



## Early Detection of Narrow hip Size through the Measurement of the right foot size of third Trimester Pregnant Women and the effects on Complexity of Labor Process

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### Abstract

**Background:** *The narrow hip size of pregnant women is one of the factors that inhibits the normal labor process. The risk that may occur due to this issue is abnormalities in babies and even prenatal death.*

**Objective:** *The purpose of the study was to determine the effectiveness of early detection of narrow hip size through the measurement of the right foot size of third-trimester pregnant women and determine its relationship with the complexity of labor process in Bahu Health Center in the Malalayang Subdistrict, Manado City.*

**Method:** *The type of research was analytical research with a cross-sectional study approach. The samples were selected by purposive sampling with criteria for third-trimester pregnant women. The obtained data were analyzed statistically using the chi-square test and the 2x2 table test was used for the diagnostic test.*

**Result:** *Results showed that the measurement of the right foot size of third-trimester pregnant women is a simple and effective way to detect narrow hip size risk factors with chi-square P-value of 0.000. The diagnostic test showed that 62.5% of respondents who had a risk of narrow hip size experienced complications in the labor process. On the other hand, 100% of respondents who did not have the risk of narrow hip size did not experience complications.*

**Conclusion:** *Early detection of narrow hip size through the measurement of the right foot size of third-trimester pregnant women is an effective way to predict if pregnant women will experience complexity in the labor process. This method is simple, easy, and important to be carried out in order to prepare the labor process in a safer way.*

**Keywords:** *Complexity, Hip size, Labor, Pregnant women.*

### Introduction

Maternal mortality is a health and social problem.

The main causes of maternal deaths in Manado area, Indonesia in 2013 were bleeding (36%), hypertension (24%), infection (3%), prolonged labor (1%) and other causes (36%) (Ministry of

Health of RI, 2014). Based on the data obtained from the Bahu Health Center in the Malalayang Subdistrict, Manado City, the number of third-trimester pregnant women which were referred to the bigger hospital was 101 out of 485 (20.82%) in 2016 and 114 out of 441 (25.85%) in 2017.

This condition indicated that the number of mothers who experience pregnancy and labor process complications has increased in the last 2 years.

Pregnant women face the risks of complications in labor which may cause discomfort, pain, or even death for the mother and the baby. Most of the complications happened during the labor process were prolonged labor. Prolonged labor is characterized by a latent phase of more than 8 hours. Labor lasts up to 12 hours or more without the birth of a baby. It can be indicated by cervical dilation on the right part of the alert line on partograph (Prawirohardjo, 2010).

Through the predictions or early detection of labor complications, safe labor process can be prepared (Rochjati, 2003). Labor process is influenced by mothers' power, passage to give birth and the position of the baby. Passage-related labor disorders are usually associated with abnormalities in the hip and pelvic size of pregnant women. The shape and size of the hip determine the smooth delivery. The narrow hip size of pregnant women is one of the factors that inhibits the normal labor process. The risk that may occur due to this issue is abnormalities in babies and even prenatal death (Nugraha, 2014).

There are various ways to detect the risk of having narrow hip size in pregnant women, including height measurements, pelvic measurements (outer pelvis and inner pelvis), radiological examination or X-ray photos, and simple methods such as measuring the length of the right foot of pregnant women, or fundal height of the woman (Rohcjati, 2003). Traditionally, the use of anthropometric measurements shows the possibility of a relationship between the size of one body part and another, or the similarity between one size and another. The previous study concluded that there was a significant linear correlation between body height and arm length for both men and women (Preedy, 2012).

The best time to measure the hip size is at 36 weeks of pregnancy. At that time, the doctor can determine the possibility of being able to give

birth normally or not. Measurement mainly concerns the diameter and area of each pelvic door. Theoretically, the wider the pelvis, the easier for the baby to come out. Conversely, the narrower the pelvis, the greater the likelihood of difficulties in labor (Lowdermilk et al., 2011).

The aim of the study was to determine the effectiveness of early detection of narrow hip size through the measurement of the right foot size of third-trimester pregnant women and determine its relationship with the complexity of labor process in Bahu Health Center in the Malalayang Subdistrict, Manado City. This method has not been done by many health workers, including at the Bahu Health Center. It is expected that this study can help pregnant women with the risk of narrow hip size so that they can be anticipated for a referral if complications occur.

### **Materials and Methods**

The type of research used was analytical research with a cross-sectional study approach. This research was conducted from May to November 2018. The population in this study were all pregnant women in the third trimester of pregnancy who had their pregnancies examined at the Bahu Health Center, Malalayang Subdistrict, Manado City. Univariate analysis of the analysis was performed on each variable from the results of the study. In general, this analysis only produced distributions and percentages of each variable. Bivariate analysis was used to find the relationship between independent variables and dependent variables with statistical tests that correspond to the scale of existing data. The statistical test used was chi-square. The significance level used was 95%. Diagnostic test analysis used in this study was a 2x2 table test. The 2x2 table test was done to get the sensitivity and specificity values.

### **Results and Discussion**

#### **Univariate Analysis**

There were 41 respondents which aged 20-35 years old (82%), 6 respondents which aged

younger than 20 years old (12%) and 3 respondents which aged over than 30 years old (6%). Age factors also greatly influence the risk of pregnancy. Ages 20-35 years old are the best age for women who want to have children. Under or above that age, pregnancy will be at high risk. At the age of under 20 years, the uterus and pelvis often have not grown in to optimum size, which results in prolonged labor or other disorders. Whereas over 35 years or more, their health has decreased resulting in children with disabilities, prolonged labor, and bleeding (Walyani, 2015). There is a relationship between mothers' age and the risk of obstetric complications. Mothers aged less than 20 years or more than 35 years have a 5 times greater risk to experience complications (Edyanti, 2014). Results showed that there was a pregnant woman aged under 20 years old who had narrow pelvic risk factors referred to the hospital. There were 23 primiparous respondents (46%) and 27 multiparous respondents (54%). Parity shows the number of babies who have been grown by a mother into a viable gestational age, whether both born alive or not. In pregnancy, the mother's uterus is stretched by the presence of a fetus. When a mother gives birth too often, the uterus will become weaker, leading to disturbances during pregnancy and childbirth. Multiparous mothers will have a higher risk in labor complications because they are more likely to experience weak contractions during labor because of weak uterine muscles, severe vaginal bleeding, and placenta previa (Misar, 2012). Thirty-one of respondents (62%) did not do sufficient Antenatal Care (ANC) visits and only 19 respondents (38%) did standardized ANC. Standardized ANC is based on the standards set by the government, which suggest pregnant women have ANC once in the first trimester, once in the second trimester, and twice in the third trimester to reduce maternal morbidity and mortality. There are other factors that can also influence the willingness to do ANC, such as social, cultural, economic, psychological, and others (Duong et al., 2015).

Some respondents had body height 145 cm, amounted 46 people (92%) and only 4 people (8%) had body height which is less than 145 cm. The height of a pregnant woman is the initial concern of the midwife because it correlates with the size of the pelvic bone. A pregnant woman whose height is less than 145 cm will get a special note from health workers because of the higher possibility of experiencing a narrow hip size. Short pregnant women are in a high-risk group. However, all pregnancies still receive the same attention and are considered risky. Basically, if the height of the mother is less than 145 cm but the size of the head and body of the baby is small, for example as in premature babies with 6-7 months of gestation, then normal labor is still possible. Conversely, even if the height is more than 145 cm, if there are certain conditions, it may have problems for normal childbirth. As this is not always the case, mothers must plan their labor process with the help of a midwife or doctor (Ministry of Health of RI, 2014).

Based on ANC examination results of third-trimester pregnant women, most of their babies had entered pelvic top door, which were 42 respondents (84%), and the babies of remaining 8 respondents (16%) had not entered the pelvic top door (Wiknjostastro, 2005). For primigravida, the babies' head should enter the pelvic top door at a gestational age of approximately 36 weeks, while in multigravida it will occur at 38 weeks or even sometimes at the beginning of labor process (Fitrayeni et al., 2017).

Results showed that most third-trimester pregnant women were not at risk of narrow hip size with 45 respondents (90%) and only 5 respondents (10%) were at risk. Difficulty in vaginal labor (normal labor) is also influenced by many factors, one of which is the narrow hip. The hip is narrow, not small, because narrow hips are not necessarily narrow (Purwandari, 2010).

Data obtained from the research showed that the maximum length of the right foot was 23 cm and the minimum was 20 cm. Average right foot length was 22.2 cm. The previous study showed

that with a mean foot length of 22.7 cm there is a tendency that the longer the length of the foot, the wider the hip. This is seen in the value of r-value of 0.001. Furthermore, based on simple linear regression analysis, both right foot length and uterine fundus height have a significant relationship with narrow hip events (Purwandari, 2010). This previous study supported the results of this study, as results showed that the measurement of the right foot size of third-trimester pregnant women is a simple and effective way to detect narrow hip size risk factors with chi-square p-value of 0.000. To support the accuracy of this method, it is important to consider the other factors including mothers' height and the position of the babies in the uterus. In this research, as much as 8 respondents (16%) experienced complications in the labor process and were referred to bigger hospital, meanwhile, the other 42 respondents (84%) did not experience complications. Mothers who experienced pregnancy complications have a higher risk of experiencing maternal death when compared to mothers who did not experience pregnancy complications (Fibriana, 2007). This explains why early detection of narrow hip size through the measurement of the right foot size of third-trimester pregnant women and the effects on the complexity of labor process was important to be carried out in order to prepare labor process in a safer way.

### Bivariate Analysis

Results showed that 5 out of 5 (100%) respondents who had a risk of narrow hip experienced labor complications and must be referred to a hospital, while 3 out of 45 (6.7%) respondents who did not have a risk of narrow hip experienced labor complications and must be referred. The statistic test results obtained a p-value of 0.000, so it can be concluded that there is a factual relationship between the risk of narrow hip size with the occurrence of maternal complications.

Table 1 shows the distribution of respondents who had a narrow hip risk and experienced labor complications.

**Table 1** Distribution of Respondents according to Narrow Hip Risk with Labor Complications in Third Trimester Pregnant Women at Bahu Health Center

Risk of Narrow Hip Size	Labor Complications		Total
	Experienced Complications	Did Not Experience Complications	
Had risk	5	0	5
Did not have risk	3	42	45
<b>Total</b>	8	42	50

Based on Table 1, the diagnostic test can be done. The sensitivity and specificity values can be calculated as follows.

$$\text{Sensitivity test} = \frac{5}{5+3} \times 100\% = 62.5\%$$

$$\text{Specificity test} = \frac{42}{0+42} \times 100\% = 100\%$$

The sensitivity value shows 62.5% of respondents who had a risk of narrow hip experienced labor complications from the total respondents who actually experienced labor complications. The specificity value of respondents who did not have a risk of pelvis narrow was 100%.

### Conclusion

From this research, it can be concluded that from the 50 respondents there were 5 respondents (10%) who had a risk of narrow hip size and those who did not have risk were 45 respondents (90%). All respondents (100%) who had a risk of narrow hip experienced labor complications and must be referred to a hospital, while 3 out of 45 (6.7%) respondents who did not have risk of narrow hip experienced labor complications and must be referred. The statistic test results obtained a p-value of 0.000, so it can be concluded that there is a factual relationship between the risk of narrow hip size with the occurrence of maternal complications. The diagnostic test showed that 62.5% of respondents who had a risk of narrow hip size experienced complications in the labor process. On the other hand, 100% respondents who did not have the risk of narrow hip size did not experience complications. Early detection of

narrow hip size through the measurement of the right foot size of third-trimester pregnant women is an effective way to predict the case of complexity in the labor process. This method is simple, easy, and important to be carried out in order to prepare the labor process in a safer way.

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