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Dare's Formula Specifications in Assessing Fetal Weight

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Abstract

One of the causes of complicating labor is the fetal factor, namely the fetus's size. If it is not treated immediately, it will increase maternal and neonatal mortality rates. Accurate estimation of fetal birth weight in pregnancy and delivery is an important indicator in determining fetal well-being. Birth weight is important to measure before labor starts, which helps anticipate possible complications in pregnancy, childbirth, and the puerperium. The accuracy of estimation of fetal body weight either by measuring the fundal height or other means will affect labor management. One way to predict the estimated fetal weight, including the Dare's Formula method, is to measure the circumference of the mother's abdomen (abdominal girth) in centimeters, the measurement results times the Fundus Uterine Height (TFU) in centimeters, and the modified Niswander formula (1.12 TFU). - 7,7) 100 (gr). The design used in this study is a Quasi Experiment. Assessment The estimated fetal weight obtained from the measurement is then compared with the newborn's body weight (actual body weight). The population in this study were all pregnant women, both primiparous and multiparous. While the sample to be taken must meet the inclusion criteria that have been set. The results of the study were based on statistical tests using independent t-test, it was found that the p value (0.000) <α (0.05) means that there is a significant difference between the difference in body weight of babies born with Dare's formula and the difference in body weight of babies born with Niswander's modification, the estimated fetal weight is more. Effective using Dare's formula rather than Niswander modification.

Keywords: Dare's Formula; Fetal Weight

INTRODUCTION

Midwives are frontline health service providers who have an essential role in reducing MMR (Maternal Mortality Rate) and IMR (Infant Mortality Rate). The role of midwives in dealing with complex problems in midwifery services is stated in the Minister of Health Decree No. 369 / Menkes / SKIII / 2007 concerning the Professional Standards for Midwives, not only covering the number but the most important thing is the quality. Indonesia is lagging in terms of health, especially maternal health services. The 2012 Indonesian Demographic and Health Survey (IDHS) results showed the MMR of 359 / 100,000 live births. Due to insufficient health services, maternal and infant mortality is still a reproductive problem in Indonesia. Research and development of medicinal plants are rapidly growing both at home and abroad, especially in the field of its pharmacological efficacy, one of which is as an anti-inflammatory. Natural materials are expected to contain compounds with high anti-inflammatory activity.

Labor complication is an obstetric complication. One of the causes is the fetal factor, namely the size of the fetus, so that if it is not treated immediately, it will increase the maternal and neonatal mortality rates. Estimating the fetus's weight by measuring the height of the uterine

fundus is very important in providing childbirth care services (Prabandari, 2014).

Mochtar (2011) argues that birth weight will affect the accuracy of management. A similar opinion was expressed by Subagio (2000), that in several hospitals, methods of estimating intrauterine fetal weight were still carried out by measuring the Uterine Fundus Height (TFU), which also affects labor management.

Unpredictable obstetric complications account for 90% -95% of maternal deaths at delivery. Unpredictable obstetric complications in labor include dystocia. Low-weight babies are at risk of disturbances in the respiratory system, and hypoglycemia or macrosomia babies can cause labor with shoulder dystocia and the risk of tearing in the perineum and other trauma to the birth canal (Rianti and Aminah, 2017).

Inhibited Fetal Growth (CHD) is one of the leading causes of perinatal mortality. TFU measurement is an effort to detect CHD, macrosomia, and multiple pregnancies (Kayem, 2009). An accurate estimation method can solve pre-delivery problems, both in infants with an extreme estimate of weight or less (Etikan,2005).

Birth weight is an essential predictive parameter for neonatal morbidity and mortality in the fetus. Accurate fetal weight estimation is a valuable tool to determine further obstetric management (Malik, 2012).

Estimating fetal weight is one way of measuring the fetus's weight while it is still in the uterus. Because the fetus's weight is significant in the implementation of delivery care, when the care provider (midwife) knows the weight of the fetus to be born, it can be determined if a referral is needed so that there is no delay in handling. Meager birth weight or macrosomia infants are at increased risk of complications during labor and the puerperium. Knowing the estimated fetal weight, caregivers can determine the spontaneous delivery plan or not (Nindrea, 2017).

A similar opinion states that birth weight dramatically affects the accuracy of childbirth care, thereby reducing the mortality and morbidity rates in maternity mothers (Rianti and Aminah, 2017).

Fetal weight needs to be estimated before labor begins, which anticipate possible complications during pregnancy, childbirth, and the puerperium. Estimating fetal weight is an essential task of the caregiver (midwife). Accuracy of fetal weight estimation, either by measuring the uterine fundus' height or by other means, will affect the delivery of childbirth care (Rianti and Aminah, 2017).

There are several ways / clinical methods commonly used, especially by midwives, in estimating fetal weight. However, clinical methods have limitations on the subject and depend on experience other than the errors in this technique. So it is necessary to devise an accurate method for predicting fetal weight that can reliably be made to achieve the best results. With accurate predictions, babies with low birth weight and new macrosomia can be predicted, and thus prevention and management efforts can be made both during pregnancy and childbirth (Kumari et al., 2013).

The technique for estimating fetal weight that caregivers, especially midwives, most often use is to measure the TFU. In studies, TFU has a significant and robust relationship with infant weight and describes fetal growth and fetal size more accurately (Rosmina et al., 2003).

Another opinion that measuring TFU in estimating fetal weight includes the Johnson-Toshack formula, Dare's, the simple method, Niswander. (Farid et al., 2014).

Another method of measuring the estimated fetal weight is the Risanto formula, where this method is also objective and easy to teach, namely by measuring the weight of the newborn based on the measurement of the uterine symphysis distance (in centimeters) multiplied by the regression coefficient 126.7 then reduced by a constant of 931. , 5. However, this clinical method still needs further study (Shamawarna, 2012)

Accurate estimation of fetal weight, together with gestational age and maternal pelvic adequacy, is essential information for managing labor and delivery. One way to predict the estimated fetal weight, including the Dare's Formula method, is to measure the mother's abdomen's circumference (abdominal girth) in centimeters using a centimeter tape. The measurement results are multiplied by the Uterine Fundus Height (TFU) in centimeters (Sahputra et al., 2014). While the modification of Niswander with the formula (1.12 TFU - 7.7) 100 gr (Gayatri and Afiyanti, 2006). This study aimed to measure the specificity of Dare's formula and Niswander's modification in estimating fetal body weight, where the gold standard is actual birth weight.

METHOD

This type of research is Quasi-experimental by comparing estimated fetal body weight using Dare's formula and Niswander's modification method with actual newborn weight. Data analysis was performed using an independent t-test to compare the level of specificity of Dare's formula with Niswander's modification in estimating fetal body weight, where the gold standard is the actual birth weight of all pregnant women.

This study's population was all mothers in childbirth at the Maternity Clinic, with as many as 30 respondents. The research subjects were volunteers who were willing to be examined and met the inclusion criteria (intrapartum, single pregnancy, head presentation) and signed informed consent (willing to be examined). The exclusion criteria were: IUFD, significant congenital abnormalities, such as anencephaly, hydramnios and oligohydramnios, and obesity. Sampling was carried out by accidental sampling, namely accidental sampling by taking respondents who happened to be there or were available in a place according to the study's context (Notoatmodjo, 2010).

This study's data were data on fundal height and abdominal circumference (in centimeters) in part mothers, characteristics of pregnant women, and birth weight measured shortly after the baby was born. Meanwhile, the tools used to collect data were a checklist about pregnant women's characteristics, measuring tape (centimeters), and baby scales. Meanwhile, the comparative data is the actual birth weight of the newborn, which is measured using the baby scales. At the time of the mother's birth, the Estimated Fetal Weight was calculated using the Formula Dare's method, then compared with the baby's actual weight (weight of the baby at birth). Likewise with fetal wight estimation using the Niswander modification compared to the actual baby weight. The mother had previously obtained consent by signing informed consent.

Data analysis was carried out by independent t-test, which compares the level of specificity of Dare's formula with Niswander's formula in estimating fetal body weight, where the gold standard (gold standard) is the actual birth weight. This research has received approval from the Health Research Ethics Committee of the Sumatera Utara University Faculty of Nursing with letter number 2221/IX/SP /2020.

RESULTS AND DISCUSSION

Table 1. Distribution of Birth Weight Infants

Estimated Fetal Weight	Total	%
2.500-3.500 gr	27	90
>3.500 gr	3	10
Total	**30**	**100**

From table 1, it is known that 27 people (90%) and > 3500 gram are born with a weight of 2500 - 3500 gram and 3 (10%). Birth weight is also the result of the interaction of various factors that occur during pregnancy. Various factors can affect birth weight, including maternal, paternal, environmental, pathological conditions, and pregnancy complications such as hypertension, preeclampsia, and gestational diabetes mellitus. The more parity, the larger the fetus will be. Female fetuses tend to be smaller than male fetuses at the same gestational age, where the mean difference between male and female fetuses is around 136 gram (Nahum GG et al. l, 2002).

Table 2. Estimated Fetal Weight With Dare's Formula and Niswander Modification

Method	Estimated Fetal Weight	Total	%
Dare's Formula	2.500-3.500 gr	14	93
	>3.500 gr	1	7
	Total	**15**	**100**
Modifikasi Niswander	2.500-3.500 gr	15	100
	>3.500 gr	0	0
	Total	**15**	**100**

From table 2 it is known that the majority of the estimated fetal body weight by Dare's formula is 2500-3500 grams by 14 people (93%). The majority of the estimated fetal body weight with modified Niswander modifications is 2500-3500 grams as many as 15 people.

Table 3. Characteristics of Respondents

Characteristics	Category	Dare's		Niswander	
		n	%	n	%
Age	21-35 years	11	73	8	53
	>35 years	4	27	7	47
Occupation	Housewife	6	40	5	33
	Employee	9	60	10	67
Last Education	Primary School	0	0	1	7
	Junior High School	3	20	2	13
	Senior High School	10	67	9	60
	University	2	13	3	20
Gravida	Primi	6	40	5	33
	Secundi	7	47	7	47
	Multi	2	13	3	20

From table 3, it can be seen that the age distribution of respondents with Dare's formula is the majority aged 21-35 years, as many as 11 people (73%), and the majority using the Niswander modification are 21-35 years old, namely eight people (53%). Based on the respondent's work with Dare's formula, most workers are nine people (60%), and the majority of those who use Niswander's modification work as many as ten people (67%). Based on respondents' education with Dare's formula, the majority of them have high school education as many as ten people (67%), and the majority of those who use the Niswander modification have high school education as many as nine people (60%). Based on gravida respondents with Dare's formula, most scundigravida were seven people (47%), and those who used the modification of the scundigravida majority were seven people (47%).

Table 4. Difference in average birth weight difference between babies and Dare's Formula and Niswander's modification

	Independent Differences							
	Mean	SD	SE Mean	95% Cl		t	df	Prob
				Lower	Upper			
Difference in body weight in Dare's Formula	22,6	18,718	5,091	-240,619	-114,048	-5,740	28	0.000
Difference in body weight in Niswander	200	118,019	30,472	-243,269	-111,397			

From table 4, it is known that the average difference between birth weight and infant weight estimation using Dare's formula is 22.6 grams, and the average difference between birth weight and estimated infant weight using the Niswander modification is 200 grams.

Based on statistical tests using an independent t-test, it was found that the p-value (0.000) <α (0.05) means that there is a significant difference between the difference in body weight of babies born with Dare's formula and the difference in body weight of babies born with Niswander's modification where the estimated birth weight is more effective using Dare's formula than the Niswander modification.

Kumari's research et al. (2010) concluded that Dare's Formula could be used to estimate fetal weight, where the results showed that Formula Dare's clinical method was as accurate as ultrasound in predicting fetal weight.

Another supporting study, comparing the accuracy of estimates of fetal weight according to Dare's Formula with Johnson's Tausack, found that Dare's Formula is more accurate than Johson-Thousak (Sahputra et al., 2014). The same research that supports Dare's Formula is more accurate in determining fetal weight estimates than Risanto's Formula (Kumari et al, 2010).

Another study, that in the group of low birth weight babies Formula Dare's method is as accurate as of the use of ultrasound (Prajapati et al., 2018). Labor complication is an obstetric complication. One of the causes is the fetal factor, namely the fetus's size, so that if it is not treated immediately, it will increase the maternal and neonatal mortality rates. Estimating the fetus's weight by measuring the height of the uterine fundus is very important in providing childbirth care services (Prabandari, 2014).

The weight of a very small or huge baby is associated with increased complications during labor and the puerperium. Also, by knowing the estimated fetal weight, birth attendants can decide whether to plan for vaginal delivery spontaneously or not (Rianti and Aminah, 2017) and (Nindrea, 2017).

A similar opinion states that birth weight greatly affects the accuracy of childbirth care, thereby reducing the mortality and morbidity rates in maternity mothers (Rianti and Aminah, 2017).

The technique for estimating fetal weight that is most often taught to midwives is the measurement of the fundal height. Measurement of the fundal height is precisely done on a centimeter scale. Uterine fundal height has a strong and meaningful relationship with baby weight and reflects fetal growth and fetal size more accurately2. From various research results, the interpretation of fetal weight by abdominal palpation examination tends to be subjective.

However, Formula Dare's clinical method is considered objective and easy to teach students (Kumari, et al., 2013).

CONCLUSION

Estimated Fetal Weight (TBJ) is more effective using Dare's formula than Niswander's Modification.

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