

THE RELATIONSHIP BETWEEN ANEMIA IN MOTHER DURING PREGNANCY WITH STUNTING IN TODDLERS IN THE STUNTING LOCUS AREA OF NORTH LOMBOK REGENCY

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ABSTRACT

Stunting in toddlers is a global problem. Stunting is caused by various factors associated with the growth and development process and chronic malnutrition within the long time that takes place for the First 1000 Days of Life. Stunting have a lower length or height when compared to their peers, resulting in non-optimal cognitive, motor, and verbal development. This observation determines the connection between anemia in mothers during pregnancy and stunting in toddlers within the stunting locus location of North Lombok Regency. This study has a type of analytical design with a cross-sectional approach. The subjects of the study were mothers who had toddlers aged 0-24 months, totalling 106 respondents in the Stunting Locus of North Lombok Regency, which used stratified random sampling techniques. Data was collected from the Maternal and Child Health (KIA) book and a questionnaire with bivariate data analysis using the Chi-Square test. The result of this study showed that 28.3% of mothers who experienced anemia while pregnant and 50.9% of stunting toddlers in the Stunting Locus of North Lombok Regency. The results of the bivariate test using the Chi-Square method obtained a p-value of 0.459 ($p > 0.05$), which confirmed that there was no significant relationship between anemia in mothers during pregnancy and stunting in toddlers in the stunting locus area of North Lombok Regency.

Keywords: Stunting., Anemia, Pregnancy., The First 1000 Days of Life

INTRODUCTION

Stunting is a condition associated with the process of growth and development and the occurrence of chronic malnutrition in the long term.¹ A child is said to be stunted if the child has a height according to age lower than the applicable national standard according to WHO, which is below minus 2 Standard Deviations (< -2 SD).² In the Global Nutrition Targets 2025, according to WHO, stunting is a permanent condition, with most of it caused by repeated infections due to inadequate nutritional intake during a child's First 1000 Days of Life.³ Stunting can be caused at the First 1000 Days of Life from conception to two years of age when linear growth children are sensitive to nutritional deficiencies and the influence of environmental stress.⁴

From 2005-2017, the prevalence of stunting toddlers in Indonesia was 36.4%, with the third highest rank in Southeast Asia.¹ West Nusa Tenggara Province in 2021, based on the results of the Indonesian Nutritional Status Study is the province with the fourth highest stunting prevalence at 31.4% with North Lombok Regency occupying a prevalence rate of 34%.⁵

Stunting is a problem that remains a global concern. One in three children under five years old experiences stunted growth or is not by their age due to malnutrition factors, including stunting problems, so stunting in children can not only have a direct impact on their growth but will also have an impact on long-term development.⁶ Cognitive, verbal, and motor development that is not optimal is a short-term impact, while having a body stature that is not optimal in adulthood or having a height shorter than his age is a long-term impact of stunting.¹ This impact can be lifelong and affect later generations.⁷ Stunting that can make children vulnerable to disease and can cause death.⁸ Stunting in children have a higher risk of being overweight in adulthood.⁹ Such weight gain is associated with a higher risk of stroke, hypertension, diabetes, coronary heart disease.¹⁰ The direct causes that affect toddlers experiencing stunting are food intake factors, infections in toddlers such as diarrhea, and incomplete immunization while indirect causes include unmaintained food conditions, unclean sanitation, and toddler growth that is not monitored regularly.¹¹

Nutritional status in pregnancy can affect the incidence of stunting. Poor nutritional status during pregnancy causes nutritional intake not to be fulfilled optimally due to reduced appetite, the mother becomes weak, which will potentially cause anemia.¹² It is said that anemia in pregnancy if it has a hemoglobin (Hb) value on laboratory examination of $<11 \text{ g / dL}$ and when the anamnesis has complaints of fatigue, firefly eyes, frequent dizziness, and severe vomiting during young pregnancy.¹² Anemia is a condition of the body when hemoglobin, red blood cell count, and hematocrit levels are below average values.¹³ Anemia affected 37% of pregnant women and 23% over the age of 15 in 2013. If the mother has anemia during pregnancy, it will affect the nutrition of the baby she is carrying and experience disorders.¹⁴ Previous research has stated that some parents who have stunted children have never carried out health checks and child growth and development at local health care facilities. The most common cause of anemia in mothers during pregnancy is not routine for the consumption of iron tablets (Fe) given at the time of antenatal care (ANC) for nausea or discomfort when taken. Stunting can occur in children at birth even though hemoglobin levels are normal during pregnancy, therefore monitoring child growth and development at healthcare facilities is necessary.¹²

Treatment in children aged 0-24 months is important to pay attention to prevent growth retardation in early childhood due to stunting so that long-term nutritional improvements since the First 1000 Days of Life can increase the average adult height.¹⁵ Interventions that can determine the incidence rate of stunting are at the age of the First 1000 Days of Life.¹⁶ The First 1000 Days of Life is a critical and significant period because it is at such a rapid stage of growth and development.¹⁷ Anemia in pregnancy is a health problem that often occurs, especially in women of childbearing age.¹⁷ Anemia during pregnancy causes adverse effects on mothers, such as risk factors for death and also babies conceived, namely premature birth and low birth weight babies who have the potential to give birth to children with stunting conditions.¹⁸ Based on this background and there has been no specific research conducted on anemia in mothers during pregnancy with stunting conditions in West Nusa Tenggara, researchers are interested in examining the relationship between anemia in mothers during pregnancy with stunting in toddlers in the stunting locus area of North Lombok Regency.

METHODS

This study is an observational analytical design with a cross-sectional approach. The study was located in the stunting locus area of North Lombok Regency from September to December 2022.

Sampling using the probability sample method, namely stratified random sampling. Anemia in mothers during pregnancy as an independent variable and the incidence of stunting in toddlers in the stunting locus area of North Lombok Regency as a dependent variable. Data collection was carried out using hemoglobin level data in the Maternal and Child Health (MCH) or KIA book, stunting data on activity results reports at the North Lombok Regency Health Centers, and using questionnaire instruments consisting of questions including the identity of respondents and children, history of disease in children, complete primary immunization status, parenting style (exclusive breastfeeding and complementary food for breast milk (MP-ASI)). Mothers with toddlers aged 0-24 months as the target population, and mothers with toddlers aged 0-24 months are seen in the MCH book. There is recorded data on measuring maternal hemoglobin during pregnancy in the stunting locus area of North Lombok Regency as an affordable population. The inclusion criteria are mothers of toddlers residing in North Lombok Regency, stunting toddlers diagnosed at the North Lombok Regency Health Centers, mothers who perform hemoglobin tests during pregnancy are recorded in the MCH book and can be accessed by researchers, and mothers who are willing to become research subjects by signing informed consent. The exclusion criteria for this study are toddlers who have congenital diseases such as congenital heart disease (CHD) and cerebral palsy (CP), low birth weight babies and premature toddlers who have a history of infectious diseases (diarrhea, gastrointestinal disorders, pneumonia, malaria) in the last three months or that occur repeatedly four times a year, and mothers who have severe diseases and need care when pregnant such as malaria and chronic disease infections (HIV/AIDS, tuberculosis). The data in this study was processed using IBM SPSS application version 25. This study used univariate and bivariate data analysis to see a significant relationship between the two variables. Analysis of bivariate data using the Chi-Square test provided that it is said to have a significant relationship if the p-value <0.05 .

RESULT

The number of samples in this study was 106 respondents in the stunting locus area of North Lombok Regency from the Public Health Centers were selected after randomization from 12 integrated service post (posyandu), namely Posyandu Batu Santek Bawah, Posyandu Padamara,

Posyandu Sambik Elen II, Posyandu Labang Kara, Posyandu Karang Gedeng, Posyandu Ruak Bangket, Posyandu Lendang Mamben, Posyandu Sri Menganti, Posyandu Dasan Lendang, Posyandu Telaga Legundi, Posyandu Oma Segoar, and Posyandu Bon Gontor.

Table 1. Frequency of stunting in toddlers

Diagnosis	Subcategory	Frequency (n)	Percentage (%)
Normal Stunting		52	49.1
	Stunted	35	33.0
	Severely stunted	19	17.9
Total		106	100.0

The condition of stunting in toddlers is obtained from the results of measuring Z-score body length or height according to age (PB/U). Based on Table 1 obtained from the 106 respondents who have stunting status according to the WHO, stunted category as many as 35 toddlers, with a percentage of 33.0%, severely stunted as many as 19 toddlers with a percentage of 17.9%, and those who are not stunted or normal as many as 52 toddlers with a percentage of 49.1%.

Table 2. Frequency of anemia in mothers during pregnancy

Diagnosis	Frequency (n)	Percentage (%)
Anemia	30	28.3
Normal	76	71.7
Total	106	100.0

Anemia in mother during pregnancy is obtained from hemoglobin levels recorded in the MCH book. Hemoglobin levels are checked at the Public Health Centers when patients check the complete blood using the Mindray's© hematology analyzer machine. Table 2 obtained from the 106 respondents, as many as 76 mothers (71.7%) with conditions normal during pregnancy and 30 mothers (28.3%) experienced anemia during pregnancy.

Table 3. Bivariate analysis result on the relationship between anemia in mothers during pregnancy with stunting in toddlers

Anemia	Stunting Incident				p- value
	Stunting		Normal		
	n	%	n	%	
Anemia	17	31	13	25	0.459
normal	37	69	39	75	
Total	54	100	52	100	

Based on Table 3, the number of mothers who have stunted children and experience anemia during pregnancy is 17 (31%), while mothers who have anemia and have children who are not stunted are 13 (25%). The number of mothers without anemia when pregnant and having stunted

children was 37 (69%) while mothers without anemia and not having stunted children amounted to 39 (75%). Based on the bivariate analysis results, the p-value is 0.459 or $p > 0.05$ which means there is no significant relationship between anemia in mothers during pregnancy with stunting in toddlers in the stunting locus area of North Lombok Regency.

DISCUSSION

Pregnancy causes several changes in the physiological condition of the body such as increased energy metabolism so that the need for nutrients and energy needed more is used for the process of fetal development. One of the nutritional problems that can occur during pregnancy is anemia.¹⁹ Giving birth to a healthy child can be affected by the health of the mother during pregnancy because it will affect a healthy and normal delivery.²⁰

Anemia is a condition when hemoglobin levels in red blood cells are lower than normal values, resulting in inadequate oxygen transport capacity so that the function of meeting the physiological needs of the body becomes disrupted. In pregnancy, anemia is said to have hemoglobin levels of $<11 \text{ g / dL}$.²¹ Anemia is one indicator of poor health and nutrition.³ Hb plays a role in the process of transporting oxygen throughout the body. Iron deficiency can reduce the immune response ability in the body, making it susceptible to disease. Recurrent infectious diseases affect the growth and further development of children.²² Anemia has a collection of symptoms that can be caused by many factors, in addition to iron deficiency, anemia can be caused by hemolysis, bleeding, erythrocytes that are not produced optimally, and poor nutrition that interfere with nutrient absorption. If the fetus gets nutrition that is not optimal, it will cause inhibition of the growth rate and cell development.²³ Nutrients function in the formation of hemoglobin due to the cause of disturbances in absorption or due to lack of consumption such as folic acid, iron, vitamin B12, protein.²⁴

A crucial period that can affect growth and development from the beginning of fertilization to the age of two. Since conception, the health status of the mother greatly influence on the condition of the fetus conceived. In mothers during pregnancy, maternal nutrition has an impact on fetal growth and development. If the nutritional needs of the fetus are not optimal, it can cause disturbances or abnormalities in the structure, metabolism or body functions. Anemia can occur due to micronutrient deficiencies such as one of the nutrients, namely iron, folic acid, and other nutrients. These micronutrients can support growth and reduce morbidity in children. Stunting can also occur starting from mothers who experience malnutrition during pregnancy, resulting in babies born with low birth weight. If the mother's nutritional intake is not optimal, the intake in the fetus is also not optimal. Babies born with low birth weight that continues to not get good nutritional intake will cause stunting.²³

This study showed no significant relationship between anemia in mothers during pregnancy with stunting in toddlers at the stunting locus of North Lombok Regency. The number of stunted children with anemic mothers during pregnancy was 17 (31%), while mothers who were anemic and had children who were not stunted amounted to 13 (25%). The number of mothers without anemia when pregnant and having stunted children was 37 (69%) while mothers without anemia and not having stunted children amounted to 39 (75%). Some things that can affect this include the result of mothers during pregnancy not routinely checking at the puskesmas and not taking iron supplement (Tablet Tambah Darah (TTD)) given during antenatal care which is a risk factor for anemia in pregnancy. Besides that, not only anemia is a risk factor for stunting in the West Nusa Tenggara area but in contrast to other regions, it can be influenced by maternal education factors, history of infectious diseases, parenting in breastfeeding and complementary feeding, primary immunization status or due to age factors of child marriage that have not been studied in this study.

Stunting can occur due to toddler malnutrition and is interconnected with other factors. Malnutrition is a condition when the body does not get optimal nutrition.²⁵ One of the causes of malnutrition is micronutrient deficiency. If food intake is not optimal, it will affect the occurrence of malnutrition. Besides that, toddlers are also susceptible to infections that cause frequent illness, so there is a great potential for malnutrition. Non-optimal feeding can be caused by, among others, family social and economic status or parents' education level. If this continues, it will result in chronic malnutrition that causes stunting. Chronic malnutrition as a cause of stunting if left untreated, will have an impact in adulthood later. The First 1000 Days of Life is a critical period in growth and development so that at this time if malnutrition occurs it can still be handled to pursue optimal growth.²⁶

Another study using parameters in the first trimester found that there was no relationship between hemoglobin levels of pregnant women and the incidence of stunting in toddlers in Congeang District, Sumedang Regency with the incidence of anemia in mothers by 54% and the incidence of stunting by 50%. Toddlers require more nutrition in the process of growth and development, but at that age children often experience disorders that cause stunted growth and development which is a risk of stunting. The effects of stunting include weak cognitive abilities, stunted psychomotor, and poor intellect.²⁷ Stunting interventions can be carried out during The First 1000 Days of Life period because this is an important period for the growth and development of various organ systems. Maintain nutritional intake for mothers during pregnancy, exclusive breastfeeding and complementary feeding, micronutrients such as iron, folic acid, and other nutrients, and maintain sanitation.²⁵

CONCLUSION

The relationship between anemia in mothers during pregnancy with stunting in toddlers in the stunting locus area of North Lombok Regency did not have a significant relationship. As many as 28.3% of anemic mothers when pregnant in the stunting locus area of North Lombok Regency while 50.9% of toddlers are stunted in the stunting locus area of North Lombok Regency.

RECOMMENDATIONS

Further research is expected in the process of taking anthropometric data and congenital heart disease (CHD) and cerebral palsy (CP) can be carried out directly with primary data, further research methods can use cohort studies with strength in proving causal relationships and the need for complete blood tests in mothers to be able to distinguish the type of anemia experienced by mothers and classify anemia according to the classification based on trimester. Conduct further research on risk factors for stunting in toddlers, such as nutritional content or food intake, maternal knowledge, belief or tradition, economic conditions, and clean and healthy living behaviour. There is a need for special attention to cases of child marriage that have the potential to give birth to stunted children.

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