The Relationship between Pregnancy Exercise in Primigravida and The Prolonged Second Stage of Labor

Wiwit Marliana, Hikmah
Public Health Department, Faculty of Public Health
Ahmad Dahlan University Yogyakarta
Email correspondence: marlianwi.midwifery@gmail.com

ABSTRACT

Prolonged second stage of labor is one of the mortality causes in women, due to its risk of infection, decrease in energy, dehydration, and postpartum hemorrhage. The duration of labor is determined by three factors: power (the ability of the mother to push the baby from the womb), passage (the condition of the birth canal), and passenger (the condition of the fetus). The only controllable factor is power. The mother’s ability to push and expulse the fetus can be augmented by pregnancy exercises. This study is aimed to determine the effect of pregnancy exercises in primigravidas with the prevalence of prolonged second stage of labor in PKU Muhammadiyah Gamping Hospital in Yogyakarta. This study is an observational study with a cross-sectional design. A total of 57 samples were obtained through purposive sampling, all of whom are patients giving birth at PKU Muhammadiyah Gamping Hospital in Yogyakarta. Data analysis was done with univariate and bivariate chi-square. 31 samples (54,3%) attended pregnancy exercise classes, and 4 (7,0%) had a prolonged second stage of labor. A total of 26 samples (45,6%) did not practice any pregnancy exercises, and 22 of them (38,5%) had a prolonged second stage of labor. Mothers who did not practice any pregnancy exercises had a 6,558 higher risk of the prolonged second stage of labor compared to those who had practiced pregnancy exercises (p =0,000, 95% CI 2,590-16,606). There was a significant correlation between pregnancy exercises with the prevalence of prolonged second stage labor in PKU Muhammadiyah Gamping Hospital in Yogyakarta.

Keywords: pregnancy exercises, prolonged second stage of labor, cross-sectional study.
INTRODUCTION

Maternal and child health determines the level of health status. The World Health Organization (WHO) has predicted that every year more than 585,000 pregnant women worldwide die during pregnancy or childbirth (1). The maternal mortality ratio in developing countries is the highest with 450 maternal deaths per 100,000 live births when compared to the maternal mortality ratio in 9 developed countries and 51 developing countries (2). Based on the Indonesian Demographic Health Survey, it is known that the main cause of maternal death in obstetrics and gynecology is bleeding. The second rank is followed by hypertension in pregnancy, then cases of infection, and the incidence of prolonged labor (5%). The prolonged second stage of labor is one of several causes of maternal and new born mortality. The average maternal mortality in the world is 8% due to prolonged second stage of labor and 1% due to abortion problems. Apart from obstetric cases, maternal deaths can also be caused by other causes (non-obstetrical) 32% (3). Data from the Household Health Survey show that the prolonged second stage of labor is the 5th most common cause of maternal death in Indonesia. In Yogyakarta, the Maternal Mortality Rate (MMR) experienced a significant increase in 2015 by 29 cases and became 39 cases in 2016. Most cases occurred in the Bantul area (13 cases) and the lowest cases occurred in Yogyakarta City (4 cases). Meanwhile, the Infant Mortality Rate (IMR) has decreased in 2015 by 329 cases to 278 cases in 2016, but this figure rose again in 2017 to 313 cases. In light of the rise in maternal and newborn mortality, it is critical to determine the causes of these incidents.

A common cause of infant and neonatal death in Yogyakarta is asphyxia at birth due to the prolonged second stage of labor, transverse position, and narrow pelvis. The highest cases of infant mortality occurred in Bantul Regency (110 cases) and the lowest in Yogyakarta City (25 cases) (4). The prolonged second stage of labor is labor with adequate contraction but without signs of progress in cervical dilation, lowering of the head, and pivot rotation during the last 2 hours. The prolonged second stage of labor is one of the causes of maternal death because at that time it can cause infection, loss of energy, dehydration in the mother, and postpartum hemorrhage which is very dangerous for the mother’s safety (5). This syndrome leads the mother to become fatigued, rendering her unable to push, and the risk faced, in addition to maternal death, is child death. The duration of the labor process is determined by three factors, namely power, passage, and passenger. Abnormalities in the energy factor can be caused by inertia (irregular contraction, no coordination, and synchronization between contractions and their parts) and tetanic (too strong and too frequent contraction so there is no relaxation of the uterus).

Regardless of the underlying causes, pregnant women can control labor by engaging in pregnancy exercises. Pregnancy exercise is an exercise regimen designed specifically for pregnant women. As a result, pregnancy exercise incorporates unique movement principles that are tailored to the needs of pregnant women. Pregnancy exercises are specifically developed to keep pregnant women healthy and fit, eliminate complaints that arise during pregnancy, and physically and psychologically prepare the mother for childbirth. Pregnancy exercise is a relaxation exercise practiced by pregnant moms from 23 weeks till birth, and it is one of the activities in prenatal care in Indonesia (6). Research conducted previously stated that there was a significant relationship between the regularity of pregnancy exercise and the length of the delivery process. This shows that 92% of mothers who regularly exercise during pregnancy experience a normal length of the delivery process and 8% do not normally. Meanwhile, 43% of mothers who did not regularly take part in pregnancy exercise experienced a normal delivery process and 57% did not normally (7).
Based on the background above, one of the causes of child and neonatal mortality in Yogyakarta is prolonged second stage of labour. Based on secondary data obtained at PKU Muhammadiyah Gamping Yogyakarta Hospital, it is known that the incidence of the prolonged second stage of labor is one of the causes of pathological deliveries (caesarean section, vacuum extraction, etc.) in 2014, namely 198 cases and the 2015 period increased to 344 cases. Efforts to prevent the problem of prolonged second stage of labor can be overcome with pregnancy exercise activities, so case studies at PKU Muhammadiyah Gamping Hospital in Yogyakarta are needed to further investigate the relationship between pregnancy exercise and prolonged second stage of labor.

METHODS
This research was conducted in September-October 2016 at PKU Muhammadiyah Gamping Yogyakarta Hospital. This research is a type of quantitative research with observational analytic methods and cross-sectional designs (8). The instruments of this study were medical report that transform to tabulation as secondary data obtained at PKU Muhammadiyah Gamping Yogyakarta Hospital.

The population in this study were all mothers giving birth at PKU Muhammadiyah Gamping Yogyakarta Hospital which were recorded in the medical records for the January-June 2015 period of 177 people. The sample in this study were patients who met the exclusion and inclusion criteria so after being calculated using the sample size formula, 57 patients were sampled. In this study, the sampling method used was purposive sampling. The analysis in this study was carried out using univariate and bivariate analysis. Bivariate analysis was carried out with the Chi-Square test (9).

RESULTS AND DISCUSSION
Based on the data in the table below, it is known that of the 57 respondents studied, the majority of respondents were 20-30 years old totaling 42 (73.5%), and 15 respondents aged 31-35 years (26.3%). Characteristic data can be seen as follows:

<table>
<thead>
<tr>
<th>Characteristics of Respondents</th>
<th>Number of Respondents</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-30 years</td>
<td>42</td>
<td>73.5</td>
</tr>
<tr>
<td>31-35 years</td>
<td>15</td>
<td>26.3</td>
</tr>
<tr>
<td>Total</td>
<td>57</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Primary data, 2016

Univariate analysis
Univariate analysis was used to analyze each of the variables studied by calculating the distribution and percentage of each variable as presented in table 2 below:
Table 2. Frequency Distribution of Respondents Based on Variables of Pregnancy Exercise and Prolonged Second Stage of Labor

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnancy Exercise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>31</td>
<td>54,3</td>
</tr>
<tr>
<td>No</td>
<td>26</td>
<td>45,6</td>
</tr>
<tr>
<td>Prolonged Second Stage of Labor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>26</td>
<td>45,6</td>
</tr>
<tr>
<td>No</td>
<td>31</td>
<td>54,3</td>
</tr>
<tr>
<td>Total</td>
<td>57</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Primary data, 2016

Based on the data in table 2, it is known that from 57 respondents, the number of cases of the prolonged second stage of labor at PKU Muhammadiyah Gamping Yogyakarta Hospital was 26 (45.6%), and the number not prolonged second stage of labor cases was 31 (54.3%). Respondents who took part in pregnancy exercise had a greater percentage (54.3%) or as many as 31 respondents.

Bivariate Analysis

Table 3. Relationship between Pregnancy Exercise and Prolonged Second Stage of Labor

<table>
<thead>
<tr>
<th>Pregnancy exercise</th>
<th>Prolonged Second Stage of Labor</th>
<th>Not Prolonged Second Stage of Labor</th>
<th>Total</th>
<th>P Value</th>
<th>RP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Yes</td>
<td>4</td>
<td>7.0</td>
<td>27</td>
<td>47.3</td>
<td>31</td>
</tr>
<tr>
<td>No</td>
<td>22</td>
<td>38.5</td>
<td>4</td>
<td>7.0</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>45.6</td>
<td>31</td>
<td>54.3</td>
<td>57</td>
</tr>
</tbody>
</table>

Source: Primary data, 2016

Based on the data presented in table 3, it shows that of the 31 respondents who took part in pregnancy exercise, 4 (7.0%) experienced a prolonged second stage of labor and 27 (47.3%) respondents did not experience a prolonged second stage of labor. Of the 26 respondents who did not take part in pregnancy exercise, 22 (38.5%) of the respondents had a prolonged second stage of labor and 4 (7.0%) respondents did not experience a prolonged second stage of labor.

Bivariate analysis of pregnancy exercise with a prolonged second stage of labor using the Chi-square test. The results of the analysis with a significant level of 0.05 obtained a P-Value = 0.000 <0.05), so Ha was accepted, then there was statistical significance between pregnancy exercise and the incidence of the prolonged second stage of labor. The biological significance was found that the Ratio Prevalence was 6.558 (95% CI = 2.590–16.606), CI does not reach the number of 1, meaning that a history of pregnancy exercise is a risk factor for the occurrence of the prolonged second stage of labor at PKU Muhammadiyah Gamping Yogyakarta Hospital.
Relationship between Pregnancy Exercise and Prolonged Second Stage of Labor

The patients who were the samples in this study were taken based on the medical records of mothers giving birth at the Gynecology Polyclinic at PKU Muhammadiyah Gamping Yogyakarta Hospital for the January-June 2015 period which were collected using an observation sheet. There were 177 patients giving birth at the obstetric polyclinic in January-June 2015. After being calculated using the sample size formula, the patients collected by 57 people. This study used a cross-sectional design. The independent and dependent variables were measured at the same time by looking at the status of pregnancy exercise and the duration of the second stage of labor in the medical record.

The results of the study of 57 respondents, from the frequency distribution in table 1, show that there are more primigravida mothers aged 20-30 years with 42 respondents (73.5%), compared with those aged 31-35 years were 15 respondents (26.3%). This happens because, at the age of 30 years and over, women usually have more than one child or are pregnant with a second child (multigravida) is higher than the age of fewer than 30 years. Apart from that, medically speaking, a long second stage of labor can be experienced by anyone, both primigravidas and multigravidas. At the age of 30 years, women have a greater risk of experiencing a prolonged second stage of labor compared to those before the age of 30 (10). This is supported by WHO recommendations that the safest age for pregnancy and childbirth is 20 to 30 years (2).

The distribution of respondents based on pregnancy exercise and the prolonged second stage of labor in table 2 informs that the majority of maternity patients at the Gynecology Polyclinic at PKU Muhammadiyah Gamping Hospital take part in pregnancy exercise, there are 31 respondents (54.3%) and the rest do not take part in pregnancy exercise, there are 26 respondents (45.6%). This is because patients who do pregnancy checks get advice from doctors to do pregnancy exercises. In addition, the possibility of patients obtaining information and insight regarding the benefits of pregnancy exercise is influenced by their level of education, so patients are willing to do pregnancy exercises. Pregnancy exercise is highly beneficial for preserving mental health, bringing tranquility, and conquering stomach pain. The goals of pregnant exercise include: 1) maintaining the health of the muscles and joints that have a role in the process of birthing through regular pregnancy exercise; 2) Improving physical and psychological health, as well as self-esteem and helpers in the face of childbirth 3) Assisting women in achieving a physiological delivery. Pregnancy exercise specifically aims to 1) Strengthen and maintain the elasticity of the muscles of the abdominal wall, pelvic floor muscles, ligaments, and fascia tissue that play a role in the mechanism of labor; (2) Loosen the joints associated with the birth process; (3) Form excellent body posture to help overcome complaints, the location of the fetus, and reduce shortness of breath; and (4) Get the perfect way to do contraction and relaxation. (5) Possibility of putting yourself at ease (6). From the results of research by Wadhwa et.al, pregnancy exercise is part of the effort that can be made to produce perfect contractions and relaxation so that labor can take place normally (11).

The distribution of respondents based on the status of the prolonged second stage of labor in table 2 states that 26 respondents experienced a prolonged second stage of labor (45.6%) and who did not experience a prolonged second stage of labor as many as 31 respondents (54.3%). The cause of the prolonged second stage of labor is multicomplex. It can be due to abnormalities in the fetus, birth canals, or other factors related to the patient's psychology, such as fear of childbirth and excessive anxiety. In line with research from Wijayanti who found that the risk factors for length of labor in primigravidas during the second stage were contraction abnormalities, malposition of the fetus, mother's age over 35 years, and mother's height less than 150 cm (12).
The results of statistical tests on the relationship between pregnancy exercise and the prolonged second stage of labor can be seen in table 3. The results showed that of the 31 respondents (54.3%) who took part in pregnancy exercise, there were 4 respondents (7.0%) who experienced a prolonged second stage of labor, whereas, of the 26 respondents (45.6%) who did not take part in pregnancy exercise, there were 22 respondents (38.5%) who experienced a prolonged second stage of labor. The results of data analysis obtained p-value of 0.000 <α (0.05) so it can be concluded that there is a significant relationship between pregnancy exercise and prolonged second stage of labor at PKU Muhammadiyah Gamping Yogyakarta Hospital.

The opportunity for the magnitude of the risk can be seen from the value of RP = 6.558, meaning that primigravida mothers who do not take part in pregnancy exercise are likely to have a risk of experiencing a prolonged second stage of labor 6,558 times greater than primigravida mothers who participate in pregnancy exercises. Based on the results of this analysis, shows that there is a significant relationship between pregnancy exercise in primigravidas and the prolonged second stage of labor. Respondents from primigravida who did not participate in pregnancy exercise had a 6.558 times greater risk of having a prolonged second stage of labor compared to primigravida who took part in pregnancy exercise. This shows that pregnancy exercise can help the delivery process go faster. In line with the results of research conducted by Widyawati showing that pregnancy exercise has a significant effect on the duration of the second stage of labor, especially in primigravidas (13).

Pregnancy exercise is a good activity carried out by pregnant women so that they become mentally and physically prepared to face a safe, smooth, and spontaneous delivery process (14). This is supported by Wahyuni that the benefits of pregnancy exercise are to increase the need for oxygen in the muscles, stimulate the lungs and heart, as well as joint and muscle activities. In general, pregnancy exercise produces changes in the whole body, especially the ability to process and use oxygen, increases blood circulation, improves muscle fitness and strength, facilitates childbirth, relieves back pain and constipation, burns calories, reduces fatigue, and making a good body shape after giving birth (15).

The second stage of labor lasts a long time and has harmful effects on both the mother and the fetus. As for the mother it will result in uterine atony, lacerations, bleeding, infection, fatigue, and shock. In addition, the longer the delivery, the higher the morbidity and mortality of the fetus so asphyxia, cerebral trauma caused by pressing on the fetal head, injuries due to extraction procedures, and death are more common (16). This is in line with the Yogyakarta Health Office report which shows the infant mortality rate is 135 cases. The reason is that the baby has asphyxia resulting from a prolonged second stage of labor. In addition, there were 18 cases of maternal death with one of the causes being the prolonged second stage of labor.

The length of the delivery process can be influenced by three components, namely power, passage, and passenger. Until now the components that can be controlled is about power. Abnormalities in the power factor can be caused by the occurrence of irregular contraction, too strong and often contraction, so that there is no relaxation of the uterus. This can cause labor jams. If not treated immediately it will result in fetal distress and rupture of the mother's uterus. Efforts that can be made by pregnant women so that labor goes smoothly can be controlled by doing pregnancy exercises. However, heavy stretching exercises such as aerobics, floor exercises with strong stretching during body language are not recommended for pregnant women. The movement of body language exercises can cause muscle contractions in the abdominal muscles which can harm the womb (17). This statement is following research by Mulyati, et.al., who said that out of 35 respondents who did pregnancy exercise, there were 29 respondents (82.9%) of the effectiveness of normal labor in primigravida mothers with the Chi-Square statistical test showing a p-value of 0.001 which significant so that there is a significant relationship between pregnancy exercise and the effectiveness of delivery time for primigravida mothers (7). Sulastri also emphasized that if done correctly and regularly, pregnancy exercise
can expedite the delivery process. One of the factors that affect the length of the delivery process is the implementation of the pregnancy exercise program (18).

The results in this study are following Novita's study in Mutiara Maternity Home, Malang Regency about the relationship between the regularity of pregnancy exercise and the duration of labor. The research shows that of women who regularly exercise during pregnancy as many as 86% have a normal delivery process and 14% have abnormal. While mothers who do not regularly take part in pregnancy exercise as much as 49% have a normal delivery process and 51% have abnormal (19). Guszkowska also explained the implementation of pregnancy exercise in breathing exercises is very useful for getting oxygen regularly and training so that the mother is ready for childbirth. Pregnancy exercise also helps the relaxation process to overcome tension or pain during labor and assists in childbirth so that mothers can give birth without difficulty (20).

The purpose of the exercise movement according to E. Sari Dewi et.al., is to help deal with any mild stress and tension during pregnancy and prepare for the process of childbirth and the period after childbirth (21). Pregnancy exercise is also one of the care of the mother's love movement provided by medical personnel in particular (midwives). In addition, pregnancy exercise is needed for pregnant women as a form of psychological need in the form of attention, protection, and reproductive health. This is explained in the Qur'an that pregnant women have the right to get protection from both their husbands and the surrounding environment. Pregnant women have the right to guarantee safety and health related to their reproductive function. This right is absolute given the enormous risk for mothers in carrying out their reproductive functions. Starting from menstruation, having sex, pregnancy, childbirth, and breastfeeding. A pregnant woman has the right to get various protections from her husband. Islam has placed men (husbands) as leaders and protectors in the household. Allah Subhanahu Wa Ta'ala says: "Men are in charge of women by [right of] what Allah has given one over the other and what they spend [for maintenance] from their wealth. So righteous women are devoutly obedient, guarding in [the husband's] absence what Allah would have them guard." – Quran Surah An-Nisa verse 34 (22).

The pregnancy exercise movements that we already know and have implemented in almost all pregnant women have similarities with the prayer movements that we do 5 times every day. The results of research from a Tonto University doctor (Najwa Ibrahim As-Sa‘id A’lan) said that women who are in a state of pregnancy and childbirth when they perform prayer movements can help blood circulation and there is no dilation of blood vessels in the calves, which usually occurs in some postpartum mothers. When viewed from a health perspective, every movement in prayer certainly has great benefits for health. Likewise, the prayer movement is beneficial for pregnant women during their pregnancy. Based on health benefits, pregnancy exercise is mubah (permissible) for muslim women in a special place or a public place as long as the implementation is bound by all provisions of Islamic law, both related to interaction arrangements and others. As pregnancy exercise is carried out to achieve a healthier quality of life, this is following Islamic recommendations in a hadith narrated from Abu Hurayrah (may Allah be pleased with him) reported that the Messenger of Allah (may Allah's peace and blessings be upon him) said: "A strong believer is better and dearer to Allah than a weak believer, and it is good in both. Adhere to whatever brings you to benefit, seek the help of Allah, and do not feel helpless. " – Hadith Sahih Muslim (23).
CONCLUSION

Based on the results of research on the relationship between primigravida pregnancy exercise and the prolonged second stage of labor at PKU Muhammadiyah Gamping Yogyakarta Hospital, it was concluded that out of 31 respondents who took part in pregnancy exercise, 4 (7.0%) of respondents had a prolonged second stage of labor and 27 (47.3%) of respondents did not experience prolonged second stage of labor. These results indicate that there is a relationship between pregnancy exercise in primigravidas and the prolonged second stage of labor at PKU Muhammadiyah Gamping Yogyakarta Hospital. With biological significance, it was found that the Ratio Prevalence was 6.558 (95% CI = 2.590–16.606). The author hopes that the results of this study can become the basis for further, more in-depth research on the relationship between primigravida pregnancy exercise and the prolonged second stage of labor to produce more specific and certain quality data.

REFERENCES

4. DIY DK. Health Profile In Yogyakarta In 2019. DIY Health Service. 2020;
13. Widyawati, Syahrul F. The Influence Of Pregnant Gymnastics On Delivery Process And


