THE RELATIONSHIP BETWEEN KNOWLEDGE ABOUT ANEMIA AND COMPLIANCE WITH IRON TABLET CONSUMPTION AMONG ADOLESCENTS

Yuniarti Br Hombing[1], Susilawati[2], Ike Ate Yuviska[3]

[1 2 3] Faculty of Health Sciences, Malahayati University, Bandar Lampung
Email correspondence : susilawati@malahayati.ac.id

ASBTRAK : HUBUNGAN ANTARA PENGETAHUAN TENTANG ANEMIA DAN KEPATUHAN TERHADAP KONSUMSI TABLET BESI DI KALANGAN REMAJA

Latar Belakang: Prevalensi anemia di SMPN 07 Pesawaran tercatat sebesar 36,9% di kalangan siswi. Berdasarkan pemeriksaan yang dilakukan oleh petugas kesehatan dari Unit Pelaksana Teknis (UPTD) Puskesmas Roworejo di SMPN 07 Pesawaran pada Januari 2025, ditemukan bahwa 31 siswi (36,9%) didiagnosis menderita anemia, diklasifikasikan sebagai ringan atau sedang. Dampak anemia di SMPN 07 Pesawaran terlihat dari beberapa keluhan yang sering dilaporkan oleh siswi, seperti mudah lelah, kesulitan berkonsentrasi selama pelajaran, dan sering mengantuk di kelas. Beberapa guru juga melaporkan bahwa beberapa siswi sering mengalami pusing atau bahkan pingsan selama upacara bendera atau kegiatan fisik lainnya.

Tujuan: Tujuan penelitian ini adalah untuk mengetahui hubungan antara pengetahuan tentang anemia dan kepatuhan konsumsi tablet Fe di kalangan remaja di SMPN 07 Pesawaran, Kabupaten Pesawaran, pada tahun 2025.

Metode: Penelitian ini menggunakan pendekatan kuantitatif dengan desain cross-sectional. Populasi terdiri dari seluruh 242 siswi di SMPN 07 Pesawaran, Kabupaten Pesawaran, dengan sampel sebanyak 151 responden yang dipilih melalui purposive sampling. Data dikumpulkan menggunakan kuesioner dan dianalisis melalui metode univariat dan bivariat (uji chi-square).

Hasil: Hasil menunjukkan bahwa 85 responden (56,3%) memiliki pengetahuan yang baik, sedangkan 119 responden (78,8%) menunjukkan kepatuhan rendah terhadap konsumsi tablet Fe. Hubungan yang signifikan diidentifikasi antara pengetahuan tentang anemia dan kepatuhan terhadap konsumsi tablet Fe di kalangan remaja di SMPN 07 Pesawaran, Kabupaten Pesawaran, pada tahun 2025 (nilai p = 0,013). Disarankan agar petugas kesehatan membangun kolaborasi berkelanjutan antara puskesmas dan sekolah, khususnya melalui program PKPR (Pusat Kesehatan Remaja) dan UKS (Unit Kesehatan Sekolah). Kolaborasi dengan guru sebagai pengawas dan fasilitator juga penting untuk mendukung program konsumsi tablet Fe di sekolah.

Kesimpulan: Pengetahuan yang lebih baik berhubungan dengan kepatuhan yang lebih tinggi dalam konsumsi tablet Fe. Namun, secara keseluruhan kepatuhan masih rendah.

Saran: Pendidikan berkelanjutan dan kolaborasi antara sekolah dan pusat kesehatan melalui program PKPR dan UKS diperlukan. Guru harus berperan sebagai pengawas dan fasilitator dalam program konsumsi tablet Fe rutin di sekolah.

Kata kunci: Anemia, kepatuhan konsumsi tablet Fe, pengetahuan, remaja

ABSTRACT

Background: The prevalence of anemia at SMPN 07 Pesawaran was recorded at 36.9% among female students. Based on examinations conducted by health workers from the Technical Implementation Unit (UPTD) Roworejo Community Health Center at SMPN 07 Pesawaran in January 2025, it was found that 31 female students (36.9%) were diagnosed with anemia, classified as either mild or moderate. The impact of anemia at SMPN 07 Pesawaran was evident from several complaints frequently reported by students, such as easy fatigue, difficulty concentrating during lessons, and frequent drowsiness in class. Several teachers also reported that some students often experienced dizziness or even fainted during flag ceremonies or other physical activities.

Purpose: The purpose of this study was to determine the relationship between knowledge of anemia and compliance with Fe tablet consumption among adolescents at SMPN 07 Pesawaran, Pesawaran Regency, in 2025.

Methods: This research employed a *quantitative* approach with a *cross-sectional* design. The population consisted of all 242 female students at SMPN 07 Pesawaran, Pesawaran Regency, with a sample of 151

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respondents selected through *purposive sampling*. Data were collected using questionnaires and analyzed through univariate and bivariate methods *(chi-square test)*.

Results: The results showed that 85 respondents (56.3%) had good knowledge, while 119 respondents (78.8%) demonstrated low compliance with Fe tablet consumption. A significant relationship was identified between knowledge of anemia and compliance with Fe tablet consumption among adolescents at SMPN 07 Pesawaran, Pesawaran Regency, in 2025 (*p-value* = 0.013). It is recommended that health workers establish ongoing collaboration between community health centers and schools, particularly through PKPR (Youth Care Health Services) and UKS (School Health Unit) programs. Collaboration with teachers as supervisors and facilitators is also essential to support the Fe tablet consumption program in schools.

Conclusion: Better knowledge is associated with higher compliance in Fe tablet consumption. However, overall compliance remains low.

Suggestion: Continuous education and collaboration between schools and health centers through PKPR and UKS programs are necessary. Teachers should serve as supervisors and facilitators in routine Fe tablet consumption programs in schools.

Keywords: Anemia, Fe tablet consumption compliance, knowledge, adolescents

INTRODUCTION

Anemia is a condition characterized by a deficiency in the number of red blood cells or hemoglobin, which functions to transport oxygen throughout the body. Adolescent girls are a group that is particularly vulnerable to anemia, not only because they often experience malnutrition, but also because they undergo regular menstruation. Menstruation increases the body's need for iron (Fe), which is essential for the production of red blood cells. When iron intake is insufficient, the risk of anemia increases (Muhayaroh, 2024).The high prevalence of anemia among adolescent girls may be caused by several factors, including chronic blood loss, inadequate iron intake, poor iron absorption, and increased iron requirements during growth, puberty, and lactation (Sab'ngatun & Riawati, 2021).

According to the World Health Organization (WHO), the global prevalence of anemia reaches two billion people. The national micronutrient survey report indicated that 18% of women in Ethiopia aged 15–49 years suffer from anemia. In Somalia, the prevalence of anemia is 34.8%, in Gambella 26.7%, and in Africa overall 26.2%, which is significantly higher than the national average (Chisti et al., 2022). In Indonesia, the prevalence of anemia among women aged 15 years and older is 23%, which is higher compared to neighboring countries such as Malaysia (21%) and Singapore (22%). Among those aged 15–24 years, the prevalence of anemia in Indonesia is reported at 32% (Riskesdas, 2018). Based on data from the Indonesian Health Survey (SKI, 2023), 16.3% of respondents aged 5–14 years (out of 5,671) were found to have anemia, and 15.5% of respondents aged 15–24 years (out of 5,760) experienced anemia. In terms of characteristics, 18.0% of anemia cases occurred among females (SKI, 2023).

A study conducted in Bandar Lampung City by Zuraida et al. (2020) showed that the prevalence of anemia among adolescent girls ranged from 21% to 80.9%, indicating that anemia remains a serious health problem in various regions, including Lampung. In Lampung Province, data from January 2025 reported that there were 31,557 adolescent girls in Pesawaran, of whom 16,845 consumed iron supplementation tablets completely, while only 11,135 underwent anemia screening. The screening targeted seventh-grade junior high school and tenth-grade senior high school students due to limited equipment and materials for hemoglobin testing. Among those screened, 85 were identified with anemia, consisting of 62 mild cases, 23 moderate cases, and no severe cases (Dinkes Provinsi Lampung, 2025).

Anemia in adolescents has wide-ranging impacts, including reduced physical capacity, reproductive physiology disorders, and decreased productivity in adulthood (Chisti et al., 2022). Adolescents with iron deficiency are 2.3–2.4 times more likely to have poor academic performance, particularly in subjects such as mathematics (Ayu Sunarti, 2022). Other consequences include delayed physical growth, behavioral and emotional disturbances, and reduced immunity. Adolescents with anemia tend to feel weak, tire easily, have difficulty concentrating, and experience decreased learning and working productivity (Sari, P., Hilmanto, D., Herawati, D. M. D., & Dhamayanti, 2022). A reduction in hemoglobin levels can also cause physical symptoms such as fatigue, tachycardia, and shortness of breath (Bakta, 2019). Moreover, unmet iron requirements in adolescent girls may

lead to obstetric complications in the future, including low birth weight, preterm birth, or even maternal mortality during childbirth (Chisti et al., 2022).

Several factors contribute to anemia in adolescent girls, including menstruation, increased iron requirements during puberty, and lifestyle or dietary patterns that do not support adequate nutritional intake (Mone, 2020; Sab'ngatun & Riawati, 2021). Other factors such as limited knowledge about nutrition, socioeconomic status, physical activity, and menstrual patterns also contribute to the high rate of anemia. Parental education, family income, and eating habits are also significant risk factors (Budiarti et al., 2021).

The Indonesian government has made various efforts to reduce the prevalence of anemia among adolescent girls, one of which is through the iron supplementation program in schools, in accordance with the Circular Letter of the Director General of Public Health of the Ministry of Health Number HK.03.03/V/0595/2019. This program requires educational institutions to provide a collective "iron tablet consumption day" for adolescent girls, with a dosage of one tablet per week for women of reproductive age (Kemenkes RI, 2018). However, despite the implementation of this program, many adolescent girls remain non-compliant with iron tablet consumption. The Indonesian Health Survey (SKI, 2023) revealed several reasons, such as the perception that the tablets are unnecessary (12.8%), consumption only during menstruation (7.6%), forgetfulness (29.2%), unpleasant taste and smell (29.7%), and side effects such as constipation (8.2%). Other influencing factors include a lack of parental support in providing nutritious meals and limited awareness of the importance of iron tablets (Budiarti et al., 2021).

Based on hemoglobin (Hb) examinations conducted by UPTD Puskesmas Roworejo in January 2025 among seventh- and tenth-grade adolescent girls across nine schools, it was found that out of 359 students examined, 70 students had mild anemia (Hb 11.1–11.9 g/dl) and 48 students had moderate anemia (Hb 8–10.9 g/dl). At SMAN 1 Neket, 101 students were examined, with 22.8% of female students found to have anemia. At SMK Fatul Ulum, with a total of 32 students, 21.9% were identified with anemia. At MA Raudhatul Huda Sidomulyo, out of 16 students examined, 21.3% were found to have anemia. Meanwhile, at MTs Nurul Hidayah, 26.7% of 18 students examined were anemic. MTs Raudhatul Huda Sidomulyo had 22 students screened, with 27.8% of them experiencing anemia. At MTs Guppi Tri Rahayu, 21.6% of 19 students examined had anemia. At SMPN SATAP, 20% of 10 students examined were identified with anemia. At SMPN 21 Pesawaran, 22.7% of 44 students were anemic. Meanwhile, SMPN 07 Pesawaran showed the highest prevalence among the nine schools, with 36.9% of 82 students experiencing anemia.

These findings indicate that anemia remains a significant public health issue requiring greater attention, particularly in terms of nutrition education, increasing the consumption of iron-rich foods, and routine iron supplementation programs in schools. In addition to limited funding allocations, several reasons explain why hemoglobin (Hb) examinations are not regularly conducted. Hb screening for adolescent girls has not yet become a primary priority in school health or government programs, as focus is often directed toward other health issues such as immunization, stunting prevention, or communicable disease control. Some health programs are not carried out annually but follow certain cycles (e.g., every three years) to reduce operational burdens and ensure that results can be compared with previous periods within a sufficient time frame to observe trends. Hb testing also requires specific tools, such as a hemoglobinometer and reagents with limited shelf life. If supplies run out or are insufficient, testing cannot be carried out. Furthermore, local or central government policies may shift program priorities. If a policy emphasizes alternative approaches such as nutrition education or iron supplementation without Hb screening, the screening activities may be temporarily suspended.

Based on examinations conducted by health officers from UPTD Puskesmas Roworejo at SMPN 07 Pesawaran in January 2025, it was found that this school had a relatively high number of female students compared to other schools, with a total of 242 students from grades 7 to 9. The health center carried out blood tests on 82 seventh-grade students to identify anemia through hemoglobin level examinations. The results showed that 31 students (36.9%) were diagnosed with anemia, classified into mild and moderate categories. More specifically, among the 31 students with anemia, 18 had mild anemia with Hb levels of 11.1–11.9 g/dl, while 13 had moderate anemia with Hb levels of 8–10.9 g/dl. No cases of severe anemia were found in this examination. These findings indicate that anemia remains a significant problem among adolescent girls at SMPN 07 Pesawaran Negeri Katon, most likely due to insufficient iron intake and low compliance with iron tablet consumption. In addition to Hb examinations, unstructured

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interviews were conducted with 10 students to assess their compliance with iron tablet consumption. The interviews revealed that 70% of the students did not consume iron tablets as recommended, which is once a week. Various reasons were reported, including forgetfulness, dislike of the tablet's odor, and the perception of being healthy and thus not needing regular consumption. A lack of understanding regarding the importance of anemia prevention was also identified as a major factor contributing to low compliance.

The impact of anemia at SMPN 07 Pesawaran was evident from several complaints commonly reported by students, such as fatigue, difficulty concentrating during lessons, and frequent drowsiness in class. Some teachers also reported that several students often experienced dizziness or even fainted during flag ceremonies or other physical activities. This condition may affect academic achievement and learning activities, as anemia can lead to decreased memory and cognitive performance.These survey results highlight the need for more intensive interventions in preventing anemia at SMPN 07 Pesawaran, particularly through nutrition education, raising awareness of the importance of iron tablet consumption, and stricter monitoring of iron supplementation programs in schools. Such efforts are expected to help reduce the incidence of anemia among adolescent girls and improve their overall health and academic performance.

Based on the background above, the research is entitled "The Relationship Between Knowledge About Anemia and Compliance With Iron Tablet Consumption Among Adolescents at SMPN 07 Pesawaran, Pesawaran Regency in 2025."

RESEARCH METHODS

This research is a quantitative study with a cross-sectional approach aimed at testing the hypothesis regarding the relationship between adolescents' knowledge about anemia and their level of compliance with iron tablet consumption. The study was conducted at SMPN 07 Pesawaran, Pesawaran Regency, from March 11 to May 22, 2025, starting from the pre-survey stage to the main data collection.

The study population consisted of all female students at SMPN 07 Pesawaran, totaling 242 individuals. The sample size was determined using Slovin's formula with a precision level of 5%, resulting in 151 respondents. The sampling technique applied was proportional random sampling, with the sample distribution based on the proportion of students in each class.

The variables in this study consisted of the independent variable, which was knowledge about anemia, and the dependent variable, which was compliance with iron tablet consumption. Knowledge was measured using a questionnaire covering aspects such as definition, impacts, prevention, and the importance of iron tablet consumption, while compliance was assessed using the Morisky Medication Adherence Scale (MMAS-8). Knowledge was categorized as "good" if the score was >50% and "poor" if ≤50%. Compliance was classified as low (score <6), medium (score 6–7), and high (score 8). Both variables were measured on an ordinal scale.

The instruments used were tested for validity and reliability. The knowledge questionnaire was found to be reliable with a Cronbach's Alpha value of 0.954 and valid based on the correlation test results where r-count > r-table. Meanwhile, the MMAS-8 instrument was validated through expert review and the product-moment test, with a Cronbach's Alpha value of 0.746, indicating good reliability.

Data collection was carried out in several stages. In the preparation stage, the researcher obtained permission from the school authorities and the university ethics committee, as well as prepared the questionnaire. During the implementation stage, respondents were proportionally selected at random from each class, provided with an explanation regarding the purpose of the study, and then asked to complete the questionnaire anonymously. The researcher supervised the completion process and ensured that respondents understood the instrument. The completed data were then collected and prepared for processing.

Data processing was conducted in four steps: editing, to ensure completeness and consistency; coding, by assigning numerical codes to respondents' answers; processing, using SPSS version 25 software; and cleaning, to identify and correct data entry errors.

Data analysis was performed using univariate analysis to describe the frequency distribution of each variable, and bivariate analysis to examine the relationship between knowledge about anemia and compliance with iron tablet consumption. The Chi-Square test was applied with a significance level of 5% ($\alpha = 0.05$), and the Odds Ratio (OR) was calculated to determine the magnitude of the risk of low compliance based on adolescents' knowledge levels.

RESEARCH RESULTS

Respondent Characteristics

Table 1
Frequency Distribution of Respondents' Age at SMPN 07 Pesawaran, Pesawaran Regency, 2025

Age (years)	Frequency	Percent (%)
12	7	4.6
13	53	35.1
14	55	36.4
15	32	21.2
16	4	2.6

Based on Table 1, the frequency distribution of respondents' ages at SMPN 07 Pesawaran in 2025 shows that the majority were 14 years old, with a total of 55 students (36.4%). The second largest group was 13 years old, comprising 53 students (35.1%). Furthermore, 32 students (21.2%) were 15 years old, while 7 students (4.6%) were 12 years old. The smallest group was 16 years old, with only 4 students (2.6%).

Univariate Analysis

Table 2
Frequency Distribution of Adolescents' Knowledge about Anemia at SMPN 07 Pesawaran, Pesawaran District, 2025

Knowledge Level	Frequency	Percent (%)
Poor	66	43.7
Good	85	56.3

Based on Table 2, it was found that 66 respondents (43.7%) had poor knowledge, while 85 respondents (56.3%) had good knowledge.

Table 3
Frequency distribution of Fe tablet consumption adherence among adolescents at SMPN 07 Pesawaran, Pesawaran Regency, in 2025

Fe Tablet Consumption Adherence	Frequency	Percent (%)
Low adherence	119	78.8
Moderate adherence	27	17.9
High adherence	5	3.3

Based on Table 3, it is evident that the majority of respondents at SMPN 07 Pesawaran demonstrated a low level of adherence in consuming Fe tablets, with 119 students (78.8%). A total of 27 students (17.9%) fell into the moderate adherence category, while only 5 students (3.3%) were categorized as having high adherence.

Bivariate Analysis

Table 4
The Relationship Between Knowledge of Anemia and Adherence to Fe Tablet Consumption Among Adolescents at SMPN 07 Pesawaran, Pesawaran Regency, 2025

Hemoglobin Level	Mean (g/dl)	Difference (g/dl)	CI 95%	P value
Before				
Intervention	10,4 gr/dl			
Control	10,3 gr/dl			
After				
Intervention	11,4 gr/dl	0,435 gr/dl	0,24 - 0,63 gr/dl	0,000
Control	10,9 gr/dl			
Increase				
Intervention	1,0 gr/dl			
Control	0,5 gr/dl			

Based on Table 4, it was found that among the 66 respondents with poor knowledge, 59 (89.4%) demonstrated low adherence to Fe tablet consumption, 5 (7.6%) showed moderate

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adherence, and 2 (3.0%) had high adherence. Meanwhile, among the 85 respondents with good knowledge, 60 (70.6%) demonstrated low adherence, 22 (25.9%) showed moderate adherence, and 3 (3.5%) had high adherence.
The statistical test yielded a *p*-value of 0.013, which is less than α = 0.05. Therefore, it can be concluded that there is a significant relationship between knowledge of anemia and adherence to Fe tablet consumption among adolescents at SMPN 07 Pesawaran, Pesawaran Regency, in 2025.

DISCUSSION

Univariate Analysis

The results of the univariate analysis showed that among 151 female adolescents at SMPN 07 Pesawaran, 56.3% had good knowledge about anemia. This indicates that the majority of adolescents understood the importance of consuming nutritious food and iron supplementation tablets. However, in-depth understanding of medical aspects, such as the relationship between anemia and low blood pressure, remained limited. Differences in the level of knowledge were likely influenced by factors such as education, learning interest, and access to information.

In contrast, the level of adherence to Fe tablet consumption revealed concerning findings. A total of 78.8% of respondents fell into the low adherence category, 17.9% demonstrated moderate adherence, and only 3.3% showed high adherence. Most adolescents intentionally discontinued tablet consumption because they felt healthy or did not perceive immediate benefits, and some were affected by mild side effects such as nausea. The lack of support from both the school environment and family further exacerbated the low adherence level.

These findings are consistent with previous studies indicating that adherence to Fe tablet consumption among female adolescents remains low, despite having relatively good knowledge. Therefore, educational and participatory interventions are urgently needed. Approaches that are visually engaging, digital-based, and involve active participation from teachers and parents may improve adherence and effectively prevent anemia.

Effectiveness of Fe + Folic Acid Administration (Control Group)

The control group, which received only Fe and folic acid tablets, showed an increase in Hb levels from a mean of 10.36 g/dl to 10.93 g/dl. Although an improvement was observed, the magnitude of the increase was relatively smaller compared to the intervention group. The increase occurred consistently across all categories of age, education, and occupation, indicating the effectiveness of the standard supplementation. Nevertheless, the more limited improvement suggests the need for additional combined interventions to achieve more optimal outcomes. These findings support the notion that roselle infusion may serve as a natural complement to enhance the effectiveness of Fe therapy.

Bivariate Analysis

The results of the bivariate analysis showed a significant relationship between knowledge about anemia and adherence to Fe tablet consumption (p = 0.013). This finding is consistent with previous studies, which have reported that the level of knowledge influences adolescents' health behaviors. Adequate knowledge can increase awareness of the importance of iron supplementation and the risks of anemia, thereby encouraging adherence.

However, this study also revealed a gap between knowledge and practice. Several respondents with good knowledge still demonstrated low adherence. This indicates that knowledge alone is insufficient to foster compliant behavior. Other factors, such as side effects of Fe tablets, lack of support from family or teachers, and negative perceptions of the tablets, also influence adolescents' decisions regarding supplementation.

Conversely, there were respondents with poor knowledge who nonetheless exhibited moderate or high adherence, which may be attributed to personal experiences with anemia or encouragement from their social environment. These findings suggest that motivational factors and social support play an important role in shaping adherence, regardless of the level of knowledge.

Overall, while knowledge serves as a fundamental basis, the development of health behavior requires a more holistic approach. Educational interventions must be accompanied by strategies that foster motivation, build support from schools and families, and address both physical and psychological barriers experienced by adolescents in consuming Fe tablets.

CONCLUSION

1. It was found that 66 respondents (43.7%) had poor knowledge, while 85 respondents (56.3%) had good knowledge.
2. It was found that 119 respondents (78.8%) had low adherence to Fe tablet consumption, 27

respondents (17.9%) had moderate adherence, and 5 respondents (3.3%) had high adherence.

3. There was a significant relationship between knowledge about anemia and adherence to Fe tablet consumption among adolescents at SMPN 07 Pesawaran, Pesawaran District, in 2025 (p-value = 0.013).

SUGGESTION

For Adolescents

Improving knowledge about anemia is essential through peer counselor training in collaboration with the Adolescent Care Health Service Program (PKPR) of the community health center. This approach is expected to encourage adolescents to be more actively engaged in education and anemia prevention.

For SMPN 07 Pesawaran

The school is advised to collaborate with the community health center to conduct regular health education and counseling sessions. Guidance teachers and School Health Unit (UKS) staff should be actively involved in mentoring and monitoring students' Fe tablet consumption.

For Health Workers (Community Health Center)

Strengthening collaboration with schools through PKPR and UKS activities is necessary, along with providing facilities such as routine hemoglobin (Hb) examinations. Health education should be delivered consistently and sustainably to ensure long-term behavioral changes.

For Universitas Malahayat

It is recommended to expand student involvement in community service activities and enhance collaborative research focusing on adolescent health and anemia prevention. This will not only enrich academic contributions but also support community health empowerment.

For Future Researchers

Future studies are recommended to incorporate additional variables such as dietary patterns, physical activity, and socioeconomic status. Moreover, qualitative approaches should be considered to explore psychological factors underlying non-adherence to Fe tablet consumption among adolescents.

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