Factors Affecting Adherence To Consumption Of Fe Tablets In The Prevention Of Anemia In High School Students: A Literature Review

Sri Rahayu¹, Saifulaman Muhamed Said², Tukimin Bin Sansuwito³

¹ Student Ph.D. In Health Science, Lincoln University, Malaysia
² Lecturer Ph.D. In Health Science, Lincoln University, Malaysia
³ Lecturer Ph.D. In Nursing and Public Health, Lincoln University, Malaysia

Abstract

Introduction: Anemia is when the blood's hemoglobin (Hb) level is less than usual. Anemia is a nutritional problem that is prevalent throughout the world. Anemia occurs not only in developing countries but also in developed countries. Anemia can occur anywhere and can happen to anyone. The impact of anemia on adolescent girls in the short term is to disrupt growth and development, reduce physical ability and work activity, reduce learning concentration, and hurt the digestive tract, central nervous system, cardiovascular system, and immunity. Material and Methods: This research is a literature review. Articles according to the theme were selected from 2018-2023 from electronic databases such as Science Direct, PubMed, and Google Scholar. We used the PRISMA method for the analysis of the literature review. Results: From 217 selected articles, 16 eligible studies were thoroughly reviewed, and only 10 could be analyzed. The results of the ten articles examined that many factors affect adherence to taking Fe tablets, namely knowledge that dominates in the matter. Conclusion: With the help of their parents, families, and teachers, the students exhibited a promising level of compliance with taking iron tablets, which is anticipated to lower the prevalence of anemia among teenage girls.

Keywords: Factors, Fe Tablets, Prevention Of Anemia, High School Students

Corresponding Author: Sri Rahayu
Email: sri.rahayu680513@gmail.com
1. Introduction

Adolescents are individuals with both female and male types who are 10 to 19 years old. At this age, adolescents experience puberty; in women, menstruation will occur. Menstruation will bleed as much as 16-33.2 cc and will lose iron ± 1.3 mg per day. In this condition, menstruating women are prone to anemia (Ministry of Health, 2016). Women who are of childbearing age are more likely to suffer from nutritional anemia. This is because women experience menstruation every month, which is made worse by the lack of iron intake in the food that is ingested. To produce hemoglobin, iron reserves are depleted, leading to iron deficiency anemia (Proverawati, 2011).

Anemia is when the blood's hemoglobin (Hb) level is less than usual. Anemia is a nutritional problem that is prevalent throughout the world. Anemia occurs not only in developing countries but also in developed countries. Anemia can occur anywhere and can happen to anyone. Anemia sufferers account for 27% of the world's population (1.93 billion people), with contributions from developing countries reaching 89% of the total sufferers. Anemia patients account for 26.8% in Southeast Asia. Iron deficiency anemia is the most dominant cause (>60%) globally, with an estimated 62.2% of women experiencing iron deficiency (Safiri et al., 2021).

There are still a lot of people in Indonesia who have anemia. According to Basic Health Research (2013), 21.7% of people in Indonesia have anemia. Of these people, 18.4% were men and 23.9% were women. Women aged 5 to 14 had a 26.4% chance of having anaemia, while women aged 15 to 24 had an 18.4% chance. Around 22.7% of women ages 15 and up had anemia, while 37.1% of pregnant women had anemia. Additionally, studies from different parts of Indonesia showed that between 32.4% and 61% of teenage girls had anemia. This happens when you get iron from food, which only meets about 25% of your needs (Andriastuti et al., 2020).

The impact of anemia on adolescent girls in the short term is to disrupt growth and development, reduce physical ability and work activity, reduce learning concentration, and hurt the digestive tract, central nervous system, cardiovascular system, and immunity. The
long-term impact of anemia on adolescent girls is that if they become pregnant, they will
be at risk of giving birth to a baby with low birth weight (LBW), prematurity, and bleeding
before and after childbirth. In addition, the ongoing impact of anemia is the risk of abortion
and congenital disabilities (Hodeida et al., 2022).

Tablets containing iron are typically distributed to students in junior high school
(SMP) or equivalent grades and senior high school (SMA) or equal grades. As a result of
the findings of RISKESDAS in 2018, it was discovered that the percentage of adolescent
females who took blood supplement tablets was 76.2%; of those 76.2%, 80.9% received
iron tablets at school children. Based on the 80.9% figure, consuming blood supplement
tablets for adolescent girls ≥52 grains was only 1.4%, while <52 grains amounted to 98.6%.
This means that there is still a low awareness among adolescent girls of the importance of
adherence to Fe tablet consumption as a step to prevent anemia (Kemenkes RI, 2018).

Compliance is a way or effort of a person to show conformity with existing
recommendations or compliance from professionals, especially health to support their
health. A person's compliance in consuming Fe tablets can be influenced by two things: the
support of health workers and the self-awareness of each individual. Compliance with
consuming Fe tablets also significantly correlates with the increase in hemoglobin levels in
adolescents, especially adolescent girls (Thummak et al., 2023).

According to research by Chusna et al (2023), several factors influence compliance
in consuming Fe tablets, namely knowledge; from the results of data analysis on the
knowledge variable, a p-value of 0.000 was obtained. The significance value is <0.05,
meaning a relationship exists between knowledge and adolescent compliance in consuming
Fe tablets. Several factors affect knowledge, including the need for more information from
health workers. When providing health services such as counseling, they are only given
verbal information, so the information provided is often less effective. Therefore, health
education is essential about consuming Fe tablets that are good and correct according to the
rules to increase their knowledge. (Chusna et al., 2023).
In addition to knowledge, support is also a factor in adherence to consuming Fe tablets. Support can be defined as encouraging/motivating, enthusiastic, and giving advice to others in a decision-making situation. Information support in the form of education, advice, suggestions, and feedback on what respondents should do is needed. Research shows that education about anemia and Fe Tablets in adolescents using media like leaflets and videos can increase adolescents' knowledge about anemia and Fe Tablet supplementation (Dodokh, 2022). Many factors cause adolescents not to consume or still have low consumption of Fe tablets. Therefore, this study aims to see the factors that influence adherence to taking Fe tablets in preventing anemia in high school students or adolescents based on research that has been extracted (filtered and summarized).

2. Research Method

Research Design, Setting, and Samples

This research is a literature review study. Articles that fit the theme were selected from 2018-2023. Inclusion criteria were full-text articles, freely accessible. Exclusion criteria were conference papers, chapters, and editorials, not open access. In addition, the inclusion criteria for this literature review were 1) Research on adherence and factors contributing to adherence to iron supplementation or Fe tablets. 2) The target population is high school children or adolescents. Studies of adolescent boys and girls. 3) Researchers include mixed methods and intervention studies. Surveys, observational analyses, cross-sectional studies, and intervention studies are all possible approaches to the research design. There are two types of interventions: Randomised Controlled Trials (RCTs) and non-RCTs. Interventions can be conducted in schools or communities. The following are the conditions for exclusion: 1) A systematic or meta-analysis-based review of the research and associated literature. 2) Research on pregnant women, even though they are teenagers.

Data Collection

The publications located in the electronic databases Science Direct, PubMed, and Google Scholar served as the sources of information for this study (Goossen et al., 2020).
When searching through each database, the researcher utilised the following search method, which included the keywords Factors, Fe Tablets, Anemia Prevention, High School Students, Adolescents.

**Data Analytics**

As can be seen in Figure 1, researchers followed the appropriate steps or research protocol by employing the Preferred Reporting Items for Systematic Reviews and Meta-analysis Statement (PRISMA) technique. This was done in order to ensure that the research was conducted correctly (Haddaway et al., 2022).

3. **Results And Discussions**

   a. **Result**

      Based on the search strategy selection criteria, out of a total of 217 articles selected, 16 studies were thoroughly reviewed. Finally, ten eligible studies were selected and could be analyzed to the end. The selection process for this study is presented in Figure 1.
Figure 1 Selection Process of Studies Based on PRISMA (Haddaway et al., 2022)

Table 1. Result of article analysis

<table>
<thead>
<tr>
<th>No.</th>
<th>Author</th>
<th>Sample</th>
<th>Method</th>
<th>Factors</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(Thifal et al., 2023)</td>
<td>Adolescent girls between 12 and 19 were included in the sample. These girls came from 43 junior high schools and 26 senior high schools.</td>
<td>Cross-sectional</td>
<td>Knowledge of adolescent girls, place of residence, access to a source of information on iron tablets, hemoglobin test, and whether or not iron tablets have ever been obtained or purchased.</td>
<td>Only four variables were shown to have a significant link with the adherence variable. These variables were as follows: knowledge of the WUS, receiving or purchasing blood supplements or iron tablets, and checking Hb levels. In the meantime, the factors of district and city did not significantly impact</td>
</tr>
<tr>
<td>Research Study</td>
<td>Sample Description</td>
<td>Study Design</td>
<td>Measured Variable</td>
<td>Factors Influencing Adolescent Females' Adherence to Iron Supplementation</td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>--------------------</td>
<td>--------------</td>
<td>-------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>2 (Aprianti et al., 2018)</td>
<td>One hundred teenagers enrolled in senior high school made up the sample.</td>
<td>Cross-sectional</td>
<td>Factors that influence an individual's behavior include parental income, knowledge, perceived vulnerability, perceived severity, perceived threat, perceived rewards, perceived hurdles, and perceived self-efficacy. The measured variable was the inclination of adolescent females to consume iron supplements.</td>
<td>There were strong links between teenage girls' plans to take iron tablets and their perceptions of risks (p=0.02), benefits (p=0.01), barriers (p=0.02), and sense of self-efficacy (p=0.00). There was no link between parental income, what the teen knew, how vulnerable they thought they were, how important they thought the problem was, and their plan to take iron tablets. According to the results of this study, the things that make teenage girls take iron pills are perceived danger, perceived benefits, perceived barriers, and perceived self-efficacy.</td>
<td></td>
</tr>
<tr>
<td>3 (Regasa &amp; Haidar, 2019)</td>
<td>A total of 448 teenagers, ranging in age from 15 to 19 years old.</td>
<td>Cross-sectional</td>
<td>Age, Place of residence and Menarche status.</td>
<td>Compared to younger adolescents and young adults, older adolescents and young adults have had a significantly higher risk of anemia. Teenagers who lived in rural areas had a much higher risk of having anemia compared to those who lived in urban areas. The prevalence of anemia among adolescents living in rural areas was about four times higher than that of adolescents living in urban areas.</td>
<td></td>
</tr>
<tr>
<td>4 (Apriningsih et al., 2020)</td>
<td>274 subjects aged 14-16 years old</td>
<td>Cross-sectional</td>
<td>People's age, how much they know about anemia, their desire to take blood supplement tablets, their confidence in their ability to deal with anemia and iron</td>
<td>The primary determinants of high school students' adherence were the implementation of a school-wide program for students to consume iron tablets at</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>(Sethi et al., 2019)</td>
<td>4,183 adolescents boys or girls adolescents in grades 6-12 adolescents who are not enrolled in school adolescents who are between the ages of 10 and 19.</td>
<td>Cross-sectional</td>
<td>side effects stomach pain, nausea.</td>
<td>folic acid, their previous Hb level, whether their school had a program to encourage them to do so, and whether their teachers had ever talked to them about anemia and the benefits of folic acid. Health education sessions from primary healthcare workers were also looked at. School collectively (OR=7.2, CI=3.5-14.6, ( p=0.000 )), as well as the motivation of the students themselves (OR=5.3, CI=2.5-11.3, ( p=0.000 )). The class teachers educated the students on anemia and IFA (odds ratio = 2.3, confidence interval = 1.2-4.6). However, factors such as student knowledge, self-efficacy, and previous evaluation of Hb levels were shown to be confounding variables.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>6</td>
<td>(Sudfeld et al., 2020)</td>
<td>4,448 teenagers between the ages of 10 and 19 took part in the study. Adolescents who were enrolled in school, as well as adolescents who were not enrolled in school, were included in this study.</td>
<td>Cross-sectional</td>
<td>The absence of apparent advantages, the recommendation from peers to avoid using WIFS, and a history of adverse effects that have been reported.</td>
<td>There is a need to increase the coverage of a sufficient weekly iron and folic acid supplementation (WIFS) program for teenage females, both in-school and out-of-school, in rural Birbhum.</td>
</tr>
<tr>
<td>No</td>
<td>Author(s)</td>
<td>Sample Size</td>
<td>Study Type</td>
<td>Variable(s)</td>
<td>Findings</td>
</tr>
<tr>
<td>----</td>
<td>-------------------</td>
<td>--------------</td>
<td>----------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>7</td>
<td>(Yeni &amp; Inayah, 2020)</td>
<td>90 female students in grades XI and XII</td>
<td>Cross Sectional</td>
<td>source of information, role of health workers, perception, peer support, knowledge, self-concept.</td>
<td>Among the six variables studied, the dominant independent variable affecting adolescent girls' compliance in taking blood supplement tablets is the knowledge variable at 19.59%, and the lowest is the peer support variable at 5.24%.</td>
</tr>
<tr>
<td>8</td>
<td>(Siti, 2023)</td>
<td>108 respondent</td>
<td>Cross-sectional</td>
<td>Knowledge, attitude, motivation, peer support, health worker support, dormitory supervisor support</td>
<td>There is a significant correlation between knowledge (p = 0.000), attitude (p = 0.002), motivation (p = 0.043), peer support (p = 0.019), health worker support (p = 0.007), dormitory coach support (p = 0.018) and compliance. The knowledge variable is assigned a value of B: 2.516 and an Exp (B) value of 12.383. This indicates that knowledge has the most substantial impact on the compliance of adolescent females in taking blood supplement pills.</td>
</tr>
<tr>
<td>9</td>
<td>(Dubik et al., 2019)</td>
<td>424 junior high school girls aged 10 and 15 years old</td>
<td>Cross-sectional</td>
<td>Awareness of anaemia, Knowledge of anaemia, Knowledge of the IFAS program</td>
<td>The findings of this study indicate that a majority (56.8%) of adolescent females have inadequate knowledge regarding anemia. Most (64.9%) of the adolescent girls understood the IFAS program poorly. Approximately 67.9% of adolescent females have yet to be educated on anemia.</td>
</tr>
<tr>
<td>10</td>
<td>(Sari, 2020)</td>
<td>83 respondent</td>
<td>Cross-sectional</td>
<td>Knowledge and Behavior</td>
<td>DispositionThe findings demonstrated a correlation between knowledge and behavior about compliance with Fe pill use. The data</td>
</tr>
</tbody>
</table>
b. Discussion

Anemia is much higher in the late teenage age group than in the younger age group. This is because monthly blood loss causes an increased need for iron, leading to an increase in the prevalence of anemia. Teenagers who come from rural areas have a much higher prevalence of anemia than those who come from urban areas. It was shown that adolescents living in rural areas had an almost fourfold higher risk of becoming anemic compared to adolescents living in urban areas. This may be because girls from rural areas need more information on adequate nutrition and economic factors (Regasa & Haidar, 2019).

There is a significant association between perceived threats (p=0.02), perceived advantages (p=0.01), perceived barriers (p=0.02), and perceived self-efficacy (p=0.00) and the intent of adolescent girls about the use of iron pills, as demonstrated by the research conducted by Aprianti et al (2018). There was no association between the intention to take iron tablets and adolescents' knowledge, the perceived vulnerability of adolescents, the perceived seriousness of adolescents, or the parents' income. According to the findings of Sedlander et al (2021), the factors that are linked with the consumption of iron pills in adolescent girls include perceived threat, perceived benefits, perceived hurdles, and perceived self-efficacy. This is comparable to the findings of the research that was conducted recently. On the other hand, according to the findings of (Apriningsih et al., 2020), the factors that have the most significant impact on the compliance of high school students are the following: school organization, which ensures that students take iron tablets.
together at school (odds ratio = 7.2, confidence interval = 3.5-14.6, p = 0.000); student motivation (odds ratio = 5.3, confidence interval = 2.5-11.3, p = 0.000); and class teachers educating students about anemia and iron-flux anemia (OR = 2.3, CI = 1.2-4.6). However, student knowledge, self-efficacy, and previous Hb-level checks are considered to be confounding factors.

In Sudfeld et al (2020) study, the percentage of adolescents who reported taking four WIFS tablets over the previous month, as required by the national program, was 9-4% for school-going girls, 7-1% for school-going boys, and 2-3% for non-school-going girls. This was the exact number that was supposed to be achieved. A significant shortfall in the provision of WIFS and a lack of compliance are the causes of the low adequately covered population. Sixty-seven percent of girls are enrolled in school, seventy-three percent of boys are attending school, and ninety-seven percent of girls are not attending school. The majority of teenagers were not given WIFS tablets in the previous month. Counseling from teachers, administrators, and other school staff was the primary reason that adolescents reported taking WIFS tablets. On the other hand, the primary reasons for non-adherence were a lack of perceived benefit, advice from peers not to take WIFS, and a history of reported side effects. This aligns with the findings of Ansari et al (2021).

From the research of Yeni & Inayah (2020), six variables were studied: information sources, health workers' roles, perceptions, peer support, knowledge, and self-concept. The dominant independent variable affecting adolescent girls' compliance in taking blood supplement tablets is the knowledge variable, 19.59%, and the lowest is the peer support variable, 5.24%. Anand & Gupta (2018) explains that knowledge plays a vital role in increasing adherence to taking iron tablets, so explanations about iron tablets by health workers must be optimized so that compliance increases. Knowledge about procedures and what foods and drinks can help absorption, and adolescent girls must know those that can inhibit the absorption of blood supplement tablets. If adolescents have good knowledge, their compliance in taking blood supplement tablets will be better, so young women can prevent anemia effectively.
According to the research findings conducted by Siti (2023), the most significant factor determining whether adolescent females will take blood supplement tablets is their level of understanding. This is consistent with the findings of Saleh & Bakoil (2021), who found that the knowledge of how to take TTD experienced by adolescent girls is connected to their compliance with iron supplements.

The research conducted by Dubik et al (2019), showed that more than half of teenage girls, or 56.8%, had a limited understanding of anemia. Sixty-four point nine percent of the adolescent females had a limited understanding of the IFAS program. Sixty-seven point nine percent of the girls in their teenage years had never been educated about anemia. Adolescent girls must demonstrate a higher level of support for the IFAS program. Tablets were not provided to adolescent females by their teachers, and the lack of their presence was seen to be a substantial obstacle to the student's adherence to the medication. The mother's degree of education, occupation, awareness of anemia, and extensive knowledge of both the IFAS program and anemia were significant factors in determining the mother's level of adherence. In line with research Khairunnisa (2021), schools and teachers are places that strongly support adolescent girls (school children) to be able to adhere to taking TTD. It is hoped that there will be cooperation between the health sector and the education sector, in this case teachers, to get training on nutrition.

The results of Sari (2020) there is a connection between knowledge and attitude and the degree to which individuals adhere to taking iron tablets. Upon conducting the Kendal tau test of knowledge with compliance, the data analysis yielded a p-value of 0.02, a result that is less than 0.05. While the attitude towards drinking iron tablets is analyzed using the Kendal tau test, the p-value was found to be 0.004; this is less than the significance level of 0.05. This research is supported by Sembiring et al (2022), who found that a high level of knowledge about iron can form a positive attitude toward compliance with taking Fe tablets. This research is supported by research Merlina (2019), that 39 adolescent girls (56%) have received information about Fe tablets that the information obtained by these adolescents made them know about Fe tablets through mass media, making themselves able to obtain
various information about Fe tablets, which makes their knowledge good. The onset of adherence to taking Fe tablets is because adolescents have good knowledge about Fe tablets.

From the literature review results, it was found that most researchers researched adolescent female respondents. Adolescent girls are vulnerable to anemia because they have a menstrual cycle every month. Therefore, if this is left unchecked, there is a need for improvement, and assistance in consuming Fe tablets prevents more severe impacts on sufferers.

4. Conclusion

The variables that hinder or facilitate can be categorized as personal, social, environmental, and organizational factors. The adherence of adolescent girls to taking iron tablets can be enhanced by leveraging the social capital among them. The encouragement provided by parents, family, and teachers demonstrated a positive level of adherence to using iron tablets, which is anticipated to decrease the prevalence of anemia among adolescent females. Additional investigation is required to examine the current social capital in adolescent females in order to enhance their adherence to iron supplementation.

5. Compliance with ethical standards

Acknowledgements
The authors would like to convey their gratitude to all those who have contributed to this research for their aid in implementing the study. Our objective is to advance health research for the betterment of society.

Disclosure of conflict of interest
As part of the process of carrying out this research, the researcher ensures that no potential conflicts of interest are involved.

Statement of informed consent
As writers, everything we do is based on a mutual agreement or consent.
Reference


Kemenkes RI. (2018). *pedoman pencegahan dan penanggulangan anemia pada remaja putri dan wanita usia subur (wus).*


International Journal of Health Sciences is licensed under a Creative Commons Attribution 4.0 International License


