

# The Effectiveness of Pelvic Rocking Exercises on the Length of Time of the First and the Second Stage of Labor

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**Abstract - Background:** Prolonged labor is the most common cause of cesarean delivery. Risks of prolonged labor in mothers are bleeding due to uterine atony, laceration of the birth canal, infection, fatigue, and shock while the risks of prolonged labor in the fetus can increase the risk of severe asphyxia, cerebral trauma, infection and injury from the action. Good physical preparation can minimize prolonged labor. One of the physical preparations is by doing exercises. Pelvic Rocking Exercises (PRE) is one of the pelvic exercises which aims to train, maintain pelvic mobility and help decrease the head into the pelvic cavity so that it is expected to shorten the length of time in the first stage and the second stage of labor. **Method:** This study was quasi-experiment research involving 164 respondents who gave birth in the Public Health Service Center in Banjarnegara. The respondents were divided into 2 groups: the experimental group with PRE given in 6 meetings from 34 weeks' gestation while the control group was only with the standard care of the Public Health Service Center. Data were collected by questionnaire, examination, observation sheet of PRE implementation and observation sheet of labor with partograph. Data analysis done in this study were using Product Moment correlation and Mann Whitney U.

**Results:** There was not any correlation between the characteristics of maternal age, parity, gestational age, High Uterine Fundus and baby birth weight with the length of time of labor in the first stage  $p$ -value (0.25-0.89) > 0.05. There was a significant correlation between the characteristics of age, parity, and gestational age with the length of time of labor in the second stage with  $p$  value (0.0001-0.020) <  $\alpha$  (0.05) while the variable of High Uterine Fundus and baby birth weight had no correlation with the length of time of labor the second stage. There was a significant difference in the length of time of labor during the active

phase between the group with the PRE treatment and the control group with  $p$ -value  $0.0001 < \alpha$  (0.05). On the contrary, at the time of the second stage of labor, there was not any significant difference between the experimental group with the PRE and the control group with  $p$ -value  $0.451 > \alpha$  (0.05).

**Conclusion:** PRE effectively shortens the length of time of the first stage of labor while there is not any significant difference between the experimental group and the control group on the length of time of the second stage of labor with PRE treatment.

**Keywords:** *pelvic rocking exercises, length of labor time*

## BACKGROUND

In Indonesia, within 5 years the incidence of cesarean section exceeds the maximum limit set by WHO, which is 5-15%. It was 15.3% of 20,591 labors. 38% of caesareans are mothers having their first child/*primiparous*, 75% mothers are not at risk age and only 15.4% of cesarean mothers have signs of complications during pregnancy [1]. The results of Chang X et al. showed that primiparous mothers who had experienced the second stage of labor 57% of deliveries were performed with SC and 85% of the causes of prolonged second stage labor were due to malposition of the fetal head [2].

Prolonged labor is closely related to the increase of maternal and neonatal morbidity, an increase of abnormalities in the physiology of labor, and an increase of labor rates with a cesarean section while in infants it increases the infant mortality rate and decreases the average APGAR value [3]. Mothers with prolonged labor are more at risk of bleeding due to uterine atony, laceration of the birth canal, infection, fatigue and shock, while the prolonged labor in the fetus can increase the risk of severe asphyxia, cerebral trauma, infection and injury due to action [4]. Maternal Mortality Rate (MMR) in Banjarnegara region in 2016 was 120.3 live births. It showed an

increase compared to the data in 2015, which was 107.61 / 100,000 live births, caused by several factors including hypertension 26.3%, heart/stroke 26.3%, infections 10.5, bleeding 5.3% and others 42.1%. In infection cases, bleeding and other causes are mostly because of the length of time of delivery [5]. Based on a survey of 3 Basic Obstetric Neonatal Emergency Services (BONES in Indonesia known as Poned) of Public Health Service Centers in Banjarnegara, the incidence number of prolonged labors was 59 cases out of 468 labors or 12.6%. labor, 42 mothers from the 59 cases of prolonged experienced labor with a first time > 14 hours (71.18%) and 17 mothers (28.81%) with a second time > 2 hours.

Labor in primiparous mothers is called prolonged labor when it occurs > 8 hours for the latent phase, > 6 hours for the active phase, and 2 hours in the second stage [6]. In multiparous mothers, the length of normal delivery in the first stage of the active phase is between 3 to 6 hours and in the second stage of it is 30 minutes to 1 hour [7]. Prolonged labor time, when the labor stage I > 14 hours or the labor stage II > 2 hours, is one indication to do interventions. The common interventions in labor have been performed recently such as rupture of artificial membranes, intravenous oxytocin, lumbar anesthesia, labor with vacuum, episiotomy and cesarean section [4]. According to Walshin, in primipara mothers, the average opening of labor occurs 1 cm/hour while in multi-primipara mothers 1 cm / 30 minutes [6]. The first stage of labor is the longest delivery process, the labor contractions make the first stage of labor feels very uncomfortable and frightening in some mothers. Mother's mobility training is needed to keep the ligaments loose, relaxed, free of tension and more room for the baby to get down the pelvis. Good maintained physical pelvic mobility helps mothers be better prepared for labor so that the length of time in the first and second stages of labor is expected to be fast and normal. Then, the maternal and infant mortality can be minimized.

Pelvic Rocking Exercises (PRE), also known as pelvic gymnastics for pregnant women, is the body's exercise by turning the waist and hips. The purpose of PRE is to train the strength of the thigh muscles, waist muscles, hips with movements that loosen the pelvic area. These exercises can help lower the baby's head into the pelvic cavity into the birth canal. This PRE can be done without or with childbirth ball aid [8]. The PRE movement by moving the pelvis back and forth, to the left and rotating the pelvis in a

circular pattern is useful to flex the muscles around the pelvis and encourage the reduction of the fetal pelvic cavity which ultimately launches the labor process besides it can also reduce back pain [9].

According to the research conducted by Kariminia A. et al., the effects of hands and knees posturing on the incidence of occiput posterior position at birth with the main movement of the PRE did not show any significant difference. Mothers in the intervention group 105 (8.1%) and 98 (7.8%) in the control group who had a baby in the posterior occiput position during childbirth, the risk difference was 0.3%, 95% CI (1.8-2.4) [10]. Other benefits of Birth ball exercise could be an alternative means of relieving back pain and labor pain in the labor ward and could decrease pethidine consumption in laboring women [11].

The results of a previous study conducted by Surtiningsih in 2016 entitled "The Effectiveness of Pelvic Rocking Exercises on the length of time of delivery in Primipara mother" showed that PRE effectively shortened the length of time in the first stage ( $p$ -value,  $0.0001 < \alpha (0.05)$ ) and the length of time in the second stage ( $p$ -value,  $0.007 < \alpha (0.05)$ ). From the results of t-test, it was found that there was the difference in the delivery time of mothers joining PRE and those who did not attend the PRE with a time difference of 135 minutes in the labor length of the first stage of and 18 minutes in the second stage. This study involved 40 primiparous respondents [12].

In the previous study, the samples taken were all primiparous mothers so that this study implemented PRE in both primiparous and multiparous mothers. With heterogeneous respondents, the effectiveness of PRE was tested for the length of time in the first and second stages of labor.

## RESEARCH METHOD

### Research Design

The research type is a Quasi-experiment with a post-test only control design. This study was conducted in January - October 2017. The independent variable in this study was the Pelvic Rocking Exercises and the dependent variable was the length of labor time in the active first stage of and the second stage. The PRE treatment was carried out following the Standard Operating Procedure (SOP). PRE was carried out twice a week, a 30-minute exercise with a total of 6-8

meetings and the respondents started exercising from 34 weeks' pregnancy. The frequency of heartbeats and blood pressure of pregnant women were recorded and documented every meeting before and after PRE.

Measurement of the effects of pelvic rocking exercises by observing and recording the length of time the first stage of labor is active and the length of time of the second stage of labor required by the respondent both the treatment group and the control group.

The effectiveness of PRE was done through observation and note-taking towards the length of labor time at the first stage in the active phase and the second required by the respondents in both the experimental ground and control group. The measurement at the first stage observed in the active phase which was opening 4-10 cm while the length of the second stage was observed from the complete opening until the baby was born. The measurement of the length of time used a stopwatch and was recorded on the observation sheet and partograph.

#### Population and Sample

The population in this study was all third-trimester (TM III) pregnant women with a gestational age of 34-35 weeks who having examinations at Klampok 1 Public Health Service Centre and Wanadadi Banjarnegara Public Health Service Centre. The total population in this study was 254 respondents who would be treated with PRE after 34 weeks of their pregnancy. The Pelvic Rocking Exercises treatment has received Ethical clearance from the Health Research Ethics Commission of the Faculty of Public Health, the University of Diponegoro with No. 09 / EC / FKM / 2016.

Samples were taken by purposive sampling technique with inclusion criteria which were pregnant women, gestational age of the respondent was about 34-35 weeks when treatment started, no history of pregnancy complications (non-risk such as hyperemesis gravidarum, Pre-eclampsia, hypertension or diabetes mellitus), a single pregnancy with presentation of head and High Uterine Fundus (HUF) no more than 40 cm, age of atherem birth >

36 weeks and spontaneous vaginal delivery at Klampok I Public Health Service Center and Wanadadi Banjarnegara Public Health Service Center. 254 respondents were appropriate with the inclusion criteria in this study. Respondents were divided into 2 groups which were observed from 34 weeks of pregnancy until delivery. The first group was the experimental group with PRE, and the second was the control group with the standard care of the public health service center.

#### Research Statistic

Univariate analysis was used to determine the variables of maternal age, parity, gestational age, High Uterine Fundus (HUF), birth weight, length of time in the first stage of labor and length of time in the second stage of labor in the experimental group applying and the control group. This bivariate analysis was used to examine the relationship or influence of maternal age, parity, gestational age, High Uterine Fundus (HUF), birth weight and PRE for the length of time in the first stage of labor and the second stage in labor using Product Moment Correlation analysis [13]. Analysis to test the difference in the length of time in the first stage of labor and the second stage of labor in the treatment group while in the control group the Mann Whitney statistical test was used because the data were not normally distributed before the normality test was done using the Shapiro-Wilk test [14].

#### RESULTS

The total sample in this study were 254 respondents consisting of 127 respondents in the experimental group with PRE and 127 respondents in the control group with the standard care of the public health service center. During the research, not all respondents neither in the experimental group nor the control group experienced vaginal spontaneous delivery.

In the experimental group, there were 88 respondents experienced vaginal spontaneous delivery while in the control group there were 76 respondents. As a consequence, the rest of the respondents with no spontaneous vaginal delivery were excluded. Therefore, the number of samples in this study was 164 respondents, which 88 respondents in the experimental group and 76 respondents in control groups.

1. The Characteristics based on Age, Parity, Gestational Age, High Uterine Fundus (HUF) and Baby Birth Weight in Labor Mothers Who Carried Out PRE and Those Who Did Not Do PRE.

Table 3.1 Frequency Distribution of Characteristics of Mother's Age, Parity, Gestational Age, HUF and Baby's Weight Born in Mothers Giving Birth to PRE and Those Who Did Not Do PRE

Variable	Experimental Group PRE Mean ± SD	Control Group Mean ± SD	Correlation test	
			Length of stage I active phase	Length of Stage II
Age (Year)	28.82± 6.21	28.96 ± 6.23	ρ: 0.259	ρ: 0.000
Parity	1.99 ± 1.07	2.29 ± 1.9	ρ: 0.299	ρ: 0.000
Gestational Age (week)	39.36±1.15	39.22 ± 1.48	ρ: 0.596	ρ: 0.020
High Uterus Fundus (cm)	30.05± 1.72	30.32 ± 2.02	ρ: 0.402	ρ: 0.218
Baby birth weight (g)	3044.89±383.65	3018.42 ± 386.59	ρ: 0.649	ρ: 0.065

t-test: Mann Whitney Correlation Test: Correlation Product Moment

Based on the table 3.1 the characteristics of respondents in the experimental group the average of maternal age 28.82 years, parity 1-2, gestational age 39.36 weeks, High Uterus Fundus (HUF) 30.05 cm, and the average of birth weight was 3044.89 grams, while the characteristics of respondents in the control group the average of maternal age 28.96 years, parity 2-3, gestational age 39.22 weeks, High Uterus Fundus (HUF) 30.32 cm, baby birth weight 3018.42 grams. According to the correlation test results, there was no relationship between the variables of gestational age, parity, gestational age, HUF and baby birth weight to the length of the first stage labor time. However, three variables which were age, parity and gestational age had a significant relationship to the length of the first stage labor time.

According to the table above, the respondents' characteristics in the experimental group are the average of their age 28.82 years old, parity 1-2, gestational age 39.36 weeks, HUF 30.05 cm, baby birth weight 3044.89 grams. Whereas, the respondents' characteristics in the control group are the average of their age 28.96 years old, parity 2-3, gestational age 39.22 weeks, HUF 30.32 cm, baby birth weight 018.42 gram. Based on the Correlation test showed that there is no correlation between maternal age, parity, HUF, BBW, towards the length of the first stage labor time. However, there are three variables such as maternal age, parity, and gestational age that have correlation with the length of the first stage labor time.

2. The Effectiveness of Pelvic Rocking Exercises on the Length of Time of the First Stage Labor of Active Phase

Table 3.2 The Difference of Length of Time of First Stage Labor on Mothers Applying Pelvic Rocking Exercises and Those without Pelvic Rocking Exercises

Variable	Experimental Group (PRE) Mean±SD	Control Group Mean±SD	Mann Whitney test	Mean Deference
The length of active phase of first stage	164.49±125.60	351.71 ±207.53	0.0001	187.22

SD: Standar Deviation, t-test: Mann Whitney

According to the table 3.2, the average of the first stage length on the experimental group is 164.49 minutes while that in the control group is 351.71 minutes. The t-test Mann Whitney with  $\rho$ -value  $0.0001 < \alpha (0.05)$  meaning that there is significant

difference in the length of first stage labor on mothers applying PRE and those did not; the difference of length of active phase of first stage labor is 187.22 minutes.

3. The Effectiveness of Pelvic Rocking Exercises towards the length of time of second stage labor

Table 3.3 The difference of the Length of Time of Second Stage Labor on Mothers Applying Pelvic Rocking Exercises Those did not.

Variable	Experimental Group Mean±SD	Control Group Mean±SD	Mann Whitney test	Mean Deference
The length of time of second stage labor	27.03±19.77	28.51 ±28.30	0.451	1.48

SD : Standard Deviation, t-test: Mann Whitney

According to the results, the average of the length of the second stage in the experimental group is 27.03 minutes while that of first stage in the control group is 28.51 minutes. The t-test Mann Whitney  $p$ -value  $0.451 < \alpha (0,05)$  meaning that there is no significant difference of the length of time of the second stage of on mothers applying Pelvic Rocking Exercises and those did not; the different length of time of second stage of labor is only 1.48 minutes.

**DISCUSSION**

1. The characteristics of labor mothers applying Pelvic Rocking Exercises and those did not.

Childbirth is a series of processes that end with the release of the results of conception, this process begins with the true contraction of labor, which is characterized by cervical changes and ended with the birth of the placenta [15]. In the labor process, four important factors influence each other. These four factors are power, passage, passenger, and psychological condition. If there are problems with these 4 important factors, this can increase the risk of labor complications. Other factors that can also influence the delivery process include birth attendants, maternal characteristics such as age, parity, the distance of labor, nutritional status and the level of maternal knowledge [6], [16].

Based on table 3.1, related to the characteristics of respondents in the experimental group and the control group, it shows that there is not any correlation between the characteristics of maternal age, parity, gestational age, HUF and baby birth weight with the duration of the first stage of labor  $p$ -value  $(0.25-0.89) > 0.05$ . The results of this study are the following research conducted by Surtiningsih with the title ‘factors affecting the length of time of delivery’. There is not any correlation between age, parity, gestational age, HUF and baby birth weight towards the length of time of the first stage ( $p$ -value  $0.257 -0.746 > 0.05$ ) [17].

The results of this study found that there was a significant correlation between the

characteristics of age, parity, and gestational age with the length of time of labor when the two values of  $p (0,0001-0,020) < \alpha (0.05)$  while the HUF variable and birth weight did not correlate with the length of time of the second stage of labor. There is a difference between the results of the 2017 Surtiningsih’s research. There is a significant correlation between maternal parity factor and the length of time II ( $p$ -value  $0.001 < 0.05$ ) second stage ( $p$ -value  $0.266-0.826 > 0.05$ ). In this study, the results of correlation analysis show that the characteristics of age, parity and gestational age have a relationship with the length of time of the second stage of labor with correlation coefficient values  $-0.329$  and  $-0.419$  which means the older the mother's age and many parities, the faster the time of second stage of labor. However, in the gestational age variable, the coefficient correlation value is  $0.181$  which means that the greater the pregnancy, the longer the time of the second stage of labor.

2. The Effectiveness of Pelvic Rocking Exercises on the length of time of the first stage labor of active phase

The active phase of first stage labor is the time when the largest cervical dilatation occurs and the fetal presentation part descends further into the pelvis. Primiparous women are estimated to have dilated at least 1 cm/hour and multiparous mothers 0.5 cm/hour. According to Friedman, the average length of the active phase of labor in primiparous mothers is 5.8 hours or 348 minutes while according to Kilpatrick and Laros, the average length of the active phase in primiparais 8.1 hours or 486 minutes [6]. In Indonesia, partograph is one of the observation tools of labor used in every order of delivery services in the first phase of labor during the active phase of the opening from 4 cm to 10 cm which normally is 6 hours or 360 minutes [18]. An agency formed by WHO in 1988 recommended that the latent phase should not be more than 8 hours [4]. Using the Friedman Curve, the average length of labor in the active phase of the first stage in primiparous mothers is 5.8 hours

or 348 minutes whereas based on the old partograph, the normal active phase is 16 hours (360 minutes) [15].

Pelvic rocking exercises or often referred to as rocking the pelvis is one of the exercises by shaking the pelvis towards the left, right, fore, back and rotate the pelvis. It can also be done with the help of a ball with a circular swing to the right or left or back [19]. According to the North Dakota Department of Health, PRE consists of 3 positions. The first position is the hand and knee position, this movement is useful to change the position of the fetal head from occiput posterior to occiput anterior. The second position with the lying position and the third position by standing in doing the PRE by maximizing the gravity force to help decrease the head[20].

Effective function on the pelvic floor (pelvic diaphragm) depends on maintaining good muscle tone and balance of muscles on both sides of the pelvis. Women who begin to become pregnant with good general muscle tone and have regular activities and exercises as part of their daily lives are less likely to experience pelvic floor trauma during childbirth compared to women who live without physical activity. A healthy function is a necessity so that the function of micturition, defecation, and sexual activities will remain normal and can be enjoyed by all women of all ages. Any form of exercise that improves muscle tone needs to be recommended as long as it is harmless and not too excessive. The activities such as walking, swimming, dancing, cycling can be done safely as long as the women are still able to do. With good training, the ligaments and muscles will be stronger and elastic [21].

PRE is recommended when gestational age approaches the estimated date of birth which is useful in keeping the pelvis in a relaxed and mobile condition, muscles and loose ligaments free from tension [22]. It is not only useful for maintaining pelvic elasticity but also for maintaining abdominal muscles and relieving back pain. The greater the gestational age, the more limited fetal space. This exercise plus the force of gravity will help the baby to enter the pelvic cavity. It can be done routinely at the end of pregnancy or when the mother experiences back pain. Another study conducted by Mathew A et al found that the duration of the first stage of labor was 471 minutes shorter on average. The group of pregnant women who did birthing ball with the main movements on the pelvis compared to the group who did not do birthing ball with an

average of 763 minutes. In the second stage of labor, the group with the birthing ball had a shorter second stage of time, 23.9 minutes compared to the control group 49.8 minutes [23].

Based on table 3.2 it can be seen that the average length of time of the first stage in the experimental group is 164.49 minutes while that in the control group is 351.71 minutes. The analysis results of the different tests using the Mann-Whitney test found that there are significant differences in the length of time of the first stage of labor in mothers who did PRE and those who did not do PRE ( $p$ -value  $0.0001 < \alpha 0.05$ ) with Mean Difference 187.22 minutes.

In the study of Stremmler R, et al., it was stated that Pelvic Rocking with hand and knees positioning can significantly reduce back pain. Pregnant women who performed hand and knees during delivery experienced a change in the location of the fetal head to anterior by 16% while the control group was only 7% [24]. Hence, there is a reduction in birth by surgery and the effect on the length of the birth process at delivery in the experimental group is shorter than in the control group. Measurement of success using SF-MPQ and ended with ultrasound tests. In the study of Renaningtyas D, Sucipto E, Chikmah AM whose respondents were all mothers (primiparous or not). And the samples involved was 30 respondents revealed that labor mothers who did Pelvic Rocking with Birthing Ball were able to expedite the delivery process in the first stage. The result of  $x$  arithmetic  $13.33 > x$  table 9.488 and  $p$ -value  $0.01 < 0.05$  [25].

### 3. The Effectiveness of Pelvic Rocking Exercises on the length of time of second stage labor

The passage is the birth canal that must be passed by the fetus consisting of the pelvic cavity, pelvic floor, cervix and vagina [7]. The pelvic floor consists of muscles and various tissues. To make the baby can easily pass the passage, the tissue and muscles must be weak and easily stretched. If there is stiffness in the tissues, these muscles will easily rupture.

Abnormalities in the soft birth canal include stiff cervix (in former primary or secondary primi and deformed or sciatic cervix), hanging cervix, conglomerate cervix, cervical edema, vaginal septum, and vaginal tumors [15]. The bones of the pelvis consist of the ossa coxae, os sacrum, os coccygis. Ossa coxae can be divided into os ilium, os ischium, and os pubis. These bones are related to one another. In women who are not articulation pregnant only have slight

shifts, but in pregnancy and time of delivery, it can shift farther and more loosely. For example, the tip of the coccyx can move backward approximately 2.5 cm [6].

Moreover, the muscles and ligaments supporting the pelvis including the ligamentumcardinalesinistrum and dextrum (Mackendrot) are useful to prevent the uterus from descending. Sacro ligament - uterine sinistrum and dextrum function to hold the uterus not moving much curvelly from the back of the left and right cervix through the rectal wall towards the left and right os sacrum. Rotundumsinistrum ligament and round ligament which function to hold the uterus in anteflexion position. The left and right uterine fundus angle to the left and right inguinal. The Latumsinistrum ligament and dextrum (Broad Ligament) also function to support the uterus laterally. Pelunduminfundibulo ligament which functions to hold the fallopian tube from the infundibulum to the pelvic wall [3].

At the end of pregnancy, an increase in mobility of the hip joint is in a normal state of minimal mobility. This change is caused by the effect of the relaxin hormone which works to soften collagen and causes it to relax the pelvic ligaments. This relaxin hormone has a relaxing effect on basic pelvic muscles and ligaments during pregnancy so that the muscles and ligaments are softer to prepare for stretching that occurs during labor, especially in the second stage [15]. Mother's mobility is needed to keep ligaments loose, relaxed, free from tension and more space for babies to get down the pelvis, one of which is Pelvic rocking exercises with or without balls, belly dancing or by doing birthing ball exercises [19].

PRE helps the baby to be in the most appropriate position before labor time and can increase the pelvic outlet by as much as 30% to provide wider space for the baby's head down to facilitate the delivery process. According to Jamieson PRE can strengthen the muscles of the abdomen and lower back, reduce pressure on blood vessels in the area around the uterus and pressure in the mother's bladder, help mothers relax, improve the function of the digestive process, increase the size of the pelvic cavity that can help smooth labor process [26]. Finally, it can run more effectively. clinical implementation of the birth ball exercise program could be an effective adjunctive tool to improve childbirth self-efficacy and reduce pain among women in labor. Based on our mediating model, the results further suggest that confidence is greater after

prenatal preparation powerfully related to decreased pain perception and decreased medication/analgesia use during labor. obtained Birth Ball Exercises with pelvic rocking as the main movement significantly influences the rotation of the fetus head from the posterior occiput to the anterior occiput ( $p = 0.001$ ). The success of the vaginal delivery process one of the important factors is the passenger. The three main aspects of passenger accuracy are fetus weight, fetus presentation, and position of the presentation part concerning the maternal pelvis. These three aspects must be seen as a unity, not as separate factors [6]. Based on the results of the study with the position of the anterior occiput head, the length of time of the second stage of labor was faster than the position of the posterior occiput head.

Another study conducted by Golmakani et al. which examined the effectiveness of body training with delivery balls with the type of delivery in primiparous mothers. The study used a clinical trial research population with 54 respondents who were divided into 2 groups through random techniques. The experimental group was given Birth Ball Exercises with 4 positions (sitting, standing, kneeling, squatting) with one of the exercises being pelvic rocking [27]. Mirzakhani et al. Obtaining the characteristics of age, frequency of ANC, education, occupation, income, and caregiver are not related to the type/model of maternal delivery it seems that the value  $p > 0.05$ . In the group with Birth Ball Exercises the vaginal delivery was 92.60% while that in the control group was only 66.70%. There was a significant relationship between Birth Ball Exercises with the type of delivery ( $p = 0.0018$ ) [28].

One limitation of this study is the composition of respondents' parity in the control group and the intervention groups do not have the same amount. The PRE majority group with primiparous parity and the multipara majority control group. from table 1.1 it is known that there is a significant relationship between parity and the length of the second stage of labor results in the study based on table 3.3 there is no significant relationship and there is no difference in the length of time of pregnant women who do PRE with the control group. This is different from the results of previous studies conducted by Surtiningsih where pregnant women applying PRE at the length of time of the second stage are shorter than women not applying PRE  $p$ -value of  $0.006 < \alpha (0.05)$ . Different from the results of

previous studies with all respondents are primipara who gets effective PRE shortens the length of time the second stage of labor ( $p$ -value,  $0.007 < \alpha (0.05)$  [12]. The difference in these results could be due to the respondents in this study not only involving primiparous mothers but also multiparous mothers. From the results of the relationship test in this study, it was also known that parity affected the length of the second stage of labor.

#### CONCLUSION

There is no correlation between the characteristics of maternal age, parity, gestational age, High Uterine Fundus and baby birth weight with the length of time of labor in the first stage. There is a significant relationship between the characteristics of age, parity, and gestational age with the length of time of labor in the second stage, while the variable High Uterine Fundus and baby birth weight have no relationship with the length of time of labor the second stage.

Pelvic Rocking Exercises are very effective in shortening the length of time of the active phase of the first stage of labor.

Pelvic Rocking Exercises is less effective in shortening the length of time of the second stage of labor with  $p$ -value  $0.451 > \alpha (0.05)$ .

#### SUGGESTION

PRE can be implemented to the pregnant women as one of the exercises to prepare for childbirth so that the length of labor can be shorter. Particularly Public health service centers in the Banjarnegara Region (Klampok 1, Wanadadi and Mandiraja) can apply PRE as part of the program in pregnant mothers to shorten the length of the first stage and second stage of labor and to minimize the occurrence of long deliveries.

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