

Systematic Literature Review: Benefits of Fe Tablets for Adolescents

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Abstract. Iron tablets act as iron supplements. Iron is a mineral needed to form red blood cells. Iron deficiency can lead to anemia. Anemia is a disease caused by a lack of hemoglobin (Hb), which occurs when red blood cells are insufficient to supply oxygen to tissues. This systematic review aims to systematically examine the benefits of iron tablets for adolescents. The research method used was a systematic literature review sourced from PubMed and Scopus databases spanning 2014-2024. Six articles analyzed revealed that iron tablets are beneficial for adolescents in increasing blood hemoglobin levels and preventing anemia.

Keywords: benefits, fe tablets, anemia, adolescents

1 Introduction

Iron tablets are the most important biocatalytic element in human enzymology, playing a crucial role in oxidative metabolism, cell proliferation and growth, and oxygen storage and transport. Iron tablets act as an iron-containing supplement. Iron is a mineral needed for red blood cell formation. This occurs when the number of red blood cells or their oxygen-carrying capacity are insufficient to meet physiological needs, which the British Institute defines as anemia [1].

Anemia is a condition caused by a lack of hemoglobin (Hb), which occurs when there are not enough red blood cells to supply oxygen to the tissues. Iron deficiency anemia is the most common type of anemia and is caused by a lack of iron in the body. This condition reduces the number of healthy red blood cells in the body. According to the World Health Organization, the normal Hb level is 12.0 g/dl for children aged 5 to 11 years and >13.0 g/dl for boys [2].

Anemia is a diet-related disease. The most common problem worldwide is anemia, particularly caused by iron deficiency. Anemia is a common nutritional problem worldwide, especially in developing countries. According to the 2017 Indonesian Demographic and Health Survey (SDKI), the prevalence of anemia in girls aged 13-18 was 23%, compared to 17% in boys aged 13-18. A lack of hemoglobin (Hb) in the blood can quickly make the body tired, weak, lethargic, and easily fatigued, leading to decreased learning ability and work productivity in adolescents [3].

Anemia in adolescence negatively impacts immunity, concentration, learning ability, physical fitness, and productivity. Anemic adolescent girls are at risk of developing anemia during pregnancy. This can negatively impact fetal growth and development, leading to complications during pregnancy and childbirth, and in some cases, even maternal and child mortality [4].

The 2015-2019 National Health and Midwifery Strategic Plan states that the objectives of the maternal, child, and nutrition health program include increasing the availability and affordability of quality health services for the entire community, and also includes indicators that need to be promoted as improvements in community nutrition, namely the provision of iron supplement tablets (TTD) to adolescent girls with a target of 30% in 2019 [4]. One of the government's efforts to combat anemia is by providing iron tablets as regulated in the Minister of Health Regulation Number 88 of 2014 concerning Standards for Blood Supplement Tablets for Women of Childbearing Age and Pregnant Women

2 Methods

This study used a literature review method with the Prisma approach as data collection by searching journals or articles in Scopus and PubMed. The search was conducted with the keywords "Benefits" AND "Iron Tablets" AND "Adolescents". The journals used as the main sources in this study were studies on the benefits of iron tablets in adolescents. In the initial stage, the researcher collected 33

articles or research results through Scopus and 21 PubMed journal articles. Then, in the second stage, the researcher selected related journal articles and obtained 10 journals and 8 journals. In the third stage, a more in-depth selection was carried out to identify more relevant and specific articles, resulting in 4 Scopus journals and 2 PubMed journals. Furthermore, the 6 journals will be analyzed and reviewed further by the researcher.

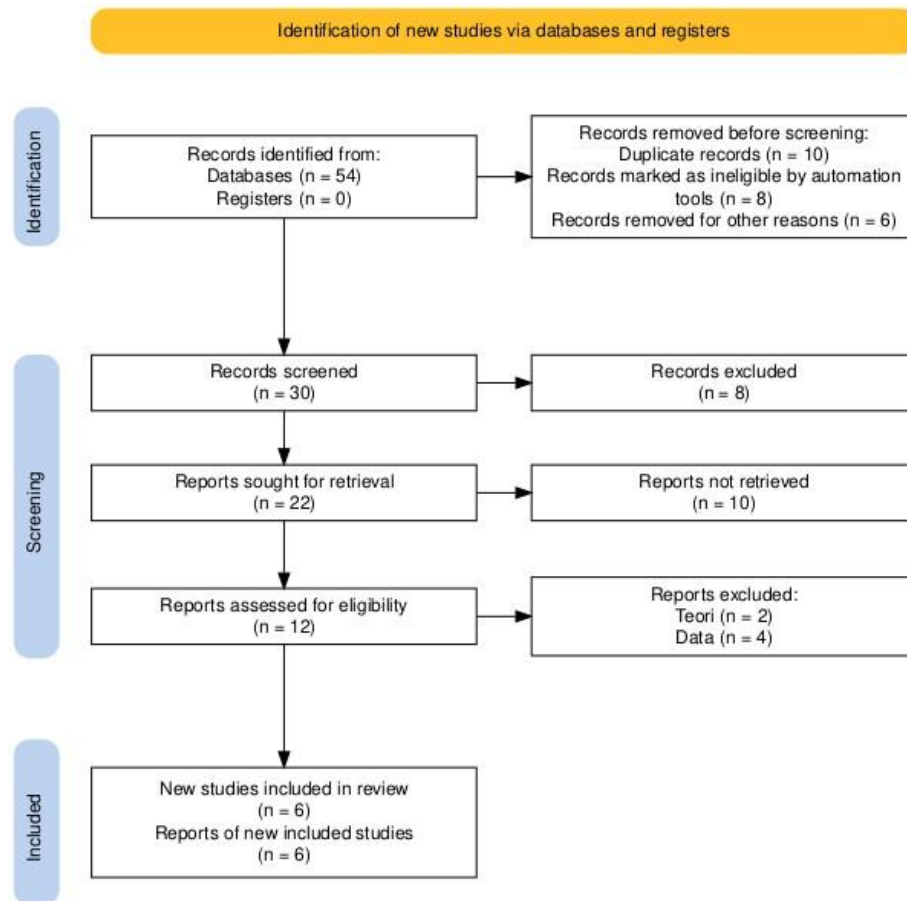


Figure 1. PRISMA flow diagram

3 Results And Discussion

Table 1. List of Journal Review Literature

Research Area Coverage	Research Location	Number of Articles	Researcher, Year of Publication
Country	India	4	Joshi et al., 2013
	Republic of Burkina Faso	3	Compaore., et al 2014
Regency/City	Aceh	1	Nurhasanah., et al 2020

Table 2. Analysis Result

No	Researcher, Year of Publication	Title	Method	Results
1.	Nurhasanah et al (2020)	The effective consumption of papaya (<i>Carica papaya</i> linn.), vitamin C, and Fe tablets in	Quasi-experimental design with non-randomized pretest-posttest	The statistical results of the one-way ANOVA test showed a significant difference in hemoglobin levels ($p > 0.05$). Administration of papaya + Fe

No	Researcher, Year of Publication	Title	Method	Results
		improving hemoglobin levels for adolescent girls with anemia in polytechnic of health-ministry of health, aceh	control group design.	increased hemoglobin levels more than Vitamin C + Fe. The difference in average hemoglobin levels in each group was due to the consumption of papaya fruit containing Vitamin C along with Fe tablets being effective in increasing hemoglobin levels.
2.	Shrivastava et al (2019)	Status and effectiveness of implementation of weekly iron and folic acid supplementation scheme in schools in central India	Quantitative and qualitative (in-depth interviews) and cross-sectional	The WIFS scheme coverage was found to be 11.54%. The mean hemoglobin level in the WIFS group was 11.84 +1.82 mg/dl, while the mean hemoglobin level in the non-WIFS group was 11.8 +1.56 mg/dl.
3.	Compaore et al (2014)	“There is iron and iron...” Burkinabè women's perceptions of iron supplementation: a qualitative study.	Qualitative studies in randomized controlled trials	Perceptions about Iron Tablets: • Iron tablets can increase blood volume and help women withstand large amounts of blood loss during childbirth. • For severe blood loss, blood transfusion is indicated. Knowledge about Iron: • Women lack knowledge about the role of iron. • Not realizing that iron supplements contain trace iron. Views of Youth and Field Workers: • There is uncertainty about the benefit of supplementing non-pregnant adolescents, as they are mistakenly considered to be at low risk of anemia. [5]
4.	Joshi et al (2014)	Weekly iron folate supplementation in adolescent girls--an effective nutritional measure for the management of iron deficiency anemia	Randomized Controlled Trial	The weekly group was more promising (p=0.0012) than the daily group.
5.	Sethi et al (2017)	Applying Positive Deviance for Improving Compliance to Adolescent Anemia Control Program in Tribal Communities of India	PD (Positive deviance) approach methodology	The perceived benefits of iron and folic acid tablets and nutritional care during adolescence were low. Positive deviations occurred among adolescent girls (26 of 434), in rural areas (2 of 17), and in schools (2 of 17). [6]
6.	Kandasamy et al (2024)	Adherence to weekly iron folic acidation and associated factors among adolescent supplement girls - A mixed-method study	cross-sectional with mixed methods design	Multivariable regression analysis revealed that adverse events encountered during IFAT iron-folic acid therapy (Odds ratio (OR) = 0.5, P = 0.009) were associated with higher levels of non-adherence, while regular supply (OR = 13.6, P = 0.000), health education to parents (OR = 2.76, P = 0.002), and perceived

No	Researcher, Year of Publication	Title	Method	Results
				benefits (OR = 1.72, P = 0.006) were associated with higher levels of adherence. This was supported by qualitative findings.

Of the six articles analyzed (Table 1), the studies were conducted in various regions, including four studies in India, one study in West Africa, specifically the Republic of Burkina Faso, and one study from Indonesia, specifically the province of Aceh. The results (Table 2) indicate that iron tablets are beneficial for adolescents in increasing hemoglobin levels and preventing anemia.

The following is a discussion of the benefits of iron tablets for teenagers to increase hemoglobin levels in the blood. Increased hemoglobin levels in the blood are an indication of an increase in the amount of hemoglobin contained in red blood cells, where the relationship between increased hemoglobin (Hb) levels and the use of iron (Fe) tablets is very closely related, especially in the context of treating iron deficiency anemia. Iron tablets are often used as the main therapy to overcome iron deficiency anemia, which is caused by a lack of iron in the body. Iron is needed for the synthesis of hemoglobin, a protein in red blood cells that binds and transports oxygen from the lungs throughout the body. However, in the application in the community regarding the consumption of iron tablets to increase hemoglobin levels in the blood is still not optimal because it is influenced by several main factors, namely knowledge and environment, where both of these factors also influence supporting factors, namely compliance in consuming iron tablets, self-awareness in consuming iron tablets, and food intake that affects the absorption of iron tablets. This is supported by research conducted Shrivastava & Maliye., 2019 stated that to achieve maximum benefit from this important and demanding scheme, accurate information regarding Weekly Iron Folic Acid Supplementation (WIFS) must be communicated through appropriate channels so that awareness of the program's compliance and benefits reaches the beneficiaries, namely adolescents. Therefore, regular training for teachers and health workers working with adolescents should be conducted jointly on this program [7]. Research is also needed Kandasamy., et al (2024) which states that ignorance regarding the impact of anemia on adolescent health, fear of side effects, unpleasant effects experienced on iron and folic acid (IFA) intake, and inadequate counseling determine compliance with weekly IFA supplements in adolescent girls [8]. Similarly, the research conducted Nurhasanah., et al 2020 which states that the administration of Vitamin C samples, in the consumption of papaya fruit and Fe resulted in a relatively higher increase in hemoglobin levels in the papaya + Fe group. The statistical results of the one-way ANOVA test showed a significant difference in changes in hemoglobin levels ($p > 0.05$). Consumption of papaya + Fe increased hemoglobin levels more. Thus, there is a continuous relationship between knowledge and environment regarding compliance and awareness in consuming Fe tablets to increase hemoglobin levels in the blood for adolescents [9]. Other benefits of Fe tablets for preventing anemia, especially iron deficiency anemia, involve various strategies aimed at ensuring that the body has enough iron and other essential nutrients to produce sufficient amounts of hemoglobin. In addition to consuming foods rich in iron, it is certainly necessary to be assisted by iron supplementation which is very good if supported by foods that help increase iron absorption. As research Joshi., et al 2013 which states that the study results in the 'Daily Iron and Folic Acid Supplement' and 'Weekly Iron and Folic Acid Supplement' groups were 13.48 and 13.55 years, respectively. Their average pre-intervention hemoglobin was 10.1 ± 1.1 gm/dl and 10.4 ± 1.1 gm/dl, respectively. The average increase in hemoglobin after a 1-month period in each group was almost the same, namely 1.0 ± 0.7 gm/dl and 1.0 ± 0.8 gm/dl. so that with additional iron supplementation can prevent anemia [10]. This is also supported by research Nurhasanah., et al 2020 states that anemia can be prevented naturally by consuming fruits rich in vitamin C, such as papaya [9]. Papaya also contains vitamin A and folic acid. Vitamin A and folic acid help form red blood cells, thus interacting with iron. Consuming papaya, which contains vitamin C, along with iron tablets, is effective in increasing hemoglobin levels, thus preventing anemia in adolescents.

4 CONCLUSION

Iron tablet administration has been shown to be beneficial for adolescents, providing significant benefits in increasing hemoglobin levels and preventing iron deficiency anemia. Iron tablet supplementation has been shown to be effective in improving adolescent nutrition and health, especially when combined with vitamin C-rich foods, which aid iron absorption. However, the effectiveness of iron tablet consumption in the community is still influenced by various factors, including knowledge, attitudes, compliance, support, the environment, and education from health workers and teachers. Therefore, a more comprehensive strategy is needed, including outreach, ongoing education, and active involvement of families and schools, to ensure optimal benefits of iron tablets.

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