Proceeding of The International Conference of Inovation, Science, Technology, Education, Children, and Health

E-ISSN: 2776-9062

Research Article

Relationship Between Nutritional Status and Anemia Incidence in Pregnant Women in the Second Trimester (In the Work Area of Hikun Health Center Tabalong Regency, South Kalimantan)

Dewi Wulandari[1], Anik Purwati[2]*, Maria Veronika Widiatrilupi[3]

[1] Clinical Midwifery, Puskesmas Ribang, Indonesia

[2-3] Bachelor of Midwifery Program, Faculty of Health Sciences, Institut Sains dan Teknologi Kesehatan RS dr. Soepraoen, Malang, Indonesia email : anikasyda@itsk-soepraoen.ac.id

* Corresponding Author : Anik Purwati

Abstract: It is crucial for individuals at all life stages—ranging from fetuses to the elderly—to receive proper nutrition for healthy development and well-being. During pregnancy, malnutrition can lead to abnormal physical development, impaired cognitive function, decreased work productivity, reduced immune resistance, and, ultimately, higher risks of illness and death. Women who maintain proper nutritional intake before conception can help prevent anemia, as the increased demand for iron during pregnancy may otherwise lead to deficiencies. This study aims to analyze the relationship between individual nutritional conditions and the prevalence of anemia in pregnant women during their second trimester in the work area of the Hikun Health Center, Tabalong Regency, South Kalimantan. The research utilized an observational analytical approach with a cross-sectional design. Univariate and bivariate analyses were conducted, where univariate analysis examined the distribution of individual variables, and bivariate analysis employed the chi-square method to assess the relationship between two variables. The findings indicated that non-ideal nutritional status was associated with a decrease in anemia cases by 80.0%. However, this association was not statistically significant (p-value = 0.317). The data analysis concluded that there was no significant effect between maternal nutrition and anemia levels in pregnant women at the Hikun Health Center. These results suggest that while nutritional status is a factor in anemia prevalence, other variables may also play a role, and further research is needed to explore potential contributing factors and to refine the understanding of how nutrition, dietary habits, and lifestyle choices impact anemia in pregnant women.

Keywords: Anemia; Nutritional Status; Pregnant Women

1. Introduction

Adequate nutrition is very important for every human being, from fetuses to babies, toddlers, adolescents, adults, and the elderly. Malnutrition during pregnancy can cause impaired physical development and cognitive function, reduce work productivity, and reduce endurance, thereby increasing morbidity and mortality (Aisyah, 2016).

Given that anemia during pregnancy is described as a "possible threat to the mother and child", all stakeholders in the health sector must pay considerable attention (Siregar et al., 2019). When the amount of hemoglobin is insufficient to meet the physiological needs of the body, it is called anemia. A sign of anemia is when a person's hemoglobin level is below 11.0 g/dl (Hasanah et al., 2023).

According to WHO 2020, the frequency of anemia in pregnant women globally has decreased by 4.5% over the past 19 years, from 2000 to 2019. In contrast, in Indonesia, the prevalence of anemia in pregnant women increased to 44.2% in 2019, up from 42.1% in 2015. "(World Health Organization (WHO), 2020). Riskesdas 2018 data shows that 48.9% of

Received: 17, May 2025
Revised: 31, May 2025
Accepted: 16, June 2025
Published: 30, June 2025
Curr. Ver.: 30, June 2025

pregnant women in Indonesia experience anemia. Around 84.6% of anemia cases in pregnant women are found in the 15-24 year age demographic (Basic Health Research (Riskesdas) (2018)."

The increased need for iron required for fetal development can cause anemia in pregnant women. If a woman maintains adequate nutritional intake before conception, anemia in pregnancy can be prevented (Rohani et al., 2023). Although anemia during pregnancy is described as "a potential danger to the mother and child," all stakeholders in health services must pay special attention (Siregar et al., 2019). Anemia occurs when the number of red blood cells or hemoglobin is insufficient to meet the body's physiological needs. A hemoglobin concentration below 11.0 g/dl indicates anemia. (Hasanah et al., 2023).

In Indonesia, anemia in pregnant women is still a major problem; 0.5% of them have hemoglobin (Hb) levels below 11 g/dl, which means anemia is classified as moderate anemia, and eradication of anemia in pregnant women must be carried out. According to the 2013 Basic Health Research (Riskesdas), around 37.1% of pregnant women have hemoglobin levels below 11.0 g/dl. This number is higher in urban areas and lower in rural areas, respectively. Nutrition Data (2015). Around 5,324,562 people in Indonesia were pregnant women in 2017 (Ministry of Health of the Republic of Indonesia, 2018).

The nutritional status of a pregnant woman is influenced by her food intake during pregnancy. The eating habits of pregnant women significantly affect the development of the fetus in the womb. Poor maternal nutritional conditions during pregnancy can interfere with fetal brain development and cause abortion, among other consequences. Pregnant women need complete nutrition, although they often lack protein, energy, and essential minerals such as iron and potassium. Iron deficiency will result in complications, including anemia (Priyanti, 2020). One of the causes of anemia is poor nutritional status. Consumption of nutrients can affect a person's nutritional status (Fatkhiyah et al., 2022). The cause of anemia, namely reduced hemoglobin levels in the body, is considered significantly below normal by some demographics. Anemia in pregnant women can affect the mother and her baby (Sugihastuti et al., 2022).

The common etiology of anemia is vitamin deficiency often associated with disease, starvation, or disorders. Adequate diet during pregnancy can help the body cope with this challenge. Diet is shaped by several factors, including habits, pleasures, culture, religion, socioeconomic status, and environment. Pregnant women's dietary choices affect the mother's nutritional condition. Pregnant women's diet significantly affects the mother and fetus during pregnancy (Mulia, 2023).

Anemia can harm the fetus and cause miscarriage, stillbirth, premature birth, low birth weight, congenital abnormalities, and increased risk of infection. Pregnancy in women can cause abortion, premature delivery, risk of cord decompensation, and risk of premature rupture of membranes. This can cause poor contractions during birth, placental retention,

and postpartum hemorrhage due to uterine atony (Sari et al., 2022). Inadequate nutritional status of pregnant women can cause various risks and complications in the mother, including anemia, bleeding, insufficient weight gain, susceptibility to infectious diseases, prolonged and difficult labor, premature labor, postpartum hemorrhage, and a higher likelihood of cesarean section (Sari et al., 2020). The purpose of this study was to determine whether nutritional conditions and prevalence of anemia in pregnant women in the second trimester in the Hikun Health Center work area in Tabalong Regency, South Kalimantan, correlate with each other.

2. Research methods

"This study is an analytical observational study using a cross-sectional strategy. The study was conducted at the Hikun Health Center located in Tabalong Regency, South Kalimantan. This study involved 30 pregnant women in the second trimester, including 20 research samples. The first stage in this research methodology is to obtain research permission from the research site by showing a letter of approval from the institution. Furthermore, reporting to the Head of the Health Center to carry out the research and collect data from the mother's medical records. After the data is collected, the information will be summarized and analyzed using SPSS, followed by the preparation of a "research report. This study used medical records. The analysis carried out was univariate and bivariate. Univariate analysis examines the distribution of the variables studied, while bivariate analysis uses the chi-square technique to assess the relationship between the two variables analyzed.

3. Result and Discussion

Table 1. Frequency of respondents based on respondent characteristics at the Hikun Health Center, Tabalong Regency

Characteristics	Frequency	Percent(%)
Age		
<20 years	4	20.0
20-35	11	55.0
>35	5	25.0
Work		
housewife	16	80.0
civil servant	3	15.0
Private sector employee	**1**	**5.0**
Parity		
1	7	35.0
2-4	10	50.0

>4	3	15.0
Amount	20	100

Based on table 1 above, it shows that the majority of pregnant women are aged 20-35 years, namely 11 people (55.0%), 16 respondents (80.0%) work as housewives, and there are 10 respondents (45.2%) who are parity 2-4.

Table 2. Overview of Frequency Distribution of Nutritional Status of Pregnant Women in the Second Trimester

Nutritional status	Frequency	%
Abnormal	14	70.0
Normal	6	30.0
Amount	20	100

Based on table 2 above, it shows that the majority of respondents had abnormal nutritional status, namely 14 people (70.0%) and 6 people (30.0%) had normal nutritional status.

Table 3. Overview of frequency distribution of pregnant women in the second trimester with anemia

Anemia Occurrence	Frequency	%
Anemia	15	75.0
No Anemia	5	25.0
Amount	20	100

Based on table 3 above, it shows that of the 20 respondents, 15 people (75.0%) had anemia and 5 people (25.0%) did not have anemia.

Table 4. Results of analysis of nutritional status of pregnant women with the incidence of anemia in pregnant women in the second trimester

Nutritional status	Anemia Occurrence				Total		P.Value
	Anemia		No Anemia				
	f	%	f	%	f	%	
Abnormal	10	66.7	4	80.0	14	70.0	0.317
Normal	5	62.5	1	20.0	6	30.0	
Total	15	100	5	100	20	100	

Based on Table 4, the results of the study showed that non-ideal nutritional status reduced the risk of anemia by 80.0%. However, this finding was not statistically significant (p value = 0.317). In the Hikun Health Center Working Area, Tabalong Regency, South Kalimantan, there was no relationship between the nutritional status of pregnant women and the prevalence of anemia.

3.1. Sub Section 1

The findings show that of the 20 respondents who were pregnant women in their second trimester, the majority, namely 11 people (55.0%), were between 20 and 35 years old. The age range of 20 to 35 years is the optimal phase for giving birth. At that age, the reproductive organs work optimally, but under the age of 20, their development is still in the early stages, so most of the nutritional intake is allocated to the growth of the mother, which can inhibit fetal development. Women aged 20 to 35 who are pregnant often show better health because they are in their reproductive period (Majidah, 2017). Meanwhile, according to Komang Arie Wiyasmari (2021)The optimal reproductive age is between 20 and 35 years, because this period is most conducive to conception, childbirth, and breastfeeding, because this is the ideal age for pregnancy, childbirth, and breastfeeding. Individuals aged 20 to 35 years often show low risk during pregnancy and childbirth, because the uterus is generally ready for pregnancy, and they have the mental maturity needed to care for themselves and care for the baby. Pregnancy at the age of under 25 years and over 35 years can cause anemia, because pregnancy under 20 years is biologically less optimal, emotionally unstable, and mentally immature, so that individuals are susceptible to stress that can reduce their focus on nutritional deficiencies during pregnancy (Isnaini, YS, Yuliaprida, R., & Pihahey, 2021; Komang Arie Wiyasmari, 2021).

The results showed that 3 people (15.0%) were working, and 16 people (80.0%) were not working (housewives). Previous studies by Obai et al. (2016) on variables associated with anemia in pregnant women undergoing antenatal care at Gulu and Hoima Hospitals in Uganda strengthen these findings. These findings indicate a significant relationship between job characteristics and the prevalence of anemia in the population. The risk of anemia increases for pregnant housewives. Many women depend on their husbands' salaries (Obai G, Odongo P, 2016).

Based on the results of the study, the majority of pregnant women were categorized as having abnormal nutritional status; only four (80.0%) did not experience anemia. A small number experienced anemia, although one pregnant woman (20.0%) was considered to have adequate nutritional status. This implies that there are other factors besides nutritional status that contribute to anemia in pregnant women. Increased blood volume, also known as hydremia or hypervolemia, is another component that contributes to anemia during pregnancy. However, the increase in plasma is greater than the increase in blood cells, resulting in blood dilution. This increase corresponds to an increase in plasma of 30.00%, an increase in red blood cells of "18.00%, and an increase in hemoglobin of 19.00%. Reduced red blood cell synthesis, which causes anemia or red blood cell deficit (Risma Putri Utama, 2021). The results of this study contradict the research of Melorys and Nita (2017), which found a significant relationship between nutritional status and the prevalence of anemia (p =

0.000), but this study found that there was no relationship between nutritional status and the prevalence of anemia. This may be because there are other variables that affect the number of anemia cases in pregnant women. Respondent age, occupation, education, parity, and gestational age are some factors that can indicate no correlation between nutritional conditions and anemia (Widhiastuti, 2020).

Table 1. Frequency distribution of respondents based on the nutritional status of pregnant women with anemia at the Hikun Health Center. Most of the 20 respondents who were in the second trimester of pregnancy did not experience anemia, based on the data, 15 people (75.0%) had anemia and 5 people (25.0%) did not experience anemia. Reduced oxygen-carrying capacity in the blood is a sign of an underlying disease characterized by thinning of blood components, inadequate materials, or lack of nutrients needed for red blood cell growth (Sulaiman et al., 2022). There is no relationship between nutritional status and the prevalence of anemia in pregnant women, based on the chi-square statistical test, which was carried out at a 95% confidence level and produced a p-value of 0.686 (> 0.05). The results of this study are consistent with the results of the study by Tuti Meihartati and Lidia Widia (2017), which found that there was no significant relationship between the prevalence of anemia and nutritional status in the Simpang Empat Health Center area, as indicated by a p-value of 0.624 which is higher than $\alpha = 0.05$. The sample used in Etik Widhiastuti's study, "The Relationship between Nutritional Status and the Incidence of Anemia in Third Trimester Pregnant Women at the Pleret Bantul Health Center" was 36 third trimester pregnant women who suffered from anemia. There was no statistically significant relationship between nutritional status and the incidence of anemia in third trimester pregnant women at the Pleret Bantul Health Center, based on statistical analysis using the chi-square test at $\alpha = 0.05$ which produced a p value of 0.725 ($p>0.05$) (Widhiastuti, 2020).

The results of this study contradict the results of the study by Ismiatul Isnaini (2016) who found a p-value of 0.04 ($p <0.05$) for the relationship between nutritional status and the incidence of anemia in pregnant women. Isnaini, Ismiatul (2016). With a p value of 0.00 ($p <0.05$), the study "The Relationship between Body Mass Index of Pregnant Women and the Incidence of Anemia in the Motoboi Kecil Health Center Work Area" shows a significant relationship between the two variables (Moh. Rizki Fauzan, 2022)."

The correlation between nutritional status and anemia prevalence at Hikun Health Center showed that most pregnant women with poor nutritional status were at risk of anemia, but some respondents did not experience anemia due to consistent use of iron pills during pregnancy. Respondents who were not at risk of anemia experienced the condition due to other characteristics, including age, education, and occupation.

3.2. Sub Section 2

Based on the results of the study, 4 (80.0%) pregnant women did not experience anemia, but the majority were categorized as having unsatisfactory nutritional conditions. Only a few pregnant women experienced anemia, and only one (20.0%) was considered to have adequate nutritional conditions. This implies that there are other factors besides nutritional status that contribute to anemia in pregnant women. Increased blood volume, known as hydremia or hypervolemia, is a cause of anemia during pregnancy; however, the increase in plasma "is greater than the increase in blood cells, resulting in blood dilution. This increase corresponds to a 30.00% increase in plasma, an 18.00% increase in red blood cells, and a 19.00% increase in hemoglobin. Anemia or lack of red blood cells is caused by slow red blood cell synthesis (Risma Putri Utama, 2021). The results of this study are contrary to the results of the study by Melorys and Nita (2017), which found a significant relationship (p = 0.000) between the prevalence of anemia and nutritional status. The findings of this study indicate that there is no relationship between the prevalence of anemia and nutritional status, which is related to other factors that influence the incidence of anemia in pregnant women. Respondent age, occupation, education, parity, and gestational age are some of the variables that can cause no relationship between nutritional status and the prevalence of anemia (Widhiastuti, 2020).

Based on the nutritional status of pregnant women with anemia at the Hikun Health Center, the frequency distribution of respondents was determined. Based on these data, the majority of the 20 respondents who were in the second trimester of pregnancy did not experience anemia, namely 15 people (75.0%) had anemia and 5 people (25.0%) did not experience anemia. Anemia is a sign of an underlying disease that reduces the blood's ability to transport oxygen, such as a deficiency of elements, a decrease in nutrients needed for the formation of red blood cells, or thinning of blood components (Sulaiman et al., 2022). There is no relationship between nutritional status and the prevalence of anemia in pregnant women, based on the chi-square statistical test, which was carried out at a 95% confidence level and produced a p-value of 0.686 (> 0.05). The results of this study are consistent with the results of the study by Tuti Meihartati and Lidia Widia (2017), which found that there was no significant relationship between the prevalence of anemia and nutritional status in the Simpang Empat Health Center area, as indicated by a p-value of 0.624 which is higher than α = 0.05. The sample used in Etik Widhiastuti's study, "The Relationship between Nutritional Status and the Incidence of Anemia in Third Trimester Pregnant Women at the Pleret Bantul Health Center" was 36 third trimester pregnant women who suffered from anemia. There was no statistically significant relationship between nutritional status and the incidence of anemia in third trimester pregnant women at the Pleret Bantul Health Center, based on statistical analysis using the chi-square test at α = 0.05 which produced a p value of 0.725 (p>0.05) (Widhiastuti, 2020).

The results of this study contradict the results of the study by Ismiatul Isnaini (2016) who found a p-value of 0.04 (P <0.05) which indicates a relationship between nutritional status and the prevalence of anemia in pregnant women. Isnaini, Ismiatul (2016). With a p value of 0.00 (P <0.05), the study "The Relationship between Body Mass Index of Pregnant Women and the Incidence of Anemia in the Motoboi Kecil Health Center Work Area" found a relationship between the two. (Fauzan, Moh. Rizki, 2022).

Regarding the correlation between nutritional status and anemia prevalence at Hikun Health Center, most pregnant women with suboptimal nutritional status are at risk of anemia, but some respondents do not experience anemia due to consistent use of iron pills during pregnancy. Respondents who are not at risk of anemia experience the condition due to other characteristics, including age, education, and occupation."

4. Conclusion

The majority of respondents were employed, the majority of pregnant women at the Hikun Health Center had abnormal nutritional status, and the majority of pregnant women did not experience anemia, according to the author's chi-square test analysis of the relationship between nutritional status and anemia prevalence at the facility. This study did not find any relationship between the incidence of anemia at the Hikun Health Center and nutritional status. Regular pregnancy check-ups are recommended for pregnant women to detect anemia. Health workers are expected to provide guidance on the importance of nutrition during pregnancy and can use this study as a reference source.

Reference

Aisyah, S. (2016). Relationship between nutritional status and the incidence of anemia in the third trimester of pregnancy at the Jabung Health Clinic. *Journal of Midwifery, 8*(2), 10. https://doi.org/10.30736/midpro.v8i2.11

Fatkhiyah, N., Salamah, U., Indrastuti, A., & Nurfiati, L. (2022). Correlation study of nutritional status with the incidence of anemia in pregnant women. *Journal of Community Health, 8*(3), 569–575. https://doi.org/10.25311/keskom.vol8.iss3.1295

Hasanah, M. M., Azka, A., & Margiyati, M. (2023). Relationship between nutritional status and the incidence of anemia in pregnant women at Sewon II Health Center in 2023. *Journal of Obstetrics, 10*(1), 39–45. https://doi.org/10.48092/jik.v10i1.225

Marlapan, S., Wantouw, B., & Sambeka, J. (2013). The relationship between nutritional status and the incidence of anemia in pregnant women in the Tuminting Community Health Center, Tuminting District, Manado City. *Nursing Journal, 1*(1).

Mulia, U. S. (2023). Midwifery and complementary care: Relationship between nutritional status and anemia incidence in pregnant women. *01*(02), 73–78.

Mutiarasari, D. (2019). Relationship between nutritional status and the incidence of anemia in pregnant women at Tinggede Health Center. *Healthy Tadulako Journal, 5*(2), 42–48.

Rohani, A., Wathan, F. M., & Yunola, S. (2023). The relationship between nutritional status, ANC visits, and consumption of Fe tablets, and the incidence of anemia in pregnant women in the third trimester at the Pembina Health Center, Palembang in 2022. *IMJ Journal: Indonesia Midwifery Journal, 6*(2), 18–27.

Sari, L. P., Sarwinanti, S., & Djannah, S. N. (2020). Relationship between nutritional status and the incidence of anemia in pregnant women at the Kotagede II Health Center, Yogyakarta. *Jurnal Cakrawala Promkes, 2*(1), 24. https://doi.org/10.12928/promkes.v2i1.1576

Sari, N. V., Muldaniyah, & Asli, K. (2022). Relationship between nutritional status and the incidence of anemia in pregnant women in the Bara-Baraya Makassar Health Center work area. *Zahra: Journal of Health and Medical Research, 2*(3), 204–211.

Siregar, N., Azhari, & Syukur, N. A. (2019). Relationship between nutritional status and the incidence of anemia in pregnant women in the third trimester at the Aminah Amin Clinic, Samarinda in 2018. *Husada Mahakam Journal, IV*(8), 492–504. https://doi.org/10.35963/hmjk.v4i8.159

Sugihastuti, L., Sugesti, R., & Yolandia, R. A. (2022). The relationship between tea drinking habits, compliance with Fe tablet consumption, and nutritional status to the incidence of anemia in pregnant women. *Indonesian Interprofessional Journal of Health, 2*(1), 203–210. https://doi.org/10.53801/jipki.v2i1.42

Susilawati, M. (2016). The relationship between parity and nutritional status with the incidence of anemia in pregnant women. *Journal of Obstetrics, 5*(1), 41–48.

Utama, R. P. (2021). Nutritional status with the incidence of anemia in pregnant women. *Sandi Husada Scientific Journal of Health, 10*(2), 689–694. https://doi.org/10.35816/jiskh.v10i2.680

Widhiastuti, E., & Nawangsih, U. H. E. (2015). The relationship between nutritional status and the incidence of anemia in pregnant women in the third trimester at the Pleret Bantul Health Center (Doctoral dissertation, STIKES Aisyiyah Yogyakarta).

Wirke, N., Afrika, E., & Anggraini, H. (2022). The relationship between ANC visits, compliance with Fe tablet consumption, and nutritional status with the incidence of anemia in pregnant women in the third trimester at the Kutaraya Health Center, Kota Kayuagung District, Ogan Komering Ilir Regency. *Scientific Journal of Batanghari Jambi University, 22*(2), 798–802. https://doi.org/10.33087/jiubj.v22i2.1888