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The Relationship Between Nutritional Status And The Incidence Of Anemia In Pregnant Women At The Mayangan Jombang Community Health Center

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Abstract

Anemia during pregnancy remains a major nutritional problem in Indonesia, leading to the risk of premature birth, postpartum hemorrhage, and maternal death. One contributing factor is malnutrition or Chronic Energy Deficiency (CED). This study aims to analyze the relationship between nutritional status and the incidence of anemia in pregnant women in the Mayangan Community Health Center, Jombang Regency. This analytical study, using a cross-sectional design, involved 183 pregnant women selected using a simple random sampling technique. Data were collected through measuring the Upper Arm Circumference (MUAC) and analyzing hemoglobin (Hb) levels. Data were analyzed using the Chi-Square test. The majority of respondents showed good nutritional status (73.8%) and did not experience anemia (55.7%). The results of the Chi-Square analysis showed a p-value of 0.028 ($p < 0.05$) with a χ^2 value of 5.222. There is a significant relationship between nutritional status and the incidence of anemia in pregnant women at the Mayangan Community Health Center. The better the mother's nutritional status, the lower the risk of anemia.

Keywords: Nutritional Status, LILA, Anemia, Pregnant Women.

INTRODUCTION

Anemia in pregnant women is a common health condition and remains a major nutritional problem in developing countries, including Indonesia. This condition is characterized by hemoglobin (Hb) levels below 11 g/dL in the first and third trimesters, or below 10 g/dL in the second trimester.(Merdayanti & Fauzi, 2024)Common signs and symptoms that occur in pregnant women with anemia include increased heart rate and breathing, due to the body's efforts to obtain more oxygen, which can cause complaints of dizziness, fatigue, pale skin, nausea, and decreased hair and skin quality.(Jelsi Aryuni, Dewi Anggraini Harahap, 2025)If left untreated, anemia can lead to serious risks, including premature birth, postpartum hemorrhage, and maternal death.(Musfida & St. Hateriah, 2023).

The prevalence of anemia during pregnancy globally is 43.9%(Anggrawati Wulandari et al., 2023). According to the 2023 Indonesian Health Survey (SKI), the prevalence of anemia in pregnant women in Indonesia is 27.7%.(Serli Haitul Hasanah, 2025)When compared with the 2018 Riskesdas data, there was a decrease of 21.2%, from 48.9% to 27.7%.(Farida et al., 2023)In East Java Province, the prevalence of anemia in pregnant women in 2020 was 19.6%.(Dwi Fitriyatul Arifah, 2024)In Jombang Regency, the number of pregnant women was 19,811, and 2,391 suffered from anemia. In the Mayangan Community Health Center Work Area, the number of pregnant women suffering from anemia was 209 (Health Service Profile, 2023).

One cause of anemia during pregnancy is malnutrition. A pregnant woman's nutritional status is influenced by her nutritional intake. Inadequate nutritional intake can lead to health problems that contribute to the risk of chronic energy deficiency (CED). Nutritional status in pregnant women can be assessed by measuring the mid-upper arm circumference (MUAC).(Fatkhiyah et al., 2022). Assessment of the upper arm circumference (MUAC) in pregnant women with good nutritional status shows a MUAC > 23.5, while pregnant women with poor nutritional status have a MUAC < 23.5(Adriati & Chloranyta, 2022).

Other factors that cause anemia in pregnant women include parity, ANC visits, and compliance in taking iron tablets.(RIEZQY ARIENDHA et al., 2022). Nulliparous or primiparous women have a higher risk of developing anemia during pregnancy due to hyperemesis gravidarum, resulting in insufficient nutritional intake and poor eating patterns.(Dwi Fitriyatul Arifah, 2024). The frequency of Antenatal Care (ANC) check-ups can reduce the risk of anemia in pregnant women by providing information on nutritional status and enabling early detection of abnormalities or diseases, especially anemia.(Eka Noviana Anggraini, 2021). Compliance with iron consumption also influences the incidence of anemia and increases hemoglobin levels. Iron tablets are more effective when combined with vitamin C, as iron is difficult for the body to absorb, so vitamin C can help.(Adfar et al., 2022).

Based on research(Fatkhiyah et al., 2022)Pregnant women who experience malnutrition can result in Chronic Energy Deficiency (CED) and anemia, thereby increasing the risk of giving birth to a baby with Low Birth Weight (LBW), bleeding, and postpartum difficulties due to weakness, which can lead to high mortality rates during childbirth. Globally, the number of maternal deaths after childbirth reaches 500,000 each year, of which 20-40% is the main cause of anemia.(Sitepu et al., 2021). The results of research conducted previously by(Putri & , Asri Kusyani, 2023)that there is a relationship between nutritional status and the incidence of anemia during pregnancy.

The government's efforts to address nutritional issues in pregnant women are carried out through the Provision of Supplementary Food (PMT). PMT is provided not only to mothers experiencing Chronic Energy Deficiency (CED), but also to poor families, those with anemia, and those without CED. To reduce the incidence of anemia in pregnant women, the government has implemented an iron (Fe) supplementation program, which is recommended for consumption before or during the 12th week of pregnancy. Pregnant women who do not take iron supplements are at risk of experiencing a significant decrease in iron reserves from the first trimester. Therefore, pregnant women are advised to consistently consume one iron tablet every night, with a total of at least 90 tablets throughout pregnancy, to prevent anemia and support the health of the mother and fetus.

Based on this explanation, the research question is how nutritional status relates to the incidence of anemia in pregnant women at the Mayangan Community Health Center in Jombang Regency. The purpose of this study was to analyze the relationship between nutritional status and the incidence of anemia in pregnant women in the Mayangan Community Health Center area. The results are expected to provide consideration for health professionals and local governments in strengthening anemia prevention strategies through continuous nutritional monitoring of pregnant women.

RESEARCH METHODS

This research is analytical with correlational design to identify the relationship between variables, namely nutritional status (independent variable) and the incidence of anemia in pregnant women (dependent variable) through a cross-sectional approach. This research was conducted in the operational area of the Mayangan District Health Center. Jogoroto, Jombang Regency, with a research period from June to August 2025. The population in this study included all pregnant women who underwent pregnancy check-ups at the Mayangan District Health Center, Jombang Regency during the research period, with a total population of 334 pregnant women.

The sample size was determined using the Slovin formula with an error rate (e) of 0.05, which was 183 respondents. The technique used was Simple Random Sampling. Researchers compiled a list of all pregnant women who underwent examinations at the Mayangan Community Health Center (N=334) and randomly selected them with serial numbers 1–183 as the research sample.

Data were collected through anthropometric measurements including height (H), weight (BW), and mid-upper arm circumference (MUAC), as well as hemoglobin (Hb) level analysis using a digital hemoglobinometer. A MUAC below 23.5 cm is categorized as undernourished, while a level above

23.5 cm is considered well-nourished. A Hb level below 11 g/dL is considered anemic, while a level above 11 g/dL is considered abnormal. Additionally, additional data such as blood pressure was recorded to support the analysis of the pregnant woman's physiological condition.(Retsanboy et al., 2025).

The data were analyzed in two stages: descriptive analysis presenting respondent characteristics based on age, MUAC, and Hb levels in frequency distribution tables and diagrams. The analysis used the Chi-Square (χ^2) correlation test to identify the relationship between nutritional status (MUAC) and the incidence of anemia. The significance level used was $\alpha = 0.05$. If the p-value <0.05, there is a significant relationship.

RESULTS AND DISCUSSION

General Characteristics of Respondents

Table 1. Distribution of frequency of age, parity, nutritional status and incidence of anemia in pregnant women at Mayangan Community Health Center

Variables	Number (n)	Percentage(%)
Age		
Risky	40	21.9
No risk	143	78.1
Parity		
Primipara	56	30.6
Multipara	117	63.9
Grand multipara	10	5.5
Nutritional status of pregnant women		
Malnutrition	48	26.2
Good nutrition	135	73.8
The incidence of anemia in pregnant women		
Anemia	81	44.3
No anemia	102	55.7

The table above shows that most of the mothers' ages are not at risk, namely 143 pregnant women (78.1%), multiparous 117 pregnant women (63.9%), and the nutritional status of most pregnant women is good, namely 135 people (73.8%), and most pregnant women do not experience anemia, namely 102 people (55.7%).

Table 2. Relationship between Nutritional Status and the Incidence of Anemia

Nutritional status	Anemia in Pregnant Women						
	Yes		No		Amount		χ^2
	F	%	F	%	F	%	= 5,222
Good	53	39.3%	82	60.7%	135	73.8%	
Not good	28	58.3%	20	41.7%	48	26.2%	P=0.028
Total	81	44.3%	102	55.7%	183	100%	

Chi-Square Test Results

Based on the analysis using SPSS, the Chi-Square test results showed a value (χ^2) = 5.222 with a p-value = 0.028 (<0.05), which indicates a relationship between nutritional status and the incidence of anemia in pregnant women. The contingency coefficient (C) = 0.167 indicates a moderate and positive relationship, which means that increasing maternal nutritional status is associated with a reduced risk of anemia.

Discussion

1. Nutritional Status of Pregnant Women

The research findings showed that 26.2% of respondents had a Mid-Upper Arm Circumference (MUAC) of less than 23.5 cm, thus they were categorized as malnourished. This is in line with previous research conducted by (Alifani Faiz Faradhila, Marisa Marcelina Limbong, 2025) on the relationship between nutritional status and anemia in pregnant women with the results obtained a p-value of 0.000 <α (0.05), the OR value obtained was 11,000 (2,817-42,947), so that pregnant women with KEK nutritional status have an 11,000 times chance of experiencing anemia compared to pregnant women with normal nutritional status. According to WHO (2021), MUAC <23.5 cm is an indicator of chronic energy deficiency (CED) which can affect the body's metabolism and reduce hemoglobin levels. Pregnant women with nutritional deficits generally have insufficient intake of calories, protein, and micronutrients, such as iron and folic acid. Nutritional deficiencies result in disruption of erythrocyte and hemoglobin formation, which ultimately leads to anemia.

The prevalence of nutritional deficits in pregnant women at the Mayangan Community Health Center (Puskesmas Mayangan) is 26.2%. This indicates that meeting macronutrient and micronutrient intake in pregnant women in the Puskesmas Mayangan area remains a challenge and requires specific interventions. Low MUAC in pregnant women is not just an anthropometric figure, but rather a representation of chronic energy deficiency that inhibits the efficiency of red blood cell metabolism.

2. Overview of Anemia Events

A total of 81 of 183 pregnant women (44.3%) experienced anemia. The majority were classified as mild anemia (Hb 10–10.9 g/dL). These results align with a report from the Ministry of Health (2023), which showed that the prevalence of anemia in pregnant women in Indonesia is around 47%. The causes of anemia in pregnant women are likely multifactorial, including increased blood plasma volume during pregnancy, deficiencies in iron, folic acid, or vitamin B12, and poor compliance with the use of iron supplement tablets.

3. The Relationship Between Nutritional Status and the Incidence of Anemia

The results of the Chi-Square test showed a significant relationship between nutritional status (MUAC) and the incidence of anemia (p = 0.028). This indicates that pregnant women with nutritional deficit status have a higher risk of experiencing anemia compared to pregnant women with optimal nutritional status. The findings of this study are consistent with the results obtained by (Fatkhiyah et al., 2022) who stated that pregnant women with MUAC <23.5 cm have a three times greater risk of experiencing anemia than those with normal MUAC. In a study conducted by (Fadilah Syaharani & Listyawardhani, nd) on nutritional status, consumption patterns and the incidence of anemia. Of the pregnant women, there were 67 respondents (80.7%) with good nutritional status/Non-CED and 16 respondents (19.3%) with malnutrition status/CED. The results of the Chi-Square test showed a significance value of 0.001 (p <0.05), indicating a significant relationship between nutritional status and the incidence of anemia in pregnant women.

Chronic energy deficiency physiologically disrupts the process of hematopoiesis, the formation of red blood cells. Fifty-three (39.3%) pregnant women with good nutritional status experienced anemia. This phenomenon indicates that good nutritional status anthropometrically does not guarantee adequate micronutrients in the blood. The increased rate of anemia in pregnant women with adequate nutritional status may be caused by many factors that inhibit iron absorption, such as the habit of consuming tea and coffee after meals, which can bind non-heme iron. Therefore, a paradigm shift in the clinical approach is needed from merely ensuring adequate physical fitness to ensuring quality of consumption, where increasing compliance with iron tablets (TTD) becomes the primary focus and avoiding inhibiting substances becomes key, even if the pregnant woman appears physically healthy. If only considering MUAC as a single indicator, then women with good nutritional status but anemia are at risk of being overlooked in specific nutrition intervention programs.

Apart from nutritional status, there are other factors that influence the hemoglobin levels of pregnant women:

a. Compliance with iron tablet consumption. Many pregnant women report not taking their iron tablets regularly due to side effects such as nausea or constipation.
b. Diet. Some mothers have a habit of drinking tea or coffee after meals, which can inhibit the absorption of non-heme iron.
c. Socioeconomic conditions. Mothers with low socioeconomic status tend to consume foods low in animal protein.

Although some mothers have good nutritional status, cases of mild anemia are still found, which suggests that other factors such as iron absorption and individual metabolism also play a role.

4. Implications of Research Results

The results of this study confirm that improving nutritional status is a key step in reducing the prevalence of anemia in pregnant women. Community health centers and healthcare workers need to:

a. Conduct routine LILA and Hb checks at every antenatal care (ANC) visit;
b. Providing balanced nutrition education to pregnant women and their families;
c. Ensuring the availability and compliance of iron tablet consumption
d. Involving Posyandu cadres in nutrition monitoring and community education.

This study used only one indicator of nutritional status, namely the MUAC, so it does not yet describe the overall nutritional status (e.g., based on BMI or daily food intake). Furthermore, the data were collected at a single point in time (cross-sectional), so causality cannot be definitively established. Nevertheless, the findings of this study provide a concrete picture of the nutritional status and anemia of pregnant women in the Mayangan Community Health Center operational area and can inform maternal and child health interventions.

CONCLUSION

Based on the results of the study, there is a significant relationship between nutritional status and the incidence of anemia in pregnant women at the Mayangan Jombang Community Health Center, with a p value of 0.028 and $\chi 2 = 5.222$. Pregnant women with poor nutritional status tend to experience anemia more often, so strengthening LILA monitoring, Hb examination, nutrition education, and compliance with Fe tablet consumption need to be an important part of ANC services to reduce the risk of anemia.

However, this study has limitations because it used only a cross-sectional design, which makes causality uncertain. Furthermore, nutritional status was only measured through the MUAC, which does not reflect the overall nutritional condition. Future research is recommended to include other variables such as food intake, iron tablet adherence, parity, pregnancy spacing, and socioeconomic factors, as well as to use a longitudinal design to allow for a more robust and comprehensive analysis of the relationships between variables.

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