

# Determinants of Anemia Event in Baby Age 6 Months in Jeneponto District

Nur Ulmy Mahmud, Tahir Abdullah, Arsunan, A.A, Muhammad Syafar, Veni Hadju

**Abstract:** Anemia is a threat to global public health, especially in developing countries. The purpose of this study was to determine the determinants of anemia in infants aged 6 months. The research method used in this study is cross sectional study. The sample in this study was 68 infants in 6 sub-districts located in Jeneponto Regency, South Sulawesi. The selection of the sub-district will be carried out based on an agreement with the Jeneponto Health Office with consideration of the performance of health workers in the Puskesmas, especially midwives and nutrition workers who oversee the sub-district so as to enable the implementation of this study properly. Measurement of levels of Hb baby is done by sampling blood of babies at 6 months old baby is done by laboratory personnel who are already certified. Data analysis uses logistic regression. The results showed that the most sex is known in the sex of men who are not anemic that is about 51.6% and about 87.5% of babies get colostrum and as many as 81.3% are still breastfed until the age of 6 months, while for most birth weight in babies who are not anemic about 98.4% while for the length of the birth body the most is  $\geq 48$  cm (82.8%) . Identifying factors related to anemia, bivariate analysis was performed to select candidate variables to be included in multivariate regression showing that maternal age ( $p = 0.249$ ), family income ( $p = 0.051$ ), ANC ( $p = 0.094$ ), breastfeeding ( $p = 0.095$ ), birth weight ( $p = 0.063$ ) and birth length ( $p = 0.158$ ). The results showed that the determinant factor for the incidence of anemia in 6-month infants in Jeneponto District was birth weight.

**Keywords:** anemia, birth length, birth weight, Six month old baby.

## I. INTRODUCTION

Anemia is a threat to global public health, especially in developing countries. Iron deficiency (ID) is the most common nutritional deficiency worldwide. Iron deficiency anemia (IDA), a manifestation of chronic ID is a global public health challenge, especially among children under 5 in developing countries. The World Health Organization (WHO) estimates that around 43% of children aged 6 to 59 months worldwide suffer from anemia. In addition to an increased risk of death in infants, anemia is associated with growth retardation, motor disorders and

cognitive development. Risk factors related to nutrition of IDA age children are easily prevented if mothers exclusively breastfeed their babies [1],[2],[3]

Approximately 162 billion people (24.8 %) of the world's population suffer from anemia and 50% of cases of anemia are due to iron deficiency. According to data from the Ministry of Health of the Republic of Indonesia (2003) the prevalence of anemia is around 21.7% and the prevalence of iron deficiency anemia in women aged 15-50 years in Indonesia is around 33.1% and young women around 28%. Iron deficiency anemia can cause growth and physical development disorders and mental disorders, low intellectual, ability to learn, the ability to exercise, impaired cognitive development and behavior. Weak immune system, susceptibility to infectious diseases, reducing the capacity, productivity, and creativity of adolescents and during pregnancy can increase complications, the risk of maternal death, prematurity, low birth weight and perinatal mortality [4].

In 2013 in low and middle income countries it was estimated that around 6.3 million children under the age of 5 died, 45% of these deaths were caused by malnutrition, stunted growth and iron deficiency. In addition to increasing the risk of children under five, anemia is associated with growth, motor disturbances and cognitive development. Risk factors related to nutrition for children older than 6 months are easily prevented if the mother exclusively feeds her baby [5].

## II. MATERIALS AND METHOD

This research is a continuation of the main research. The research method used in this study is cross sectional study. The sample in this study was 68 infants in 6 sub-districts located in Jeneponto Regency, South Sulawesi. The selection of the sub-district will be carried out based on an agreement with the Jeneponto Health Office with consideration of the performance of health workers in the Puskesmas, especially midwives and nutrition workers who oversee the sub-district so as to enable the implementation of this study properly. Measurements of Hb baby is done by sampling blood of babies at 6 months old baby is done by laboratory personnel who are already certified.

The data that has been collected will be processed and analyzed using SPSS software. Before further statistical tests are carried out, all data processing variables will be presented in the form of averages, standard deviations, ranges and frequencies. Normality test is useful to determine whether the data collected is normally distributed or not, unpaired t test is used to compare differences between treatments on variables,

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Logistic regression test is used to identify factors related to exclusive breastfeeding, bivariate analysis is done to select candidate variables that will be included in multivariate regression. This research was carried out after obtaining approval from the Ethics commission of the Faculty of Public Health, University of Hasanuddin with number 1071909130.

Before the measurement and interview will be given an explanation of the actions to be taken to each respondent (mother and baby). After the explanation, respondents were asked for approval to participate in this study by signing an informed consent.

### III. RESULTS AND DISCUSSION

The results of this study were carried out in 6 Districts of Jeneponto Regency. This research was conducted by interviewing respondents in the area. Table 1 characteristics of respondents based on normal groups (not anemia). As many as 68 respondents, there were 62.5% of mothers aged tahun 26 years, for the ANC most checked their pregnancies  $\geq 4$  times, as many as 42.2%. Around 70.3% of mothers give birth at Puskesmas/pustu/polindes and most give birth normally, as many as 93.8%, most mothers work are housewives (90.6%) while the father's job is seaweed farmers, which is around 39.1%. the highest level of education for mothers is around 31.3% while for fathers the average is only graduated from elementary school (28.1%). Monthly family income is at most  $< 2$  million 79.7%.

**Table-I : Characteristic of respondents in Jeneponto**

Variable	n (%)		P
	Normal	Anemia	
<b>Mother Age</b>			
<26 years old	24 (37.5)	2 (50.0)	0.249
$\geq 26$ year	40 (62.5)	2 (50.0)	
<b>ANC</b>			
$\geq 4$ times	27 (42.2)	2 (50.0)	0.094
<4 times	37 (57.8)	2 (50.0)	
<b>Place to give birth</b>			
Maternity Hospital	12 (18.8)	1 (25.0)	0.526
Puskesmas / pustu / polindes	45 (70.3)	3 (75.0)	
House	7 (10.9)	0	
<b>The process of giving birth</b>			
Normal	60 (93.8)	3 (75.0)	0.269
secsio	4 (6.3)	1 (25.0)	
<b>Mother's job</b>			
Housewife	58 (90.6)	4 (100)	0.411
work	6 (9.4)	0	
<b>Mother's education level</b>			
Never School	1 (1.6)	0	0.484
Not complete in Primary School	8 (12.5)	0	
Graduated from elementary School	15 (23.4)	0	
Middle School	17 (26.6)	3 (75.0)	
High School	20 (31.3)	1 (25.0)	
Diploma	1 (1.6)	0	

Bachelor	2 (3.1)	0	
<b>Father's occupation</b>			
Seaweed Farmer	25 (39.1)	0	0.470
Honorary	4 (6.3)	0	
Motorcycle taxi / bentor	3 (4.7)	0	
Daily Labor	12 (18.8)	0	
Government Employees	1 (1.6)	0	
Privat Employees	2 (3.1)	0	
Driver	2 (3.1)	0	
Fisherman	5 (7.8)	0	
Entrepreneur	9 (14.1)	1 (25.0)	
Does Not Work	0	0	
Others	1 (1.6)	1 (25.0)	
<b>Father's education level</b>			
Never school	5 (7.6)	0	0.207
Not completed in Primary School	16 (25.0)	0	
Graduated from elementary School	18 (28.1)	0	
Middle School	5 (7.8)	1 (25.0)	
High School	16 (25.0)	3 (75.0)	
Diploma	1 (1.6)	0	
Bachelor	3 (4.7)	0	
<b>Family Income (IDR)</b>			
<2 million	51 (79.7)	3 (75.0)	0.051
$\geq 2$ million	13 (20.3)	1 (25.0)	
<b>Intervention Group</b>			
Moringa Flour	9 (14.1)	0	0.825
Fe tablets	22 (34.4)	2 (50.0)	
Moringa Extract	33 (51.6)	2 (50.0)	

Source: primary data

Based on Table 2 Characteristics of infants aged 6 months based on sex most known in the sex of men who are not anemic that is about 51.6% and about 87.5% of babies get colostrum and as many as 81.3% are still breastfed until the age of 6 months, while for most birth weight in babies who are not anemic about 98.4% while for the length of the birth body most of which is  $\geq 48$  cm (82.8%).

**Table-II: Characteristics of 6 month old infants in Jeneponto District (n = 68)**

Variable	n (%)		P
	Normal	Anemia	
<b>Gender</b>			
Male	33 (51.6)	1 (25.0)	0.397
Girl	31 (48.4)	3 (75.0)	
<b>Breastfeeding</b>			
exclusive breastfeeding	52 (81.3)	3 (75.5)	0.095
No breast milk	12 (18.8)	1 (25.5)	
<b>Baby's birth weight</b>			



Normal	63 (98.4)	1 (1.6)	0.063
Low Birth Weight	4 (100)	0	
<b>Birth length</b>			
≥48 cm	53 (82.8)	3 (75.0)	0.158
<48 cm	11 (17.2)	1 (25.0)	
<b>Colostrum</b>			
Yes	56 (87.5)	2 (50.0)	0.100
No	8 (12.5)	2 (50.0)	

Source: primary data

Identifying factors related to the incidence of anemia, a bivariate analysis was performed to select candidate variables to be included in multivariate regression. The results are the age of the mother, family income, ANC, breastfeeding, birth weight and birth length. Multivariate logistic regression is used to identify predictor variables after controlling for confounding variables. All variables <0.25.

**Table-III: Logistic regression analysis of determinant factors of anemia in infants**

Variable	B	Sig.	Exp (B)	95% CI. For EXP (B)	
				Lower	Upper
Mother's age	-0,554	0,616	0,575	-19,941	34,042
Family income	0,501	0,707	1,651	-19,443	32,273
ANC	0,380	0,734	1,462	-18,435	34,206
Birth weight	19344	1,000	275450850,235	-33,560	38,064
Birth length	0,472	0,707	1,603	-20,076	20,404
Breastfeeding	-0,275	0,741	0,759	-34,675	0,659
Constant	-22,753	1,000	0,000	-82,551	66304

Source: primary data

From the results of multivariate analysis using logistic regression in Table 3 shows that the most influential variable on the determinant of anemia in infants aged 6 months in Jeneponto is birth weight with OR 275450850,235 while the other variables show a good change in the odds ratio and the level of significance.

Newborns have sufficient iron reserves until the age of 6 months. ASI has a bladder a n iron less than 0.35 mg/liter, several determinant factors of exclusive breastfeeding in 0-6 months infants were giving colostrum, mother's work, family income, mother's education, and mother's knowledge about the benefits of exclusive breastfeeding. At the age of 6-12 months infant iron requirements increase so that the necessary additional iron from food. Research Port et al (2012) 18-month-old babies who get good nutrition, will get high Hb levels when compared with others even though the mother has anemia during pregnancy [6],[7].

Giving exclusive breastfeeding for 6 months is one form to improve nutrition in infant, Education lactation can improve knowledge, attitudes and behavior of mother to give breastfeeding up to 6 months. Iron deficiency in early life can cause brain development disorders and other developmental effects. Iron is very important for brain development, anemia causes metabolic energy deficiency and memory function [8],[9].

Iron deficiency in early life can cause brain development disorders and other developmental effects. Iron is very important for brain development, anemia causes metabolic energy deficiency, and memory function. Prevention of iron deficiency anemia in infancy plays an important role in the occurrence of long-term effects. Prevention that can be done includes primary and secondary prevention [9],[10].

Someone who suffer from anemia, cells and body tissues will lack oxygen intake so this clearly affects the body's performance. Anemia also affects and greatly affects more than half of pregnant women, women and children aged less than five years. Severe anemia categorized as hemoglobin level <5 g/dL has an increased risk of death. In children, anemia can interfere with cognitive and motor development, growth, immune function and physical work of children [11],[12].

In Africa, many children live in dangerous iron balance conditions. Infants with low total iron in the body are very susceptible to anemia. Data from Benin and Uganda in Africa show that more than 80% of 10-month-old infants have anemia, and about one-third have hemoglobin levels less than 8 g/dL. Anemia with iron deficiency and iron deficiency without anemia during infancy and children can have a detrimental effect on long-term nerve development. Therefore, pediatricians and other health care providers must strive to eliminate iron deficiency and iron deficiency anemia. The need for proper iron intake for infants and toddlers as well as methods for screening iron deficiency and iron deficiency anemia [11],[12].

#### IV. CONCLUSION

The results showed that the determinant factor for the incidence of anemia in 6-month infants in Jeneponto District was birth weight.

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## Determinants of Anemia Event in Baby Age 6 Months in Jeneponto District

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