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ORIGINAL RESEARCH

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## EFFECT OF PREGNANCY EXERCISE ON DURATION OF THE FIRST AND SECOND STAGE OF LABOR IN PRIMIGRAVIDA MOTHERS DURING THE THIRD TRIMESTER OF PREGNANCY

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### Abstract

**Objective:** This study aimed to examine the pregnancy exercise during the third trimester of pregnancy on duration of the first and second stage of labor in primigravida at the Community Health Center of Sukamaju, Bandar Lampung, Indonesia.

**Methods:** This study employed a quasi-experimental design with posttest-only non-equivalent control group. This study was conducted from 8 January 2017 to 12 February 2017 at the Community Health Center of Sukamaju. Forty-eight primigravida mothers were selected using consecutive sampling, with 24 assigned in the experiment and control group. Data were analyzed using Mann Whitney and Chi Square test.

**Results:** The average duration of the first stage of labor in the experiment group was 495 minutes and in the control group was 685 minutes ( $p=0.000$ ); while the average duration of the second stage of labor in the experiment group was 42.5 minutes and in the control group was 68.75 minutes ( $p=0.000$ ).

**Conclusion:** There was a statistically significant difference in the duration of the first and second stage of labor between experiment and control group. It is expected for midwives in the community health centers to implement pregnancy exercise program to help mothers in accelerating the delivery process.

**Keywords:** pregnancy exercise; first stage labor; second stage labor

### INTRODUCTION

Prolonged labor, also known as failure to progress, occurs when the total duration of childbirth is greater than 24 hours ([Cunningham, Leveno, Bloom, Spong, & Dashe, 2014](#)). There are two main types, one when the latent phase of labor is greater than 8 hours and the other when the active phase of labor is greater than 12 hours, which cervical dilation to the right of the alert line on the partograph ([Cunningham et al., 2014](#)).

One of complications from the prolonged labor is neonatal asphyxia, which the newborn is unable to breathe spontaneously and regularly after birth accompanied by hypoxia and hypothermia and often ends with acidosis

as well as a serious infection for the mother and fetus ([Manuaba, 2012](#)).

Efforts made by the Government of Lampung Indonesia in reducing maternal and infant mortality rate are by Posyandu (a community-based vehicle to improve child survival and development), Polindes (Health maternity Hub), health fund and TOGA program. These activities are means of health efforts that stand for the participation of the community. In posyandu, the community held a class of pregnant women organized by health facilities, i.e. the community health center ([Dinkes, 2014](#)).

Activities in the class of pregnant women aim to prepare and train the muscles so that can be utilized to function optimally in normal deliveries. It is because prolonged labor is also caused by the power factor of mothers due to irregular contraction, no coordination and synchronization between the contraction, which leads to less no relaxation of the womb ([Heardman, 1996](#)). Doing pregnancy exercise can be started at 28 weeks of gestation. The recommendation of pregnancy exercise is mainly aimed at pregnant women with normal condition ([Widyawati & Syahrul, 2014](#)). Pregnancy exercise is a form of exercise to strengthen and also maintain the flexibility of the abdominal wall, pelvic floor muscles that will facilitate the process of normal labor. Previous study revealed that the implementation of pregnancy exercise in pregnant women can speed up the time of the second stage of labor as well as to relax the pelvic floor muscle, and safe for the baby ([Gavard & Artal, 2008](#); [Nagle, 2013](#); [Widyawati & Syahrul, 2014](#)).

Preliminary study at the Community Health Center of Sukamaju Lampung showed that there were 21 cases of prolonged labor in primigravida during in the last 6 months before this study. The average duration of first stage of labor was more than 12.5 hours, and in the second stage labor was more than 1.5 hours. Thus, this study aimed to examine the exercise during the third trimester of pregnancy on duration of the first and second stage of labor in primigravida at the community health center of Sukamaju, Bandar Lampung, Indonesia.

## METHODS

### *Study design*

This study employed a quasi-experimental design with *posttest-only non-equivalent control group*.

### *Setting*

This study was conducted from 8 January 2017 to 12 February 2017 at the Community Health Center of Sukamaju, Indonesia.

### *Sample*

There were 48 primigravida mothers selected using consecutive sampling, with 24 assigned

in the experiment and control group. The inclusion criteria of the sample were primigravida mother with 35 or 36 weeks of gestational age and stayed in the work area of the Community Health Center of Sukamaju Lampung. The exclusion criteria of the sample were pregnant women who had a history of preeclampsia and other pregnancy complications, such as history of bleeding, at risk of premature labor, slow intrauterine fetal growth (IUGR) and mothers with fever.

### *Intervention*

Pregnancy exercise was given by a midwife who was certified to train the exercise. The exercise was performed 4 times in two weeks. The movements arranged in pregnancy exercise were designed to eliminate the anxiety that arises before labor because it contains elements of relaxation that can stabilize the emotional condition of pregnant women. Some types of relaxation were applied in pregnancy exercise, namely breathing and muscle relaxation. Breathing relaxation was done by raising the abdomen when inhaling, and deflating the stomach while exhaling slowly from the mouth; while muscle relaxation was done through the stretching of certain muscles for several seconds and then released. When pregnant women do the exercises correctly, it will feel a relaxation effect on pregnant women who will be useful to overcome the pressure or tension during pregnancy. Mastering diaphragm breathing technique will make the diaphragm becomes strong to help the mother at the time of straining, because at the time of straining, in addition to contraction and abdominal muscles, the diaphragm also actively pushes the baby out.

### *Instrument*

Partograph was used to monitor the process of labor. For primipara, the normal cervix dilation in the first stage of labor is 12.5 hours, and the second stage of labor was 1.5 hour.

### *Ethical consideration*

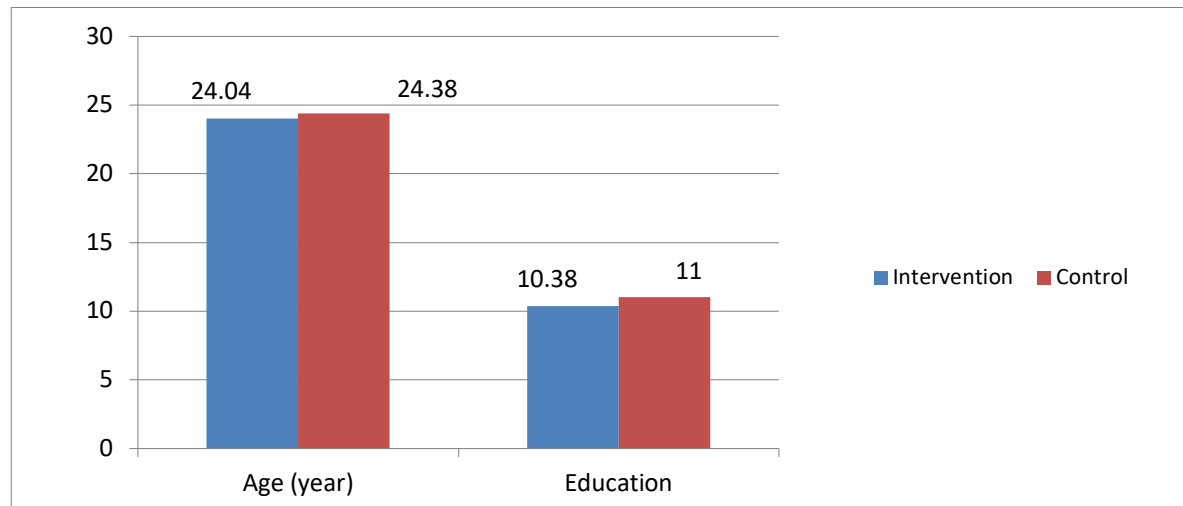
Ethical clearance was obtained from the Ethics Commission of POLTEKKES Semarang with No. 030/KEPK/Poltekkes-smg/EC/2017. Inform consent was done in each respondent, which the researchers gave

the explanation about the benefits and procedures of the study. Each respondent was signed a written informed consent prior to data collection.

#### Data analysis

Data were analyzed using Mann Whitney and Chi Square test.

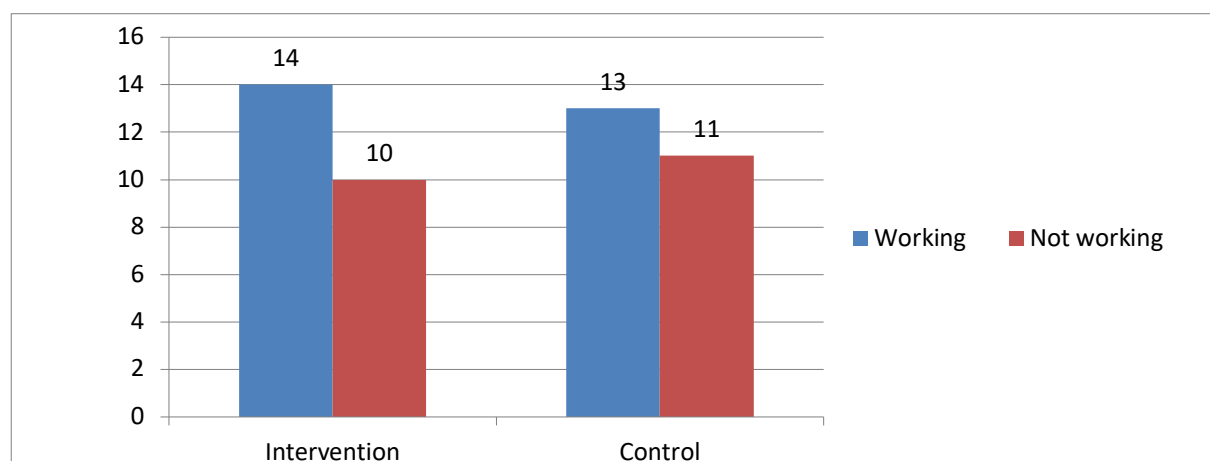
## RESULTS



**Figure 1** Characteristics of respondents based on age and education in the experiment and control group

Figure 1 shows that the average age of respondents in the experiment group was 24.04 years old with standard of deviation of 2.789, with minimum of 20 years and maximum of 29 years; while the control group was 24.38, with standard of deviation of 3.104, with minimum of 20 years and maximum of 30 years. Homogeneity test obtained p-value 0.634 ( $>0.05$ ), which indicated that there was no significant difference of age between the experiment and control group.

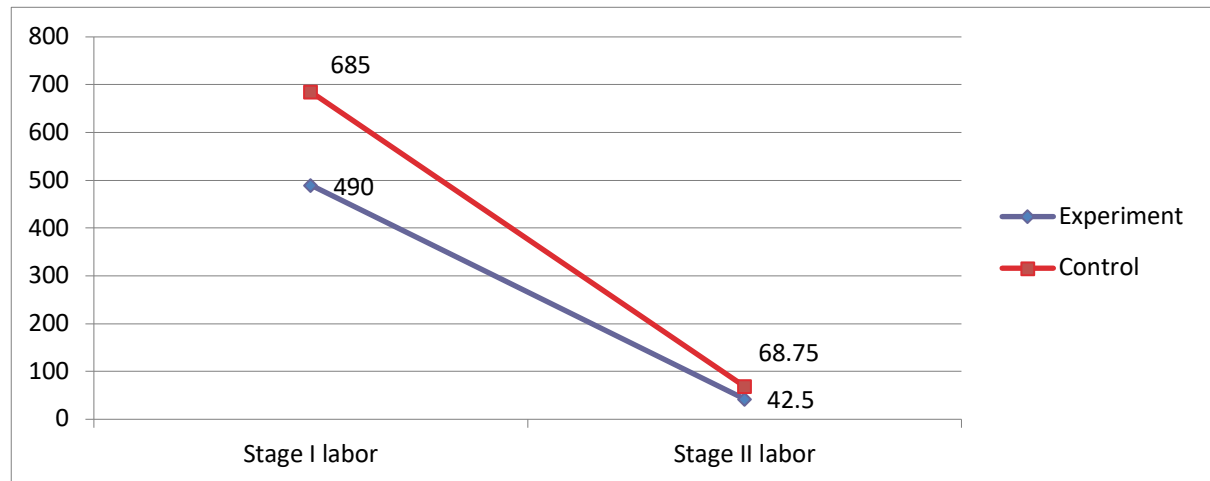
The average of education in the experiment group was 10.38 years with standard of deviation of 1.527, and in the control group was 11.00 years with standard of deviation of 3.036. Thus, the minimum duration of education was 9 years (junior high school) and the maximum was 12 years (senior high school). Homogeneity test obtained p-value 0.295 ( $>0.05$ ), which indicated that there was no significant difference of age between the experiment and control group.



**Figure 2** Characteristics of respondents based on working status in the experiment and control group

Figure 2 shows that the majority of respondents in the experiment and control group were working. Homogeneity test obtained p-value 0.590 ( $>0.05$ ), which

indicated that there was no difference characteristic of working status between both groups.



**Figure 3** Duration of the first and second stage of labor in the experiment and control group

Figure 3 shows that the average duration of the first stage of labor in the experiment group was 495 minutes with SD of 56.645, and in the control group was 685 minutes with SD of 39.232, with p-value 0.000 ( $<0.05$ ), which indicated that there was a significant difference in the duration of the first stage of labor between both groups. While the average duration of the second stage of labor in the experiment group was 42.5 minutes with SD of 13.105 minutes, and in the control group was 68.75 with SD of 13.929 minutes, with p-value 0.000 ( $<0.05$ ), which indicated that there was a statistically significant difference in the duration of the second stage of labor between both groups. The mean difference in the first stage of labor between the experiment and control group was 85 minutes, and the second stage of labor was 17.50 minutes. It could be said that the duration of the first and second stage of labor in the experiment group was faster than the duration in the control group.

## DISCUSSION

The result of this study shows that the characteristics of respondents are equal or homogeneous, which indicated that the respondent's characteristic did not affect the outcome of intervention in both groups. It should be the same because the labor process

is influenced by age, education, and occupation.

In this study, the age of respondents in the experiment and control group ranged between 20 to 30 years old. The reproductive age is divided into three groups, i.e. too young ( $<20$  years), reproductive age (20-35 years) and too old ( $>35$  years). As pregnancy requires extra energy and greater power, labor at too young age can lead to complications of pregnancy and childbirth, as reproductive organs for pregnancy are immature which may adversely affect maternal health and fetal development and growth. While at age  $>35$  years may also cause complications of labor due to maternal age at risk, which there is a decline function of the organs due to the aging process ([Hidayah, Andarini, & Anjaswarni, 2014](#)).

Whereas, educational factors determine whether or not a person easily absorbs and understands the knowledge they gain in general, the higher a mother's education the better her knowledge. Moreover, the knowledge gained by mothers during pregnancy affects the readiness of labor associated with the mother's emotional level ([Berentson-Shaw, Scott, & Jose, 2009](#)). The work of the respondents was divided into two groups, i.e. 14 respondents were working during pregnancy and 10 did not work in the

treatment group. Work is an activity done to meet the needs of life. In this case, the work might be a barrier for the mother for doing pregnancy exercise. In accordance with the research that factors affecting pregnancy exercise is fatigue due to mother activity and mother's work ([Duncombe, Wertheim, Skouteris, Paxton, & Kelly, 2009](#)).

Changes that occur in pregnant mothers can take place physiologically, and it might be complicated during pregnancy and labor. Difficulties during pregnancy such as back pain or low back pain, pelvic pain, and shortness of breath can increase maternal and infant mortality ([Hidayah et al., 2014](#)). Therefore, it is important for pregnant women to check regularly during pregnancy.

Pregnancy exercise as proposed in this study is one of the activities in pregnancy that can increase the mother's labor during childbirth. Findings of this study revealed that there was a significant difference of the duration of the first and second stage of labors between the experiment and control group with p-value <0.05 after given pregnancy exercise.

As we know that the duration of labor is influenced by 5 factors, namely labor, birth, fetal, psychological response and the assistant/helper ([Manuaba, 2012](#)); however, this study focused on the maternal strength factor/power which affects the length and frequency of labor duration.

Findings of this study were in line with theory stated that pregnancy exercise provides benefits for pregnancy to childbirth. Implementation of pregnancy exercise can increase the readiness of the mother to face labor and increase contraction ([Mintarsih, 2012](#)). In addition, the benefits of pregnancy exercise are mastering breathing techniques, strengthening muscle elasticity, reducing complaints, training relaxation and avoiding labor difficulty ([Hasibuan, 2016](#)).

This finding was also consistent with previous study with 4,069 respondents revealed that pregnancy exercise 3-5 times a week has a 14% lower risk of pelvic pain during pregnancy. This is because pregnancy

exercise enhances flexibility, strength and maintains the cardiovascular system. The movement in pregnancy exercise is intended to prepare pregnant mothers physically and mentally for a rapid labor ([Susilowati, Rini, & Setyoningsih, 2013](#)).

## CONCLUSION

In summary, pregnancy exercise four times in two weeks had a significant effect in reducing duration of the first and second stage of labor in pregnant women. Thus, it is expected that health workers, especially midwives in the community health centers to implement pregnancy exercise program to help mothers in accelerating the delivery process.

## Declaration of Conflicting Interest

None declared.

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## Author Contribution

All authors contributed equally in this study.

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