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Family support and iron supplementation adherence among pregnant women

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Abstract

Background: Anemia is a condition where the hemoglobin level in the blood is below normal and can occur in various groups. Hemoglobin functions to transport oxygen to all body tissues while supporting the energy needs of each cell. Anemia in pregnancy remains a major health concern in Indonesia, as it threatens maternal and fetal well-being and increases risks of premature birth, low birth weight, and other complications. High coverage of iron supplementation among pregnant women does not reduce anemia prevalence if adherence remains low.
Purpose: To analyze the family support on pregnant women's iron-tablet adherence.
Method: A quantitative, cross-sectional analytical study design was employed. The study population comprised 36 pregnant women selected via purposive sampling based on predefined inclusion criteria. Family support was evaluated using an adapted 9-item questionnaire scored on a dichotomous Guttman scale, while adherence was evaluated using a single self-reported item. Data were analyzed using the chi-square test, with statistical significance established at $p < 0.05$.
Results: Chi-Square test revealed a significant association between family support and iron-tablet adherence, with a p-value of 0.004 ($p < 0.05$).
Conclusion: A statistically significant association was observed between family support and adherence to iron supplementation among pregnant women.

Keywords: Anemia; Iron Supplementation Adherence; Family Support; Pregnant Women.

INTRODUCTION

Anemia is a physiological disorder characterized by a reduction in red blood cell count or hemoglobin concentration below normal limits, impairing the blood's capacity to transport oxygen to peripheral tissues. Functionally mediated by hemoglobin—an iron-containing protein within erythrocytes—suboptimal oxygenation leads to organ dysfunction and clinical symptoms such as fatigue (Bakara et al., 2025; Susanti et al., 2024). During pregnancy, anemia represents a major public health concern associated with severe maternal and fetal complications, including preterm delivery, low birth weight (LBW), and elevated rates of maternal and neonatal mortality (Aruan et al., 2025; Nasriyah & Ediyono, 2023).

Globally, the World Health Organization estimates that approximately 35.5% of pregnant women aged 15–49 were affected by anemia in 2023 (World Health Organization, 2025). Addressing this persistent burden supports the Sustainable Development Goals (SDGs) target of achieving a 50% reduction in anemia prevalence by 2025, primarily through targeted iron supplementation strategies (World Health Organization, 2025). In Indonesia, national survey and World Bank development indicator data reflect a maternal anemia prevalence of 27.1%, with the

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highest burden concentrated among pregnant women aged 35–44 (39.6%) and 25–34 (31.4%) (Ministry of Health of the Republic of Indonesia, 2024; World Health Organization, 2025).

Regional data indicate an even higher burden; in North Sumatra Province, particularly Medan City, maternal anemia prevalence reached 40.5% (Health Office of North Sumatera Province, 2025). Pathophysiologically, standard dietary intake yielding 10–15 mg of daily iron results in an effective intestinal absorption of only 1–2 mg, making routine dietary intake insufficient to meet elevated gestational iron demands (Adethia et al., 2022; Health Office of North Sumatera Province, 2025; Sari et al., 2025).

To address this deficit, public health programs enforce a standard regimen of at least 90 iron (Fe) tablets during pregnancy. In Medan City, coverage achieved 95.11% in 2024, with 35,484 out of 37,306 pregnant women receiving supplementation (Health Office of Medan City, 2025). However, high distribution coverage does not directly translate into reduced anemia incidence if maternal compliance remains suboptimal, highlighting adherence as the critical determinant of intervention efficacy (Nadeak et al., 2023).

RESEARCH METHOD

This study employed a quantitative, analytical cross-sectional design to examine the association between family support and adherence to iron tablet supplementation among pregnant women. The research was conducted in 2026 at the Vina Pratama Clinic, located in Medan Baru District, Medan City, North Sumatra, Indonesia.

The source population comprised all 80 pregnant women registered at the Vina Pratama Clinic during the study period in 2026. A sample of 36 respondents was selected using a non-probability purposive sampling technique based on specific eligibility criteria. Inclusion criteria comprised pregnant women in any gestational trimester receiving iron tablet supplementation who provided written informed consent. Women who failed to complete the questionnaire or were unavailable during the data collection window were excluded.

Family Support (Independent Variable): Operationalized as multi-dimensional assistance provided by family members—encompassing emotional, informational, appraisal/appreciation, and instrumental support—to facilitate healthy maternal behaviors. This construct was evaluated using an adapted 9-item questionnaire scored on a dichotomous Guttman scale (1 = Yes/Supportive; 0 = No/Non-supportive), yielding a total composite score of 0–9. Participants scoring ≥ 5 were categorized as receiving supportive family backing, whereas those scoring < 5 were classified as non-supportive.

Adherence to Iron Supplementation (Dependent Variable): Defined as maternal compliance with prescribed daily iron intake regimens. Adherence was evaluated using a single self-reported item ("I consume iron tablets every day") utilizing a dichotomous response format (Yes/No). Respondents answering "Yes" were classified as adherent, while those answering "No" were categorized as non-adherent. Adherence measurements reflected reported compliance up to the point of survey completion without direct pill counts or biological verification.

Primary data were gathered using a structured self-administered questionnaire written in Indonesian and adapted from previously validated instruments. Construct validity and internal consistency reliability for the multi-item family support instrument were confirmed prior to data collection. Given the single-item dichotomous nature of the adherence measure, internal consistency reliability testing was not applicable to the outcome variable. Secondary data regarding total clinic census numbers were extracted directly from institutional medical records.

Data were processed and analyzed using descriptive and inferential statistical techniques. Univariate analysis was performed to calculate frequency distributions and percentages for demographic attributes, family support levels, and adherence rates. Bivariate analysis was conducted using the Chi-square (χ^2) test for categorical independence to evaluate the association between family support and adherence status. Expected cell counts were verified prior to hypothesis testing; if distributional assumptions were violated, Fisher's exact test was designated as the non-parametric fallback. Statistical significance was defined at an alpha threshold of $p < 0.05$.

Ethical clearance for human subject research was granted by the Health Research Ethics Committee of

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the Institute of Health Sciences Mitra Husada Medan (Protocol No. 3661/KEP-MHM/III/2026). Prior to enrollment, potential participants received a comprehensive verbal explanation regarding the study's purpose, voluntary nature, procedures, potential benefits, and confidentiality protections. Written informed consent was secured from all participants before instrument administration. Data privacy and participant anonymity were maintained throughout the study lifecycle, and participants retained the right to withdraw at any time without compromising their clinical care.

RESEARCH RESULTS

Table 1. Characteristics of Respondents (N=36)

Variables	Results
Age (Mean±SD)(Range)(Year)	**(26.47±5.45)**
<21 years	1/2.78
21–35 years	32/88.89
>35 years	3/8.33
Gestational Age (n/%)	
Trimester I	19/52.78
Trimester II	15/41.67
Trimester III	2/5.55
Education (n/%)	
Elementary school	4/11.11
Junior High School	6/16.67
Senior High School	19/52.78
College	7/19.44
Family Support	
Supported	15/41.67
Not supported	21/58.33
Iron tablet Adherence	
Adherent	12/33.33
Non-Adherent	24/66.67

Table 1 presents the demographic characteristics of the respondents and family support and iron tablet adherence. The mean age was 26.47 years (SD ± 5.45), with the majority (88.89%, n = 32) falling within the maternal age range of 21–35 years. In terms of gestational age, the largest proportion of participants were in the first trimester (0–13 weeks), accounting for 52.78% (n = 19). Educational attainment was predominantly at the senior high school level, also representing 52.78% of respondents. More than half of the participants (58.33%, n = 21) reported experiencing unsupportive family support, and 66.67% (n = 24) indicated non-adherent to iron supplement intake.

Tabel 2. Family Support and Iron Tablet Adherence on Pregnant Women (N=36)

Family Support Variable	Non-Adherent	Adherent	p-value
Supported	6/40.00	9/60.00	0.004
Not supported	18/85.71	3/14.29	

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Table 2 presents the relationship between family support and iron-tablet adherence. Among the 15 respondents (41.67%) who reported receiving supportive family support, 9 (60.00%) were classified as adherent, while 6 (40.00%) were non-adherent. In contrast, of the 21 respondents (58.33%) who experienced non-supportive family support, the majority (85.71%, n = 18) were non-adherent, with only 3 (14.29%) demonstrating adherence. Statistical analysis using the Chi-Square test revealed a significant association between family support and iron-tablet adherence, with a p-value of 0.004 ($p < 0.05$).

DISCUSSION

Bivariate analysis using a cross-sectional design revealed a statistically significant association between family support and iron-tablet adherence among pregnant women at the Vina Pratama Clinic in Medan City ($p = 0.004$). Bivariate chi-square testing led to the rejection of the null hypothesis, demonstrating that pregnant women receiving adequate family support exhibited significantly higher rates of compliance than those with limited support networks.

Family support encompasses physical, emotional, informational, and moral assistance provided by spouses, parents, or in-laws (Lubis et al., 2024). During pregnancy, maternal physiological demands increase substantially to support fetal development and offset blood loss during delivery, making routine iron supplementation essential for maintaining target hemoglobin levels and preventing gestational anemia (Sinaga et al., 2025). Adequate nutrition, rest, and nutrient absorption are critical; however, pregnancy-related concerns can hinder optimal dietary intake. Support networks empower pregnant women by reinforcing healthcare provider recommendations, mitigating forgetfulness, and maintaining adherence despite potential side effects such as nausea and dizziness (Lubis at el., 2024; Setyobudihono et al., 1999; Rohmatika et al., 2025; Susanti et al, 2024).

These results corroborate prior empirical research establishing a strong relationship between family involvement and maternal adherence to iron supplementation (Chusniyati et al., 2022). Specifically, a similar significant association ($p = 0.013$) was observed, highlighting the crucial role of families in actively reminding and motivating pregnant women to sustain routine iron intake (Mayasari et al., 2023).

Despite the proven benefits of support networks, overall adherence in the study population remained low: 66.7% ($n = 24$) of respondents were non-compliant, whereas only 33.3% ($n = 12$) maintained recommended intake levels. Suboptimal compliance poses severe clinical risks, including increased susceptibility to miscarriage, premature delivery, prolonged labor, uterine inertia, and postpartum hemorrhage secondary to uterine atony (Handayani et al., 2024; Wardiyah, 2016). Given that family support for maternal iron supplementation remains persistent across clinical settings, public health interventions must prioritize family-centered health education to improve health literacy, foster positive perceptions, and optimize antenatal compliance (Yanti et al., 2022).

This study has several limitations. The sample was small and purposively selected from a single clinic, limiting generalizability. The cross-sectional design prevents causal inference and does not establish temporal ordering between family support and adherence. If the questionnaire relied on self-report, adherence may also be affected by recall or social-desirability bias. In addition, potentially important determinants of adherence were not measured or controlled for.

CONCLUSION

Family support was significantly associated with iron-tablet adherence among pregnant women at Pratama Vina Clinic in Medan City ($p = 0.004$). Adherence was more common among respondents who reported supportive family environments than among those who reported non-supportive family support. Antenatal services may consider family-inclusive counseling and practical support strategies; however, causal effects and intervention effectiveness require further study using larger, preferably multicenter and prospective or experimental designs.

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