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Original Article

Analysis of factors influencing adherence to iron tablet consumption among pregnant women at Muara Enim Community Health Center: A cross-sectional study

Ferra Puspa Sari[1*], Ali Harokan[1], Chairil Zaman[1]
[1] Sekolah Tinggi Ilmu Kesehatan Bina Husada, Palembang, Indonesia

***Corresponding Author:**
Ferra Puspa Sari
Sekolah Tinggi Ilmu Kesehatan Bina Husada, Palembang, Indonesia
Email: ferrapuspasari@gmail.com

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Abstract

Background
Anemia in pregnancy remains a major global health concern, significantly affecting maternal and fetal outcomes. In Indonesia, particularly in Muara Enim, the prevalence of anemia among pregnant women has been increasing annually. Iron tablets are a key intervention for anemia prevention, yet adherence remains low.

Objective
This study aimed to analyze the factors influencing adherence to iron tablet consumption among pregnant women at Muara Enim Community Health Center.

Methods
This study employed a quantitative approach with an analytical survey design using a cross-sectional method. The research was conducted from April 24 to May 14, 2025, at Muara Enim Community Health Center. A total of 93 pregnant women were selected as respondents using purposive sampling from a population. Data were collected through structured interviews using a validated questionnaire comprising demographic characteristics and variables such as knowledge, attitude, economic status, husband support, and adherence to iron tablet consumption. Data were analyzed for descriptive statistics, bivariate analysis using Chi-square tests, and multivariate analysis through binary logistic regression to identify the most dominant influencing factor.

Results
The results showed that only 40.9% of respondents adhered to iron tablet consumption. Bivariate analysis revealed significant associations between adherence and knowledge (p=0.00), economic status (p=0.02), and husband support (p=0.04). Multivariate logistic regression identified husband support as the most dominant factor (OR=0.34; 95% CI: 0.13–0.88), indicating that women without husband support were 0.34 times less likely to adhere to iron tablet consumption.

Conclusion
Knowledge, economic status, and husband support significantly affect adherence to iron tablet consumption among pregnant women. However, husband support emerged as the most influential factor. It is recommended that antenatal education programs actively involve husbands to enhance support systems and improve adherence. Community-based interventions and cross-sector collaborations should be strengthened, especially for pregnant women with low socioeconomic status or limited family support

Background

Anemia remains one of the major global public health problems, exerting a significant impact on women of reproductive age, particularly pregnant women (Chakole et al., 2022). Globally, approximately 539 million non-pregnant women and 32 million pregnant women are affected by anemia (Safiri et al., 2021). In 2019, the global prevalence of anemia reached 29.9%, with a particularly alarming rate of 36.5% among pregnant women (Li et al., 2022). This condition poses a serious threat as anemia during pregnancy is closely associated with increased risks of obstetric complications and maternal mortality (Lopez de Romaña et al., 2023). An estimated 20% of the 510,000 maternal deaths worldwide are attributed to anemia, especially in low- and middle-income countries (da Silva Lopes et al., 2021).

Several studies have indicated that the third trimester of pregnancy represents the most vulnerable period for the development of anemia. Globally, approximately 40.1% of pregnant women experience anemia during this stage (Mildon et al., 2023). The consequences of anemia in pregnancy extend beyond maternal health to fetal outcomes, including preterm birth, low birth weight, postpartum hemorrhage, and increased risk of intrauterine fetal demise (Santana et al., 2022). An estimated 800 million women and infants suffer from

anemia during pregnancy, placing them at heightened risk of maternal mortality.

In Indonesia, a similar situation is observed. According to the Indonesian Health Survey, the prevalence of anemia among pregnant women is reported at 27.7%, with the highest rates found in women aged 35–44 years (39.6%), followed by those aged 25–34 years (31.4%). The overall prevalence of anemia is 48.9%. Severe anemia (hemoglobin <7 g/dL) poses a substantial risk for adverse outcomes such as preterm delivery, low birth weight, and maternal death (Ministry of Health of the Republic of Indonesia, 2024).

The Muara Enim Community Health Center area has reported an increasing trend in the prevalence of anemia among pregnant women. In 2022, the prevalence was recorded at 24.70% (242 cases), rising to 28.45% (375 cases) in 2023, and escalating to 36.59% (335 cases) in 2024 (South Sumatra Provincial Health Office, 2024). These figures indicate that nearly 4 in 10 pregnant women in the area are affected by anemia. This alarming rise underscores the urgent need for more systematic and targeted interventions, including efforts to improve adherence to iron tablet supplementation during pregnancy (Peace & Banayan, 2021; Zhu et al., 2021).

Iron supplementation is one of the primary interventions employed to prevent and manage anemia in pregnancy (Kare & Gujo, 2021). However, its effectiveness is highly dependent on the level of adherence among pregnant women to regular intake (Elstrott et al., 2020). Unfortunately, adherence to iron tablet consumption remains low in many regions, including Indonesia. This non-adherence significantly compromises the success of anemia control programs and increases the risk of dangerous obstetric complications (Lopez de Romaña et al., 2023).

Previous studies have identified several factors influencing adherence to iron tablet consumption among pregnant women, including knowledge level, health-related attitudes, spousal support, maternal age, educational background, and socioeconomic status (Septiana & Sapitri, 2020; Sitepu & Hutabarat, 2020). Poor knowledge may hinder women's understanding of the importance of iron supplementation (Putri & Komala, 2022), while negative attitudes or experiences of side effects may reduce motivation to adhere (Astriana et al., 2023; Yuanti et al., 2020). Spousal support, as a primary source of emotional and practical assistance, significantly affects a woman's decision-making regarding medical recommendations during pregnancy (Simamora, 2024; Yunita et al., 2023).

Maternal age and educational attainment also influence the degree of comprehension and acceptance of health information (Yulianti et al., 2024). Older or less educated women may differ in access to information and motivation to engage in health programs (Simamora, 2024). Meanwhile, economic status plays a role in access to healthcare services, transportation to health facilities, and adherence to antenatal visit schedules and iron tablet distribution (Putri & Komala, 2022). A comprehensive analysis of these contributing factors is essential to develop effective and contextually appropriate interventions (Kare & Gujo, 2021).

Based on the aforementioned background, this study aims to analyze the factors influencing adherence to iron tablet consumption among pregnant women in the working area of the Muara Enim Community Health Center, focusing on the associations between adherence and variables such as knowledge, socioeconomic status, spousal support, age, education, and attitude.

Methods

Study Design

This study employed a quantitative approach with an analytical survey method and a cross-sectional design. This design was selected to identify the relationships between various independent variables and adherence to iron tablet consumption among pregnant women in the working area of the Muara Enim Community Health Center. The study was conducted over a period from April 24 to May 14, 2025.

Sampling

The study population comprised all pregnant women who received antenatal care services at the Muara Enim Community Health Center in 2024, totaling 1,263 individuals. A sample of 93 respondents was selected using Slovin's formula with a 10% margin of error. The sampling technique employed purposive sampling, with inclusion criteria including: (1) pregnant

women residing in the Muara Enim working area, (2) willingness to participate, and (3) the ability to communicate effectively. Individuals who did not reside in the area or declined participation were excluded from the sample.

Instruments

The primary instrument in this study was a structured questionnaire that had been tested for validity and reliability. The questionnaire consisted of two sections: (1) questions regarding respondent characteristics (age and education), and (2) closed-ended questions assessing knowledge, attitude, socioeconomic status, husband support, and adherence to iron tablet consumption. Adherence was measured using the 8-item Morisky Medication Adherence Scale (MMAS-8), where a score of <2 indicated adherence and ≥2 indicated non-adherence.

Data Collection

Data collection was carried out through face-to-face interviews conducted by the researcher and trained enumerators. Prior to completing the questionnaire, respondents were provided with an explanation of the study's purpose and benefits. Each interview was conducted in a consultation room or a private area at the health center to ensure respondent comfort and data confidentiality.

Data Analysis

Data were analyzed using SPSS version 16. The analysis involved three stages: first, univariate analysis to describe the frequency distribution and proportions of each variable; second, bivariate analysis using the Chi-square test to determine the relationship between independent variables (age, education, knowledge, attitude, socioeconomic status, and husband support) and adherence to iron tablet consumption; and third, multivariate analysis using multiple logistic regression to identify the most dominant factor influencing adherence.

Ethical Consideration

The research adhered to ethical principles, including informed consent, voluntary participation, and confidentiality. Prior to the interviews, all respondents were informed about the study's objectives, benefits, and their rights as participants. Written informed consent was obtained from each participant, and the confidentiality of personal information was strictly maintained and used solely for research purposes.

Results

The frequency distribution of each variable is presented in Table 1.

Table 1. Frequency Distribution of Respondents' Characteristics

Variables	Frequency (n)	Percentage (%)
Adherence		
Adherent	38	40,9
Non-adherent	55	59,1
Age		
Late adulthood	48	51,6
Early adulthood	45	48,4
Educational Level		
High	62	66,7
Low	31	33,3
Knowledge		
Good	49	52,7
Poor	44	47,3
Attitude		
Positive	51	54,8
Negative	42	45,2
Socioeconomic Status		
Above minimum wage (UMK)	81	87,1
Below minimum wage (Non-UMK)	12	12,9
Husband Support		
Supportive	61	65,6
Not supportive	32	34,4
Total	**93**	**100**

Based on Table 1, out of 93 respondents, 38 individuals (40.9%) were adherent to iron tablet consumption, while 55 individuals (59.1%) were non-adherent. The majority of respondents were in the late adulthood age group (51.6%). Most had a high level of education (66.7%), good knowledge (52.7%), and a positive attitude (54.8%). In terms of socioeconomic status, the majority earned at or above the minimum wage (87.1%), and most received support from their husbands (65.6%).

A bivariate analysis was conducted to examine the relationship between each independent variable and adherence to iron tablet consumption among pregnant women. The results of the Chi-Square test for the variables of knowledge, socioeconomic status, and husband support are presented in Table 2.

Table 2. Analysis of Factors Influencing Adherence to Iron Tablet Consumption Among Pregnant Women at Muara Enim Community Health Center

Variables	Adherence				Total	Pvalue
	Adherent		Non-adherent			
	n	%	n	%	n	
Age						
Late adulthood	21	43,8	27	56,2	48	0,70
Early adulthood	17	37,8	28	62,2	45	
Educational Level						
High	23	37,1	39	62,9	62	0,41
Low	15	48,4	16	51,6	31	
Knowledge						
Good	38	77,6	11	22,4	49	0,00
Poor	0	0	44	100,0	44	
Attitude						
Positive	21	41,2	30	58,8	51	1,00
Negative	17	40,5	25	59,5	42	
Socioeconomic Status						
Above minimum wage (UMK)	37	45,7	44	54,3	81	0,02
Below minimum wage (Non-UMK)	1	8,3	11	91,7	12	
Husband Support						
Supportive	30	49,2	31	50,8	61	0,04
Not supportive	8	25,0	24	75,0	32	

As shown in Table 2, there were significant associations between knowledge (p = 0.00), socioeconomic status (p = 0.02), and husband support (p = 0.04) and adherence to iron tablet consumption. All respondents with poor knowledge demonstrated 100% non-adherence. Among those with socioeconomic status below the minimum wage, 91.7% were non-adherent. In addition, 75.0% of respondents who did not receive husband support were non-adherent.

A multiple logistic regression analysis was conducted to identify the most dominant independent variable influencing adherence to iron tablet consumption. The final results of the logistic regression model are presented in Table 3.

Table 3. Final Multiple Logistic Regression Model of Independent Variables and Adherence to Iron Tablet Consumption

Variable	*pValue*	*OR*	95,0% *C.I.for EXP*(B)	
			Lower	*Upper*
Husband Support	0,02	0,34	0,13	0,88

Based on Table 3, husband support was identified as the most dominant factor influencing adherence to iron tablet consumption, with a p-value of 0.02 and an odds ratio (OR) of 0.34 (95% CI: 0.13–0.88). This indicates that pregnant women who did not

receive support from their husbands were 0.34 times less likely to adhere to iron tablet consumption compared to those who received husband support.

Discussion

The study found no significant association between the educational level of pregnant women and adherence to iron tablet consumption. This suggests that educational background, whether high or low, does not directly determine compliance with medical recommendations. While education is a lifelong learning process that contributes to individual potential development (Widyasmara, Pudjirahaju, & Razak, 2021), in this context, it appears insufficient as a sole determinant. This condition indicates that practical understanding or knowledge regarding the benefits of iron tablets can be acquired from sources other than formal education. Therefore, appropriate education remains necessary for all pregnant women regardless of their educational attainment (Priyanto, 2018).

In contrast to education, knowledge was significantly associated with adherence to iron tablet consumption. Pregnant women with good knowledge were found to be 0.22 times more likely to adhere compared to those with poor knowledge. Knowledge is acquired through sensory experiences as well as rational and intuitive learning processes (Anggraini, Mulyani, Novaria, & Virawati, 2024; Subba & Araveti, 2025). Adequate knowledge about the benefits and risks of anemia, and the importance of iron supplementation, can influence adherence behavior (Susanti & Nadiawati, 2022). This strengthens the argument that educational interventions should focus on enhancing maternal knowledge as a key to improving adherence. Hence, nutrition counseling and health education during pregnancy should be further reinforced (Gillespie et al., 2023).

Meanwhile, the results showed no significant association between attitude and adherence to iron tablet consumption. Although attitude is a manifestation of knowledge and feelings toward an object, it does not always lead to corresponding behavior. According to attitude theory, attitude comprises cognitive, affective, and conative components. Misalignment among these components can create dissonance, which may result in non-adherence (Elmore & Ellis, 2022). Another possible explanation is that some pregnant women may have prior experience with iron tablets and are aware of side effects such as nausea; therefore, even with a positive attitude, they might choose not to consume them regularly. This suggests that attitude does not always reflect actual behavior (Lopez de Romaña et al., 2023).

Socioeconomic status was found to have a significant association with adherence. Respondents whose income met or exceeded the regional minimum wage (UMK) were 9.25 times more likely to adhere compared to those below UMK. Economic limitations may affect dietary patterns, access to healthcare services, and motivation to participate in health programs (Putri & Komala, 2022). Pregnant women from lower-income families tend to have inadequate nutrition and limited attention to health. This underscores the need for social and economic interventions, such as food assistance programs or intensive health education targeted at economically vulnerable groups (Elmeida & Meirawati, 2022).

Husband support was also found to be significantly associated with adherence. Respondents who received support from their husbands were 2.90 times more likely to adhere than those who did not. Such support may be emotional, informational, or instrumental—for instance, reminding to take tablets, accompanying antenatal visits, or providing encouragement (Elmeida & Meirawati, 2022). As a central figure in family decision-making, the husband has a significant influence on maternal health behaviors. Therefore, increasing husband involvement in pregnancy-related programs is essential, such as through family-based approaches or father classes (Besral, Misrawati, Afiyanti, Ismail, & Arifin, 2023).

Furthermore, the results of the multiple logistic regression analysis revealed that husband support was the most dominant factor

influencing adherence to iron tablet consumption. With an odds ratio (OR) of 0.34 and a p-value of 0.02, pregnant women who lacked husband support were 0.34 times less likely to adhere compared to those who received support. Although knowledge and socioeconomic status were also influential, the husband's role emerged as the most critical factor for the success of iron supplementation programs. This finding should be used to inform the strengthening of family-based nutrition awareness programs and enhance family involvement in antenatal care services (Borie, Siyoum, Tsega, & Anbese, 2022).

The fact that husband support was the most dominant factor can also be understood within the socio-cultural context of Indonesian society, where household decisions are often influenced by the head of the family or husband. Support from the husband can increase maternal motivation to follow health workers' advice, including the regular consumption of iron tablets. This study highlights the importance of targeting not only pregnant women but also their partners in collaborative efforts to prevent anemia during pregnancy. Consequently, interventions that actively involve both partners are likely to be more effective than those focusing solely on pregnant women (Rezaei, Yazdanpanahi, Asadollahi, Karimi, & Ghahremani, 2025).

Overall, the findings of this study indicate that among the various factors examined—educational level, knowledge, attitude, socioeconomic status, and husband support—husband support is the most influential factor affecting adherence to iron tablet consumption. While knowledge and economic status play important roles, the absence of family support, especially from husbands, presents significant barriers to adherence. Therefore, it is necessary to develop family-based intervention strategies that emphasize husband involvement in maternal education and decision-making during pregnancy. These results are expected to serve as a foundation for maternal and child health promotion policies, particularly in addressing pregnancy-related anemia through a more comprehensive and context-specific approach.

Conclusion and Recommendation

This study demonstrated a significant association between knowledge, socioeconomic status, and husband support and adherence to iron tablet consumption among pregnant women at Muara Enim Community Health Center in 2025. Pregnant women with good knowledge, adequate socioeconomic status (at or above the regional minimum wage), and strong husband support were more likely to adhere to iron tablet supplementation. In contrast, variables such as age, educational level, and attitude showed no significant relationship with adherence.

The multivariate analysis identified husband support as the most dominant factor influencing adherence. Husband support plays a vital role in shaping the motivation and health behaviors of pregnant women, both emotionally and functionally. These findings highlight the importance of family-centered approaches in the prevention of anemia during pregnancy.

Based on the findings, it is recommended that the Muara Enim Community Health Center enhance its educational strategies by involving not only pregnant women but also their husbands as primary partners during pregnancy. Husband involvement can be promoted through family health education, fatherhood classes, and integrated counseling sessions during antenatal visits. Healthcare workers should also be more proactive in identifying pregnant women with low knowledge, sub-minimum wage income, or lack of family support, and provide them with targeted assistance and easily understandable information about the benefits and importance of regular iron tablet consumption.

Furthermore, cross-sector collaboration should be developed, involving community health workers and local leaders, to broaden the outreach of health programs, particularly for socially and economically vulnerable pregnant women. These efforts are expected to improve overall adherence to iron supplementation, reduce anemia prevalence, and contribute to the success of maternal and child health programs at the primary care level. Future research is also

recommended to explore psychosocial and local cultural factors that may influence maternal health behaviors in greater depth.

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Declaration on the Use of AI
No AI tools were used in the preparation of this manuscript.

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