Media Gizi Kesmas
p-ISSN 2301-7392, e-ISSN 2745-8598
10.20473/mgk.v14i1.2025.35-44

ORIGINAL ARTICLE **Open Access**

Analysis of Determinants of Pregnant Women's Compliance in Consuming Iron Supplement Tablets and Its Association with Pregnancy Anemia

Analisis Determinan Perilaku Ibu Hamil terhadap Kepatuhan Mengonsumsi Tablet Tambah Darah dengan Kejadian Anemia Kehamilan

Sofia Ainur Rohma[1], Ayunda Regina Maharani[2], Melinda Arta Reza Putri[2], Hasna Amalia Salsabila[1], Shrimarti Rukmini Devy[1]*

[1]Department of Epidemiology, Population Biostatistics, and Health Promotion, Faculty of Public Health, Universitas Airlangga, Surabaya, 60115, Indonesia
[2]Department of Health Administration and Policy, Faculty of Public Health, Universitas Airlangga, Surabaya, 60115, Indonesia

Article Info

***Correspondence:**
Shrimarti Rukmini Devy, Dra., M.Kes
shrimarti-r-d@fkm.unair.ac.id

Submitted: 03-12-2024
Accepted: 04-06-2025
Published: 30-06-2025

Citation:
Rohma, S. A., Maharani, A. R., Putri, M. A. R., Salsabila, H. A., & Devy, S. R. (2025). Analysis of Determinants of Pregnant Women's Compliance in Consuming Iron Supplement Tablets and Its Association with Pregnancy Anemia. *Media Gizi Kesmas*, 14(1), 35-44. https://doi.org/10.20473/mgk.v14i1.2025.35-44

ABSTRACT

Background: The distribution of iron tablets for women in pregnancy is the government's effort to provide the iron needs during pregnancy. The level of compliance among pregnant women in taking iron supplement tablets is still insufficient. Five out of ten women in pregnancy in Indonesia experience pregnancy anemia.
Objectives: This study aims to analyze five factors that influence the compliance behavior of women in pregnancy in consuming iron tablets for pregnant women, namely intention to act (Behavior intention), social support (Social-support), accessibility of information (Accessibility of information), personal autonomy (Personal Autonomy), and the situation that allows action (Action Situation).
Methods: The study was conducted using a mixed-method design (quantitative and qualitative). The quantitative study was conducted through a questionnaire survey and analyzed using Fisher's Exact Test, while the qualitative study was conducted through focus group discussion (FGD) with midwives and in-depth interviews with women in pregnancy and midwives. The sample consisted of 31 women in pregnancy in the working area of the Kenjeran Health Center, Surabaya. The data collection method used was purposive sampling. The independent variable in this study was the compliance behavior of women in pregnancy in consuming iron tablets, while the dependent variables were based on Snehandu B. Karr's theory, which includes behavior intention, social support, accessibility of information, personal autonomy, and action situation.
Results: The quantitative results show that the variable accessibility of information has a significant relationship (p value=0.0376) and a positive effect (p value=0.0292 and OR=1.9630) on the compliance behavior of women in pregnancy in consuming iron tablets for pregnant women.
Conclusion: There is a need to increase the accessibility of information from health cadres to pregnant women.

Keywords: Anemia, Behavior, Iron tablets, Maternal health, Pregnant women.

ABSTRAK

Latar Belakang: *Pemberian Tablet Tambah Darah (TTD) merupakan upaya pemerintah untuk memenuhi kebutuhan zat besi selama kehamilan. Perilaku kepatuhan ibu hamil dalam mengonsumsi TTD masih rendah. Terdapat 5 dari 10 ibu hamil di Indonesia mengalami anemia kehamilan.*

Tujuan: *Penelitian ini bertujuan untuk menganalisis lima faktor yang mempengaruhi perilaku kepatuhan ibu hamil dalam mengonsumsi TTD, yaitu niat untuk bertindak (*Behaviour Intention*), dukungan sosial* (Social-support*), akses informasi (*Accessibility of Information*), otonomi pribadi (*Personal Autonomy*), situasi yang memungkinkan untuk bertindak (*Action Situation*).*
Metode: *Penelitian dilakukan dengan desain* mixed method *(kuantitatif dan kualitatif). Penelitian kuantitatif dilakukan melalui penyebaran kuesioner dan dianalisis menggunakan uji* Fisher Exact*, sedangkan penelitian kualitatif melalui* Focus Group Discussion *(FGD) pada ibu kader dan* Indepth Interview *pada ibu hamil dan bidan. Sampel merupakan 31 ibu hamil di wilayah kerja Puskesmas Kenjeran, Surabaya. Metode pengumpulan data berupa purposive sampling. Variabel dalam penelitian ini berupa perilaku kepatuhan ibu hamil dalam mengonsumsi TTD, sedangkan variabel dependen mengacu pada teori* Snehandu B. Karr*, berupa niat, dukungan social, ketersediaan informasi, otonomi personal, dan diatasi yang memungkinkan untuk bertindak.*
Hasil: *Hasil uji kuantitatif menunjukkan variabel* accessibility of information *memiliki hubungan (p value=0.0376) dan pengaruh positif (p value=0.0292 dan OR=1.9630) terhadap perilaku kepatuhan ibu hamil dalam mengonsumsi TTD.*
Kesimpulan: Diperlukan peningkatan akses informasi dari kader dan tenaga kesehatan kepada ibu hamil.

Kata kunci*: Anemia, Ibu hamil, Kesehatan ibu, Perilaku, Tablet tambah darah*

INTRODUCTION

Based on Riskesdas data (2018), about half of women in pregnancy in Indonesia suffer from anemia. Anemia occurs when the hemoglobin (Hb) concentration decreases below the threshold or the number of erythrocyte count decreases (Kumar *et al.*, 2022). According to the 2021 Ministry of Health's Guidelines on the Administration of Iron Tablets, the consumption of iron tablets for pregnant women should begin from the early stages of pregnancy and continue through the postpartum period, with a recommended minimum intake of 90 tablets during the entire pregnancy. In East Java, 89.4% of women in pregnancy received iron tablets for pregnant women. Nevertheless, although 44.5% of pregnant women were provided with 90 or more iron tablets, only 15.8% of them consumed the tablets as recommended (Abidah and Sumarmi, 2024).

The National Basic Health Survey (SKI) 2023 shows that the proportion of pregnant women aged 10–54 years who received iron tablets in Indonesia was 92.2%, while in East Java it was 94.2%. This is in line with the data from the Indonesian Health Profile of 2021, which reports that the coverage of iron tablet supplementation among pregnant women reached 84.2% (Kementerian Kesehatan, 2021). This figure represents a significant increase compared to previous years, with coverage recorded at 64% in 2019 and 83.6% in 2020 (Kementerian Kesehatan, 2019, 2020). The data show that the coverage of iron tablets for women in pregnancy administration in women in pregnancy is quite even, but the high rates of anemia in women in pregnancy is still quite high due to non-compliance to iron tablets consumption for women in pregnancy (Nur Fauziah, Suparti and Maesaroh, 2022). According to the National Basic Health Survey (SKI) 2023, only 38.1% of pregnant women consumed at least 90 iron tablets, while the remaining 61.9% consumed less than the recommended amount, indicating a high rate of non-adherence. This trend is further reflected in regional data, where in Indonesia, 71.3% of pregnant women received fewer than 90 tablets and only 28.6% received more than 90. Meanwhile, in East Java, 70.5% received fewer than 90 tablets and 29.3% received more. In terms of actual consumption, 79.9% of pregnant women in Indonesia consumed less than 90 tablets, with only 20% meeting the recommended intake. Similarly, in East Java, 80.6% consumed less than 90 tablets, while just 19.3% adhered to the recommendation.

Anemia in pregnancy remains a significant public health issue in the Kenjeran Community Health Center coverage area. Based on preliminary data from local health records, many pregnant women still experience low hemoglobin levels, indicating a persistent issue of iron deficiency. Despite government efforts to provide iron tablets as a preventive measure, compliance among pregnant women remains suboptimal. Field observations and reports from health cadres indicate that many women either forget to take the tablets, are unaware of their importance, or experience side effects that discourage regular consumption. Understanding the root causes behind non-compliance is essential to developing effective anemia prevention strategies in the Kenjeran Health Center area.

Low maternal compliance with iron tablet consumption is a primary concern that contributes to anemia during pregnancy. Findings from a study undertaken by Aryani (cited in Salulinggi *et al*., 2021), highlighting the issue that 58.9% of women in pregnancy are not adhere with iron tablet consumption. This finding is consistent with Pohan's (2022) research demonstrating a correlation between anemia and adherence to iron tablet consumption.
The poor adherence to iron supplementation may be attributed to pregnant women's lack of knowledge regarding the importance of taking iron tablets and their low level of acceptance (Abidah and Sumarmi, 2024). Furthermore, research conducted by Nugraheni and Sulastri (2024) shows a significant association between pregnant women's knowledge levels and compliance levels in taking iron tablets (p value=0.0200). Apart from that, research led by Salulinggi *et al*. (2021) demonstrated that factors that cause poor adherence to iron tablets for women in pregnancy are laziness, forgetfulness, side effects in the form of vomiting, nausea and dizziness. This is confirmed by the research undertaken by Anggraeni and Muchtar (2021) who also stated that the primary reason for non-adherence to iron supplementation among mothers is boredom, which reaches 23.5%. These findings align with research by Utami, Naktiany and Sukanty (2024) which demonstrated that nausea, vomiting, boredom and forgetting are the primary reasons for poor adherence to iron tablet consumption for pregnant women.

One of the impacts of pregnancy anemia is still high in Indonesia, which are still developing, namely the rate of occurrence of low birth weight (LBW). According to WHO (cited in Ningsih, Damayanti and Suciaty, 2022) Indonesia is ranked ninth in the proportion LBW babies in the world, namely more than 15.5% of all births every year. Based on 2019 Statistics Data (BPS) data, the frequency of low birth weight babies in Surabaya reached 940 people. This is an important concern considering that LBW events may influence the baby's long-term quality of life.

The incidence of LBW is caused by multifactors, an example of which is anemia in pregnant women. In research, Purwanto and Wahyuni (2016), stated that anemic mothers have the potential to give birth to LBW babies 4.030 times compared to mothers who are not anemic. This is confirmed by research by Wahyuni, Ananti and Issabella, (2021) who analyzed several studies related to the correlation between anemia and the incidence of low birth weight and obtained the results that anemia in women in pregnancy has a significant effect on the incidence of LBW. This is because iron deficiency can reduce the quality of hemoglobin which can inhibit fetal growth and development.

Based on this, the author aims to explore the non-adherence behavior of pregnant women in taking iron tablets, focusing on five key factors that influence compliance: behavior intention, social support, accessibility of information, personal autonomy, and the enabling action situation. These factors are closely related to the incidence of anemia, a condition that significantly contributes to high infant morbidity rates and serves as a major public health indicator. Furthermore, this study aims to develop preventive strategies at the level of specific protection to help prevent anemia during pregnancy. These efforts can be used as a source of assessment for policy makers as a national strategy formulation as an effort to overcome anemia in pregnant women. This must be immediately intervened by the national government in an effort to realize policies that are guided by achieving good health and well-being, as outlined in Sustainable Development Goals (SDGs) 3.

METHODS

This research was conducted offline in the Kenjeran Community Health Center coverage area, Surabaya which includes Kenjeran, Kedung Cowek, Bulak and Sukolilo sub-districts from May to June 2024. It is empirical in nature and uses a mixed method design. The type of research used is a sequential explanatory strategy, consisting of quantitative data collection method and qualitative data collection. This design was chosen because this research has a strong quantitative background, but also requires qualitative supporting data, especially to get comprehensive answers regarding the mother's compliance behavior in consuming iron tablets for pregnant women. The independent variable in this study is the lack adherence behavior of pregnant women's adherence to iron tablets consumption. The dependent variable in this research refers to Snehandu B. Karr's theory which states that behavior depends on five things, namely a person's intention to act (Behavior intention), social support from the surrounding community (Social-Support), whether or not there is health information or health facilities (Accessibility of Information), personal autonomy, situations that make it possible to act or not act (Action Situation). Ethical permission was obtained from the ethical review board of Airlangga University with certificate number 069/HRECC.FODM/VII/2024 and permission to conduct research in Kenjeran Community Health Center coverage. Oral consent was obtained from each study participant and written consent was obtained from anemic pregnant women.

The data collection method is purposive sampling, with inclusion criteria specifying pregnant women with anemia in the Kenjeran Community Health Center coverage area and exclusion criteria in the form of women in pregnancy whose anemia

status is uncertain. The total population in this study is unknown due to the absence of an integrated digital health recording system, as data collection at the Kenjeran Community Health Center is still conducted manually. As a result, the sample was selected using purposive sampling based on the available data. A total of 31 pregnant women with anemia were recruited for the quantitative approach. This research involved 31 respondents for a quantitative approach with the subjects being anemic women in pregnancy who lived in the Kenjeran Community Health Center coverage area, Surabaya. According to statistical convention, samples larger than 30 are generally considered normally distributed (Sintia, Danil Pasarella and Andi Nohe, 2022). This is also confirmed by Fahmeyzan *et al.* (2018) who state that data of more than 30 is said to be a large sample and normally distributed.

Qualitative data were collected through semi-structured in-depth interviews and focus group discussions. These methods aimed to explore in greater depth the challenges behind pregnant women's non-compliance in consuming iron tablets (TTD) and to assess whether the current intervention programs have been effective or require adjustment. This qualitative approach involved four pregnant women, each representing one sub-district (Kelurahan), one midwife coordinator, and eight health cadres (one from each sub-district) in a focus group discussion (FGD). Thus, a total of 13 participants were involved in the qualitative phase.

The research subject search stage will enter the pre-field stage which is carried out by distributing surveys and direct observation. Next, quantitative data were collected by distributing questionnaires to anemic women in pregnancy in the Kenjeran Community Health Center working area. After the data were obtained according to the specified number of samples, data analysis was then carried out. The outcomes of quantitative data analysis were utilized as a reference for preparing FGDs and in-depth interviews. Qualitative data collection through Focus Group Discussion (FGD) on six female health cadres was executed offline at the Kenjeran Health Center. In-depth interviews were conducted with anemic women in pregnancy at the subject's home or at an agreed place. Data from FGDs and in-depth interviews were documented through several stages. First, audio recordings were conducted during each session with the participants' consent to ensure the completeness of information. Field notes were also taken to capture important points, non-verbal cues, and the researcher's observations. All audio recordings were then transcribed verbatim into written text for analysis. The transcribed data were analyzed through thematic coding to identify patterns and categorize key themes in accordance with the research objectives. To support the credibility of the analysis, relevant participant quotations were selected and presented in the results. All documentation, including transcripts and field notes, was securely stored with confidentiality maintained by replacing participant identities with codes.

The research instrument in this study was a demographic data questionnaire containing age, occupation, frequency of previous pregnancies, history of comorbidities, and body mass index (BMI). The knowledge, attitudes and actions questionnaire used a 4-point Likert scale consisting of 20 questions. Respondents' compliance behavior was seen based on monitoring data on the provision of iron tablets for women in pregnancy by health cadres accompanying pregnant women. The instrument for measuring variables of behavior intention, social support, accessibility of information, personal autonomy, and action situation was adapted from a structured questionnaire based on Snehandu B. Karr's theory. Each variable was measured using multiple Likert-scale items tailored to its concept. All instruments were tested for validity and reliability prior to deployment. The categories for calculating remaining medication are categories of compliance if and non-compliance. In addition, the categories for BMI were based on the World Health Organization (WHO, 2018), which are categorized into thinness, underweight, normal weight, overweight, and obesity. At the qualitative stage, semi-structured interview guides were used to direct both in-depth interviews and FGDs, focusing on barriers, social influences, and program effectiveness related to iron tablet consumption. The in-depth interview guide consisted of semi-structured questions designed to explore factors contributing to non-compliance, perceived barriers, and suggestions for improving health interventions.

The validity test of the questionnaire instrument was carried out on 31 anemic women in pregnancy in Kenjeran District. Validity test results indicate a value of "Sig. (2-tailed)" for each question on each variable is less than 0.05 and the Pearson correlation is also positive, so it can be stated that the questionnaire is valid. Meanwhile, Cronbach's alpha is used to assess reliability, with values indicating more than 0.7 it will be considered good. In this instrument, Cronbach's alpha is 0.690, which means it is sufficient but not perfect. Based on the results of the validity and reliability tests, this questionnaire instrument was declared valid and reliable so that it could be used to analyze the determinants of the behavior of anemic women in pregnancy according to. Karr's theory regarding their compliance behavior when taking iron supplement tablets. To ensure data quality, instruments at both stages were validated appropriately, and the qualitative tools were structured through thematic guides.

Quantitative data in the form of questionnaires were analyzed statistically non-parametrically using the Fisher Exact Test. Meanwhile, to deepen the quantitative findings, data were collected using qualitative methods with in-depth interviews with women in pregnancy and midwives as well as focus group discussions with health cadres. Quantitative data were first checked for completeness, accuracy and data consistency using a data cleaning process. The independent variables from the data were measured using a 4-point Likert scale to avoid neutral answers from respondents. The scale consists of scale 1 (strongly disagree), scale 2 (disagree), scale 3 (agree) and scale 4 (strongly agree). To ensure the instrument was valid and reliable, the author conducted a validity and reliability test first before collecting quantitative data. Then, data analysis was carried out using the R Studio programming application.

The stages of quantitative data analysis start from the data cleaning process to correct incorrect, inconsistent and incomplete data and simplify the analysis process and produce appropriate conclusions. Then, proceed with univariate analysis to determine descriptive statistical analysis in the form of mean, median, mode, highest value and lowest value. After univariate analysis, with bivariate analysis using the Fisher Exact Test is utilized to examine the relationship between two categorical variables. The Fisher Exact Test is used to analyze categorical data with a small sample size. Then, a multivariate analysis using logistic regression is conducted to predict the likelihood of an event based on one or more independent variables. After that, the results are interpreted and research conclusions made.

The conclusion of the research results will show the influence of intentions, social support, health information, personal autonomy, and situations that make it possible to act on the adherence behavior of women in pregnancy to iron tablet consumption regularly. Apart from that, the results of interviews and FGDs can deepen the picture of research results. The research hypothesis is that if the influence of intention, social support, health information, personal autonomy, and situations that allow for action are shown to be significant, then it can be concluded that these variables can influence the adherence behavior of women in pregnancy taking iron supplements.

RESULTS AND DISCUSSION

Samples were taken of 31 anemic women in pregnancy in the Kenjeran Community Health Center coverage area. The sample selection was taken from anemic women in pregnancy to see whether there were certain behaviors that influenced their adherence behavior when taking iron tablets. This behavior refers to Karr's theory which states five variables that can influence a person to act. These five things are a person's intention to act (Behavior intention), social support from the surrounding community (Social-Support), whether or not there is health information or health facilities (Accessibility of Information), personal autonomy (Personal Autonomy), situations that make it possible to act or not acting (Action Situation).

Based on Table 1. Demographic Characteristics of Respondents, the majority of anemic women in pregnancy were aged 20-35 years (90.32%), while the remaining three anemic women in pregnancy (9.68%) were over 35 years old. The majority of respondents were housewives with a total of 22 people (70.97%). Apart from that, there were several respondents with other jobs, namely four private employees (12.90%), two self-employed people (6.45%), one worker (3.23%), and two teachers (6.45%). Based on place of residence, the majority of respondents, namely 15 people (48.39%) lived in Bulak Village, six people each (19.35%) in Kedung Cowek Village and Sukolilo Baru Village, and four people (12.90%) in Kenjeran Village.

Table 1 also reveals that most of respondents have a normal body mass index, namely 14 respondents (45.16%), while eight respondents (25.81%) have a thin BMI and nine respondents (29.03%) have overweight BMI. The mean BMI was 24.18 with a standard deviation of 7.18, reflecting significant variations in nutritional status among respondents, with a minimum value of 17.1 and a maximum of 54. For the frequency of previous pregnancies, some respondents were as many as 12 people (38.71%) were pregnant for the first time, 10 respondents (32.26%) had given birth once, seven respondents (22.58%) had given birth twice, and two respondents (6.45%) had given birth three times. Meanwhile, for disease history, almost all respondents, namely 29 people (93.54%) had no history of disease, while one respondent each (3.23%) had low blood pressure and typhus.

Table 1. Demographic Characteristics of Respondents (n=31)

Characteristics	Frequency	%
Age		
<20 years	3	9.68
20-35 years	25	80.64
>35 years	3	9.68
Work		
Housewife	22	70.97
Private sector employee	4	12.90
Self-employed	2	6.45
Teacher	2	6.45
Laborer	1	3.23
Residence		
Bulak Village	15	48.38
Kedung Cowek Village	6	19.36
New Sukolilo Village	6	19.36
Kenjeran Village	4	12.90
BMI		
Thinness (<17.0)	0	00.00
Underweight (<18.5)	7	22.58
Normal (18,5-25,0)	14	45.16
Overweight (>25.0)	8	25.81
Obesity (>30.0)	2	6.45
Frequency of Previous Pregnancies		
0	12	38.71
1	10	32.26
2	7	22.58
3	2	6.45
Disease history		
There isn't any	29	93.54
Low blood pressure	1	3.23
Typhoid	1	3.23

Table 2. Distribution of Iron Tablets for Women in Pregnancy Consumption Compliance Behavior Categories

Category	Frequency	%
Comply	18	58.06
Not Compliant	13	41.94

Source: KIA checklist monitoring

In this research, compliance behavior is categorized into compliant behavior and non-compliant behavior. Respondents' compliance behavior was measured from the results of monitoring the (Mother and Child) MCH book checklist regarding iron tablets for women in pregnancy consumption during pregnancy. In accordance with regulations issued by the Indonesian Ministry of Health, the minimum number of blood supplement tablets that women in pregnancy must consume during nine months of pregnancy is 90 pills/tablet, meanwhile according to the Kenjeran Health Center Coordinating Midwife, women in pregnancy are required to consume a minimum of 10 pills/tablet for one month. So, this research explored the experiences of women in pregnancy who did not consume at least 10 blood supplement tablets for one month were considered non-compliant. From these observations, it was found that 13 respondents (41.94) were not compliant with taking iron tablets for women in pregnancy during pregnancy, while 18 respondents (58.06%) were compliant with consuming iron tablets for women in pregnancy during pregnancy.

Bivariate Analysis

Bivariate analysis in this study used the Fisher Exact Test because there were conditions that were not met when using the Chi-square test. Each independent variable, namely Behavior Intention, Social Support, Accessibility of Information, Personal Autonomy, and Action Situation, is analyzed in relation to the dependent variable, namely compliance behavior. Based on the 31 samples obtained, there were 18 respondents who complied and 13 non-compliant respondents regarding iron tablet consumption for pregnant women. The results of hypothesis testing regarding the relationship between Behavioral Intention and compliance behavior are presented in Table 3.

Media Gizi Kesmas
p-ISSN 2301-7392, e-ISSN 2745-8598
10.20473/mgk.v14i1.2025.35-44

Table 3. Bivariate Analysis of the Compliance Behavior of Women in Pregnancy in Consuming Iron Tablets Refers to Snehandu B. Karr's theory

Variable	p value
Behavior Intention	0.1879
Social Support	0.4130
Accessibility of Information	0.0376
Personal Autonomy	0.3324
Action Situation	0.4380

Based on Table 3, factors associated with pregnant women's adherence with iron tablet consumption for women in pregnancy is the variable whether there is information (accessibility of information). This is proven by the p value>0.05, indicating a lack of association between these variables and pregnant women's compliance. A study conducted by Setiawati and Iin Rumintary (2019) on the impact of health education on pregnant women's compliance to iron tablets consumption also showed that providing health information, in this case health education, has a positive impact on pregnant women's compliance in consuming iron tablets. This finding is also consistent with a study by Setyaningtyas, Darundiati and Dewanti (2021), which revealed that access to information is associated with the level of adherence to iron tablet consumption. Meanwhile other variables, namely behavioral intention, social support, personal autonomy, situations that allow action (action situation) have a p value<0.05, indicating that these variables are not related to pregnant women's compliance behavior variables. However, this finding contradicts the study conducted by Nurseptiana and Lestari (2023), which revealed that social support is associated with pregnant women's adherence to iron tablet consumption. Similarly, a study by Yusuf Habibie *et al*. (2024) reveal that social support from family members plays a crucial role in reminding women in pregnancy to consume iron tablets. The analysis revealed no significant association between the variable and pregnant women's adherence to iron tablet consumption in the Kenjeran Puskesmas area, where community health workers proactively conducted home visits to promote adherence. This suggests that external factors, rather than intrinsic motivation, played a more significant role in influencing adherence. Notably, pregnant women's adherence persisted despite the absence of dominant effects from social support, intention, personal autonomy, and enabling factors that facilitated independent decision-making.

Multivariate Analysis

Multivariate logistic regression analysis results are presented in Table 4. Based on the Hosmer-Lemeshow test, the p value=0.5223 (p value>0.05). This implies that the model has good goodness of fit or the model is feasible and can predict well. In the McFadden Adjusted R-squared test, a value of 0.1501 was obtained thereby allowing analysis of the independent variable's effect on the dependent variable was 15.01%. This logistic regression model has an accuracy of 87.09%.

Table 4. Multivariate Analysis of the Compliance Behavior of Women in Pregnancy in Consuming Iron Tablets Refers to Snehandu B. Karr's theory

Variable	B	OR	p value
Behavior Intention	1.1031	3.0135	0.0826
Social Support	0.4465	1.5628	0.2795
Accessibility of Information	0.6745	1.9630	0.0292
Personal Autonomy	0.2490	1.2827	0.5696
Action Situation	0.2341	1.2637	0.5628

As shown in Table 4, Accessibility of Information significantly influences compliance behavior with p value=0.0292 (p value<0.05) and the regression coefficient has a positive sign, namely 0.6745. This means that Accessibility of Information has a positive and significant effect on the adherence behavior of women in pregnancy to iron tablets consumption for pregnant women. The odds ratio value of 1.9630 indicates that women in pregnancy with high Accessibility of Information will have 1.9630 times greater compliance behavior in taking iron tablets for women in pregnancy than women in pregnancy who have poor or low Accessibility of Information. Other variables, namely Behavior Intention, Social Support, Personal Autonomy, and Action Situation in the logistic regression model, have no effect on the adherence behavior of women in pregnancy to iron tablets consumption for women in pregnancy during pregnancy.

Variable access to health information (Accessibility of Information) referred to in the test means education from health workers. This means that education from health workers is correlated to and influences the adherence behavior of women in pregnancy to iron tablets consumption for pregnant women. This finding aligns with the study by Mawaddah *et al*. (2024), which stated that providing health education can increase adherence to iron

tablet consumption. "At first I didn't want to drink sis because I felt fine, but because the midwife told me so I drank" (D, pregnant woman). This proves that education from health workers (Accessibility of Information) influences the adherence behavior of women in pregnancy to iron tablets consumption for women in pregnancy. The results outcome of this study are supported by previous research by Salulinggi *et al.* (2021), that the things that need to be done to increase the adherence behavior of women in pregnancy to iron tablets consumption for women in pregnancy is to provide information and education about blood supplement tablets themselves, both the minimum amount consumed, the effects side which is the body's physiological reaction, as well as the important role of the family in helping women in pregnancy to consume blood supplement tablets (Salulinggi *et al*., 2021). Therefore, efforts are needed by health workers to educate about the importance of preventing pregnancy anemia in the form of providing education and information regarding giving iron tablets for pregnant women.

Based on the results of interviews with the coordinator midwife at the Kenjeran Community Health Center, the form of intervention that has been carried out by the Kenjeran Community Health Center to prevent and overcome pregnancy anemia in women in pregnancy is through a pregnant mother class program which is carried out four times a month, family *posyandu* once a month, and providing tablets to increase blood when women in pregnancy check pregnancy. Blood supplementation tablets are given when women in pregnancy control their health once a month by administering 30 tablets per meeting. These three programs show that the provision of health information has been carried out well. An in-depth interview with a respondent showed that information from health workers made her behave obediently to iron tablets consumption for women in pregnancy because it was important for health. This aligns with research from Elsharkawy *et al.* (2022) which demonstrated that health information was an effective way to educate anemic pregnant women.

"If the midwife tells me to drink, I usually drink, sis. Usually, we are told to drink it before going to bed, sis, so we don't get dizzy/nauseous" (D, pregnant woman). Meanwhile, the variables Behavior Intention, Social Support, Personal Autonomy, and Action Situation are not association to the adherence behavior of women in pregnancy to iron tablets consumption for pregnant women. In the variable of a person's intention to act (Behavior intention) which relates nausea, dislike of medicine, boredom, forgetting with intention, it does not show a relationship with iron tablets for women in pregnancy drinking compliance behavior. This is because health workers recommend drinking iron tablets for women in pregnancy before bed to prevent nausea, forgetfulness and boredom. The results of this study diverge from the research conducted by Salulinggi *et al*., (2021) which states that the factors that cause non-compliance with women in pregnancy to iron tablets consumption for women in pregnancy are laziness, forgetfulness, side effects in the form of vomiting, nausea and dizziness.

In addition, the results of this study do not align with the research conducted by Nabila *et al.* (2023) which states that intentions are associated to the behavior of women in pregnancy to blood supplement tablets consumption. Likewise, research conducted by Wahyuni, Ananti and Issabella (2021) stated that low compliance was caused by forgetting, inadequate motivation, insufficient self-awareness, boredom, and unwanted side effects, and laziness. "Usually if I'm nauseous and don't forget it, I don't start drinking before going to bed, sis" (R, village midwife).

Situation variables that make it possible to act (Action Situation) which are related to people's busy lives and habits are also not related because the staff ordered to consume iron tablets for women in pregnancy before resting/sleeping so that this was done outside of the busy schedule of pregnant women. The variables Social Support and Personal Autonomy are also not related to compliance behavior to iron tablets consumption for women in pregnancy because women in pregnancy are always monitored by health cadres accompanying women in pregnancy when taking iron tablets for pregnant women. Additionally, based on the results of the FGD with health cadres mothers while assisting pregnant women, it is found that:

"Monitoring of women in pregnancy is carried out once a month, usually a program to assist women in pregnancy is carried out by visiting their homes. When making a visit, you usually check the Maternal and Child Health (MCH) book and ask the pregnant woman whether the blood supplement tablets have run out or not. Women in pregnancy also show the medicine given by the Community Health Center" (N, village health cadres).

It is very important for women in pregnancy to have knowledge and awareness of the importance of taking iron tablets for pregnant women. High knowledge can be obtained based on daily habits or other parties who have higher knowledge (Aulia *et al*., 2021). However, high knowledge is also useless if it is not supported by a positive attitude in accepting and implementing that knowledge. The acceptance of women in pregnancy is also an important factor that can influence the adherence behavior of women in pregnancy to iron tablets consumption for women in pregnancy (Abidah and Sumarmi, 2024). Therefore, health workers have a significant role in delivering health education and health cadres accompanying women in pregnancy as reminders to regularly consume iron tablets for

women in pregnancy must continue to be carried out on an ongoing basis.

Based on qualitative and quantitative analysis, it can be inferred that a gap exists between the accessibility of information provided by health workers, especially midwives and health cadres and the accessibility of information accessed by women in pregnancy regarding the intake of blood supplement tablets (iron tablets for pregnant women), starting from the number of items required consumption, how to drink it so it doesn't cause nausea, and material on the importance of consumption. Researchers realize that there are still shortcomings in this research and need to continue to be improved in future research. The limitation or limitation in this research is that it does not measure other variables that have the potential to have an influence, such as education level.

CONCLUSION

This study concludes that among the five analyzed factors, behavioral intention, social support, accessibility of information, personal autonomy, and action situation, only the accessibility of information significantly influenced the compliance behavior of pregnant women in consuming iron tablets. Qualitative findings reinforced this result, showing that education from midwives and structured health programs played a crucial role in improving adherence. The presence and support of health workers, especially in delivering comprehensive and clear information, proved vital in motivating pregnant women to consume iron tablets properly. However, non-compliance was often triggered by side effects such as nausea and vomiting, a lack of perceived necessity, and reluctance to take medication. Strengthening health education and providing consistent support and supervision by health cadres are essential steps to improve iron tablet consumption among pregnant women and help reduce the risk of anemia.

Acknowledgment

We would like to thank the Ministry of Education and Culture and Research and Technology and Airlangga University for providing funding to conduct this research. We also thank the head, midwives and health workers of the Kenjeran Community Health Center as well as the health cadres accompanying women in pregnancy in the Kenjeran Community Health Center's working area who have helped participate in this research.

Conflict of Interest and Funding Disclosure

None

Author Contributions

The author was involved in proposal writing, design, data collection, analysis and article writing. SRD: supervision, investigation, writing-review; SAR: conceptualization, funding acquisition, methodology, writing original draft and writing-review; MARP: formal analysis, funding acquisition, writing original draft and writing review; ARM: methodology, funding acquisition, validation, visualization, writing original draft and writing review; HAS: methodology, funding acquisition, validation, visualization, writing original draft and writing review.

REFERENCES

Abidah, N. and Sumarmi, S. (2024) 'A Comparison of Adherence Levels of Women in pregnancy to Consuming Multiple Micronutrient Supplements and Iron Folic Acid at Mulyorejo Public Health Center, Surabaya', *Amerta Nutrition*, 8(1), pp. 17–25. https://doi.org/10.20473/amnt.v8i1.2024.17-25.

Anggraeni, N. and Muchtar, F. (2021) 'Pengetahuan, Sikap dan Kepatuhan Mengonsumsi Tablet Tambah Darah (TTD) Pada Ibu Hamil Selama Masa Pandemi Covid-19', *Nursing Care And Health Technology*, 1(3), pp. 144–154. https://doi.org/10.56742/nchat.v1i3.28

Asmin, E., Salulinggi, A., Titaley, C. R., & Bension, J. (2021). 'Hubungan Pengetahuan Dan Kepatuhan Ibu Hamil Konsumsi Tablet Tambah Darah Dengan Kejadian Anemia Di Kecamatan Leitimur Selatan Dan Teluk Ambon'. *Jurnal Epidemiologi Kesehatan Komunitas*, 6(1), pp. 229-236. https://doi.org/10.14710/jekk.v6i1.10180

Aulia, D. T. *et al.* (2021). 'Hubungan Antara Pengetahuan tentang Gizi dengan Kebiasaan Sarapan Pada Mahasiswa'. *Jurnal Kedokteran Syiah Kuala*, 21(2). https://doi.org/10.24815/jks.v21i2.19362

Badan Pusat Statistik (BPS). 2019. *Bayi Berat Badan Lahir Rendah (BBLR) dan Bergizi Kurang di Provinsi Jawa Timur, 2019.* Jakarta.

Elsharkawy, N.B. *et al.* (2022) 'Effectiveness of Health Information Package Program on Knowledge and Compliance among Women in pregnancy with Anemia: A Randomized Controlled Trial', *International Journal of Environmental Research and Public Health*, 19(5), p. 2724. https://doi.org/10.3390/ijerph19052724

Kementerian Kesehatan (2014) Peraturan Menteri Kesehatan Republik Indonesia Nomor 97 Tahun 2014. Jakarta.

Kementerian Kesehatan (2018) *Laporan Riskesdas 2018 Nasional*. Jakarta.

Kementerian Kesehatan (2019) *Profil-Kesehatan-Indonesia-2019*. Jakarta. Available at: https://www.kemkes.go.id/id/profil-kesehatan-indonesia-2019 (Accessed: 25 October 2024).

Kementerian Kesehatan (2020) Profil Kesehatan Indonesia Tahun 2020. Jakarta. Available at: https://www.kemkes.go.id/id/profil-kesehatan-indonesia-2020 (Accessed: 25 October 2024).

Kementerian Kesehatan (2021) *Profil Kesehatan Indonesia*. Jakarta. Available at: https://www.kemkes.go.id/id/profil-kesehatan-indonesia-2021 (Accessed: 25 October 2024).

Kumar, S.B. *et al.* (2022) 'Iron Deficiency Anemia: Efficacy and Limitations of Nutritional and Comprehensive Mitigation Strategies', *Nutrients*. 14(14), p. 2976https://doi.org/10.3390/nu14142976.

Mawaddah, N. *et al.* (2024) 'Edukasi kesehatan berdasarkan Standar Intervensi Keperawatan Indonesia (SIKI) meningkatkan kepatuhan konsumsi tablet tambah darah pada remaja', *Journal of Health Research Science*, 4(2), pp. 266–275. https://doi.org/10.34305/jhrs.v4i2.1375

Nabilah, N. and Andriani, H. (2021). 'Determinan Kepatuhan Minum Tablet Tambah Darah (TTD) pada Ibu Hamil: Literature Review', *Journals Of Ners Community*, 13, pp.438–444.

Ningsih, F., Damayanti, N. and Suciaty, S. (2022) 'Gambaran Faktor-Faktor Risiko BBLR pada Bayi di Wilayah Kerja Puskesmas Palu Barat Tahun 2021', *Medika Alkhairaat: Jurnal Penelitian Kedokteran Dan Kesehatan*, 4(2), pp. 76–81. https://doi.org/10.31970/ma.v4i2.102

Nugraheni, A. and Sulastri (2024) 'Relationship between Knowledge and Compliance of Women in pregnancy in Consuming Fe Tablets in the Work Area of the Kartasura Public Health Center', *Scientific Periodical of Public Health and Coastal Health*, 6(2), pp. 1265–1274. http://dx.doi.org/10.30829/contagion.v6i2.21712

Nur Fauziah, A., Suparti, S. and Maesaroh, S. (2022) 'Faktor- Faktor yang Berhubungan dengan Anemia pada Siswi Kelas Xi di Smk Negeri Musuk Boyolali', *Jurnal Kebidanan Indonesia*, 14(1), p. 148. https://doi.org/10.36419/jki.v14i1.771

Nurseptiana, E. and Lestari, U. (2023) 'Faktor yang Berhubungan dengan Kepatuhan Ibu Hamil dalam Mengkonsumsi Tablet Zat Besi (Fe) di Wilayah Kerja Puskesmas Natam Kabupaten Aceh Tenggara Tahun 2023', *Journal of Healthcare Technology and Medicine*, 9(1), pp. 2615–109X. https://doi.org/10.33143/jhtm.v9i1.2799

Purwanto, A.D. and Wahyuni, C.U. (2016) 'Hubungan Antara Umur Kehamilan, Kehamilan Ganda, Hipertensi dan Anemia dengan Kejadian Bayi Berat Lahir Rendah (BBLR)', *Jurnal Berkala Epidemiologi*, 4(3), pp. 349–359.

Pohan, R.A. (2022) 'The Relationship Compliance with Fe Tablet Consumption with Anemia in Pregnant women', *International Journal of Public Health Excellence (IJPHE)*, 1(1), pp. 27–31. https://doi.org/10.55299/ijphe.v1i1.7

Setiawati, A. and Iin Rumintang, B. (2019) 'Pengaruh Pendidikan Kesehatan Tentang Tablet Tambah Darah (TTS) Pada Kelas Ibu Hamil Terhadap Kepatuhan Ibu dalam Mengkonsumsi Tablet Tambah Darah Di UPT BLUD Puskesmas Meninting Tahun 2018', *Jurnal Midwifery Update*, 1(1), pp. 2684–8511. https://doi.org/10.32807/jmu.v1i1.36

Setyaningtyas,N., Darundiati, Y.A. and Dewanti, N.A.Y. (2021) 'Faktor-Faktor Yang Berhubungan Dengan Praktik Konsumsi Tablet Tambah Darah (TTD) Remaja Putri di Wilayah Kerja Puskesmas Gilingan Kota Surakarta', *Jurnal Kesehatan Masyarakat*, 13(2). http://ejournal3.undip.ac.id/index.php/jkm

Sintia, I., Danil Pasarella, M. and Andi Nohe, D. (2022). *Prosiding Seminar Nasional Matematika, Statistika, dan Aplikasinya Terbitan II*.

Utami, S., Naktiany, W.C. and Sukanty, N.M.W. (2024) 'Nutritional Status and Compliance of Fe Tablet Consumption and the Incidence of Anemia in Pregnant Women', *Nutriologi: Jurnal Pangan, Gizi, Kesehatan*, 5(1), pp. 1-9

Yusuf Habibie, I. *et al.* (2024) 'Studi Kualitatif Peran Keluarga Kepada Ibu Hamil Anemia di Wilayah Kerja Puskesmas Arjowinangun, Kota Malang', *Jurnal Kesehatan Tambusai*, 5(3), pp. 2774–5848.

Wahyuni, S., Ananti, Y. and Issabella, C.M. (2021) 'Pregnancy Anemia Relationship with The Event of Low Birth Weight (Lbw): Systematic Literature Review', *Journal of Health*, 8(2), pp. 94–104. https://doi.org/10.30590/joh.v8n2.p94-104.2021

World Health Organization. (2018). *Malnutrition in women*. Available at: https://www.who.int/data/nutrition/nlis/info/malnutrition-in-women (Accessed: 25 October 2024).