

ANEMIA AS A DETERMINANT OF LOW BIRTH WEIGHT INCIDENCE AT PMI HOSPITAL BOGOR IN 2023

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ABSTRACT

Introduction: Low Birth Weight (LBW) is a significant health issue in newborns, often associated with increased morbidity and mortality. Maternal anemia is identified as one of the risk factors contributing to LBW. This study aims to analyze the relationship between maternal anemia and the incidence of LBW at PMI Hospital Bogor in 2023. **Method:** A cross-sectional design was used, with data collected from medical records of pregnant women who delivered in 2023, including anemia status and birth weight. The Chi-Square test was applied to analyze the relationship between anemia and LBW, with a significance level of p -value < 0.05 . **Results:** The study sample included 454 pregnant women, with the majority aged 20-35 years (78.9%) and having a high school education (43%). Anemia was present in 63.7% of the mothers, while 42.5% of the newborns were classified as LBW. The analysis revealed a significant relationship between maternal anemia and the incidence of LBW (p -value = 0.006). **Conclusion:** The study concludes that maternal anemia is strongly linked to LBW, highlighting the importance of early anemia detection and treatment through education and iron supplementation.

Keywords: Anemia, Low Birth Weight (LBW), Pregnant Women.

ABSTRAK

Berat Badan Lahir Rendah (BBLR) merupakan masalah kesehatan serius pada bayi baru lahir yang sering dikaitkan dengan peningkatan angka morbiditas dan mortalitas. Anemia pada ibu hamil diketahui sebagai salah satu faktor risiko yang berkontribusi terhadap kejadian BBLR. Penelitian ini bertujuan untuk menganalisis hubungan antara anemia pada ibu hamil dan kejadian BBLR di Rumah Sakit PMI Bogor tahun 2023.

Desain penelitian yang digunakan adalah potong lintang dengan populasi ibu hamil yang melahirkan di rumah sakit selama 2023. Data diperoleh melalui rekam medis yang mencakup status anemia ibu dan berat badan lahir bayi. Analisis statistik dilakukan menggunakan uji Chi-Square untuk menguji hubungan antara anemia dan BBLR, dengan tingkat signifikansi p -value $< 0,05$.

Hasil penelitian didapatkan dari 454 ibu hamil yang dianalisis, sebagian besar berusia 20-35 tahun (78,9%) dan berpendidikan terakhir SMA (43%). Sebanyak 63,7% ibu mengalami anemia, sementara 42,5% bayi lahir dengan BBLR. Hasil analisis menunjukkan adanya hubungan signifikan antara anemia ibu hamil dengan kejadian BBLR (p -value = 0,006).

Kesimpulan penelitian ini menunjukkan bahwa anemia pada ibu hamil berhubungan signifikan dengan kejadian BBLR, yang menyoroti pentingnya deteksi dini dan pengobatan anemia untuk mencegah BBLR melalui program edukasi dan suplementasi zat besi.

Kata kunci: Anemia, Berat Badan Lahir Rendah (BBLR), Ibu Hamil.

INTRODUCTION

Anemia is when a person's haemoglobin level is less than 11gr%. Women and children often experience this. Through the 2020-2024 *National Medium-Term Development Plan (RPJMN)*, the Indonesian government has made improving maternal and child health one of its main focuses. The 2020-2024 RPJMN targets a reduction in maternal and infant mortality rates and an improvement in maternal nutritional status, including overcoming anemia in pregnant women to reduce the incidence of LBW. To achieve this goal, the 2020-2024 RPJMN prioritizes increasing the distribution of iron and folic acid supplements during pregnancy, nutrition education, and strengthening antenatal services at the community level (BAPPENAS, 2019). WHO has also identified anemia as a significant risk factor for maternal and child health, with an estimated 37% of pregnant women experiencing anemia, especially in low-income countries. *The Global Prevalence of Anemia* (WHO, 2019) reports that anemia is the third most common health condition in pregnant women, with severe risks to pregnancy outcomes. Thus, addressing anemia in pregnant women is a critical intervention point in reducing the incidence of LBW and improving neonatal health outcomes (Gardner & Kassebaum, 2020; World Health Organization, 2019).

According to the latest data from the 2023 *Indonesian Health Survey (SKI)*, the prevalence of anaemia in women of reproductive age in Indonesia is still quite high, with more than 40% of pregnant women having haemoglobin levels below the recommended threshold of 11 g/dL. This shows that there are still challenges in overcoming anemia and its negative impacts on pregnancy, especially the increased risk of LBW. Low haemoglobin levels during pregnancy can reduce oxygen transport to the fetus, ultimately inhibiting fetal growth, triggering premature birth, and increasing the risk of LBW (Kementerian Kesehatan RI, 2023; World Health Organization et al., 2019).

The incidence of LBW as one of the impacts of anemia in pregnant women is quite high. Indonesian Health Survey data shows that the prevalence of LBW in Indonesia is 6.1%, while in West Java, the figure is higher at 6.2%. According to statistics, out of 19,971 LBW incidents in West Java, 1,927 came from Bogor (Badan Pusat Statistik Provinsi Jawa Barat, 2024; Kementerian Kesehatan RI, 2023).

The impact of LBW is not only on the physical but also on the development and academic abilities, including family psychology. In addition, the occurrence of LBW will also burden the health system of a country related to the need for intensive care and increasing health costs.(Badan Pusat Statistik Provinsi Jawa Barat, 2024; Gardner & Kassebaum, 2020)

This study aims to analyze the relationship between anemia in pregnant women and the incidence of LBW at PMI Hospital Bogor in 2023. Through a deeper understanding of the relationship, health service providers are expected to be able to develop more targeted interventions in preventing LBW through handling anemia in pregnant women, in line with Indonesia's national health strategy and global health priorities.

METHOD

This study used a cross-sectional design with a population of pregnant women who gave birth at PMI Hospital Bogor during 2023, from January to December. Data were collected through medical records, including anemia status in pregnant women and infant birth weight. Statistical tests using Chi-Square were performed to analyze the relationship between anemia and the incidence of LBW, with a significance level set at $p\text{-value} < 0.05$.

RESULTS AND DISCUSSION

A quantitative descriptive design was conducted on 454 Respondents, Which was done in RS PMI Bogor in 2023. In this study, there are several limitations, including:

1. The data in this study used secondary data, which was taken from the hospital's medical records. It is estimated that the data was filled in by various sources so that the justification for the validity of the resources tends to be inconsistent because it was not the researcher himself who carried out the measurements. It was very... depends on completeness of documentation.
2. This research uses secondary data, so the truth, completeness, and accuracy of the data depend entirely on the available data.

Table 1 shows the characteristics of respondents in this study. Most were aged 20-35, 214 people (81.7%); however, there were pregnant women aged less than 20. The education level of most was high school, as many as 195 people (43%). The respondents' parity was mostly multipara, as many as 283 people (62.3%). Based on gender, there were more baby girls than boys, namely 240 people (52.1%).

Table 1. Distribution Frequency Characteristics Respondents at PMI Hospital Bogor in 2023

Variable	Frequency	%
Age		
a. <20 Y	25	5.5
b. 20-35Y	358	78.9
c. >35 Y	71	15.6
Mother's Education		
a. Elementary School	45	9.9
b. Junior High School	77	16.9
c. High School	195	43
d. Diploma/S1	137	30.2
Parity		
a. Primipara	171	37.7
b. Multipara	283	62.3
Baby Gender		
a. Male	214	47.1
b. Female	240	52.1
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In Table 2, the proportion of LBW is 41.2%, and the incidence of LBW is higher in mothers with anemia, 47.4%. Based on the statistical test, a value of 0.006 means that there is a significant relationship between anemia in pregnant women and LBW.

Table 2. Relationship between pregnant women with anemia and the incidence of LBW

Pregnant mother	LBW		Non LBW		Amount		P Value
	n	%	n	%	n	%	
Anemia	137	47.4	152	52.6	289	100	0.006
Not Anemia	56	33.9	109	66.1	165	100	
Total	193	41.2	261	58.8	454	100	

DISCUSSION

Characteristics Respondents

The age characteristics of the respondents were generally 20-35 years old. However, there were still pregnant women who were under 20 years old and over 35 years old, as many as 96 people.

(21%). Age is the time lived or existed (since birth or being held). In the healthy reproductive period, it is known that the optimal age for pregnancy and childbirth is 20 years to 35 years. Age that is not a healthy reproductive age certainly dramatically affects the physical and psychological condition of pregnant women. Young age, less than 20 years old, is not physically, mentally and financially ready to undergo pregnancy. At that age, inadequate nutritional fulfilment will tend to give birth to babies with low birth weight. Age under 20 years of reproductive organ development is not optimal, emotional and mental maturity is lacking and physiological function is not optimal so unwanted complications occur more often in pregnancy. In addition, people over 35 have experienced a decline in physiological and reproductive function in general. (Haidir et al., 2022; Sachdev et al., 2021). (Araujo Costa & de Paula Ayres-Silva, 2023)

The highest level of respondent education was high school, 195 people (43%). According to Notoadmojo, education is a process of developing all human abilities and behaviour through teaching, so it is necessary to consider age (client development process) and the relationship with the learning process. The higher a person's education, the more experience will influence outlook knowledge. According to researchers, education is something that balances personality and abilities inside and outside of school and lasts a lifetime. Education affects the learning process, so the higher a person's education, the easier it is for someone to receive information with education the easier it is for that person to receive information. With higher education then, a person tends to get information (Chandra et al., 2019; Corneles & Losu, 2015; Qomarasari & Pratiwi, 2023; Sasono et al., 2021).

The parity of respondents is mostly multipara, with as many as 283 people (62.3%). Parity is a woman's condition related to having a baby born who can live. It is the number of pregnancies that end with the birth of a fetus that meets the requirements for life (28 weeks or 1000 grams).

Parity is the number of babies born from the mother's womb, alive or dead. In understanding others, parity is born after 20 weeks of growth, regardless of whether the child lives or dies. The mother's colleagues refer to mothers who give birth or die repeatedly, not abortions. Some causes of anemia in pregnant women are that the mother gives birth frequently and the mother ignores nutritional intake during pregnancy. This is because, during pregnancy, the supplement mother and The baby will be separated. According to the researcher, on woman During pregnancy, physiological changes occur which affect the metabolism carbohydrates due to the presence of the hormone placental lactogen (HPL), which is resistant to insulin (Admin & Reni Saswita, 2021; Handayani et al., 2019)

Anemia Mother Pregnant

The study results showed that anemia in pregnant women was the most, as many as 289 people (63.7%). Anemia in pregnant women is a condition where the haemoglobin level is below 11 gr/dl. The anemia that is often found in pregnant women is anemia due to iron deficiency or iron deficiency anemia (IDA), or called anemia nutrition iron (AGB). Anemia as Ht level, Hb concentration or erythrocyte count below normal limits. However, accurate average values for pregnant women are difficult to determine because the three laboratory parameters vary during pregnancy. Generally, pregnant women are said to be anaemic if the haemoglobin level is below 11 g/dl or hematocrit is less than 33%. However, the CDC makes marks intestinal limits based on the trimester of pregnancy and smoking status. In routine practice, Hb concentrations < 11 g/dl at the end of the first trimester and < 10 g/dl in the second and third trimesters are proposed as limit lower For finding the cause of anemia during pregnancy (Agarwal & Rets, 2021; Anwary et al., 2021; Figueiredo et al., 2019)

Anemia in pregnant women is caused by several things, including a lack of nutrients in the food consumed and blood thinning or *hemodilution*. Anemia often occurs due to iron deficiency in the mother, which can affect the growth and development of the fetus/baby during pregnancy and afterwards. Anemia is Wrong. One factor can cause growth disorders, *intrauterine*, so factor, is one of the causes of death of a fetus, LBW And abnormal growth . Maternal complications include PPH (postpartum haemorrhage), and fetal complications include premature birth, low birth weight and small for gestational age babies. (Adam et al., 2018; Mahmood et al., 2021; Mahmudian et al., 2021)

The researcher's assumption is that anemia can cause the mother's pregnancy to be risky for the fetus. Many risks occur if the mother has anemia. For example, the mother feels dizzy, and her face looks pale. Nausea and vomiting also cause anemia due to a lack of nutritional intake for the mother and fetus.

Incident LBW

The results of the study showed that the incidence of LBW was as many as 193 persons (41.2%). A low birth weight is a baby born with a weight of less than 2,500 grams regardless of gestational age. Babies who are below the 10th percentile are called light for gestational age. Previously, neonates with a birth weight of less than 2,500 grams or equal to 2,500 grams were called premature. This division according to weight is elementary but not satisfactory,

so it was gradually discovered that the level of morbidity and mortality in neonates does not only depend on weight but also on the level of maturity of the baby itself (Abebe et al., 2019; Admin & Reni Saswita, 2021; Mahmood et al., 2021; Villalva Luna & Villena Prado, 2021).

Babies who weigh less than 2500 grams at birth are considered low birth weight (LBW). The World Health Organization classifies babies as heavy born low into three categories: LBW (1500–2499 grams), LBW (1000–1499 grams), And BBLR (1000 grams). Babies born with low birth weight have a higher risk of disease and death than babies with average birth weight. LBW Can happen Because gestational age is less than 37 weeks, so the growth of the organs in the body has not yet entirely grown, so bad things may happen if the baby's weight is lower.

The results of the study showed that babies with LBW will experience a slowdown in their growth and development. In contrast, optimal growth and development can determine the quality of the child's future ³². According to the results of the study, where the size of the circumference arm on (LILA) < 23.5 cm has a 4.89 times greater risk of giving birth to a baby with low birth weight (Mathias et al., 2020; Villalva Luna & Villena Prado, 2021).

Research has found that mothers with a history of chronic energy deficiency during pregnancy own prevalence of LBW is 4,154 times higher. In the first trimester of pregnancy, malnutrition causes fetal death and increases the likelihood of premature birth for the unborn baby. Growth fetus can hampered and does not develop according to gestational age. Mother If malnutrition happens in the second and third trimesters. The chance of premature birth or LBW is 3.7 times higher compared to pregnant women in the third trimester if it occurs in the third trimester.(Mahmudian et al., 2021; Nabila, 2020)

The Relationship between Anemia in Pregnant Women and the Incidence of LBW

The study results showed that out of 454 respondents, most of the BBLR occurred in pregnant women with anemia. With the test statistics *Chi-square* obtained a p value of $0.006 < 0.05$, meaning it can be concluded that H_0 is rejected and H_a is accepted; there is a relationship between anemia in pregnant women and the incidence of LBW. in House Sick PMI Bogor Year 2023

Maternal anemia greatly affects the weight of the baby to be born. Mothers who are anaemic due to low Hb not only endanger the mother's life but also disrupt the growth and development and endanger the life of the fetus. This is due to the lack of nutrient and oxygen supply to the placenta, which will influence the function of the placenta to the fetus. Decreased haemoglobin levels in the mother will increase the risk of LBW, the risk of

bleeding before and after labour, and even cause the death of the mother and her baby if the mother suffers from severe anemia. The growth of the placenta and fetus is disrupted due to a decrease in Hb caused by the blood volume during pregnancy. Blood volume increased by 50 % from 4 to 6 L, and plasma volume increased slightly, which caused a decrease in Hb concentration and hematocrit values. This decrease will be smaller in mothers who consume the substance iron. The increase in blood volume meets the perfusion needs of the placenta and provides reserves when blood is lost during childbirth. During pregnancy, the uterus, placenta, and fetus require sufficient blood flow to meet nutritional needs (Agarwal & Rets, 2021; Anwary et al., 2021; Figueiredo et al., 2019; Mahmudian et al., 2021).

The results of this study are also in line with Acheampong's showing that the prevalence of anemia in pregnant women who suffer from anemia occurs due to low prevention from nutrition as well as lack of promotion of ANC nurse visits during pregnancy. Pregnant women are malnourished group inhabitant who are prone to health problems due to reduced nutrition (Acheampong et al., 2018)

CONCLUSION

The prevalence of anemia in pregnant women at PMI Hospital is very high, namely 289 people (63.7%). The prevalence of LBW cases is 193 people (42.2%). There is a relationship between anemia in pregnant women and the incidence of LBW. At PMI Hospital Bogor Year 2023 with *p-value* = 0.006.

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