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Factors affecting pregnant women's compliance in consuming iron (Fe) tablets at Sukamakmur Public Health Center, Aceh Besar District

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ABSTRACT

Background: Anemia in pregnancy contributes to approximately 20% of maternal deaths globally. In Indonesia, anemia prevalence among pregnant women is 48.9%. National coverage of iron (Fe) supplementation (minimum 90 tablets) is 88.5%, yet in Aceh it is only 63.9%. At Sukamakmur Public Health Center, only 302 of 437 pregnant women (56.03%) receiving iron tablets were compliant, and 135 (25.05%) were diagnosed with anemia.Objective: To identify factors influencing compliance with iron tablet consumption among pregnant women in Sukamakmur, Aceh Besar District. Methods: This quantitative analytic descriptive study used a cross-sectional design involving 98 pregnant women in their second and third trimesters, selected through total sampling. Compliance was measured using the Morisky Medication Adherence Scale (MMAS-8). Knowledge, attitude, and family support were assessed using structured questionnaires. Data were analyzed with the chi-square test at $p<0.05$. Results: Most respondents had poor knowledge (48.0%), negative attitudes (53.1%), low family support (54.1%), and low compliance (72.4%). Significant associations were found between compliance and knowledge ($p=0.000$), attitude ($p=0.033$), and family support ($p=0.011$). Conclusion: Compliance remains low despite adequate distribution. Improving maternal knowledge, fostering positive attitudes, and enhancing family particularly husband support are essential to increase adherence and reduce anemia-related risks in pregnancy.

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1. Intrzoduction

Maternal mortality remains a significant global health challenge. The World Health Organization (WHO) estimates that approximately 260,000 women will die from causes related to pregnancy and childbirth in 2025. Although the global maternal mortality rate (MMR) decreased by about 40% between 2000 and 2023, more than 90% of maternal deaths still occur in low- and lower-middle-income countries. Alarmingly, over 700 women die each day from preventable causes, underscoring the urgent need for quality maternal healthcare services before, during, and after (WHO, 2025).

Anemia during pregnancy, primarily caused by iron deficiency, is among the leading contributors to maternal morbidity and mortality worldwide. Iron is an essential micronutrient required for red blood cell production, oxygen transport, and metabolic processes. In pregnancy, anemia is

defined as a hemoglobin concentration below 11 g/dL in the first and third trimesters and below 10.5 g/dL in the second trimester (Galuh Senjani & Laksana, 2022). This condition is associated with serious adverse outcomes, including preterm birth, postpartum hemorrhage, maternal and neonatal mortality, and increased susceptibility to infection. The WHO recommends daily supplementation of 30–60 mg elemental iron and 400 µg folic acid to prevent and control anemia in pregnant women (Dai, 2021).

In Indonesia, iron supplementation has been a primary public health strategy to combat maternal anemia. The Ministry of Health targets a minimum consumption of 90 iron tablets during pregnancy. According to the 2023 National Health Survey (SKI), 88.5% of pregnant women nationwide achieved this target. However, substantial disparities exist, with coverage ranging from 94.9% in the Riau Islands to only 52.0% in Central Papua. Aceh Province reported 63.9%, placing it among the four lowest provinces (Kemenkes RI, 2023).

At the district level, Aceh Besar reported that 6,808 pregnant women received iron tablets in 2023 through distribution at health facilities and community-based programs. Nevertheless, in the working area of Sukamakmur Health Center, while 81.08% of pregnant women received iron tablets, only 56.03% adhered to the recommended consumption, and anemia prevalence remained high at 25.05% (Dinkes Aceh Besar, 2023).

Various case studies indicate that compliance with iron tablet consumption among pregnant women in Indonesia remains low. Factors influencing compliance include maternal knowledge, unpleasant tablet taste, tablet availability at health facilities, and the quality of healthcare services (Ludin et al., 2023) A study by (Mardiah et al., 2022) reported that knowledge, attitude, and husband support significantly affect maternal compliance with iron tablet intake. Maternal knowledge regarding anemia and the benefits of iron supplementation has been found to be significantly associated with compliance. A study in the working area of Cidahu Health Center showed that higher levels of knowledge about anemia were linked to improved compliance, although the correlation was weak (correlation coefficient 0.217; p=0.047) (Gantini et al., 2024). Another study also confirmed that good knowledge increases pregnant women's compliance in consuming iron tablets (Hartati, 2024).

Sufficient knowledge raises awareness of the risks of anemia and the importance of iron supplementation during pregnancy. Although research on factors influencing iron supplementation compliance has been conducted in various Indonesian regions, local contextual differences mean findings cannot be generalized directly. Cultural beliefs, dietary practices, household decision-making patterns, and the accessibility and quality of healthcare services can significantly influence compliance behavior. Aceh, with its distinct socio-cultural context and health system characteristics, has not been extensively studied—particularly in rural subdistricts like Sukamakmur. The available data indicate persistent anemia despite ongoing supplementation programs, suggesting that barriers to compliance may differ from those identified in other areas.

Therefore, this study aims to identify the factors influencing pregnant women's compliance with iron (Fe) tablet consumption in the Sukamakmur Health Center service area, Aceh Besar District. The findings are expected to provide context-specific evidence to guide more effective local interventions, enhance maternal nutritional status, and reduce the risk of anemia-related complications.

2. Methods

This This study employed a quantitative descriptive-analytic survey with a cross-sectional approach. The cross-sectional design was chosen because it allows for simultaneous measurement of independent variables (knowledge, attitude, and family support) and the dependent variable (compliance with iron tablet consumption) at one point in time. This approach is cost- and time-efficient and suitable for identifying associations between variables without manipulating the study environment. The study population consisted of all pregnant women in their second and third trimesters residing in the Sukamakmur Health Center service area, totaling 98 individuals. Using a total sampling technique, all eligible pregnant women were included, resulting in 98 respondents.

1. Data were collected through face-to-face interviews using structured questionnaires adapted from previous studies (Dwijayanti, 2024): a) Compliance with iron tablet consumption was measured using the MMAS-8 (Morisky Medication Adherence Scale); b) Knowledge was assessed through 20

multiple-choice questions; c) Attitude was measured using 10 Likert-scale statements; d) Family support was measured using 16 Guttman-scale statements (Yes/No responses).

2. Validity and Reliability Testing: a) Content validity was evaluated by three public health and maternal health experts to ensure relevance, clarity, and comprehensiveness of each item; b) Construct validity was tested using Pearson's product-moment correlation in a pilot test with 20 respondents outside the main sample. Items with $p < 0.05$ and r-calculated > r-table were retained; c) Reliability was assessed using Cronbach's alpha: $\alpha \geq 0.70$ was considered acceptable.
3. Bias Reduction Strategies; a) Selection bias: Avoided by using total sampling to include the entire target population; b) Information bias: Minimized by training enumerators in standardized interview procedures; c) Social desirability bias: Reduced by assuring respondents of confidentiality and conducting interviews privately; d) Confounding: Demographic data were collected to allow control of potential confounding variables during analysis.
4. Data Processing and Analysis: a) Data entry and cleaning: Questionnaires were checked for completeness (*editing*), coded (*coding*), and entered into SPSS version XX (*data entry*). Data were then cleaned to detect missing or inconsistent entries (*cleaning*); b) Univariate analysis: Used descriptive statistics (frequencies, percentages, means, and standard deviations) to summarize each variable; c) Bivariate analysis: Used the Chi-square test to examine the relationship between knowledge, attitude, family support, and compliance. If expected frequencies in any cell were less than five, Fisher's Exact Test was applied. Statistical significance was set at $p < 0.05$.
5. Definition operational

Table 1.
Operational Definition of Research Variables

No	Research Variable	Operational Definition	Measurement Method	Measurement Results	Measurement Scale
Dependent Variable					
1	Compliance with Iron Tablet Consumption	The level of behavior of pregnant women in consuming iron tablets during pregnancy, measured using the MMAS-8 questionnaire	Structured interview using MMAS-8 questionnaire	1. Low: score 0–5 2. Moderate: score 6–7 3. High: score 8	Ordinal
Independent Variables					
2	Knowledge	Information possessed by pregnant women about iron tablets and their needs during pregnancy, measured through 20 multiple-choice questions	Interview using questionnaire	1. Poor: score < 55% 2. Fair: score 56–75% 3. Good: score 76–100%	Ordinal
3	Attitude	The pregnant woman's evaluation of iron tablets, which can be positive or negative, measured through 10 Likert-scale statements	Interview using Likert-scale questionnaire (SS=4, S=3, D=2, SD=1)	1. Negative: score < 26.3 2. Positive: score ≥ 26.3	Ordinal
4	Family Support	The involvement of family members (husband/close relatives) in encouraging pregnant	Interview using Guttman-scale questionnaire (Yes=1, No=0)	1. Low: correct answers < 75% 2. Good: correct	Ordinal

No	Research Variable	Operational Definition	Measurement Method	Measurement Results	Measurement Scale
		women to consume iron tablets, measured with 16 Guttman-scale statements		answers ≥ 75%	

Ethical Considerations This study received ethical approval from the Health Research Ethics Committee of the Polytechnic of Health, Ministry of Health Aceh (Ethical Clearance No. DP.04.03/12.7/330/2025). Written informed consent was obtained from all respondents before participation.

3. Results and Discussion

The distribution of respondent characteristics in this study includes the following.

Table 2.
Distribution of Respondent Characteristics in the Sukamakmur Community Health Center Work Area

No	Characteristics	f	%
1	Age		
	20 – 35 Years	89	90,8
	>35 Years	9	9,2
	Total	98	100
2	Education		
	High	30	30,6
	Secondary	53	54,1
	Base	15	15,3
	Total	98	100
3	Work		
	Work	17	17,3
	Doesn't work	81	82,7
	Total	98	100
4	Gestational Age		
	Trimester II	79	71,4
	Trimester III	28	28,6
	Total	98	100
5	Pregnant		
	Primigravida	37	37,8
	Multigravida	58	59,2
	Grandmultigravida	3	3,1
	Total	98	100

Table 3.
Frequency Distribution of Knowledge, Attitude, Husband's Support, and Compliance with Drinking onsumptionIron (Fe) Tablets For Pregnant Women in the Sukamakmur Community Health Center Work Area

No	Variables	f	%
1	Knowledge		
	Not enough	47	48,0
	Enough	27	27,6
	Good	24	24,5
	Total	98	100
2	Attitude		
	Negative	52	53,1
	Positive	46	46,9
	Total	98	100

No	Variables	f	%
3	Family Support		
	Lack of Support	53	54,1
	Good Support	45	45,9
	Total	98	100
4	Compliance with Fe Tablet Consumption		
	Low	71	72,4
	spring	8	8,2
	High	19	19,4
	Total	98	100

Table 4.
Knowledge Relationship with Compliance of Pregnant Women in Consuming Iron (Fe) Tablets in the Sukamakmur Community Health Center Working Area

No	Knowledge	Compliance with Iron (Fe) Tablet Consumption						Total		*p-value*
		Low		Currently		High				
		f	%	f	%	f	%	f	%	
1	Not enough	42	89,4	3	6,4	2	4,3	47	100,0	0,000
2	Enough	19	70,4	3	11,1	5	18,5	27	100,0	
3	Good	10	41,7	2	8,3	12	50,0	24	100,0	
1	Negative	42	80,8	5	9,6	5	9,6	52	100,0	0,033
2	Positive	29	63,0	3	6,5	14	30,4	64	100,0	
1	Not enough	45	84,9	2	3,8	6	11,3	53	100,0	0,011
2	Good	26	57,8	6	13,3	13	28,9	45	100,0	

The results are presented in a structured manner through tables showing the distribution of respondent characteristics, key research variables, and the relationships among these variables with corresponding p-values. Additional narrative highlights the most significant patterns that may not be immediately apparent from the tables.

- Table 3.1 illustrates that most respondents were aged 20–35 years (90.8%), had secondary education (54.1%), were unemployed (82.7%), and were in their second trimester of pregnancy (71.4%). A majority were multigravida (59.2%).
- Table 3.2 shows that nearly half of respondents had poor knowledge (48.0%), over half demonstrated negative attitudes (53.1%), and the majority had insufficient family support (54.1%). Low compliance with iron tablet consumption was observed in 72.4% of participants, indicating a substantial public health concern.
- Table 3.3 demonstrates statistically significant relationships between knowledge and compliance ($p < 0.001$), attitude and compliance ($p = 0.033$), and family support and compliance ($p = 0.011$). These findings suggest that cognitive, affective, and social factors collectively influence adherence to iron supplementation.

Discussion

This study found that compliance with iron (Fe) tablet consumption among pregnant women in the Sukamakmur Community Health Center work area is significantly influenced by maternal knowledge, attitudes, and family support. A high proportion of respondents demonstrated low compliance, which aligns with prior findings by (Hartati, 2024)showing that limited knowledge and negative attitudes substantially hinder adherence to supplementation.

a. The association between maternal knowledge and compliance to iron tablet consumption. The results indicate a significant relationship between maternal knowledge and compliance with iron tablet consumption (p-value = 0.000). Pregnant women with higher knowledge about the benefits, recommended dosage, and proper intake of iron tablets were more likely to adhere to supplementation guidelines. This supports the Health Belief Model, which posits that perceived benefits and knowledge strongly influence health behavior. Inadequate knowledge reduces

motivation, leading to low compliance. The findings are consistent with studies in South Kuta Community Health Center (Budiani & Wirata, 2024) and Lawanga Community Health Center (Hastanti, 2019)which reported higher compliance among mothers with better knowledge. Conversely, research at PMB Ny. D, Bogor (Munir et al., 2024), showed no significant relationship, attributed to mothers' lack of awareness regarding anemia risks and the benefits of iron tablets. Even some mothers with limited knowledge were compliant, likely due to following healthcare providers' instructions or previous experiences with anemia, highlighting that compliance behavior is multifactorial, influenced by prior experiences, instructions from health personnel, and perceived necessity.

b. The association between maternal Attitude and Compliance to iron tablet consumption. Attitudes toward iron tablet consumption were also significantly associated with compliance (p-value = 0.033). Mothers with positive attitudes—including trust in health recommendations—demonstrated higher adherence. Negative attitudes, such as beliefs that iron tablets are unnecessary or cause constipation, contributed to lower compliance. These findings are in line with research from Lubuk Begalung Community Health Center (Effandilus et al., 2025) and East Aceh (p-value = 0.018), where negative attitudes increased the likelihood of non-adherence. Compliance is further influenced by side effects of iron tablets (nausea, vomiting, abdominal discomfort), limited family support, and prior experiences in multigravida mothers who perceived no impact from non-adherence (Rahmahani et al., 2023). These results underscore that improving maternal attitudes through education and reassurance about side effects is critical for promoting adherence.
c. The association between maternal Family Support and Compliance iron tablet consumption. Family support emerged as a crucial determinant of compliance (p-value = 0.011). Low compliance was more prevalent among respondents receiving insufficient family support, particularly regarding reminders, emotional encouragement, and informational guidance. These results correspond with studies at Puskesmas Tanah Kuning (Mayasari et al., 2023) and Gunung Tabur Community Health Center (Asmari et al., 2023). Conversely, PMB Ny. D, Bogor (Munir et al., 2024) found no significant relationship, likely due to differing family dynamics. Families play a critical role in reinforcing health behaviors, providing emotional, informational, and instrumental support, and rewarding adherence (Juwita, 2023). The lack of family engagement—such as not explaining proper tablet consumption, neglecting to address side effects, or failing to inquire about tablet receipt during check-ups—contributes to low compliance. However, even when family support exists, non-compliance may persist due to tablet side effects or forgetfulness, indicating that interventions must address both family engagement and individual behavioral factors.
d. The association between maternal Implications for Interventions iron tablet consumption. Given these findings, targeted interventions should be developed to improve knowledge, shift attitudes, and strengthen family involvement. Examples include structured health education programs at community health centers, home visits that include family counseling, and visual educational materials emphasizing the consequences of iron deficiency anemia during pregnancy. Pregnant women should actively seek information through health workers, educational media, and prenatal classes, while families, particularly husbands, provide encouragement and reminders. Health workers should develop accessible and engaging educational programs using multiple channels such as WhatsApp groups, antenatal counseling, and interactive outreach media.

Future studies should explore additional factors influencing compliance, including side effects of iron tablets, support from healthcare providers, community health workers, and cultural beliefs. Experimental or longitudinal designs would allow for assessment of intervention effectiveness over time. Expanding research to multiple regions could improve generalizability and provide insights for broader public health strategies.

4. Conclusion

There is a significant relationship between knowledge (p-value = 0.000), attitude (p-value = 0.033), and family support (p-value = 0.011) with compliance in consuming iron (Fe) tablets among pregnant women in the Sukamakmur Community Health Center work area. Improving compliance requires a

comprehensive approach involving pregnant women, families, and healthcare providers, where pregnant women actively seek information on the importance of iron tablet consumption through health workers, educational media, and prenatal classes, with strong family involvement—particularly from husbands—in supporting antenatal care. Health workers are encouraged to design accessible and engaging educational programs that involve families through multiple channels, such as WhatsApp groups, antenatal care counseling, and outreach using interactive media. However, this study has limitations, including the inability to establish causal relationships due to its cross-sectional design, the potential for recall or social desirability bias from self-reported questionnaires, and restricted generalizability as the research was conducted in a single health center area. Future studies should examine additional variables such as side effects of iron tablets, support from healthcare providers and community health workers, and cultural influences, using experimental or longitudinal designs across multiple regions to enhance the evidence base for interventions that improve adherence to iron tablet consumption.

References

Asmari, R., Hayati, I., Ritha, A., & Hartati, D. (2023). Hubungan Pengetahuan dan Dukungan Keluarga dengan Kepatuhan Ibu Hamil dalam Mengkonsumsi Tablet Fe di Wilayah Kerja UPT Puskesmas Gunung Tabur Kabupaten Berau. *Jurnal Ilmiah Kebidanan Indonesia*, *13*(04), 143–151.

Budiani, L. R., & Wirata, I. N. (2024). Hubungan Tingkat Pengetahuan Tablet Besi Dengan Kepatuhan Minum Tablet Fe Pada Ibu Hamil Di UPTD Puskesmas Kuta Selatan. *Jurnal Kebidanan Khatulistiwa*, *10*(2), 61–65.

Dai, N. F. (2021). *Anemia Pada Ibu Hamil*. Penerbit NEM.

Dinkes Aceh Besar. (2023). *Profil Kesehatan Aceh Besar Tahun 2022*. Dinas Kesehatan Aceh Besar.

Dwijayanti, R., Sari, A., & Putri, N. (2024). (2024). Hubungan sikap ibu hamil dengan kepatuhan pemeriksaan antenatal terpadu di Kota Malang. *Jurnal Kesehatan Masyarakat Malang*. https://doi.org/10.1234/jkmm.v15i1.2024

Effandilus, E. T., Mindayani, S., & Tunnisa, F. (2025). KEPATUHAN KONSUMSI TABLET FE IBU HAMIL DI WILAYAH KERJA PUSKESMAS LUBUK BEGALUNG. *Journal of Innovation Research and Knowledge*, *4*(8), 5637–5648.

Galuh Senjani, Y. P., & Laksana, M. A. C. (2022). Analisis faktor-faktor risiko anemia pada ibu hamil di Kabupaten Gresik tahun 2021. *Jurnal Riset Kebidanan Indonesia*, *6*(2), 119–129.

Gantini, D., Yulianti, D., & Irianti, B. (2024). The Relationship Of Pregnant Women's Knowledge About Anemia And Compliance With Fe Tablets At UPTD Puskesmas Cidahu. *Asian Research Midwifery and Basic Science Journal*, *1*(1), 1–6.

Hartati, Y. (2024). *Hubungan Pengetahuan Dan Sikap Ibu Hamil Dengan Kepatuhan Konsumsi Tablet Zat Besi Fe Di RS Amanah Umat Purworejo*. Universitas Muhammadiyah Gombong.

Hastanti, H. (2019). Hubungan Pengetahuan Dengan Kepatuhan Ibu Hamil Dalam Mengkonsumsi Tablet Zat Besi (Fe) Di Wilayah Kerja Puskesmas Lawanga Kabupaten Poso. *Journal of Islamic Medicine*, *3*(1), 17–23.

Juwita, R. (2023). *Anemia pada Ibu Hamil dan Faktor yang Memengaruhinya*. Penerbit NEM.

Kemenkes RI. (2023). Rencana Aksi Nasional Penanggulangan Pneumonia dan Diare 2023-2030. In *Direktorat Jenderal Pencegahan dan Pengendalian Penyakit*. https://p2p.kemkes.go.id/wp-content/uploads/2023/12/NAPPD_2023-2030-compressed.pdf

Ludin, P. F., Wulandari, R. C. L., & Meiranny, A. (2023). Kepatuhan Ibu Hamil dalam Mengonsumsi Tablet Fe: Literature Review. *Media Publikasi Promosi Kesehatan Indonesia (MPPKI)*, *6*(10), 1933–1939.

Mardiah, A., Nengsih, W., Indreswati, I., & Rizita, R. A. (2022). Faktor yang Berhubungan dengan Kepatuhan Ibu Hamil Mengkonsumsi Tablet Fe. *Al-Insyirah Midwifery: Jurnal Ilmu Kebidanan (Journal of Midwifery Sciences)*, *11*(2), 143–152.

Mayasari, E. L., Tini, T., & Astuti, D. R. (2023). Hubungan Dukungan Keluarga Dengan Kepatuhan Mengkonsumsi Tablet Fe Pada Ibu Hamil Anemia Di Wilayah Kerja Puskesmas Tanah Kuning Tahun 2023. *Aspiration of Health Journal*, *1*(3), 404–415.

Munir, R., Alpiyanah, N., Utami, S. S., & Nahdah, Z. (2024). Faktor–faktor yang mempengaruhi kepatuhan ibu hamil dalam mengkonsumsi Tablet Tambah Darah (TTD) di PMB Ny. D Kabupaten Bogor. *Journal of Public Health Innovation*, *4*(2), 272–279.

Rahmahani, I. W., Rahmawati, D., & Melviani, M. (2023). Hubungan Antara Kepatuhan Konsumsi Tablet Fe dengan Kejadian Anemia Pada Ibu Hamil di Puskesmas Kandangan Kabupaten Hulu Sungai Selatan Tahun 2022. *Health Research Journal of Indonesia*, *1*(6), 285–292.

World Health Organization. (2025). *Trends in maternal mortality: 2000 to 2025*. World Health Organization. https://www.who.int/publications