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The Effect of Birthing Balls on the Length of First Stage Labor among Primigravidas at the Barokah Main Clinic Bandung City in 2021

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Abstract

Background: Labor and birth are physiological events and normal. Delivery is said to be normal if the process is full term (37-42 weeks) without any complications. Birth ball is a technique to help progress labor that can be used during the first stage of labour. Until now, not much is known and not familiar with birth balls, even though birth balls are very effective in speeding up the delivery process. The advantage of using this birth ball is that it increases blood flow to the uterus, placenta and baby, relieves pressure and can increase the output of the pelvis by as much as 30%, provides comfort for the knees and ankles, provides counter-pressure on the perineum and erect thighs.
Objective: To determine the average duration of the first stage of labor in primigravidas using a birth ball and without using a birth ball and to determine the effect of a birthing ball on the duration of the first stage of labor in primigravidas
Methodology: This study used a quasi-experimental method with a Randomized Two-Group, Posttest only design. Held at the Barokah Main Clinic in Bandung City. The time of the research was carried out from June to July 2021. The research sample was primigravida in the first stage of the birth of 30 respondents with data analysis using the Mann Whitney test and independent sample t-test. Results: Based on the results of the study using the Mann Whitney test and the independent t-test, the p value <0.05 was obtained.
Conclusion: There is a difference in the average duration of the first stage of labor in primigravidas using a birth ball and without using a birth ball. It is expected that women in labor can know the function of the birth ball so that they can maximize the use of the birth ball in the delivery process.

Keywords: Birth ball, First stage labour, Primigravida

Introduction

Labor and birth are normal physiological events. The role of health workers, especially midwives, is to monitor labor to detect early complications during labor and birth. Labor and birth categorized as normal if the process occurs at the age of enough months (37-42 weeks) without any complications whatsoever. In the process of childbirth,

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it passes through four stages, during the first stage it is divided into two phases, namely the latent phase and the active phase. The latent phase (from 1-4 cm dilatation) is the period from the start of labor to the point when dilatation begins to progress progressively. While the active phase is the initial time from the active progress of the opening until the opening becomes complete (4-10 cm).[1]

According to data from the Indonesian Health Demographic Survey (IDHS) in 2015, The maternal mortality rate was 305/100,000 live births. This figure is still relatively high when compared to ASEAN member countries. This incidence rate puts Indonesia as the country with the second highest death rate in Southeast Asia. The latest data from the Ministry of Health of the Republic of Indonesia in 2016 stated that up to semester I of 2014 there were 1,712 cases of maternal death during childbirth. The high MMR illustrates that the degree of social welfare in Indonesia is still low. MMR 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%).[2]

Prolonged labor is labor that lasts more than 24 hours and is classified as prolonged labor, even if the progress of labor does not occur adequately, this situation must be immediately assessed for problems and resolved before the 24-hour deadline, most of the long labor causes the cervix not to open within a long period of time worthy.[3]

Prolonged childbirth is one of the contributors to MMR in the world, based on the World Health Organization (WHO) in 2018 there were cases of prolonged labor in women in the world, namely 289 per 100,000 live births. Meanwhile, in Indonesia, the incidence of prolonged labor is the highest in ASEAN, namely 359 per 100,000 live births, maternal deaths due to prolonged labor.[4]

In primigravidas, the duration of labor in the first stage has a longer duration compared to multigravidas, where the duration of the first stage of labor in primigravidas is around 20 hours while in multigravidas it is around 14 hours. However, not all natural births will end on time. In labor whose time is outside normal limits due to prolonged labour, other than that factors that can affect labor to be prolonged are presentation abnormalities, inadequate contractions, birth canal abnormalities, twin pregnancies, and anemia.[1]

The maternal mortality rate in West Java Province in 2017 which was reported in the 2017 health profile was 76.03 per 100,000 KH, when compared to the proportion of targeted MMR in 2017, the MMR in West Java Province is already below the 2015 national target (MDG's).[5] Based on District/City Health Profiles in West Java Province, year 2017 the number of reported maternal deaths was 696 people (76.03/100,000 live birth), this number has decreased compared to 2016, maternal deaths were 799. The number of maternal deaths in pregnant women was 183 people (19.9/100,000 live birth), in delivery women were 224 people (24.47/100,000 live birth), and in postpartum mothers 289 people (31.57/100,000 live birth).[5]

Birth attendants and mothers often forget about techniques for progressing labor in the first stage, this will cause the mother to have a bad birth experience and/or experience prolonged labor trauma, so it is very important for a birth attendant to meet the mother's need for comfort during labor. To accelerate the progress of labor with pharmacological methods that use drugs and non-pharmacological methods, without using drugs and carried out together with birth attendants including: hypnobirthing, active birth, counterpresure, birthball, birthing ball exercise, hydrotherapy, breathing techniques, visualization, use music and aromatherapy.[6]

Birth ball is a technique to help progress labor that can be used during the first stage of labour. Birth balls are not widely known by the public and are not yet familiar, even though birth balls are very effective in accelerating the process of labor and birth. Some of the advantages of using a birth ball are that it increases blood flow to the uterus, placenta and baby, relieves pressure and can increase pelvic output by as much as 30%, provides comfort for knees and ankles, provides counter-pressure on the perineum and upright thighs. Birth ball is a physical therapy ball that helps mothers in the first stage of labor in the progress of labor which can be used in various positions and can be adjusted to the comfortable position of the mother when using this birth ball. One of the movements is by sitting relaxed on the ball and rocking back and forth to create a feeling of comfort and help the progress of labor by using gravity while increasing the release of endorphins because the elasticity and curvature of the ball stimulates the receptors in the pelvis which are responsible for secreting endorphins.[7]

Research in 2017 showed results in the group of women who did birth ball exercises who experienced a shorter first stage of labour, low use of analgesics and low

incidence of caesarean section. This was reinforced by research from Sriwenda (2016) which proved that the duration of the active phase of labor was 30% shorter and barriers during the second stage of labor decreased significantly in the group that carried out the exercise or the group that was given the intervention.[7]

Birthing ball is an intervention that is routinely carried out by midwives at the Barokah Main Clinic in Bandung City, but there were some patients who refused to do this therapy. Thus, authors are interested in researching more about the effect of birthballs on the duration of the first stage of labor among primigravidas.

Method

1. Research design

The type of research is a quasy experiment using a randomized two-group design, posttest only or known as a quasy experimental design.

2. Setting and samples

This research was conducted at the Barokah Main Clinic in Bandung City from April 2021 – June 2021. The sample were delivery women at Barokah Main Clinic. The inclusion criteria were primigravida, no history of disease, first stage, early signs of labour, no complications. Multigravida exclusion criteria, history of disease, no signs of early labour, complications.

3. Measurement and data collection

The sampling technique is a purposive sampling. The number of samples in this study used the minimum intervention criteria, 30 primigravida in the first stage of labor and were divided into 2 groups, the group that was given treatment consisted of 15 people and the group that was not given treatment consisted of 15 people. Data collection techniques in this study used partograph sheets on patients who had birth balls and without birth balls. The instrument of this study used an observation sheet on the progress of labor (partograph).

4. Data Analysis

Data had been univariately and bivariately. The bivariate analysis used Mann Whitney test. Then, data were processed by SPSS.

Results

Univariat Analysis

Table 1
Descriptive Data on the Length of the First Stage of Labor among delivery women Using a Birthing Ball (Experimental Group) and Without Using a Birthing Ball (Control Group) at the Barokah Main Clinic, Bandung City in 2021

First stage duration	Frequency (f)	Min	Max	Mean	Std. Deviation
Using birth ball	15	193	430	315.93	81.494
Without birth ball	15	450	1165	706.53	279.080
Total	**30**				

Based on Table 1, it can be seen that in the category of groups that did birthing balls, the average length of labor was 315 minutes, while those in the group that did not do birth balls had an average length of labor of 706 minutes.

Bivariate Analysis

Table 2
Mann Whitney Test

Birthing ball	Frequency	First Stage Duration		*P-Value**
		Mean of Rank	Sum of Rank	
Without birthing ball	15	23.00	345.00	0.000
Using birthing ball	15	8.00	120.00	
Total	**30**			

** Mann Whitney*

Table 2 shows the average length of labor without using a birthing ball, which is 23.00 minutes and the average length of labor using a birthing ball, which is 8.00 minutes. Meanwhile, based on the p value, the results are obtained 0.000. Because the value of p <0.005 then Ho is rejected and Ha is accepted. So it can be concluded that there is an effect of birthing balls on the duration of the first stage of labor among Primigravidas at Barokah Main Clinic, Bandung City in 2021.

Discussion

Labor and birth are normal physiological events in life.[17] The birth of a baby is also a social event for the mother and family.[18] 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 when labor occurs.[8]

Based on the research results it is known that the average duration of the first stage of labor for mothers who were not given birthballs was 11 hours 46 minutes in the slow category, the average length of the first stage of labor for mothers using birthballs was 5 hours 15 minutes in the fast category, and if it is calculated from the average value of the first stage in the control group is 11 hours 46 minutes and in the experimental group is 5 hours 15 minutes there is a difference of 5 hours 31 minutes.

The results of the study showed that the duration of the first stage of labor for mothers who used a birth ball was faster in 5 hours 15 minutes. This is in line with Sri Wahyuni's research (2021) which states that there is a difference in the length of time during the first stage for mothers who were given the birth ball exercise treatment and those who were not given the birth ball exercise treatment with a p value of 0.015 <0.05. So, Sri Wahyuni's research says that the birth ball exercise is effective in speeding up the length of the first stage.[9]

Other studies that are in line show that the p value is 0.045 <the value of α 0.05 which means there is an effect of the birthing ball on the length of the first stage in primigravidas, so birthing balls can be recommended as a useful strategy to help shorten the duration of the first stage.[10]

The first stage is the opening stage which is marked by the discharge of mucus mixed with blood (blood show), because the cervix begins to open (dilate) and flatten (affacement).[11,15,16] Meanwhile, prolonged labor is labor that lasts longer than 24 hours. thus if the progress of labor does not occur adequately during that period the situation must be assessed immediately the problem must be identified and resolved before the 24 hour deadline is reached most prolonged labors show any lengthening which is the cause of the cervix failing to fully open within a reasonable time.[12,20]

Based on data from the Mann-Whitney Test results in table 4.3. it can be obtained that the average duration of labor without using a birthing ball is 23.00 minutes and the average length of labor using a birthing ball is 8.00 minutes. Because the p value <0.005 then Ho is rejected and Ha is accepted. So that it can be concluded that there is an effect of the birth ball on the duration of the first stage of labor among Primigravidas at the Barokah Main Clinic, Bandung City in 2021.

The effect of the birthing ball on the duration of the 1st stage of labor in primigravidas is also supported by one of the previous studies, he said that a birth ball

is a physical therapy ball that helps mothers in labor in the 1st stage to a position that helps the progress of labor. [7] This happens because of the influence of factors in the pattern of delivery birth ball. During the 1st stage of labor, the active phase, the mother can sit as comfortably as possible on the ball and the shape of the ball will adapt to the shape of the mother's body, making it easier for the mother to relax. Apart from that, the ligaments and muscles, especially those in the pelvic area, become loose and reduce pressure on the sacroiliac joints. blood vessels around the uterus and pressure on the bladder, back, waist, coccyx and can reduce pressure on the perineum.[13]

Research conducted in 2017 regarding the effectiveness of birthing balls on length of labour, cervical dilatation and descent of the fetal head in primigravida mothers showed that there was an effect of birthing balls on length of labour. Mobilization of labor with a birthing ball, which is sitting by slowly swinging and shaking the hips back and forth, right side, left side, and circular, will be beneficial so that the pressure from the baby's head on the cervix remains constant when the mother gives birth in an upright position, so that it is dilated (dilation) of the cervix may occur more rapidly.[14]

This is reinforced by research conducted by Wiliandari (2021) regarding the effectiveness of birth ball exercises for mothers in the first stage of labor on the length of the active phase I and the length of the second stage with the results of the study proving that there is an effect of birth ball therapy in primigravid mothers on the duration of the first stage of labor. with p-values $0.030<0.05$.[12]

Based on the results of the research analysis, the researchers assumed that during labor, the ball could be an important tool and could be used in various positions. Sitting upright on the ball while pushing like doing a swing or making a circular motion of the pelvis, can help the process of fetal descent. Ball provides support to the perineum without a lot of pressure and helps keep the fetus aligned in the pelvis. The sitting position on the ball is assumed to be similar to crouching to open the pelvis, thereby helping to speed up the delivery process. The gentle movements made on the ball greatly reduce the pain during contractions.

Limitation

There are no confounding variables measured in this study.

Conclusion

There is a difference in the average duration of the first stage of labor in primigravidas using a birth ball and without using a birth ball. So that there is an effect of using a birthing ball for primigravida mothers on the duration of the first stage of labor at the Barokah Main Clinic, Bandung City in 2021. It is hoped that mothers in labor can know the function of the birth ball so that they can maximize the use of the birth ball during the delivery process.

Ethical Considerations

This study has received ethical approval from the Health Research Ethics Commission Faculty of Medicine and Health Muhammadiyah University Jakarta with No: 096/PE/KE/FKK-UMJ/IV/2021.

Conflict of Interest

There is no conflict of interest in this study.

Author contribution

FO compiled and designed the research, conducted analysis and interpreted the data and drafted the manuscript. FO, R, and AS are involved in the analysis, interpretation of data. R and AS critically reviewed the manuscript. All authors read and approved the final manuscript.

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