

Relationship between the nutritional status of pregnant women and the incident of Low Birth Weight infant

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Abstract

The maternal mortality rate is 19,500 to 20,000 people every year or occurs every 26-27 minutes. The cause of maternal death is bleeding 30.5%, infection 22.5%, gestosis 17.5 and anesthesia 2%. The infant mortality rate is around 10,000 to 280,000 per 18-20 minutes. The cause of infant mortality is due to Low Birth Weight (LBW) of 15/1000%. The infant mortality rate in Indonesia is still the highest problem in other ASEAN countries. The infant mortality rate in Indonesia from 2008 was around 248 per 100,000 live births. Basic Health Research (RISKESDA) 2013 shows there are still 10.2% of babies with LBW, which is less than 2,500 grams. Neonatal death because LBW is basically affected by the nutritional status of pregnant women. This study aims to determine the relationship between the nutritional status of pregnant women and the incidence of LBW. This quantitative research uses a case control approach using a retrospective approach. The population in this study were mothers who had given birth to babies during the last two years (2016-2017). The sampling technique uses total sampling for control cases by using a ratio of 1: 1 for the case group of 40: 40 samples. Analysis using Chi Square with p value 0,000 (OR=3,500, CI 95%=2,313-5,296). There is a relationship between nutritional status of pregnant women and the incidence of LBW. Health Technology Assessment (HTA) which can seek 1000 first day of life can be a breakthrough in assessing and providing interventions of nutrition in families, especially in pregnant women.

Keywords: *nutritional status, pregnant women, Low Birth Weight infant*

INTRODUCTION

Low birth weight (LBW) remains the main cause of mortality and morbidity in infants, and a problem in the care of pregnant women world-wide particularly in developing countries. The maternal mortality rate is 19,500 to 20,000 people each year or occurs every 26-27 minutes. Infant mortality is 110,000 to 280,000 or 18-20 minutes, with the cause of infant mortality due to low birth weight babies 15/1000%. The infant mortality rate in Indonesia is still the highest problem in other ASEAN countries. The infant mortality rate in Indonesia from 2008 was around 248 per 100,000 live births. The number of incident in Indonesia varies greatly from one region to another, which ranges from 9% -30%. The results of the study in 7 multicenter regions obtained LBW rates with a range of 2,1% - 17,2%. The high rate of malnutrition in pregnant women has contributed to the high rate of LBW in Indonesia reaching 10,2% in 2013.

The low nutritional status of the mother before and during pregnancy can affect the growth of the fetus being conceived. Nutritional status of pregnant women is very important for the achievement of maternal and fetal welfare. Nutritional status of pregnant women is considered the most important regulator for fetal growth. LBW, one of which is caused by lack of nutrition factors during pregnancy, will have a bad effect on the fetus. Evidence suggests that malnutrition in mothers before and during pregnancy can cause low birth weight and birth defects. There are several ways that can be done for pregnant women to find out the status of pregnant women, among others, by monitoring weight gain during pregnancy, measuring upper arm circumference, and measuring Hemoglobin levels.

Based on the results of research conducted and data obtained, nutritional status still affects the incidence of LBW. Because infant mortality is increasing in Indonesia especially public health center Pengasih II Kulon Progo seen by the increase in cases of low birth weight babies (LBW) in 2016 to 2017 with the number of LBW cases as many as 40 cases.

RESEARCH METHODS

This study used observational analytic research. Case control research design with a retrospective approach. Research population, research sample/ participant/ informant, and sampling technique

The populations in this study were all low birth weight infant (LBW) at the public health center Pengasih II Kulon Progo in 2016 to 2017 as many as 40 cases. This study uses two groups. The case group is the mother who gave birth to LBW babies and the control group is the mother who gave birth to a normal baby. The sample of this study is 1:1 in the case group amounting to 40 taken in total sampling and the control group 40 taken randomly totaling 80 people. The inclusion criteria in this study were pregnant women who lived in the working area of public health center Pengasih II, experienced Chronic Energy Deficiency (CED) with Upper Arm Circumference <23.5, mothers who gave birth to low birth weight babies (LBW). While the exclusion criteria were LBW who were born alive, and mothers who did not have a complete identity in the report.

Data collection methods use secondary data, namely cohorts and medical records at the public health center Pengasih II Kulon Progo. Data analysis is univariate and bivariate analysis using *Chi Square* test. This research was granted permission from the Aisyiyah University research ethics commission, as well as permission from Kesbangpol DIY and Kesbangpol Kulon Progo.

RESULTS AND DISCUSSION

Table 1. Frequency distribution of respondent characteristics

Characteristic	Case		Group control		total (n)	%
	f	%	f	%		
Age						
< 35 old	30	75	40	100	70	87,5
≥ 35 old	10	25	0	0	10	12,5
Job						
Not work	36	90	0	0	36	45
Private	4	10	40	100	44	55
Paritas						
< 3	38	95	40	100	78	97,5
≥ 3	2	5	0	0	2	2,5

In getting that, out of 80 mothers who were respondents in the public health center Pengasih II Kulon Progo District most of their age was < 35 years old, amounting to 30 respondents with a percentage of 75% and age ≥35 years, amounting to 10 respondents with a percentage of 25%. For job characteristics, the majority of respondents did not work totaling 36 respondents who worked (private) amounted to 4 respondents with a percentage of 10%. For the characteristics of parity, most respondents with parity <3 as many as 38 with a percentage of 95% and respondents with parity itas 3 as much as 2 with a percentage of 5%.

Table 2. Relationship between Nutritional Status and Low birth weight (LBW) Events

Status Nutrition	Criteria LBW				Total		OR	95% CI	P Value
	LBW		No LBW		n	%			
	n	%	n	%					
CED	24	60	0	0	24	30	3,5	2,313 -5,96	0,025
No CED	16	40	40	100	56	70			
Total	40	100	40	100	80	100			

Based on Table 2, mothers with Chronic Energy Deficiency (CED) were at risk of delivering LBW babies as many as 24 (60%) and mothers with CED gave birth to LBW infants as much as 0 (0%). no one gave birth to LBW babies. Where as for the control case stated that mothers who were not CED gave birth to LBW babies as many as 16 respondents (40%) and for mothers who were not CED gave birth to LBW babies as many as 40 respondents (100%). Of the total 80 respondents (100%) the value of significancy in the results shows *p value* 0.025 (OR = 3.095, CI = 1.234-7.706). This shows that there is a relationship between the nutritional status of pregnant women and the incidence of low birth weight at the public health center Pengasih II in Kulon Progo Regency.

In this study, it was found that the nutritional status of pregnant women was associated with the incidence of low birth weight which was *p value* 0.025 (OR = 3.095, CI = 1.234-7.706).). This result means that the nutritional status of pregnant women who have less risk is 3,095 times to give birth to LBW.

The nutritional status of pregnant women greatly affects the growth of the fetus being conceived. If the nutritional status of the mother is normal during pregnancy, most likely will give birth to a healthy baby, with enough normal weight. In other words, the quality of babies born depends very much on the nutritional state of the mother during pregnancy. Poor nutrition in pregnant women, if the mother has malnutrition during pregnancy will cause problems, both in the mother and fetus. One way to find out whether pregnant women suffer from CED or not if the size of the Upper Arm Circumference is less than 23.5 cm, the pregnantwoman is said to be CED or malnourished and is at risk of having a baby with LBW.

Anthropometric examination can be used to determine the nutritional status of pregnant women for example by measuring body weight, height, body mass index, and Upper Arm Circumference. A better assessment to assess the nutritional status of pregnant women is by measuring Upper Arm Circumference, because in pregnant women with malnutrition (less or more nutrition) sometimes shows edema but this rarely affects the upper arm. If a baby is born with a low weight will have a risk of death, poor nutrition, impaired growth, and child developmental disorders. To prevent the risk of CED in pregnant women before pregnancy women of child bearing age must

have good nutrition, for example with Upper Arm Circumference not less than 23.5 cm. If the mother's Upper Arm Circumference before pregnancy is less than that number, pregnancy should be postponed so that it is not at risk of giving birth to LBW.

The results showed that CED at the limit of 23.5 cm was not yet a risk for LBW birth although the relative risk was quite high. Whereas pregnant women with CED at the limit of 23 cm had a risk of 2,0087 times to give birth to LBW compared to mothers who had Upper Arm Circumference more than 23 cm.

The cause of the occurrence of low birth weight babies (LBW) is generally multifactorial, so it is sometimes difficult to take preventive measures. Research (W. K. Kellogg Foundation et al., University of Michigan, 2015) explained that LBW remains a major cause of death and morbidity in infants, and problems in the care of pregnant women throughout the world, especially in developing countries. The results of this study explain that the frequency of LBW is 16,7%, occurs due to several factors, namely the lack of prenatal care, arm circumference in pregnant women, rural dwellings increase the risk of LBW.

The weight of the baby born can be influenced by the nutritional status of the mother both before pregnancy and during pregnancy. Maternal nutritional status before pregnancy also plays a role in maternal nutritional achievement during pregnancy, showed that the nutritional status of pre-pregnant mothers had a significant effect on the incidence of LBW. Mothers with poor nutritional status before pregnancy have a 4,27 times risk of delivering low birth weight babies compared to mothers who have good nutritional status.

A healthy mother will produce a healthy child. Nutritional status is less or often called undernutrition is a nutritional state of a person where the amount of energy that comes in is less than the energy spent. This can happen because the amount of energy that comes in is less than the recommended individual needs. LBW, one of which is caused by lack of nutritional factors during pregnancy, will adversely affect the fetus. Research (Anke Diemert et al., Maternal nutrition, inadequate gestational weight gain and birth weight: results from a prospective birth cohort, 2016) explained adherence to a balanced diet throughout pregnancy, influences maternal body weight as well as short and long term health of mother and child. Data of the 'German National Nutrition Survey II' indicate, that average nutrient intake in women of childbearing age is at least in parts inadequate. During gestation the need for certain micronutrients increases more than energy requirement. Thus, deficiencies in micronutrients may occur frequently, leading to adverse outcomes for mother and child. However, information as to dietary intake throughout gestation is limited.

CONCLUSION

Based on the results of the study the relationship between the nutritional status and the incidence of low birth weight infant at public health center Pengasih II Kulon Progo Regency with significant statistical test results (H_a accepted, H_o rejected), p value 0.025 (OR=3.095, CI=1.234-7.706). This result means that the nutritional status of pregnant women is less than 3,095 times affecting the incidence of LBW, so that the nutritional status of pregnant women can affect the occurrence of LBW.

Based on the results of this study, it is expected that the quality of ANC services will be improved. The quality of ANC services can be done by recording visits and actions taken by health workers in full in the mobile application to make it easier to

monitor what actions have not been taken. So, it can be used as a follow up material in ANC services. As well as health workers especially midwives can optimize the delivery of information and knowledge about service quality of good services in the form of antenatal care, nutrition, so that Chronic Energy Deficiency (CED) can be overcome early to prevent LBW.

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