



Pregnancy Anemia its Relation to Low Birth Weight (LBW) Incidence

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ABSTRACT

Anemia is one of the major nutritional issues in Indonesia and a prevalent problem among pregnant women worldwide, with a relatively high incidence rate. Pregnant women are particularly susceptible to anemia because the increased nutritional requirements during pregnancy are crucial for both maternal health and fetal growth. Pregnancy-related anemia is defined as a hemoglobin (Hb) level less than 11 (g/dL) in the blood of pregnant women. This study aims to analyze the relationship between anemia and the occurrence of Low Birth Weight (LBW). The research was conducted in the VK Room of Sugio Primary Health Care, Lamongan Regency, over a period of 2 months in August-September 2023. The research method used was a Retrospective Observational Study with a Cross-Sectional design. Based on the Chi-Square statistical test results, the p-value was 0.025 (p-value < 0.05). In conclusion, this study found a significant association between anemia during pregnancy and the incidence of LBW.

INTRODUCTION

Anemia is a significant aspect of the major nutritional problems in Indonesia and a global concern, particularly affecting pregnant women (Fajrin & Erisniwati, 2021; McLean et al., 2009), with a notably high prevalence rate of 42% in Indonesia (Lestari et al., 2023) and 38% worldwide (Oyerinde et al., 2023). The primary cause is often attributed to nutritional deficiencies, especially iron deficiency. Pregnant women are particularly susceptible to anemia, as the increased nutritional demands during pregnancy are crucial for maternal health and fetal growth (Rahmah & Karjadidjaja, 2020). Pregnancy-related anemia is defined as a hemoglobin (Hb) level less than 11 grams per deciliter (g/dL) in the blood of pregnant women. Anemia reduces the supply of oxygen to the fetus in the womb, a condition of serious concern due to its potential negative impact on fetal development and maternal health. Anemia also increases the risk of pregnancy complications for both the mother and the fetus, such as preeclampsia (McLean et al., 2009), prematurity, and can elevate the occurrence of Low Birth Weight (LBW) (Fajrin, 2020; McLean et al., 2009), which is a significant global public health issue (McLean et al., 2009).

Low Birth Weight (LBW) is a condition in which a baby is born with a weight of less than 2,500 grams (McLean et al., 2009). LBW is a major risk factor associated with increased neonatal mortality and morbidity in newborns (Stevens et al., 2013). According to data from Lamongan Regency, the incidence of LBW in 2021 was 661 babies, accounting for 4.4% of the total number of births. Of these cases, 21 babies (26.3%) experienced mortality out of a total of 80 cases of Infant Mortality Rate (IMR) (Lamongan Health Office, 2022). Based on the incidence and mortality rates, it is evident that LBW poses a higher risk, contributing to a higher IMR compared to other causes of death such as asphyxia, neonatal tetanus, sepsis, congenital abnormalities, and others (Lamongan Health Office, 2022). The significant occurrence of LBW requires serious attention as it can lead to short-term health problems and long-term issues, including disruptions in physical and cognitive development, as well as chronic health problems such as diabetes and cardiovascular diseases in the future (Stevens et al., 2013).

RESEARCH METHODS

This study falls under the category of "*Retrospective Observational Study*" with a *Cross-Sectional* research design. The variables examined in this research are the occurrence of Low Birth Weight (LBW) (dependent variable) and pregnancy-related anemia (independent variable). The study was conducted in the working area of Sugio Primary Health Care, Lamongan Regency. The research period spanned 2 months, specifically in August-September 2023. Data collection for this study utilized medical records to gather information on hemoglobin levels during pregnancy and the birth weight of infants. Data were extracted from the medical records of patients who delivered at Sugio Primary Health Care during the research period. The population for this study comprises all pregnant women who gave birth at Sugio Primary Health Care during the specified period.

Sample selection will be conducted using *Purposive Sampling*, with inclusion criteria specifying pregnant women delivering at Sugio Primary Health Care, capable of providing comprehensive information regarding their pregnancy history and hemoglobin levels during pregnancy, and without other medical conditions that could influence the birth weight of the infant. Data analysis for assessing the relationship between pregnancy-related anemia and the occurrence of LBW will employ the *Chi-Square* statistical test.

RESULT

Table 1. Frequency Distribution of Anemia Incidence at Sugio Primary Health Care, Lamongan Regency.

Anemia	N	%
Yes	54	42,3
No	68	55,7
Total	122	100

Based on Table 1, it can be observed that out of 120 respondents, 54 respondents (42.3%) experienced anemia, while 65 respondents (55.7%) did not experience anemia.

Table 2. Frequency Distribution of Low Birth Weight (LBW) Incidence at Sugio Primary Health Care, Lamongan Regency.

LBW	N	%
Yes	10	8,2
No	112	91,8
Total	122	100

Based on Table 2, it can be observed that out of 122 newborns, 10 respondents (8.2%) experienced Low Birth Weight (LBW), while 112 respondents (91.8%) did not experience LBW.

Table 3. Cross-Tabulation of Anemia against Low Birth Weight (LBW) Incidence at Sugio Primary Health Care, Lamongan Regency.

Anemia	LBW				Total		P-Value
	Yes		No				
	N	%	N	%	N	%	
Yes	8	11,8	60	88,3	68	42,3	<0,05
No	2	3,7	52	96,3	54	55,7	
Total	10	8,2	112	91,8	122	100	
Chi Square (x²) 0,025							

Based on Table 3, it is evident that pregnant women who experienced anemia and had Low Birth Weight (LBW) occurred in 8 individuals (11.8%), while those without anemia and experienced LBW were 2 individuals (3.7%). On the other hand, pregnant women with anemia and LBW amounted to 60

individuals (88.3%), and those without anemia and without LBW were 52 individuals (96.3%). The statistical correlation test using the Chi-Square test yielded a value of 0.025, with a significance level of $p < 0.05$. Thus, it can be concluded that there is a significant relationship between anemia during pregnancy and the occurrence of LBW.

DISCUSSION

Based on the findings of this study, a significant correlation is evident between pregnancy-related anemia and the incidence of Low Birth Weight (LBW). Pregnant women with anemia tend to face a higher risk of experiencing LBW. This is likely attributed to the diminished oxygen supply to the fetus due to low hemoglobin levels in the blood of pregnant women. Consistent with previous research, anemia during pregnancy is identified as a primary risk factor for LBW (Haider et al., 2013).

Pregnancy-related anemia is a medical condition characterized by low hemoglobin levels in the blood of pregnant women (Xiong et al., 2003). Several factors, including deficiencies in iron, folate, and vitamin B12, can contribute to the occurrence of anemia during pregnancy. This condition adversely affects the health of both pregnant women and their fetuses (Larqué et al., 2012). Anemia during pregnancy can reduce the blood's capacity to transport oxygen to body tissues, including the fetus (Susiloningtyas, 2023). Inadequate oxygen for the fetus can impede optimal fetal growth and development, resulting in decreased birth weight and an increased risk of premature birth (Stevens et al., 2013).

The increased risk of Low Birth Weight (LBW) is one of the serious consequences of pregnancy-related anemia (Haryanti, 2019). LBW is defined as the birth of a baby weighing less than 2,500 grams (WHO, 2015).

LBW can cause short-term and long-term health problems for infants, including respiratory issues, developmental disorders, and chronic health problems later in life (Kramer et al., 2012). Recent studies have indicated that pregnant women with anemia have a higher risk of delivering babies with low birth weight (Rosales et al., 2021). Anemia can hinder fetal growth and cause premature birth, significantly increasing the risk of LBW (Kc et al., 2017). The severity of anemia also plays a crucial role in the risk of LBW.

More severe anemia tends to have a more significant impact on fetal growth and the risk of LBW (Larqué et al., 2012). Therefore, accurate monitoring and management of pregnancy-related anemia are key to reducing the risk of LBW at Sugio Primary Health Care.

Other factors that may influence the relationship between pregnancy-related anemia and the incidence of LBW include gestational age, parity, gravida, maternal education, and employment status (Putri et al., 2022). Higher levels of anemia severity tend to have a more significant impact on the risk of LBW (E. Lestari, 2021). Additionally, maternal age that is too young or too old, poor nutritional status, and a history of previous pregnancies with complications can also increase the risk of LBW (Wijayanti & Pangestu, 2020). To reduce the risk of LBW occurrences, it is crucial to identify and address

pregnancy-related anemia appropriately. This involves systematic monitoring and management of anemia during pregnancy, including routine hemoglobin examinations, iron and folic acid supplementation as needed, and educating pregnant women about the importance of preventing anemia during pregnancy through proper nutrition intake. A better understanding of the factors influencing the risk of LBW allows for appropriate care and interventions to be provided to pregnant women, ultimately improving the health of the unborn baby. Proper prevention and management can help reduce the risk of LBW and enhance the health of newborns.

CONCLUSIONS AND SUGGESTIONS

Based on the research findings, it can be concluded that there is a significant correlation between pregnancy anemia and the occurrence of Low Birth Weight (LBW). Pregnant women with anemia have a higher risk of experiencing LBW, which may be attributed to the decreased oxygen supply to the fetus due to low hemoglobin levels in the blood. Pregnancy anemia which can be caused by deficiencies in iron, folic acid, and vitamin B12, has serious implications for the health of both the pregnant woman and her fetus. The recommendations from this study include conducting monitoring and early detection through routine hemoglobin tests during pregnancy to identify anemia at an early stage. Implementing a supplementation program for iron, folic acid, and vitamin B12 for pregnant women at risk of anemia is also advised. Socializing information about the importance of adequate nutritional intake during pregnancy to the community, involving healthcare teams including midwives and health officers in the monitoring and management of pregnancy anemia, is crucial.

Furthermore, developing a comprehensive monitoring program to identify LBW risk factors, including the severity of anemia, gestational age, and other factors, is recommended. Conducting further research to delve into the mechanisms of the relationship between pregnancy anemia and LBW, as well as identifying other factors that may influence this risk is also suggested.

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