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Association between iron tablet utilization and anemia status in pregnant women at Woyla Timur Community Health Center

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ABSTRACT

Anemia in pregnant women remains a health problem that can increase the risk of complications for the mother and fetus. One effort to prevent anemia during pregnancy is through regular consumption of iron tablets. However, the level of compliance of pregnant women in consuming iron tablets remains a challenge in maternal health programs. This study is a quantitative analytical study with a cross-sectional approach, which was conducted in the Working Area of the Woyla Timur Community Health Center, West Aceh Regency in January 2026. The study population was all 50 pregnant women in the third trimester. The sampling technique used total sampling so that the entire population was used as a research sample. Data were analyzed using the Chi-square test to examine the association between iron tablet utilization and anemia status among pregnant women receiving antenatal care at the Woyla Timur Community Health Center. The study findings demonstrated a statistically significant association between iron tablet utilization and anemia status among pregnant women receiving antenatal care at the Woyla Timur Community Health Center. The results of the Chi-Square test analysis obtained a p-value = 0.000 (p <0.05). A statistically significant association was observed between iron tablet utilization and anemia status among pregnant women at the Woyla Timur Community Health Center. Based on these findings, interventions focused on education, counseling, and regular monitoring should be enhanced to support optimal iron tablet utilization during pregnancy.

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1. INTRODUCTION

Anemia in pregnancy remains one of the most common public health problems worldwide and contributes significantly to increased maternal and neonatal morbidity and mortality (Fite et al., 2022). According to a recent report from the World Health Organization, anemia affects approximately 37–40% of pregnant women globally, with the majority of cases being caused by iron deficiency. This condition can increase the risk of preterm delivery, low birth weight, preeclampsia, postpartum hemorrhage, and even maternal and infant mortality. Anemia also impacts the quality of life of pregnant women by causing fatigue, decreased productivity, and impaired immune function during pregnancy (World Health Organization, 2025).

During pregnancy, the demand for iron rises substantially due to physiological adaptations, including expansion of maternal blood volume, enhanced red blood cell production, fetal and placental growth, as well as anticipated blood loss at childbirth. Insufficient fulfillment of these physiological requirements can predispose pregnant women to iron deficiency anemia, the predominant type of anemia during pregnancy. Therefore, iron and folic acid supplementation is recommended as the primary intervention for preventing anemia in pregnant women (Munyogwa et al., 2024; Srivastava et al., 2025).

Various countries have implemented iron tablet supplementation programs as an integral component of antenatal care services. Despite these efforts, maternal anemia continues to represent a major public health concern, particularly in low- and middle-income countries. Evidence suggests that the effectiveness of supplementation programs is often limited by suboptimal iron tablet utilization during pregnancy. Inadequate use of iron tablets may prevent pregnant women from meeting their increased nutritional requirements, thereby reducing the potential benefits of supplementation and contributing to unfavorable anemia status (Mare et al., 2024).

Optimal iron tablet utilization is considered an important component of anemia prevention efforts during pregnancy. Recent evidence indicates that women who regularly use iron tablets tend to achieve more favorable hemoglobin levels than those with inconsistent utilization. Conversely, inadequate iron tablet utilization may limit the ability to meet the increased iron demands of pregnancy, thereby contributing to unfavorable anemia status, particularly during the second and third trimesters when physiological requirements are substantially elevated (Ejara et al., 2024).

Previous studies have consistently reported that iron tablet utilization during pregnancy remains below the desired level. A study conducted in Ghana found that the utilization of iron tablets was still suboptimal among a proportion of pregnant women despite the availability of supplementation through routine healthcare services. Several factors were identified as barriers to optimal utilization, including forgetfulness, limited knowledge regarding the benefits of iron supplementation, concerns about potential side effects, and insufficient family support during pregnancy (Seidu et al., 2024).

A study conducted in Botswana reported that adverse effects, including nausea, vomiting, constipation, and gastrointestinal discomfort, were among the primary factors contributing to suboptimal iron tablet utilization during pregnancy. In addition, inadequate health education from healthcare providers limited some women's understanding of the benefits of iron tablet use and its role in maintaining maternal health during pregnancy. These findings suggest that behavioral factors, together with the quality of health education and counseling, are important determinants of optimal iron tablet utilization among pregnant women (Kebaabetswe et al., 2024).

The effectiveness of iron tablet supplementation programs is strongly influenced by pregnant women's engagement with maternal healthcare services. Antenatal care serves as an important platform for promoting optimal iron tablet utilization throughout pregnancy. Evidence from a multicountry study conducted in several African countries demonstrated that women who attended antenatal care services regularly were more likely to utilize iron tablets appropriately than those with limited use of prenatal healthcare services. Repeated antenatal care visits provide opportunities for healthcare professionals to deliver individualized health education, address concerns related to iron tablet use, and monitor maternal health conditions. These interactions may contribute to improved iron tablet utilization and support favorable anemia status among pregnant women (Munyogwa et al., 2024).

The beneficial role of optimal iron tablet utilization in maintaining maternal hematological health has been consistently reported in previous studies. Research conducted in Ethiopia demonstrated that pregnant women with inadequate iron tablet utilization were more likely to experience anemia than those who utilized iron tablets appropriately. Insufficient utilization of iron tablets may limit the body's ability to meet the increased iron demands of pregnancy, resulting in depleted iron stores and a gradual decline in hemoglobin levels (Abeje et al., 2023).

In Indonesia, anemia in pregnant women remains a health problem that requires serious attention. Although iron supplementation programs have long been implemented through antenatal care, anemia among pregnant women remains prevalent in various regions. Research in West Java has shown that appropriate iron tablet utilization during pregnancy is associated with improved anemia status and has a positive impact on infant health after birth. However, the success of the program is still constrained by suboptimal iron tablet utilization among pregnant women (Sartika et al., 2024).

Maternal anemia remains one of the most prevalent nutritional disorders worldwide. Data reported for 2021 demonstrated considerable regional variation in the burden of anemia during pregnancy, affecting approximately 57.1% of pregnant women in Africa and 48.2% in Asia, compared with 24.1% in the Americas and 25.1% in Europe. Overall, the global burden of anemia among pregnant women was estimated to range from 40% to 80% (World Health Statistics, 2023). Anemia remains a major health concern among pregnant women worldwide. Estimates reported for 2021 indicated that between 40% and 80% of pregnant women were affected by anemia globally. In Indonesia, national survey data showed that 48.9% of pregnant women experienced anemia in 2018, reflecting the substantial burden of this condition at the national level. Compared with the 37.1% prevalence reported in 2013, these data reflect a substantial increase over the five-year period. Data from 2018 indicated that 38.1% of pregnant women received at least 90 iron tablets, while 61.9% received fewer than 90 iron tablets. Data from 2018 indicated that 38.1% of pregnant women received at least 90 iron tablets, while 61.9% received fewer than 90 iron tablets (Ministry of Health of the Republic of Indonesia, 2018).

Although province wide data concerning maternal anemia rates throughout Aceh Province are not yet publicly available, findings from several local studies suggest that maternal anemia remains a persistent public health concern in the region. This situation is reflected in the suboptimal utilization of iron supplementation during pregnancy. Available reports indicate that the proportion of pregnant women who reached the minimum recommended intake of 90 iron tablets was only 20.53%, highlighting the ongoing challenges in achieving adequate adherence to iron supplementation recommendations (Health Research and Development Agency, 2018). Research in the Baitussalam Community Health Center in Aceh Besar Regency reported an anemia prevalence of 67.7%, while in Central Aceh Regency it reached 57.8%, indicating that anemia in pregnant women still requires serious attention in Aceh Province (Nisak, 2024).

Despite substantial evidence regarding iron tablet utilization and maternal anemia, important knowledge gaps remain that justify further investigation. Previous studies have predominantly been conducted in low- and middle-income countries, particularly in Africa, and have mainly focused on identifying determinants of iron tablet utilization such as maternal education, socioeconomic status, family support, side effects, and access to antenatal care services. While these findings provide valuable insights, their applicability to the Indonesian context may be limited due to differences in sociocultural characteristics, health system structures, and patterns of maternal healthcare utilization. In Indonesia, existing studies have largely focused on coverage and determinants of iron tablet distribution rather than directly examining the relationship between iron tablet utilization and anemia status among pregnant women at the primary healthcare level. Moreover, evidence regarding this relationship in specific local settings such as Aceh Province, particularly at the Woyla Timur Community Health Center, remains limited.

Several indicators suggest that maternal anemia in Woyla Timur remains a significant public health problem that may require more targeted interventions beyond routine antenatal care programs. The prevalence of anemia among pregnant women in the Woyla Timur Community Health Center area reached 59.3% in 2024, indicating that current prevention efforts have not achieved optimal results. In addition, preliminary observations showed that 10 out of 15 pregnant women did not regularly consume iron tablets as recommended, while limited maternal knowledge and the presence of side effects such as nausea and dizziness further contributed to suboptimal utilization. These findings indicate that the problem is not only related to the availability of iron

supplementation but also influenced by behavioral and educational factors. Therefore, it remains unclear whether iron tablet utilization is significantly associated with anemia status in this population. Addressing this gap is essential to generate context-specific evidence that can support the development of targeted interventions to improve iron tablet utilization and reduce the burden of maternal anemia.

Based on this phenomenon, researchers were interested in conducting research on "Association Between Iron Tablet Utilization and Anemia Status Among Pregnant Women Receiving Antenatal Care at Woyla Timur Community Health Center".

2. RESEARCH METHOD

This research design is an analytical quantitative study with a cross-sectional approach to measure independent and dependent variables simultaneously at one observation time, thus enabling researchers to analyze the relationship between variables in a population (Denise F. Polit, 2024). This study aims to determine the relationship between compliance with consuming iron tablets and the incidence of anemia in pregnant women in the Woyla Timur Community Health Center Work Area. This study aimed to investigate the association between iron tablet utilization and anemia status among pregnant women attending antenatal care services at the Woyla Timur Community Health Center, in January 2026. The population in this study were all third trimester pregnant women in the Woyla Timur Community Health Center work area, totaling 50 people. The sample for this study was taken with a total sampling of 50 people. Pregnant women were categorized as “compliant” if they consumed at least 90 iron tablets during pregnancy, as recommended by the Indonesian Ministry of Health and WHO guidelines, while those who consumed fewer than 90 tablets were categorized as “non-compliant.” Anemia status among pregnant women was classified based on hemoglobin (Hb) levels measured during antenatal care visits. According to the World Health Organization (WHO) criteria, pregnant women with Hb 10.0–10.9 g/dL were classified as having mild anemia, Hb 7.0–9.9 g/dL as moderate anemia, and Hb <7.0 g/dL as severe anemia. For the purpose of statistical analysis use chi-square analysis was performed to examine the association between iron tablet utilization and anemia status among pregnant women receiving antenatal care at the Woyla Timur Community Health Center.

3. RESULTS AND DISCUSSIONS

Results

Table 1. Frequency distribution of compliance levels in consuming iron tablets among pregnant women in the working area of the Woyla Timur Community Health Center

Compliance Level	F	%
Compliant	31	62.0
Non compliant	19	38.0
Total	50	100

Primary data (Processed, 2026)

Based on table 1, it shows that the majority of respondents were compliant, namely 31 people (62.0%).

Table 2. Frequency distribution of anemia incidence in pregnant womenin the working area of the Woyla Timur Health Center

Anemia Incident	F	%
Mild Anemia	27	65.4
Moderate Anemia	23	35.9
Severe Anemia	0	0.0
Total	50	100

Primary data (Processed, 2026)

Based on table 2, it shows that the majority of respondents with mild anemia were 27 people (65.4%).

Table 3. Association between iron tablet utilization and anemia status among pregnant women receiving antenatal care at Woyla Timur Community Health Center

Compliance level	Anemia Incidence						Total	*P-Value*
	Mild anemia		Moderate anemia		Severe anemia			
	N	%	N	%	N	%		
Compliant	27	54.0	4	8.0	0	0.0		
Non compliant	0	0.0	19	38.0	0	0.0	100	0,000
Total	27	54.0	23	46.0	0	0.0	100.0	

Primary data (Processed, 2026)

The findings shown in Table 3 demonstrated a statistically significant association between iron tablet utilization and anemia status among pregnant women receiving antenatal care at the Woyla Timur Community Health Center ($p < 0.001$). This result indicates that maintaining regular iron tablet use throughout pregnancy may support adequate hemoglobin levels and reduce the occurrence of maternal anemia. This finding may be explained by the progressive nature of iron deficiency anemia, where irregular iron supplementation fails to restore iron stores, leading to a gradual decline in hemoglobin levels and progression from mild to moderate anemia.

Anemia during pregnancy not only impacts the mother's health but also the health of the fetus and unborn baby. Evidence from recent studies suggests that mothers affected by anemia during pregnancy are more likely to experience adverse outcomes, including stunting, impaired neurological development in children, low birth weight, and neonatal mortality (Arabzadeh et al., 2024). Therefore, preventing anemia by increasing adherence to iron tablet consumption has long-term benefits for the quality of future generations (Moumin et al., 2024; Rao, 2024; The Lancet Global Health, 2026; Zhao et al., 2024).

Various studies have shown that iron tablet utilization during pregnancy is influenced by multiple factors, including socioeconomic status, educational attainment, maternal knowledge, family support, access to health services, and the quality of counseling provided by healthcare professionals. Furthermore, variations in sociocultural characteristics and healthcare systems across regions may affect both iron tablet utilization and anemia status among pregnant women. Therefore, locally relevant research is required to guide the development of targeted interventions that promote optimal iron tablet utilization and improve anemia status during pregnancy (Guye et al., 2025; Mare et al., 2024; Saeed et al., 2024).

Appropriate iron tablet utilization during pregnancy has been associated with improved hemoglobin status and a lower occurrence of maternal anemia. Conversely, inadequate utilization of iron tablets may prevent pregnant women from meeting their increased iron needs, thereby increasing the likelihood of anemia. A recent study reported that adherence to iron and folic acid supplementation plays a significant role in reducing the incidence of anemia in pregnant women, especially in regions experiencing a substantial burden of maternal anemia (Seid et al., 2025).

Recent studies have reported higher hemoglobin concentrations among women who consistently consume iron supplements than among those with inconsistent intake. This compliance is influenced by various factors, including the frequency of antenatal care (ANC) visits, knowledge about anemia, and counseling provided by health workers. Pregnant women who receive education about the benefits of iron supplementation and the risks of anemia during pregnancy are more likely to take iron supplements regularly, thereby reducing the risk of anemia (Merga et al., 2025).

Pregnant women's knowledge about anemia has also been shown to be associated with adherence to iron tablet consumption. Mothers who understand the impact of anemia on their own and their fetus' health tend to be more compliant with supplementation programs than those with less knowledge. Effective education can increase maternal awareness of the importance of regularly taking iron tablets during pregnancy (Salifu et al., 2024).

Previous studies have demonstrated that educational and counseling interventions integrated with iron tablet distribution can enhance iron tablet utilization during pregnancy and contribute to improved maternal hematological status. Evidence from a recent quasi-experimental study indicated that strengthening pregnant women's knowledge and awareness regarding iron tablet use resulted in better utilization practices, higher hemoglobin concentrations, and more favorable anemia status. These findings suggest that iron tablet utilization is a modifiable behavior that can be targeted through antenatal care interventions to support maternal health and reduce the burden of anemia during pregnancy (Anato & Reshid, 2025).

Furthermore, current advances in health technology are also beginning to be utilized to improve adherence to iron tablet consumption among pregnant women. A systematic review showed that digital-based interventions such as mobile phone reminder messages, maternal health apps, and e-education significantly improved iron supplementation adherence compared to conventional methods. These findings suggest that innovative strategies can be used to address non-adherence among pregnant women (Shao et al., 2024).

The findings of this study have important implications for the effectiveness of the ongoing iron supplementation program in antenatal care services. Although iron tablet distribution programs have been widely implemented, the significant association between iron tablet utilization and anemia status indicates that program effectiveness is not determined solely by availability, but largely depends on maternal adherence. The high burden of anemia among non-compliant pregnant women highlights that suboptimal utilization remains a major barrier to achieving the intended outcomes of iron supplementation programs. Therefore, strengthening the existing program should not only focus on the provision of iron tablets but also emphasize behavioral and educational interventions, including improved counseling during antenatal care visits, management of side effects, and involvement of family support systems. In addition, the integration of digital health strategies may further enhance adherence and optimize program effectiveness in reducing maternal anemia.

4. CONCLUSION

The Chi-square test yielded a p-value of less than 0.001, indicating a statistically significant association between iron tablet compliance and anemia status among pregnant women. The observed association provides further evidence that regular iron tablet use may help reduce the occurrence of anemia among pregnant women. These findings underscore the importance of prioritizing strategies that support optimal iron tablet utilization within antenatal care programs. Enhancing educational, counseling, and monitoring efforts may improve iron tablet utilization and contribute to favorable anemia status among pregnant women, thereby promoting improved maternal and neonatal health outcomes. In practical terms, healthcare workers should not only focus on the distribution of iron tablets but also play an active role in improving maternal adherence through continuous health education, effective counseling, monitoring of iron tablet consumption, and involvement of family support systems to prevent anemia during pregnancy. Future research is needed to further explore other determinants of anemia among pregnant women beyond iron tablet utilization, including dietary intake, micronutrient status, infections, socioeconomic factors, and health service accessibility. In addition, longitudinal or cohort study designs are recommended to better establish causal relationships between these factors and anemia status during pregnancy.

REFERENCES

Abeje, S., Yosef, Y., & Fikadu, Y. (2023). Assessment of Iron–Folate Adherence and Associated Factors Among Pregnant Women in Public Health Facilities of Durame Town, Southern Ethiopia. SAGE Open Nursing, 9. https://doi.org/10.1177/23779608231189964

Anato, A., & Reshid, M. (2025). Effect of nutrition education and iron-folic acidation on anemia among pregnant women supplements in Ethiopia: a quasi-experimental study. Scientific Reports, 15(1). https://doi.org/10.1038/s41598-025-87957-x

Arabzadeh, H., Doosti-Irani, A., Kamkari, S., Farhadian, M., Elyasi, E., & Mohammadi, Y. (2024). The maternal factors associated with infant low birth weight: an umbrella review. BMC Pregnancy and Childbirth, 24(1). https://doi.org/10.1186/s12884-024-06487-y

Health Research and Development Agency. (2018). Aceh Province Riskesdas Report.

Denise F. Polit, & CTB (2024). Essentials of nursing research: Appraising evidence for nursing practice. In npj Digital Medicine (11th ed., Number 1). Wolters Kluwer.

Ejara, D., Ferede, A., Shifa, J.E., Bekele, F., & Ahmed Hassen, T. (2024). Compliance level and associated factors of iron folic acid supplementation among pregnant women in North Shoa Zone, Ethiopia. Scientific Reports, 14(1). https://doi.org/10.1038/s41598-024-63111-x

Fite, M.B., Bikila, D., Habtu, W., Tura, A.K., Yadeta, T.A., Oljira, L., & Roba, K.T. (2022). Beyond hemoglobin: uncovering iron deficiency and iron deficiency anemia using serum ferritin concentration among pregnant women in eastern Ethiopia: a community-based study. BMC Nutrition, 8(1). https://doi.org/10.1186/s40795-022-00579-8

Guye, A.H., Abera, L., Nigussie, T., Girma, D., Diriba, B.S., Dejene, H., Legesse, E., Iticha, D., & Adugna, L. (2025). Determinants of non-adherence to iron folic acid supplementation among pregnant women attending public health facilities in Bishoftu Town, Ethiopia: case–control study. BMC Pregnancy and Childbirth, 25(1). https://doi.org/10.1186/s12884-025-08295-4

Kebaabetswe, P., Diseko, M., Zash, R., Mayondi, G., Mabuta, J., Mmalane, M., Makhema, J., Lockman, S., Moeng, L., Lowenthal, E., Shapiro, R., & Caniglia, E.C. (2024). A qualitative assessment of barriers to iron and folic acid supplementation among pregnant women in Botswana. BMC Public Health, 24(1). https://doi.org/10.1186/s12889-024-20685-5

Ministry of Health of the Republic of Indonesia. (2018). National Riskesdas Report.

Mare, KU, Aychiluhm, SB, Mulaw, GF, Sabo, KG, Ebrahim, OA, Tebeje, TM, & Seifu, BL (2024). Non-adherence to antenatal ironation and its supplementary determinants among pregnant women in 35 sub-Saharan African countries: a generalized linear mixed-effects modeling with robust Poisson regression analysis. BMC Pregnancy and Childbirth, 24(1). https://doi.org/10.1186/s12884-024-07105-7

Merga, R.T., Birhane, M., Dhinsa, M., Muleta, B., Jemal, J., & Belay, M.M. (2025). Determinants of compliance with iron-folic acid supplementation among pregnant mothers in Bule Hora district, Southern Ethiopia: unmatched case-control study. BMC Public Health, 25(1). https://doi.org/10.1186/s12889-025-22005-x

Moumin, N.A., Shepherd, E., Liu, K., Makrides, M., Gould, J.F., Green, T.J., & Grzeskowiak, L.E. (2024). The Effects of Prenatal Iron Supplementation on Offspring Neurodevelopment in Upper Middle- or High-Income Countries: A Systematic Review. In Nutrients (Vol. 16, Number 15). Multidisciplinary Digital Publishing Institute (MDPI). https://doi.org/10.3390/nu16152499

Munyogwa, MJ, Gibore, N.S., Ngowi, A.F., & Mwampagatwa, I.H. (2024). Routine uptake of prenatal iron-folic acid supplementation and associated factors among pregnant women in peri-urban areas of Dodoma City, Tanzania: a cross-sectional study. BMC Pregnancy and Childbirth, 24(1). https://doi.org/10.1186/s12884-024-06871-8

Nisak, B. (2024). Determinants of Anemia Incidence in Pregnant Women in the Baitussalam Community Health Center Work Area in 2023. 5(1).

Rao, R.B. (2024). Biomarkers of Brain Dysfunction in Perinatal Iron Deficiency. In Nutrients (Vol. 16, Number 7). https://doi.org/10.3390/nu16071092

Saeed, M.S., Adam, G.K., Hussein, S.M., Alhabardi, N., & Adam, I. (2024). Prevalence and Factors Associated with Adherence to Iron-Folic Acid Supplementation Among Pregnant Women in Eastern Sudan: A Cross-Sectional Study. Patient Preference and Adherence, 18, 1665–1674. https://doi.org/10.2147/PPA.S476738

Salifu, Y., Agyeman, Y. N., & Lasong, J. (2024). Adherence to and predictors of iron-folate acid supplementation among pregnant women in a pastoral population in Ghana: a community-based cross-sectional study. Reproductive Health, 21(1). https://doi.org/10.1186/s12978-024-01877-z

Sartika, RAD, Wirawan, F., Putri, PN, & Shukri, NHM (2024). Association between Iron–Folic Acid Supplementation during Pregnancy and Maternal and Infant Anemia in West Java, Indonesia: A Mixed-Method Prospective Cohort Study. American Journal of Tropical Medicine and Hygiene, 110(3), 576–587. https://doi.org/10.4269/ajtmh.23-0411

Seid, M.A., Gebru, A.S., Yimer, A., Ali, K., Yesuf, A., Sirage, N., Seid, A., Tesfa, N.A., & Ahmed, H. (2025). Exploring adherence to iron and folic acidation in pregnant women at rural supplement health facilities in Waghimra zone, Northern Ethiopia. BMC Pregnancy and Childbirth, 25(1). https://doi.org/10.1186/s12884-025-08119-5

Seidu, H., Gaa, P. K., & Mogre, V. (2024). Adherence to Iron and Folic Acid Supplementation Among Pregnant Women From Northern Ghana. Nutrition and Metabolic Insights, 17. https://doi.org/10.1177/11786388231218664

Shao, Y., Meng, C., & Liang, Y. Z. (2024). Digital versus non-digital health interventions to improve ironation in pregnant women: a supplementary systematic review and meta-analysis. In Frontiers in Medicine (Vol. 11). Frontiers Media SA. https://doi.org/10.3389/fmed.2024.1375622

Srivastava, M., Gulia, A., Upadhyay, A.D., Patel, K.K., Sankar, M.J., Sinha, A., & Kumar, P. (2025). Impact of iron-folic acid supplementation on maternal and neonatal outcomes: A systematic review & meta-analysis. In Nutrition and Health (Vol. 31, Number 1, pp. 81–90). SAGE Publications Ltd. https://doi.org/10.1177/02601060241299010

The Lancet Global Health. (2026). Resistance is not futile. The Lancet Global Health, 14(5), e668. https://doi.org/10.1016/S2214-109X(25)00238-4

World Health Organization. (2025). WHO global anemia estimates. In World Health Organization. https://iris.who.int/handle/10665/382291

World Health Statistics. (2023). SDGs Sustainable Development Goals.

Zhao, B., Sun, M., Wu, T., Li, J., Shi, H., & Wei, Y. (2024). The association between maternal anemia and neonatal anemia: a systematic review and meta-analysis. BMC Pregnancy and Childbirth, 24(1). https://doi.org/10.1186/s12884-024-06832-1