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Nutritional Status and Compliance with Blood Supplemental Tablets as a Cause of Anemia in Pregnant Women

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A B S T R A C T

Health issues that might arise during pregnancy include anemia. Pregnant women who have good nutritional status do not experience anemia. Conversely, pregnant women with poor nutritional status can cause anemia if blood-supplemented tablets that are not consumed regularly can result in pregnant women experiencing iron deficiency which is closely related to the incidence of anemia. This study aims to determine the relationship between nutritional status and adherence in consuming blood supplement tablets with anemia in third-trimester pregnant women. This research is a form of analytic survey research with a cross-sectional analytical design research approach. This research was conducted from March to April 2023. The sample in this study were all third-trimester pregnant women at the Sikumana Health Center, 50 people using a total sampling technique. There was no significant relationship between nutritional status and anemia in third-trimester pregnant women with a p-value (0.050), while there was a significant relationship with anemia adherence with a p-value (of 0.000). Based on the results of the study, it was concluded that there was no statistically significant relationship between nutritional status and the incidence of anemia in third-trimester pregnant women. In the analysis of compliance with anemia, there was a statistically significant relationship between adherence to consuming blood supplement tablets and the incidence of anemia in third-trimester pregnant women.

Anemia sebagai permasalahan kesehatan yang sering muncul dalam masa kehamilan. Seorang wanita hamil dengan keadaan status gizi baik lebih cendrung untuk tidak mengalami anemia, sebaliknya ibu hamil dengan staus gizi kurang dapat mengakibatkan terjadinya anemia. Tablet tambah darah yang tidak dikonsumsi secara teratur dapat mengakibatkan ibu hamil mengalami kekurangan zat besi yang sangat berhubungan dengan kejadian anemia. Penelitian ini ditujukan untuk melihat hubungan antara status gizi dan kepatuhan dalam menkonsumsi tablet tambah darah dengan anemia kehamilan trimester III. Penelitian ini merupakan bentuk penelitian surveianaltik dengan pendekatan penelitian design Cross Sectional Analityc. Penelitian ini dilakukan pada bulan Maret hingga April 2023. Sample dalam penelitian ini adalah semua ibu hamil trimeseter III di Puskesmas Sikumana sejumlah 50 orang dengan teknik total sampling. Tidak terdapat hubungan bermakna antara status gizi dengan anemia ibu hamil trimester III dengan nilai p-value (0,050), sedangkan pada kepatuhan dengan anemia ada hubungan bermakna dengan nilai p-value (0,000). Berdasarkan hasil penelitian disimpulkan bahwa tidak terdapat hubungan yang bermakna secara statistic antara status gizi dengan kejadian anemia pada ibu hamil trimester III. Pada analisis kepatuhan dengan anemia terdapat hubungan yang bermakna secara statistic antara kepatuhan ibu hamil mengkonsumsi suplemen penambah darah dengan masalah anemia kehamilan trimester III.

Introduction

Pregnancy is an essential period in a woman's life. A safe and healthy pregnancy can support entering a safe labor period so that you can give birth to a healthy baby. To keep a good pregnancy process, a woman needs optimal nutritional intake so that it can be used for physical health or spiritual health. Pregnant women usually experience several complaints, such as headaches, fatigue, shortness of breath and pale faces, as well as other health complaints. These complaints indicate that there are indications that pregnant women are experiencing anemia during their pregnancy (Tampubolon et al., 2021).

When a pregnant woman has anemia, her body does not produce enough red blood cells necessary to carry oxygen to the body's numerous organs and cells. According to WHO, a pregnant woman is said to be anemic if her haemoglobin or Hb level is less than 11 g%. Fulfilment of nutritional needs and fetal nutrition is also taken from the body of pregnant women, so it is not surprising that the problem of anemia in pregnant women often occurs and continues to increase (Irmawanti & Rosdianah, 2020).

Anemia can be said to be one of the world's health problems that are very common and widespread and can affect 56 million women in the world, and nearly two-thirds of them occur in the Asian region (Soh, 2015). The problem of anemia that occurs in developing countries can be a health problem for pregnant women that needs serious attention, this is because anemia has an impact on the fetus and mother which contributes to the incidence of maternal mortality. Pregnant women who are anemic run a higher risk of preterm delivery, infant and mother death, and infectious illnesses. Pregnant women who acquire iron deficiency anemia may also have effects on their unborn child's growth and development both during and after pregnancy (Zuiatna, 2021).

The problem of anemia in pregnancy in the world mostly occurs in countries with small and middle income, which is around 56%. The countries that have the highest incidence of anemia in pregnancy are Africa as much at 57%, Southeast Asia reaching 48% and the lowest incidence of countries that have pregnant women with anemia is South America (Stephen, et al., 2018).

According to the findings of the 2018 Basic Health Research (Riskesdas), 48.9% of pregnant women in Indonesia alone had anemia. The age range of 15 to 24 years accounts for up to 84.6% of anemia in pregnant women, while the Ministry of Health's figures on family health programs show an annual rise in the number of maternal mortality. In Indonesia in 2021, there were 7,389 fatalities. This figure represents an increase of 4,627 fatalities from 2020. According to the reasons, COVID-19 had 2,982 instances, haemorrhage had 1,330 cases (anemia is one of the causes of bleeding in pregnant women), and pregnancy-related hypertension had 1,077 cases in 2021 (RI Ministry of Health, 2022).

Pregnancy-related nutritional status and adherence to iron supplementation are two causes of anemia in pregnant women, among other variables. Taking into consideration the findings of Tanziha's (2016) study, it can be seen that both in rural (37.9%) and urban (38.2%) areas of Indonesia, the incidence of anemia in pregnant women is still rather high. Nutritional status, namely Chronic Energy Deficiency (CED), is the factor that is associated with the likelihood of developing anemia. Pregnant

women with CED nutritional status had a 1.975 times higher risk of developing anemia than pregnant women with normal nutritional status (Tanziha et al., 2016).

Anemia tends to affect pregnant women with poor nutritional status (KEK) more frequently than it does healthy pregnant women. This results from an unbalanced pattern of food ingestion and absorption during pregnancy. A person's nutritional condition is significantly impacted by nutrition. Pregnant women run the danger of developing nutritional problems or chronic energy shortage, which can result in anemia, if they do not take a balanced diet during their pregnancy, including both macronutrients and micronutrients (Aminin, 2014).

The incidence of anemia in pregnant women is significantly impacted by compliance with blood-supplement tablet usage. This is evident from the findings of a study conducted by Wulandari (2018), which demonstrates through correlation and regression analyses that adherence to blood-added tablet usage has a highly significant or strong effect on Hb levels and the rate of positive or unidirectional relationship; that is, if pregnant women adhere to the regimen of consuming bloo The objective of this research endeavor was to ascertain the correlation between the nutritional status of third-trimester expectant women at the Sikumana Health Center, Sikumana Village, Kupang City, East Nusa Tenggara, and their adherence to the consumption of blood-supplemented tablets regarding anemia.

Method

This is quantitative research. In this study, an analytical survey employing a cross-sectional analytical design was utilized as the research methodology. The nutritional status of pregnant women and their adherence to blood-supplement tablet consumption in relation to the incidence of anemia in pregnant women were assessed by the researcher simultaneously or at a single point in time, without any subsequent intervention on the results of the measurements. The study was carried out at the Sikumana Health Center, situated in Kupang City, East Nusa Tenggara. The sample for this research comprised fifty expectant women in their third trimester who were receiving care at the Sikumana Health Center in Kupang City, East Nusa Tenggara. Fifty individuals were included in the research samples, which were obtained through the use of a total sampling method (Notoatmodjo, 2014). The investigation spanned the months of March to April in the year 2023. The sample for this study must satisfy the following inclusion criteria: 1) Pregnant women in their third trimester who visit the Puskesmas for pregnancy checks; 2) Pregnant women in their third trimester who are able to communicate in Indonesian; and 3) Mothers of third-trimester pregnant women who are willing to participate in this study. 1) Pregnant women in their first and second trimesters; and 3) Pregnant women who declined to participate as respondents in the study constituted the exclusion criteria.

Research procedures in measuring independent variables: the nutritional status of pregnant women Researchers measured mid-upper arm circumference (MUAC) and adherence to taking blood supplement tablets researchers used a questionnaire. Maternal nutritional status is defined as the nutritional status of pregnant women assessed based on MUAC, into (1) poor nutritional status if MUAC <23.5 cm and (2) good nutritional status if MUAC > 23.5 cm. Maternal adherence to taking iron

supplement tablets is the level of patient attention in following the medical rules given in the form of medication. Disobeying if pregnant women get an MMAS-8 score (<6) = 1 and Compliant if pregnant women get an MMAS-8 score (6-8) = 2. While the dependent variable: Anemia, is done by measuring haemoglobin (HB) according to WHO criteria, be (1) if anemia, namely Hb level < 11 and (2) not anemia, if Hb level ≥ 11. The research used two types of data analysis: univariate and bivariate. The relationship between nutritional status and adherence to anemia treatment among expectant women was determined bivariate through bivariate analysis and the Chi-square test with a significance level of p<0.05. For the analysis of data in this research, SPSS was utilized.

Results

Table 1. Variable Frequency Distribution of Nutritional Status of Pregnant Women, Compliance of Pregnant Women and Anemia of Third Trimester Pregnant Women

Variable	Frequency (f)	Percentage (%)
Nutritional Status of Pregnant Women		
Poor (if MUAC pregnant women < 23.5 cm)	16	32
Good (if mother's MUAC > 23.5 cm)	34	68
Compliance with Pregnant Women		
Not obey (if pregnant women get an MMAS-8 score (<6))	40	80
obey (if pregnant women get an MMAS-8 score, (6-8))	10	20
Anemia of Pregnant Women		
Not Anemia (if Hb level≥11gr/dl)	7	14
Anemia (if Hb level < 11gr/dl)	43	86
Number of Respondents	50	100

Primary data source 2023

Based on the results of the frequency distribution analysis presented in Table 1, it can be observed that the majority of the fifty pregnant women who participated in the study have a favorable nutritional status. However, between forty-two and thirty-four per cent (68 and 80 per cent), respectively, are disobedient to taking iron supplement tablets, and approximately forty-three per cent (86 per cent) of the third-trimester pregnant women have experienced anemia.

Table 2. Bivariate Analysis of The Association Between Pregnant Women's Nutritional Status and the Prevalence of Anemia in Mothers in Trimester Three

Variable	Category	Third Trimester Pregnant Women's Anemia			P-values
		Not Anemia n %	Anemia n %	Total % n%	
Nutritional status	Poor	0 (0)	16 (32)	16 (32)	0.050
	Good	7 (14)	27 (54)	34 (68)	
Amount					

Primary data source 2023

Based on the results presented in Table 2, it is evident that expectant women who had a satisfactory nutritional status were 54% more likely to develop anemia compared to those who had a deficient nutritional status, who was as much as 32% more likely to develop anemia. Based on the p-value > 0.005 (p=0.050) obtained from the statistical analysis test utilizing Chi-Square, it can be deduced that the association between nutritional status and the occurrence of anemia among third-trimester expectant women is not statistically significant.

Table 3. Bivariate Analysis of The Association Between Pregnant Women's Compliance with and The Prevalence of Anemia in Mothers in Trimester Three

Variable	Category	Third Trimester Pregnant Women's Anemia			P-values
		Not Anemia n %	Anemia n %	Total % n%	
Adherence to taking iron tablets	Not obey	1 (2)	37 (74)	38 (76)	0.000
	obey	6 (12)	6 (12)	12 (24)	
Amount		7 (14)	43 (86)	50 (100)	

Primary data source 2023

The findings presented in Table 3 indicate that a greater proportion of pregnant women (n=37, or 74%) who fail to take blood-supplementing tablets develop anemia, compared to pregnant women who do adhere to this practice and only experience anemia as few as six respondents (12 per cent). Based on the statistical analysis test conducted using Chi-Square, the obtained p-value of 0.005 (p=0.000) indicates that the relationship between adherence to iron supplement tablet consumption and the incidence of anemia in third-trimester expectant women is statistically significant.

Discussion

The findings of the analysis indicate that pregnant women who have a healthy nutritional status are 54% more likely to develop anemia compared to those who have a low nutritional status, who are as much as 32% more likely to develop anemia. Based on the statistical analysis test employing Chi-Square, the obtained p-value of 0.050 (>0.005) indicates that the association between nutritional status and the occurrence of anemia in third-trimester expectant women is not statistically significant. Consistent with the findings of Putri (2017), the application of multiple logistic regression analysis yielded statistically insignificant results ($p < 0.299$), indicating that nutritional status had no bearing on adolescent pregnancy-related anemia. This shows that good or poor nutritional status has no direct effect on anemia in teenage pregnant women (Putri, 2017).

Sufficient nutrition is an essential requirement for all individuals, including those in pregnancy, infants, children, adolescents, adults, and the elderly. Inadequate nutrition during pregnancy can lead to hindered physical development and intellectual progress, decreased work output, and compromised body resistance or endurance. Consequently, these consequences may escalate the risk of illness and mortality (Aisha, 2016). The present study exhibits an inverse correlation with the research conducted by Purwaningtyas and Prameswari (2017). The findings of an examination of the correlation between maternal anemia incidence and nutritional status at the Karang Anyar Health Center in Semarang City indicate a significant relationship, as indicated by a p-value of 0.000 (<0.005). Malnutrition will result in adverse outcomes for both the mother and the fetus.

Malnutrition has the potential to induce anemia in the mother, thereby impeding the blood supply that supplies nourishment and oxygen to the embryo and subsequently impeding the growth and development of the fetus. Consequently, it is critical to closely monitor the nutritional status of expectant mothers (Purwaningtyas & Prameswari, 2017). Additionally, other research has established a correlation between nutritional status and the occurrence of anemia; expectant women who have a healthy

nutritional status have a 6,500-fold greater chance of avoiding anemia than those who have a poor nutritional status. Furthermore, nutritional status is found to have a 30.6% impact on the prevalence of anemia (Mutiarasari, 2019). According to the findings of Aminin (2014) study, expectant women with CED have a higher incidence of anemia than those without the condition. This is frequently the result of an unbalanced diet and absorption pattern maintained throughout pregnancy. Dietary requirements can influence an individual's nutritional status. Pregnant women who fail to incorporate micronutrients and macronutrients into their diets during pregnancy run the risk of developing nutritional complications, such as chronic energy deficiency, which may culminate in the development of anemia. Pregnant women without CED have a lower risk of developing anemia compared to those with the condition (Aminin, 2014).

Consistent with the findings of Herlena's (2020) research, nutritional status was identified as the most influential factor in anemia in expectant women (RP = 1.7, 95% CI 1.1-2.6). According to Martha & Hayati (2020)**,** expectant women who have a KEK nutritional status are 1.7 times more likely to develop anemia compared to those who have a non-SEZ nutritional status. Furthermore, it is worth noting that nutritional deficiency is the most prevalent nutritional disorder globally, predominantly impacting expectant women aged 15-49 who reside in tropical and subtropical regions (Ghosh et al., 2019). Anemia contributes to 20-40% of maternal fatalities in India, and over 50% of pregnant women lack adequate iron reserves (Ganaphati, 2017).

Adequate nutrition is essential throughout pregnancy in order to support fetal development and growth, preserve maternal health, and provide the necessary nutrients for lactation. Anemia can be induced in expectant women due to a nutritional deficiency (Rismawati & Rohmatin, 2018). The absence of a statistically significant correlation between nutritional status and the occurrence of anemia among expectant women in their third trimester indicates that nutritional status does not appear to be the primary etiological factor in this population. There are still additional factors that contribute to the development of anemia in expectant women; these factors require additional study. Additional factors that warrant further investigation in relation to the aetiology of anemia include the level of maternal knowledge, household income, parity, pregnancy in women with specific diseases, and birth spacing. While no correlation has been found between nutritional status and anemia in expectant women, it is important to acknowledge that optimal nutrition during pregnancy facilitates the initiation of a risk-free delivery period, thereby increasing the likelihood of delivering healthy infants.

The findings presented in Table 3 indicate that a greater proportion of pregnant women (n=37, or 74%) who fail to take blood-supplementing tablets develop anemia, compared to pregnant women who do adhere to this practice and only experience anemia as few as six respondents (12 %). Based on the statistical analysis test conducted using Chi-Square, the obtained p-value of 0.005 (p=0.000) indicates that the relationship between adherence to iron supplement tablet consumption and the incidence of anemia in expectant women in their third trimester is statistically significant. Pregnant women who have anemia are at an increased risk of developing infectious diseases, maternal and infant mortality, and

preterm birth. During and after pregnancy, iron deficiency anemia in the mother can impair the growth and development of the fetus or neonate.

According to the 2018 Riskesdas, 48.9% of expectant women in Indonesia were diagnosed with anemia. Approximately 84.6% of all cases of anemia in expectant women occur between the ages of 15 and 24. It is recommended that all expectant women consume a minimum of 90 iron tablets throughout their pregnancy in order to prevent anemia (RI Ministry of Health, 2022). However, there are several problems encountered in consuming blood-supplementation tablets in Indonesia, namely some pregnant women who find it difficult to consume blood-boosting tablets every day for reasons of nausea, forgetting, not liking the smell of blood-boosting tablets and various other reasons resulting in non-adherence. pregnant women in consuming blood supplement tablets. The findings of this study align with the research undertaken by Awalamaroh in 2018. A statistical analysis conducted in his study yielded findings that established a noteworthy correlation (p=0.000) between anemia status and adherence to Fe tablet regimens among expectant women who were at least 36 weeks along in gestation (Awalamaroh et al., 2018).

Consistent with the findings of Ainur's (2022) research, the obtained statistical test results (ρ.value 0.0001) indicated the presence of a correlation between expectant women's adherence to Fe tablet consumption and the occurrence of anemia. The greater a pregnant woman's adherence to the prescribed regimen of blood-supplementing medications, the reduced likelihood of developing anemia. Conversely, the greater a pregnant woman's disobedience with regard to the consumption of blood-supplementing tablets during pregnancy, the higher the risk that she will develop anemia. A reduction in the prevalence of anemia will contribute to the enhancement of maternal and infant health (Ainur et al., 2022). Although blood tablets are not the sole method of treating anemia, they should be supplemented with iron-rich foods. Prahesti et al. (2016) state that blood iron tablet supplementation is the optimal method for meeting iron requirements during pregnancy.

Furthermore, the findings corroborated the research conducted by Rismawati (2018), which demonstrated that Fe intake did indeed influence the prevalence of anemia among expectant women. Iron deficiency and folate deficiency are deficiencies that are more prevalent in pregnant women; therefore, it is advised that each woman take at least 90 tablets of iron tablets during her pregnancy. Pregnant women will require 200–300% more blood-supplement pills to support the development of the placenta and red blood cells. 1040 mg of iron is required during pregnancy. Of this total, the body keeps 200 mg of Fe during labor and loses the rest 840 mg. Up to 300 mg of iron is delivered to the fetus, with specifics including 50–75 mg for placenta development, 450 mg to increase red blood cell count, and 200 mg lost at birth. Compared to pregnant women who consistently take pills every day, those who take less or just one iron tablet each week run a twelvefold higher risk of getting anemia. Several factors contribute to the low adherence rate of expectant women taking iron tablets, including knowledge, proper medication administration, adverse effects, and the conduct of healthcare professionals in communicating the significance of iron tablets (Rismawati & Rohmatin, 2018).

The issue of anemia in expectant women may still be attributed to inadequate adherence to iron tablet consumption throughout the course of pregnancy. Iron supplement tablets that are not consistently ingested during pregnancy may lead to iron deficiency in women, a condition that is strongly associated with the prevalence of anemia in this population. Iron deficiency during pregnancy is an additional factor that can contribute to the development of anemia during pregnancy. Iron deficiency may arise from factors such as inadequate iron content in food, obstruction of the absorption process, or excessive iron excretion from the body (Sarah, 2018).

Conclusion

Based on the results of the research, there is no correlation that is statistically significant between the incidence of anemia in expectant women in their third trimester and their nutritional status. Non-adherence to consuming blood supplement tablets can cause pregnant women to experience anemia. It is recommended that future researchers investigate a multitude of additional etiological factors associated with anemia and maximize sample size by optimizing study time and materials. This will enable them to obtain more comprehensive insights into the correlation between nutritional status, adherence to blood supplement tablet consumption, and the incidence of anemia among pregnant women. at a separate medical facility.

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