the mother, by helping to open the baby's birth canal, besides moving the hips forward and backward can reduce pain and dilate blood vessels so that the pain is slightly reduced and resolved.

2. Average labor pain in the group not given the birthing ball in the working area of the Talang Jawa Inpatient Health Center in 2021

The average labor pain in the group that was not given a birthing ball in the Work Area of the Talang Jawa Inpatient Health Center in 2021, the pretest with a mean of 50.80, the mean measurement value of 1 was 75.40 and the mean value of the 2nd measurement was 88.80.

The results of this study are in line with Fitriahadi's theory., Utami (2019) Labor pain is characterized by uterine contractions, contractions have actually occurred in the 30th week of pregnancy called Braxton Hicks contractions due to changes in the hormones estrogen and progesterone but are irregular in nature, It is painless and the strength of the contraction is 5 mmHg, and the strength of this Braxton Hicks contraction will be the strength of his in labor and is regular in nature. Sometimes seen amniotic fluid discharge which usually ruptures before complete dilatation, but can also come

out before the delivery process. With the rupture of the membranes, labor is expected to take place within 24 hours.

These results are in line with research by Kurniawati (2018) The Effectiveness of Birth Ball Exercise on Reduction of Active Phase I Labor Pain in Primigravida. The results showed that the average labor pain in the group given the birth ball exercise was 4.5 lower than the control group 5.4 with a p-value of 0.01.

Pharmacological action is still controversial because the administration of drugs during labor can cross the placental barrier and have an effect on the fetus as well as on the mother. Non-pharmacological methods are not harmful to the mother or fetus, do not delay labor if adequate pain control is given, and do not have allergic effects or other negative effects.

Bivariate Analysis

The effectiveness of giving birthing balls to labor pain in mothers in active phase 1 in the working area of the Talang Jawa Inpatient Health Center in 2021

The results of the statistical test obtained a P-value = 0.000 which means that there is an effectiveness of giving birthing balls to labor pain in maternity mothers in the Work Area of the Talang Jawa Inpatient Health Center in 2021.

This shows that the treatment of labor pain in the 1st stage does not only use pharmacological drugs, as well as several complementary therapies that are carried out to reduce labor pain, including by giving lavender aromatherapy to mothers in labor. The results obtained on the distribution of the average frequency of labor pain intensity in the experimental group given Lavender Aromatherapy before the intervention, namely 7.20 belonging to the intensity of severe/severe pain and 5.27 belonging to the intensity of pain after the intervention. The distribution of the average frequency of labor pain intensity in the control group before is 7.13 and after is 7.53 which is classified as severe/severe pain intensity without experiencing a decrease in labor pain intensity with T-test results at a significance value of P-value $0.000 \leq (0.05)$ (Putri, dkk, 2019).

Dainty's research (2019) by doing hot cold compress therapy on maternity mothers. The results of the study found that the average labor pain before being given Hot Cold Compress was 6.93 with a standard deviation of 0.799. The average labor pain after being given Hot Cold Compress was 5.27 with a standard deviation of 1.100. There is a difference in pain intensity in the experimental group and the control group where the p-value = 0.004 (< 0.05) the difference in the mean value is 1.6 points. (Maternity, 2019)

Research by Nita, et al (2019) by conducting complementary therapy with acupressure in maternity mothers to reduce pain. The results of the study the average labor pain before being given the SP6 acupressure technique was 7.3 and after being given the SP6 acupressure technique was 5.47. There was an effect of SP6 acupressure technique on labor pain in the active phase I at Airan Raya Hospital, South Lampung in 2020 (p-value $0.00 < 0.05$) with a decrease of 1.83. (Nita, dkk, 2019)

Complementary therapies such as birthing balls can be used to reduce labor pain. The purpose of birth ball therapy is to control, reduce and eliminate pain in labor, especially the first stage (Kustari, dkk, 2012;). In addition, Kurniawati (2017) stated that the use of birth balls also aims to help the progress of maternal labor. The rocking motion on the ball creates a sense of comfort and helps labor progress by using gravitational movements while increasing the release of endorphins because the elasticity and curvature of the ball stimulate the receptors in the pelvis that are responsible for secreting endorphins. Other benefits that can be felt by mothers are reducing anxiety and helping the process of lowering the head and increasing maternal satisfaction and well-being.

Based on research conducted by Sahtria at RB Rahayu Unggaran in 2015, the results obtained p value $0.000 < 0.005$ there was a decrease in labor pain in the first stage of the active phase before pelvic rocking with birth balls was performed and after pelvic rocking with birth balls for women giving birth. These results are in line with research by Irawati (2019) Reducing Labor Pain with the Birthing Ball Technique. Data processing used the Wilcoxon-test to determine the effect of the treatment given. Based on the results of the bivariate analysis showed that the p value was <0.001 .

Based on research conducted by Sahtria at RB Rahayu Unggaran in 2015, the results showed that p value $0.000 < 0.005$ there was a decrease in labor pain in the first stage of the active phase before pelvic rocking with birth balls was performed and after pelvic rocking with birth balls for women giving birth. This is in line with Zen Zainul's opinion (2007; Ibrahim, 2020) with the process of relaxation or relaxation, the organs of the body will occasionally experience a resting phase. Based on the above understanding, it can be concluded that relaxation techniques are a form of therapy in the form of giving instructions to someone in the form of movements that are systematically arranged to relax the mind and body parts such as muscles and restore conditions from a tense state to a relaxed state. normal and controlled, from hand movements to foot movements.

From this study, it was found that the average labor pain in the group given the birthing ball in the Work Area of the Talang Jawa Inpatient Health Center in 2021, the first measurement obtained a mean value of 62.67 in the intervention group, while the first measurement in the control group obtained a mean of 75.40. Furthermore, in the second measurement of the intervention group, the mean was 68.93 and the mean was 88.80 in the control group.

This explains if the mother in labor will experience pain in labor, and the longer the pain will increase with each increase in opening. In this study, the group that was given a birthing ball experienced an increase in pain but it was not too large, in contrast to the group that was not given a birthing ball, it experienced a higher increase in pain. Thus, it can be concluded that giving birthing balls can minimize pain so that the pain that is felt does not increase greatly.

In line with the research results of Rania et al (2018), data regarding the level of pain and anxiety during the first stage of labor are as follows; there was no statistically significant difference between the study group and the control group before intervention $P = (0.07 \text{ \& } 0.09)$ regarding pain and anxiety levels respectively. However, after intervention with the birthing ball during the active and transition phases, the study group experienced less pain and anxiety levels with statically significant differences compared to the control group.. (rania, dkk. 2018)

One of the factors that can affect pain is attention. Increased attention is associated with increased pain, and vice versa. The presence of distraction or distraction is associated with a reduced response to pain. By focusing the client's attention and concentration on other stimuli, their awareness of pain decreases. When the mother in labor applies the use of a birth ball, her attention to pain will be diverted by physical activity by doing patterned movements that make her feel comfortable and relaxed and can build the confidence of the mother in childbirth to cope with the pain she feels. That way, the pain felt by the mother can be reduced (Leung RW,2013; Fadmiyanor, 2017).

4. Conclusion

1. The average labor pain in the group that was given the birthing ball before being given the intervention with a mean of 57.00 and after being given the intervention the mean value of the 1st measurement was 62.67 and the 2nd measurement was 68.93.

2. The average labor pain in the group that was not given the birthing ball pretest with a mean of 50.80, the mean measurement value of 1 was 75.40 and the mean value of the 2nd measurement was 88.80.
3. There is an effectiveness of giving birthing balls to labor pain in women giving birth in the Work Area of the Talang Jawa Inpatient Health Center in 2021 (p-value <0.005)

Limitation And Study Forward

1. **For Patients and Family**
The results of this study can be used as input for clients to find out how to divert pain, pain can be reduced, controlled and even eliminated without having to use medical drugs (Pharmacology) pain can be reduced by several kinds of complementary therapies such as birthing balls. and this birthing ball exercise should be done from the time of pregnancy to achieve maximum results
2. **For Talang Jawa Inpatient Health Center**
The results of this study can be used as input/Advocacy for the Talang Jawa Inpatient Health Center, to reduce the pain felt by maternity mothers, midwives can use birthing balls to reduce pain in the first stage of active labor.
3. **For the next researcher**
Can conduct more in-depth studies related to research on labor pain; factors that affect labor pain, factors that can reduce labor pain and the effectiveness of the birthing ball.

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