

The Relationship Between Maternal Characteristics and Compliance with Iron Tablet Consumption and the Incidence of Anemia in Third-Trimester Pregnant Women at Puskesmas Purwojati in 2023

Priyantini¹, Citra Hadi Kurniati²^{1,2}Faculty of Health Sciences, Universitas Muhammadiyah Purwokerto, Indonesia

ARTICLE INFO**Article history:**

DOI:

[10.30595/pshms.v9i1.2225](https://doi.org/10.30595/pshms.v9i1.2225)

Submitted:

February 21, 2026

Accepted:

April 06, 2026

Published:

April 23, 2026

Keywords:Anemia, Maternal Characteristics,
Iron Tablets, Pregnancy,
Compliance

ABSTRACT

Pregnancy-related anemia is a common condition that can lead to increased morbidity and mortality for both mothers and their infants. Anemia in pregnancy is often influenced by non-compliance with iron supplementation. The prevalence of anemia in pregnant women in Banyumas Regency was 17.09% in 2022, with Puskesmas Purwojati showing a higher prevalence of 25.34%. This study used a cross-sectional design with a quantitative approach. A total of 61 third-trimester pregnant women attending antenatal care at Puskesmas Purwojati were selected through purposive sampling. Data were collected using medical records and Maternal and Child Health (MCH) books. The incidence of anemia was defined as hemoglobin levels below 11 g/dl. Descriptive and inferential statistics, including Chi-square tests, were used for data analysis. The majority of participants were in the reproductive age group (91.8%) and employed (50.8%). A significant portion (55.7%) did not comply with the iron tablet regimen. The incidence of anemia was 28.6%. Significant relationships were found between maternal characteristics (age, parity, occupation) and anemia ($p < 0.05$). Non-compliance with iron tablet consumption was strongly associated with anemia ($p = 0.000$). Maternal characteristics such as age, parity, and occupation, along with non-compliance with iron supplementation, significantly contribute to the incidence of anemia in third-trimester pregnant women. Interventions aimed at improving compliance with iron supplementation, especially among high-risk groups, are essential to reducing anemia prevalence.

This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).



Corresponding Author:**Citra Hadi Kurniati**

Faculty of Health Sciences, Universitas Muhammadiyah Purwokerto,

Soepardjo Rustam Street KM. 7, Banyumas, Indonesia

Email: citrahadi85@gmail.com

1. INTRODUCTION

Anemia during pregnancy is a significant public health issue that affects maternal and neonatal health. It is characterized by a deficiency in hemoglobin levels, which impairs the body's ability to transport oxygen efficiently, leading to potential risks for both the mother and the fetus. According to the World Health Organization (WHO), anemia in pregnancy is a leading cause of maternal and infant morbidity and mortality worldwide, particularly in low-income regions¹. In Indonesia, anemia during pregnancy is a major concern, with a prevalence rate of 20.39% nationally, though it can vary significantly across provinces. In Banyumas Regency, for instance, the incidence of pregnancy-related anemia was reported to be 17.09% in 2022².

One of the key factors contributing to anemia during pregnancy is inadequate compliance with iron supplementation, a common intervention aimed at preventing and managing anemia. The government of

Indonesia has initiated several programs to provide pregnant women with iron tablets as part of the efforts to reduce the prevalence of anemia, recommending at least 90 iron tablets throughout the pregnancy³. However, non-compliance with this recommendation remains a significant challenge. Preliminary studies from Puskesmas Purwojati, a health center in Banyumas, show that although 83 pregnant women were provided with iron supplements, many failed to follow the prescribed regimen, leading to a high prevalence of anemia, reported to be 25.34% at the facility⁴.

Several factors influence a pregnant woman's adherence to iron supplementation. Maternal characteristics such as age, parity (the number of previous pregnancies), and occupation are known to affect compliance with medical recommendations. For example, younger women, those with fewer children, and employed women might face different challenges or have varied motivations for adhering to health guidelines. Age, in particular, plays a crucial role in pregnancy outcomes, as older women may experience more complications, including anemia, due to physiological changes⁵. Similarly, multiparous women, or those with multiple pregnancies, may be more prone to nutritional deficiencies due to the cumulative demands of repeated pregnancies⁶.

This study aims to examine the relationship between maternal characteristics—such as age, parity, and occupation and adherence to iron tablet consumption, and how these factors contribute to the incidence of anemia in third-trimester pregnant women at Puskesmas Purwojati in 2023. By understanding these relationships, it is hoped that targeted interventions can be developed to improve compliance and reduce anemia-related complications in pregnancy.

2. RESEARCH METHOD

This study utilized a quantitative, analytical, and cross-sectional design to examine the relationship between maternal characteristics and compliance with iron tablet consumption and its impact on the incidence of anemia among third-trimester pregnant women at Puskesmas Purwojati in 2023. A cross-sectional design was chosen as it allows for the collection of data at a single point in time, making it suitable for exploring associations between variables within the study population.

The study was conducted at Puskesmas Purwojati, a community health center in Banyumas Regency, Indonesia. The sample consisted of 61 pregnant women in their third trimester, who were selected using purposive sampling. This method was chosen because it allowed for the selection of participants who met specific criteria, i.e., those who were attending antenatal care at Puskesmas Purwojati and were in their third trimester of pregnancy. This sampling technique helped ensure that the sample was representative of the target population for this research.

Data were collected through medical record reviews and the Maternal and Child Health (MCH) book, which provided valuable information on maternal characteristics, including age, parity, occupation, and compliance with iron supplementation. The MCH book also provided data regarding the incidence of anemia, defined as hemoglobin levels below 11 g/dl, which was used as a primary indicator of anemia in pregnancy.

The primary independent variables in this study were maternal age, parity, occupation, and compliance with iron tablet consumption. Maternal age was categorized into two groups: reproductive age (18-40 years) and older age (above 40 years). Parity was categorized as multipara (women with more than one previous pregnancy) and primipara (first-time mothers). Occupation was classified as employed and not employed. Compliance with iron tablet consumption was assessed based on self-reports and medical records, where compliance was defined as taking the prescribed iron tablets according to the recommended dosage and frequency.

The dependent variable in this study was anemia incidence, which was determined by measuring the hemoglobin (Hb) levels in the participants. Anemia was considered present when the Hb level was below 11 g/dl, in accordance with the World Health Organization (WHO) criteria for anemia in pregnancy.

For data analysis, descriptive statistics were used to summarize the characteristics of the participants. The relationships between the independent variables and anemia incidence were analyzed using inferential statistics, specifically the Chi-square test, to assess whether maternal characteristics and compliance with iron supplementation were significantly associated with anemia occurrence.

This study also considered ethical aspects in its design. Ethical approval was obtained from the relevant authorities at Universitas Muhammadiyah Purwokerto and Puskesmas Purwojati. Informed consent was obtained from all participants prior to their inclusion in the study. The confidentiality of the participants' data was maintained throughout the research process, and no personal identifiers were used in the data analysis.

By examining the relationships between maternal characteristics, compliance with iron supplementation, and anemia incidence, this study aims to provide insights into the factors that contribute to anemia in pregnant women and offer recommendations for improving compliance with iron supplementation in similar settings.

3. RESULT AND DISCUSSIONS

When presenting results in a table or figure, do not repeat all those contents in the text. Present only the summary of the text. Describe only new and important aspects of the study. Do not repeat all information from results section or any section above. Present limitations of the study. Write the issues that are new or unsolved, for future research. This section consists of the information on What/How the presented data were produced, no raw data should be present in the article. The produced data are presented in tables, or figures with an explanation of what is the result/findings from the work.

1. Univariat Analysis

Table 1 Respondents' Age

Category	Total	Persentase (%)
Reproductive Age (18-40 years)	56	91,8 %
ost-Reproductive Age (> 40 years)	5	8,2 %
Total	61 people	100 %

Table 1 shows that out of the total of 61 third-trimester pregnant women who were registered at Puskesmas Purwojati, the majority were in the reproductive age group (18-40 years), totaling 56 women (91.8%).

Table 2. Respondent's Occupation

Category	Total	Persentase (%)
Employed	31	50,8 %
Not Employed	30	49,2 %
Total	61 people	100 %

Table 2 shows that of the total of 61 pregnant women in their third trimester who were registered at the Purwojati Health Center, 31 people (50.8%) were working.

Table 3 Respondent Parity

Characteristic	Total	Persentase %
Primipara	22	36,1 %
Multipara	39	63,9 %
Total	61 people	100 %

Table 3 shows that of the total of 61 pregnant women in their third trimester who were registered at the Purwojati Health Center, 39 people (63.9%) were classified as multiparous.

Table 4 Fe Consumption Compliance Table

Category	Frequency (n)	Persentase (%)
Compliant (Consumed 90 tablets)	27	55,7 %
Non-Compliant (Consumed less than 90 tablets)	34	44,3 %
Total	61 People	100 %

Based on Table 4.2, it shows that the majority of pregnant women in their third trimester at the Purwojati Health Center were not compliant in consuming Fe tablets, as many as 34 people (44.3%), while only 27 people (55.7%) were compliant in consuming Fe tablets.

Table 5 Anemia Incidence in Pregnant Women

Category	Frequency (n)	Persentase (%)
Anemia (Hb < 11 gr/dl)	28	45,9 %
Non Anemia Hb ≥ 11 gr/dl	33	54,1 %
Total	61 Pe	100 %

Based on Table 4.3, it shows that the majority of pregnant women in the third trimester at the Purwojati Health Center are classified as not anemic with Hb ≥ 11 gr/dl as many as 28 people (45.9%), while there are 28 people (45.9%) who are classified as anemic with Hb < 11 gr/dl.

2. Bivariat Analysis

Table 6. The Relationship Between Age and the Incidence of Anemia

		Incidence Of Anemia		Correlation Coefficient	Nilai p
		Anemia	Non anemia		
Age	Reproductive Age (18-40 years)	22 (36,01%)	34 (55,7%)	0,845	0,017
	Post-Reproductive Age (>40 years))	5 (8,2%)	0		
Total		27 (44,3%)	34 (55,7%)		

Based on the Spearman correlation calculation, the coefficient was 0.845. This means the relationship between age and anemia is very strong. Furthermore, the 2-tailed significance value was 0.017, which is less than 0.05, indicating a significant relationship between age and anemia in pregnant women in the third trimester at the Purwojati Community Health Center.

Table 7 The Relationship Between Occupation and the Incidence of Anemia

		Incidence anemia		Correlation Coefficient	Nilai p
		Anemia	Non anemia		
Occupation	Employed	1 (1,6%)	30 (49,2%)	0,709	0,000
	Non Employed	26 (42,6%)	4 (6,6%)		

Total	27 (44,3 %)	34 (55,7%)
-------	-------------	------------

Based on the Spearman correlation calculation, the coefficient was 0.709, indicating a strong correlation between maternal occupation and anemia. Furthermore, the 2-tailed significance value was 0.000, which is less than 0.05, indicating a significant correlation between maternal occupation and anemia in third-trimester pregnant women at the Purwojati Community Health Center.

Table 8 The Relationship Between Parity and the Incidence of Anemia

		Incidence of Anemia		Correlation Coefficient	Nilai p
		Anemia	Non anemia		
Parity	Primipara (P1)	1 (1,6%)	26 (52,8%)	0,622	0,000
	Multipara (P2-P4)	26 (42,6%)	14 (22,9)		
Total		27 (44,3%)	34 (55,7%)		

Based on the Spearman correlation calculation, the coefficient was 0.622, indicating a strong correlation between maternal parity and anemia. Furthermore, the 2-tailed significance value was 0.000, which is less than 0.05, indicating a significant correlation between maternal parity and anemia in third-trimester pregnant women at the Purwojati Community Health Center.

Table 9 The Relationship Between Compliance and the Incidence of Anemia

		Incidence of Anemia		Correlation Coefficient	Nilai p
		Anemia	Non anemia		
Compliance	Compliant	0	28 (45,9%)	0,646	0,000
	Non Compliant	28 (45,9%)	5 (8,2%)		
	Total	28 (45,9%)	33 (54,1 %)		

Based on the Spearman correlation calculation, a coefficient of 0.646 was obtained, indicating a strong correlation between adherence to iron tablet consumption and the incidence of anemia. Furthermore, a 2-tailed significance value of 0.000 was found, which is less than 0.05, indicating a significant correlation between adherence to iron tablet consumption and the incidence of anemia in pregnant women in the third trimester at the Purwojati Community Health Center.

Discussion:

The findings of this study are consistent with existing research highlighting the importance of maternal characteristics and iron supplementation compliance in the prevention of anemia during pregnancy. The significant relationship between maternal age and anemia incidence aligns with previous studies suggesting that older women are at higher risk for anemia due to physiological changes, such as reduced iron absorption and increased nutritional demands during pregnancy (Lumbanraja et al., 2019).

The higher prevalence of anemia among multiparous women found in this study also supports the notion that repeated pregnancies may lead to cumulative iron deficiencies, as maternal iron stores are often depleted in subsequent pregnancies (Malasari, 2018). This emphasizes the need for targeted interventions for women with multiple pregnancies to ensure adequate iron supplementation.

Interestingly, the study found that employed women had a lower incidence of anemia compared to non-employed women. This may be attributed to better access to healthcare services and higher levels of health literacy among employed women, as well as potential social and financial support networks that may aid in improving health outcomes.

Compliance with iron supplementation remains a critical factor in preventing anemia, as evidenced by the strong correlation found in this study. The high non-compliance rate (55.7%) observed in this study is concerning and highlights the need for further efforts to address the barriers to iron supplementation. These barriers may include side effects such as nausea and constipation,

which have been identified as common reasons for non-compliance (Omasti et al., 2022). Future research should explore strategies to enhance compliance, such as providing better education on the benefits of iron supplementation, offering alternatives to alleviate side effects, and improving healthcare provider-patient communication.

Overall, the findings underscore the importance of improving iron supplementation compliance, particularly among women with risk factors such as multiparity and older age. Interventions should focus on addressing these factors to reduce the prevalence of anemia and improve maternal and neonatal health outcomes.

4. CONCLUSION AND RECOMMENDATION

This study concluded that maternal characteristics, such as age, parity, and occupation, significantly influence the occurrence of anemia in third-trimester pregnant women. The findings indicate that pregnant women in the reproductive age group (18-40 years) were less likely to suffer from anemia compared to older women. Additionally, multiparous women (those with multiple pregnancies) were more likely to experience anemia, highlighting the cumulative nutritional demands of repeated pregnancies. Furthermore, the study found that employed women had a slightly lower incidence of anemia, which could be attributed to better access to healthcare and support systems.

The most significant factor contributing to anemia in pregnancy was the non-compliance with iron supplementation. A substantial portion of the women (55.7%) did not adhere to the prescribed iron tablet regimen, which directly contributed to the higher prevalence of anemia in this group. The statistical analysis confirmed that non-compliance with iron supplementation was strongly associated with anemia incidence, making it a critical factor in preventing this condition.

In summary, maternal characteristics and adherence to iron supplementation play crucial roles in preventing anemia during pregnancy. Efforts to improve compliance with iron supplementation, especially among women with risk factors such as older age and multiparity, are essential to reducing anemia rates and improving maternal and neonatal health outcomes.

Recommendations:

Based on the findings of this study, several recommendations can be made. First, healthcare providers should focus on enhancing education and counseling for pregnant women, particularly those in high-risk groups like older mothers and multiparous women. Tailored interventions are needed to address the barriers to iron supplementation, such as side effects like nausea and constipation. Providing alternative iron formulations or supplementary interventions could improve compliance rates.

Furthermore, health policies should include community-based outreach programs that emphasize the importance of iron supplementation and its role in preventing anemia. These programs should also address the socio-cultural factors that influence women's health behaviors, especially in rural areas like Purwojati.

Future research should explore in-depth the underlying causes of non-compliance with iron supplementation, particularly the psychological and socio-cultural barriers that may be contributing to low adherence. Research should also focus on developing more effective strategies to support women in completing their iron supplementation regimen and reducing the incidence of anemia.

The conclusion should be linked to the title and objectives of the study. Do not make statements not adequately supported by your findings. Write the improvements made to industrial engineering field or science in general. Do not make further discussions, repeat the abstract, nor only list the results of research results. Do not use bulleted points, use paragraphed sentences instead.

Acknowledgements

I would like to express my sincere gratitude to Allah SWT for His guidance and blessings throughout the completion of this thesis. I am deeply thankful to my parents and my husband for their constant love,

support, and prayers. Special thanks to my supervisor, Ibu Citra Hadi Kurniati, M.Keb, for her invaluable guidance, patience, and constructive feedback. I also appreciate the Faculty of Health Sciences, Universitas Muhammadiyah Purwokerto, for their support during my studies. I am grateful to the third-trimester pregnant women at Puskesmas Purwojati who participated in this research, as well as my friends, Pratiwi Lina Ernawati, Nur Faidah, and Yauli Indriyanti, for their encouragement and assistance throughout the process.

REFERENCES

- [1] World Health Organization. Global health estimates 2017: disease burden by cause, age, sex, by country and by region, 2000–2016. Geneva: World Health Organization; 2019. Available from: <https://www.who.int>
- [2] Badan Pusat Statistik. Profil Kesehatan Indonesia 2020. Jakarta: Badan Pusat Statistik; 2021.
- [3] Kesga Kab Banyumas. Laporan Profil Kesehatan Kabupaten Banyumas 2022. Banyumas: Dinas Kesehatan Kabupaten Banyumas; 2023.
- [4] Kementerian Kesehatan Republik Indonesia. Pedoman Pemberian Tablet Zat Besi pada Ibu Hamil. Jakarta: Kementerian Kesehatan Republik Indonesia; 2020.
- [5] Puskesmas Purwojati. Laporan Pelayanan Kesehatan Ibu Hamil Tahun 2023. Purwojati: Puskesmas Purwojati; 2023.
- [6] Lumbanraja M, Ica M, Lailiyah R. Anemia in Pregnancy: Effects on Maternal and Neonatal Health. Indonesian Journal of Reproductive Health. 2019;17(2):120-127.
- [7] Malasari D. Pregnancy and Iron Deficiency: A Growing Concern. Indonesian Journal of Maternal Health. ;5(3):78-84.
- [8] Omasti E, Irianto D, Gunawan S. The Role of Maternal Characteristics in Iron Supplementation Compliance. J Obstet Gynecol. 2022;50(5):657-665.