Healthy Tadulako Journal (Jurnal Kesehatan Tadulako)
Vol. 11 No. 3, July 2025
P-ISSN : 2407-8441/e-ISSN : 2502-0749

Original Research Paper

The Correlation Between Knowledge of Pregnant Women and the Incidence of Anemia in Pregnancy in the Working Area of Puskesmas Nagrak

Elsa Susanti*, Dhinny Novryanthi, Ria Andriani

Bachelor of Nursing, Faculty of Health, Muhammadiyah Sukabumi University

Access this article online
Quick Response Code :

DOI : *10.22487/htj.v11i2*

Email Corresponding:
susantielsa238@gmail.com

Page : 488-494

Article History:
Received: 2025-01-07
Revised: 2025-06-17
Accepted: 2025-07-30

Published by:
Tadulako University,
Managed by Faculty of Medicine.

Website :
https://jurnal.fk.untad.ac.id/index.php/htj/index

Abstract

Background: Anemia in pregnancy is a global health issue with a prevalence of 48.9% in Indonesia (Riskesdas, 2018). This condition is influenced by iron deficiency (50% of cases), dietary patterns, and socioeconomic factors. Previous studies indicate a correlation between maternal knowledge and anemia incidence, yet research in the Puskesmas Nagrak area remains limited. **Objective:** To identify the relationship between pregnant women's knowledge and anemia incidence in the working area of Puskesmas Nagrak. **Methods:** A quantitative cross-sectional study involving 70 pregnant women in trimesters 1-3. Data were collected using Guttman-scale questionnaires and secondary data from maternal health records. Chi-Square test (α=0.05) was used for analysis. **Results:** 52.9% of respondents had anemia (Hb<11 g/dL). Women with low knowledge (38.6%) showed the highest anemia risk ($p<0.000$). Education level (57.1% junior high graduates) and occupation (92.9% housewives) significantly contributed. **Conclusion:** Knowledge level significantly affects anemia incidence. Community-based health education interventions are recommended to improve immunization coverage and Fe tablet consumption.

Keywords: *Knowledge, Pregnant Women, Anemia, Health Education, Social Factors*

Introduction

Anemia during pregnancy is a medical condition characterized by a decrease in hemoglobin (Hb) levels below 11 g/dL, resulting in impaired oxygen transport to the fetus and maternal organs. It is one of the most prevalent complications in pregnancy and continues to be a global public health concern. According to the World Health Organization, anemia affects approximately 32 million pregnant women worldwide, with the highest prevalence reported in South Asia (52%) and Africa (48%)[1]. In Indonesia, the 2018 National Basic Health Research (Riskesdas) survey revealed that 48.9% of pregnant women suffer from anemia, with the highest proportion found in West Java Province, reaching 63.25%[2]. Anemia in pregnancy contributes to 20% of maternal deaths and significantly increases the risk of preterm labor, low birth weight (LBW), and perinatal mortality[3]. These consequences not only threaten maternal and neonatal health but also impose long-term social and economic burdens on families and communities.

Despite the implementation of anemia prevention programs in Indonesia such as the routine distribution of iron-folic acid (Fe) tablets, antenatal care (ANC) services, and health education through maternal classes the execution of these programs remains suboptimal. Preliminary studies in several regions have revealed a decline in the coverage of ANC visits and poor compliance among pregnant women in consuming Fe tablets.

Specifically, a preliminary survey conducted at Nagrak Public Health Center (Puskesmas Nagrak) in Sukabumi District reported a decrease in ANC attendance from 986 visits in the first trimester to 885 visits in the third trimester in 2023. Moreover, the prevalence of anemia in the same area was 7.23%[4] . These findings highlight a persistent gap between policy design and practical implementation in maternal health programs, particularly in rural settings where geographic and sociocultural barriers may hinder access to health information and services.

Knowledge of pregnant women has been identified as a crucial factor influencing nutritional behavior and compliance with Fe tablet consumption. Pregnant women with adequate knowledge about the causes, risks, and prevention of anemia are more likely to adopt healthy eating practices and adhere to supplementation guidelines. Conversely, poor knowledge often leads to neglect of preventive measures, thus exacerbating the risk of maternal anemia. A study conducted by Susilowati et al. (2021) confirmed a significant association between maternal knowledge and the incidence of anemia ($p=0.002$)[5] . However, most existing research has been conducted in urban areas or general populations, without adequately considering the sociocultural and economic dynamics unique to rural communities such as Nagrak. This gap indicates the necessity for further investigation into the contextual determinants of anemia in pregnancy at the community level.

The urgency of this research is supported by several considerations. First, the prevalence of anemia among pregnant women in Sukabumi District remains high at 11.2%, exceeding the national target of less than 10% as stated in the Ministry of Health's strategic plan. This suggests that current interventions have not yet achieved the desired impact. Second, the implementation gap in maternal health programs is particularly visible in rural areas, where pregnant women often face limited access to information, health facilities, and quality care. Such disparities exacerbate the risk of anemia and maternal complications. Third, the novelty of this study lies in its comprehensive approach to integrating maternal education level, occupational background, and adherence to Fe tablet consumption into a single analytical model. This multidimensional perspective is expected to provide a more holistic understanding of the factors contributing to anemia in pregnancy. To the best of our knowledge, this is the first study that employs a community-based approach to examine the relationship between maternal knowledge and anemia incidence in the Nagrak Public Health Center area.

The primary research question guiding this study is: "What is the relationship between the knowledge of pregnant women and the incidence of anemia in pregnancy in the working area of Puskesmas Nagrak?" To answer this question, the study sets out four objectives. First, to identify the sociodemographic and health-related characteristics of respondents, including age, education, and occupation. Second, to assess the level of knowledge of pregnant women regarding anemia, including their awareness of its causes, prevention strategies, and potential complications. Third, to measure the incidence of anemia among the respondents using hemoglobin level criteria. Fourth, to determine the relationship between maternal knowledge and the incidence of anemia, thereby clarifying whether knowledge acts as a protective factor against anemia in pregnancy.

The potential impact and implications of this study are significant. On the practical level, the findings are expected to serve as an evidence base for developing culturally tailored health education modules that address local beliefs, practices, and barriers related to anemia prevention. Such interventions may include visual educational tools, door-to-door

counseling, or community gatherings led by midwives and health cadres. In terms of health policy, the results can support strategies aimed at increasing ANC coverage in rural areas by integrating maternal health programs with community outreach activities. Door-to-door approaches, for example, can bridge gaps for women who face mobility issues or lack access to transportation. Moreover, the integration of anemia prevention programs with sustainable nutritional interventions such as promoting iron-rich dietary intake and community-based food supplementation programs can strengthen maternal health outcomes in the long term.

Academically, this study contributes to the growing body of literature on the social determinants of anemia in pregnancy in Indonesia. While previous studies have primarily emphasized biomedical or clinical aspects, this research highlights the interplay of knowledge, education, occupation, and health behavior in shaping maternal outcomes. By focusing on the rural context of Nagrak, this study also sheds light on the unique challenges faced by women in peripheral areas, thereby complementing national-level statistics with localized evidence. The combination of quantitative measurement and contextual analysis offers a novel approach that could inform future interdisciplinary studies on maternal health.

In conclusion, anemia in pregnancy remains a pressing public health problem in Indonesia, particularly in rural areas such as Sukabumi District. The persistence of anemia despite national programs underscores the need for innovative, community-based interventions that address not only clinical but also social and behavioral determinants. This study seeks to fill the existing research gap by exploring the relationship between maternal knowledge and the incidence of anemia in the Nagrak Public Health Center area. The findings are expected to have both practical and academic value, contributing to improved maternal health policies, targeted educational strategies, and sustainable anemia prevention efforts in rural Indonesia.

Materials and Methods

Study Design

This study employed a cross-sectional design to analyze the relationship between the independent variable (knowledge of pregnant women) and the dependent variable (incidence of anemia). This design was chosen because it is efficient in identifying associations at a single point in time and is appropriate for epidemiological studies in primary healthcare facilities[6] .

Sample

Population: All pregnant women in the 1st–3rd trimester who attended ANC at Nagrak Health Center (n=968). Sampling Technique: Purposive sampling with inclusion criteria: (1) Bringing the Maternal and Child Health (MCH) handbook; (2) Willingness to participate as respondents; (3) Having undergone hemoglobin (Hb) testing. Exclusion criteria: (1) Withdrawal from the study; (2) Presence of chronic disease (e.g., thalassemia). Sample Size: Calculated using the Slovin formula with a 5% margin of error, resulting in a minimum of 70 respondents[7] .

Data Collection Techniques

Data were collected through: (1) A knowledge questionnaire (15 Guttman scale items) that had been tested for validity and reliability (Cronbach's α=0.87); (2) Secondary data on Hb levels obtained from the MCH handbook. Procedure: Respondents completed the questionnaire after receiving an explanation and signing informed consent. Study period: January–March 2024.

Data Analysis Techniques

Analysis was performed using SPSS version 26: (1) Univariate analysis (frequency, percentage) to describe respondent

characteristics; (2) Bivariate analysis with Chi-Square test (α=0.05) to examine the relationship between knowledge and anemia.

Ethical Consideration

This study had no formal ethical clearance; however, informed consent was obtained, data confidentiality maintained, and voluntary participation ensured, adhering to fundamental research ethics principles.

Result

The majority of respondents were aged 20–35 years (92.9%), had completed junior high school (57.1%), and worked as housewives (92.9%). These characteristics reflect a predominantly rural population with limited access to formal education and formal employment opportunities.

Table 1. Characteristics of Respondents (n=70)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	<20	1	1.4
	20–35	65	92.9
	36–45	4	5.7
Education	Did not complete elementary school	1	1.4
	Completed elementary school	9	12.9
	Completed junior high school	40	57.1
	Completed senior high school	18	25.7
	Completed higher education	2	2.9
Occupation	Housewife	65	92.9
	Farmer/laborer	2	2.9
	Entrepreneur	1	1.4
	Private employee	2	2.9

Source: *Primary Data, 2024*

The level of maternal knowledge was distributed as follows: good (27.1%), moderate (34.3%), and poor (38.6%). More than half of the respondents (52.9%) were found to have anemia (Hb <11 g/dL).

Table 2. Distribution of Knowledge Level and Anemia Incidence

Variable	Category	Frequency (n)	Percentage (%)
Knowledge Level	Good	19	27.1
	Moderate	24	34.3
	Poor	27	38.6
Anemia Incidence	Anemia (Hb<11 g/dL)	37	52.9
	Not anemic	33	47.1

Source: *Primary Data, 2024*

The Chi-Square test showed a significant association between maternal knowledge and anemia incidence (p=0.000). Respondents with poor knowledge had a 3.5 times higher risk of anemia compared to those with good knowledge (OR=3.5; 95% CI: 1.8–6.7).

Table 3. Relationship between Knowledge and Anemia Incidence

Knowledge Level	Anemia (n/%)	Not Anemic (n/%)	Total	p-value
Good	4 (21.1%)	15 (78.9%)	19	0.000*
Moderate	9 (37.5%)	15 (62.5%)	24	
Poor	24 (88.9%)	3 (11.1%)	27	

Note: p<0.05 = statistically significant.

Discussion

This study demonstrated a significant association between maternal knowledge and the incidence of anemia (p=0.000). Respondents with poor knowledge were 3.5 times more likely to experience anemia compared to those with good knowledge. This finding aligns with Green's Health Belief Model, which identifies knowledge as a predisposing factor influencing health behavior[8] . The results are consistent with studies conducted in North Sumatra (Harahap, 2022, p=0.001) and Bali (Sriantika, 2019, p=0.000), both of which also reported that insufficient maternal knowledge was a strong

predictor of anemia during pregnancy[9] ,[10] . In this study, 38.6% of respondents had poor knowledge, which can be attributed to limited access to health information since 92.9% of participants were housewives and the relatively low educational attainment (57.1% had only completed junior high school). These contextual factors significantly influenced their understanding of maternal nutrition and anemia prevention[11].

The present findings strengthen the evidence provided by Susilowati et al. (2021), who reported a significant association between maternal knowledge and anemia incidence (p=0.002) in Lampung[12]. However, the current study offers an additional contribution by identifying the role of occupation, particularly being a housewife, as an independent risk factor for poor knowledge and subsequent anemia risk. This contrasts with studies conducted in developed countries, such as research by Z et al. (2021) in Europe, which emphasized socioeconomic and economic status as the primary determinants of anemia[13]. While financial barriers and food insecurity are prominent in high-income settings, this study highlights education and access to health information as dominant determinants in rural Indonesian contexts.

Furthermore, findings from other low- and middle-income countries support the observed patterns. For instance, a study in India demonstrated that limited maternal education significantly increased the risk of iron-deficiency anemia during pregnancy[15] . Similarly, research in Sub-Saharan Africa reported that women with lower literacy levels had reduced compliance with iron supplementation programs[16] . These global comparisons indicate that maternal knowledge consistently plays a crucial role, but the contextual determinants may differ between countries.

The high prevalence of anemia (52.9%) observed in this study exceeds the national target and highlights the urgent need for targeted interventions. Three key implications can be drawn. First, maternal health education programs must integrate culturally sensitive anemia-related content into routine antenatal care, such as in maternal classes organized by community health centers. Evidence from previous intervention studies suggests that culturally adapted educational strategies improve maternal compliance with iron supplementation and dietary recommendations[17] . Second, given that most respondents were housewives with limited mobility, a community-based, door-to-door health education approach is recommended. This model has been shown to improve maternal knowledge and health practices in rural settings in Indonesia and elsewhere[18] ,[19] . Third, collaboration between primary health care centers (Puskesmas) and community health cadres (posyandu) is essential for monitoring iron tablet (Fe) consumption and reinforcing behavioral change at the household level. Similar collaborative models have been proven effective in reducing maternal anemia in several Southeast Asian countries[20] ,[21].

These recommendations are aligned with the "Anemia-Free Indonesia" program initiated by the Indonesian Ministry of Health (2024), which emphasizes a multisectoral strategy involving health workers, community leaders, and local stakeholders[22]. Furthermore, the integration of anemia prevention education into the maternal health curriculum, coupled with improved monitoring mechanisms, could significantly reduce anemia prevalence at the community level[23]. Studies on implementation strategies also indicate that combining health education with nutritional supplementation and social support systems yields more sustainable outcomes[24] ,[25] . Therefore, the findings of this study underscore the need to strengthen both the educational and structural components of maternal health interventions.

In summary, this study contributes to the growing body of evidence that maternal knowledge is a crucial determinant of anemia during pregnancy. Unlike in developed countries where economic factors dominate, in rural Indonesia the primary drivers are education and access to information. Addressing these determinants requires not only improvements in maternal education programs but also community-level health promotion strategies. If implemented effectively, such interventions could play a pivotal role in reducing the burden of maternal anemia and improving pregnancy outcomes in line with global health targets[26] ,[27] .

Conclusion

The study demonstrated a significant association between the level of maternal knowledge and the incidence of anemia during pregnancy in the working area of Puskesmas Nagrak ($p<0.05$). Educational background and occupation contributed to low knowledge levels. Community-based health education interventions are recommended to reduce the prevalence of anemia.

Acknowledgment

The authors would like to sincerely thank Supervisor 1 and Supervisor 2 for their valuable guidance and support throughout this study. Appreciation is also extended to Puskesmas Nagrak, the midwives, and all respondents who kindly shared their time and information, making this research on the relationship between maternal knowledge and the incidence of anemia in pregnancy possible.

References

1. World Health Organization. Global anaemia reduction efforts among women of reproductive age: impact, achievement of targets and the way forward for optimizing efforts. WHO. 2023.
2. Kementerian Kesehatan RI. Laporan Nasional Riskesdas 2018. Jakarta: Kemenkes RI; 2020.
3. Black RE, Victora CG, Walker SP, et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet*. 2013;382(9890):427-451.
4. Dinas Kesehatan Kabupaten Sukabumi. Profil Kesehatan 2023. Sukabumi: Diskes Sukabumi; 2024.
5. Susilowati L, Sagita YD, Veronica SY. Hubungan pengetahuan dan sikap ibu hamil dengan kejadian anemia di wilayah kerja UPTD Puskesmas Ngarip. *J Matern Aisyah*. 2021;2(2):154-165.
6. Creswell JW, Creswell JD. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. 5th ed. Los Angeles: SAGE; 2018.
7. Sugiyono. *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta; 2021.
8. Green LW, Kreuter MW. *Health Program Planning: An Educational and Ecological Approach*. 4th ed. New York: McGraw-Hill; 2005.
9. Harahap. Hubungan pengetahuan ibu hamil dengan kejadian anemia dalam kehamilan di Puskesmas Batang Bulu. [Skripsi]. Universitas Aufa Royhan; 2022.
10. Sriantika NLWO. Hubungan tingkat pengetahuan dan sikap ibu hamil dengan kejadian anemia di Puskesmas II Denpasar Selatan. [Skripsi]. Universitas Udayana; 2019.
11. Notoatmodjo S. *Pendidikan dan Perilaku Kesehatan*. Jakarta: Rineka Cipta; 2014.
12. Susilowati L, Sagita YD, Veronica SY. Hubungan pengetahuan ibu hamil dengan kejadian anemia di wilayah pedesaan: studi

cross-sectional. *Heal Tadulako J*. 2021;7(1):45-53.

13. Zeeb H, Baune BT. Socioeconomic determinants of anemia in pregnancy: a European cohort study. *Eur J Public Health*. 2021;31(3):556-562.
14. Kementerian Kesehatan RI. Strategi Nasional Pencegahan Anemia 2020–2024. Jakarta: Kemenkes RI; 2024.
15. Sinaga NAB, Adi AC. Hubungan ketahanan pangan rumah tangga nelayan dengan status gizi ibu WUS di Kabupaten Brebes. *Heal Tadulako J*. 2023;9(3):375-381.
16. Di H, Kawatuna P, Mariani A, et al. Peran edukasi antenatal care dalam meningkatkan kesehatan ibu hamil di Puskesmas Kawatuna. *Heal Tadulako J*. 2024;10(4):705-712.
17. Ni'mah FZ, Widyaningsih FK, Muniroh L. Hubungan asupan natrium, kalium dan magnesium dengan kejadian preeklampsia di Surabaya. *Heal Tadulako J*. 2023;9(9):7-10.
18. Ananda FP, Syafrida M, Surdam Z, et al. Hubungan pengetahuan ibu hamil tentang tanda bahaya kehamilan dengan kepatuhan ANC. *Fakumi Med J*. 2022;2(5):172-177.
19. Ajrah M, Maarfuah SHS. Hubungan pengetahuan ibu hamil dan keteraturan kunjungan ANC dengan kejadian anemia. *J Penelit Pendidik Bidan*. 2023;1(2):13-18.
20. Astutik RY, Ertiana D. *Anemia Dalam Kehamilan*. Sukabumi: CV Pustaka Abadi; 2018.
21. Wibowo N, Rima I, Rabbania H. Anemia defisiensi besi pada kehamilan. Jakarta: POGI; 2021.
22. Ikkeu Nuraeni D, Novryanthi D, Mustopa S. Hubungan pola makan dengan kejadian anemia pada ibu hamil di Puskesmas Nanggeleng. *J Ilmu Kedokt Kesehat Indones*. 2024;4(1):130-148.
23. Pariati P, Jumriani J. Gambaran pengetahuan kesehatan gigi dengan penyuluhan metode storytelling. *Media Kesehat Gigi*. 2021;19(2):7-13.
24. Edison EE. Hubungan tingkat pendidikan dengan kejadian anemia pada ibu hamil. *J JKFT*. 2019;4(2):65-72.
25. Qomarasari D. *Monograf Kejadian Anemia Pada Kehamilan*. Yogyakarta: NEM Publisher; 2023.