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Research Article

The Effect of Birthing Ball Use on the Duration of the First Stage of Active Labor

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Abstract: Birth and delivery are normal physiological events involving the expulsion of the fetus that occurs during 37-42 weeks (full term pregnancy). For a mother, the labor process can cause fear and pain so that the risk of labor that is too long increases. By using a birthing ball, the mother can move more comfortably and experience less pain, so that labor will be shorter. This study aims to determine the Effect of Using a Birthing Ball on the Length of Stage 1 of the Active Phase at the Paguyaman Gorontalo Health Center. The purpose of this study was to analyze how the birthing ball method affects the length of the active phase I stage. The design of this study was a static Group Comparison pre-experimental design. Statistical tests with the Independent T Test. The population of this study were mothers giving birth at the Paguyaman Gorontalo Health Center. The sample consisted of 32 people. The results of the study on the use of birthing balls obtained an average labor progress of 288 minutes. The results of the statistical test with a significance value of 0.00 which means p <0.05. The conclusion of this study is that there is a significant influence in the use of the birthing ball method on the length of the first active phase in mothers giving birth in the Paguyaman Gorontalo Health Center Area. Suggestions for health workers in making plans to improve maternal care during labor by using birthing balls to help the progress of labor.

Keywords: 1st Stage, Birthing Ball, Length of Labor

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1. Introduction

Childbirth is the event of delivering the baby, placenta, and amniotic membranes from the uterus to the outside world. Normal labor occurs at term without complications. Labor begins when the uterus contracts and causes changes in the cervix (dilation and effacement) and ends with the complete expulsion of the placenta [1].

Throughout the reproductive process, labor is a natural event for women. However, this natural process may not always proceed smoothly. Prolonged labor is the most common complication of childbirth. Prolonged (dystocia) labor is defined as abnormal or inadequate labor, a delay in the process of labor progression, failure of cervical dilation, and the descent of the fetal head [2]. Prolonged labor is one of the most common labor complications (41%), followed by a history of previous prolonged labor (30%), and premature rupture of membranes occurring more than 6 hours before labor begins (19%). These labor complications can often be managed with cesarean delivery [3].

According to Jessica [4], one effort to accelerate the labor process is using a birthing ball. A birthing ball is a supporting tool that can be used for physical exercises during pregnancy. However, its use requires special attention so that the mother does not fall during use, considering the ball's round shape and the mother's balance while carrying a large weight in the abdominal area. The ball helps mothers during the first stage of labor by facilitating the labor process. Additionally, it can be used in various positions, such as sitting on the ball while gently rocking, which creates a feeling of relaxation and aids labor progression through the use of gravity while increasing the release of endorphins. The elasticity and curvature of the ball stimulate receptors in the pelvis responsible for secreting endorphins [5].

The birthing ball also helps in massaging the perineal area of pregnant women and assists in maintaining an upright position. An upright posture during labor allows the uterus to work as efficiently as possible by widening and opening the pelvic outlet. Gravity will help the baby's head descend more quickly into the pelvis when the mother is sitting upright on the ball [6].

In a previous study, it was found that mothers who used a birthing ball experienced a 30% shorter duration of the active phase of the first stage of labor [7]. Based on a survey and observation conducted on October 7–9, 2024, Puskesmas Paguyaman was identified as one of the health centers using birthing balls during the first stage of labor in Gorontalo Regency. The use of birthing balls at Puskesmas Paguyaman aims to help speed up the labor process. This method has been used for approximately seven years.

Based on this phenomenon, the researcher is interested in conducting a study entitled: "The Effect of Birthing Ball Use on the Duration of the First Stage of Active Labor."

2. Research methods

The type of research used in this study is a quasi-experimental design using a Static Group Comparison design. The population in this study consisted of all laboring mothers, totaling 32 individuals, at Puskesmas Palguyaman, Gorontalo. The sampling technique used was purposive sampling, with a total sample of 32 pregnant women divided into two groups: one group of mothers using the birthing ball, and the other group not using birthing ball therapy. Statistical analysis was conducted using SPSS software with an Independent T-Test, applying a 95% confidence level, with a significance threshold of $p < 0.05$.

3. Result and Discussion

Univariate Analysis

Table 1. Frequency Distribution Based on Respondents' Age Characteristics

Respondents' Characteristics Based on Age	F	%
20-25 years	10	31,2
>25 years	33	68,8
Total	32	100

Based on Table 1, it can be seen that the majority of respondents were aged over 25 years, totaling 22 people (68.8%). Meanwhile, those aged 20–25 years amounted to 10 people (31.2%).

Table 2. Frequency Distribution of First Stage Active Labor Progression

Labor Progression	N	Mean	Standart Deviation	Max	Min
Labor Progression	32	361.8	91.42	560	360

Based on Table 2, it was found that the average duration of the first stage of active labor in the control group was 361 minutes with a standard deviation of 91.42.

Bivariate Analysis

Bivariate analysis was conducted to determine the effect of birthing ball use on the progression of the first stage of active labor. Before performing the analysis, a normality test was conducted to assess whether the data were normally distributed. Data are considered normally distributed if the p-value is > 0.05, and not normally distributed if the p-value is < 0.05.

The normality test used in this study was the Shapiro-Wilk test, which is effective and valid for small sample sizes. In this study, the number of research subjects was 32 participants, thus the Shapiro-Wilk test was deemed highly appropriate for this research.

Table 3. The Effect of Birthing Ball Use on the Progression of the First Stage of Active Labor

Variable	N	Mean	SD	MD	P-value
With Birthing Ball	16	288.7	50.05	146.25	0.000
Without Birthing Ball	16	435.5	57.96		

Based on Table 3, it can be seen that the use of the birthing method had an effect. The use of the birthing ball was found to be more effective, with an average duration of labor of 288 minutes (SD ± 50.05), while without the birthing ball, the average duration was 435 minutes (SD ± 57.96). From the statistical test results, the p-value was 0.00 (< 0.05), indicating that there is a significant effect of birthing ball use on the duration of the first stage of active labor.

Frequency Distribution Based on Respondents' Age Characteristics

Based on Table 1, it was found that respondents aged over 25 years were more dominant compared to those under 25 years. The age group of over 25 years is considered to be within the ideal and healthy reproductive age range. When a mother gives birth within this optimal reproductive age range, the risk of complications during labor tends to be lower [8]. One of the factors that can cause the first stage of active labor to progress slowly is cervical insufficiency, which is indicated by delayed cervical dilation during the first stage of labor. Therefore, when labor progresses slowly during the first stage of active labor, one of the key aspects that can be directly observed and evaluated is cervical dilation [9]. This is consistent

with the statement by Yosi and Syami [10], who stated that mothers experiencing prolonged labor may be influenced by cervical insufficiency. As a result, the first stage of labor tends to last longer because cervical dilation and fetal descent do not occur efficiently.

Progression of First Stage Active Labor with Birthing Ball Use

From the research results on the effect of birthing ball use during the first stage of active labor, 16 respondents who used the birthing ball had an average labor duration of 288 minutes (SD ± 50.05). This result is in line with the findings of Annisa et al. [11], who stated that the birthing ball allows women to maintain an upright position, which can significantly affect the acceleration of the first stage of active labor.

The more relaxed and mobile the mother is, the shorter the time needed to reach full cervical dilation. At the beginning of labor, the mother should not remain curled up in bed. Changing positions frequently can greatly help the mother during labor. The birthing ball is a non-pharmacological intervention that is highly effective for movement and relaxation during labor [12].

According to a study conducted by Tiara (2021) at PMB Rika Hardi, 7 mothers in labor used the birthing ball technique to support the smooth progression of their labor. Among 10 mothers who experienced normal labor using the birthing ball, 3 experienced a prolonged first stage of labor [13].

From the researcher's perspective, both methods showed significant differences in the progression of the first stage of active labor. Over approximately four weeks of research, birthing ball use was shown to have a considerable influence on labor progression. The theory suggests that the birthing ball is a physical therapy tool that helps in facilitating labor progression. This is also supported by the presence of supportive husbands, families, and midwives, allowing the mother to follow instructions and progress quickly through labor [14].

During the research, many respondents reported positive experiences with birthing ball use. The ball helped the fetal head to descend more quickly. The seated position on the ball is similar to a squatting position, which exerts pressure on the perineum without requiring the mother to push excessively. As a result, it helps open the pelvis and makes labor progress faster.

The Effect of Birthing Ball Use on First Stage Active Labor Progression

Based on the survey results from 16 respondents and the statistical tests conducted, it was shown that birthing ball use had a significant effect on the progression of active labor. The intervention and control groups showed a significant p-value of 0.00 (< 0.05). Therefore, it can be concluded that birthing ball use significantly affects the progression of the first stage of active labor.

According to research by Sri Wahyuni [15], there is a difference in labor progression between mothers who used a birthing ball and those who did not. The average duration in the birthing ball group was 224.3 minutes, which was significantly shorter than in the non-birthing ball group. With a 95% confidence level, a p-value of 0.0000 (< 0.05) was obtained, indicating a statistically significant effect of the birthing ball technique on labor progression.

Research conducted by Darma and Nurul [16] also showed that the average labor progression score with birthing ball use was 2.6 with an SD of ±1.71, with a minimum score of 1 and maximum of 5. The statistical test produced a p-value of 0.034 ($p < 0.05$), concluding that the

Active Birth Technique using a birthing ball significantly influences the progression of the first stage of labor in mothers giving birth.

4. Conclusions

Based on the results of the study and the discussion, it can be concluded that respondents who used the birthing ball (intervention group) experienced a shorter duration of the first stage of active labor. The findings also indicate that there is a significant effect of birthing ball use on the duration of the first stage of active labor in laboring mothers, with a p-value (0.00) < α (0.05). The upright position facilitated by the birthing ball allows gravity to assist in the descent of the fetal head, combined with gentle movements that help make uterine contractions more effective, making birthing ball use influential in accelerating the first stage of active labor.

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