KESANS: International Journal of Health and Science
2808-7178 / 2808-7380
http://kesans.rifainstitute.com/index.php/kesans/index

A Systematic Review of Barriers to the Implementation of Iron Tablet Distribution in Indonesia

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Article Information
Submitted: **14 August 2025**
Accepted: **04 September 2025**
Publish: **20 September 2025**

Keyword: Adolescent Anemia; Iron Supplements; Distribution; Compliance;

Abstract
Introduction: *Anemia in adolescent girls is a public health problem that requires serious attention. One recommended intervention is the regular administration of iron-fortified iron tablets (IBF).* ***Objective****: This study aims to evaluate the implementation of the TTD distribution program in Indonesia.* ***Methods:*** *The research method uses a systematic review using the PRISMA guidelines. After deduplication and screening, 10 articles met the inclusion criteria for analysis.* ***Results and Discussion:*** *Health education, cadre empowerment, and school environmental support have been shown to be effective in improving knowledge, attitudes, and some adherence to iron supplement consumption among adolescent girls. Barriers in urban areas include low adherence due to perceived side effects and unsupportive dietary patterns, while in rural areas, the main obstacles are limited access to distribution and healthcare resources.* ***Conclusion:*** *Program success is influenced by communication, resources, implementer disposition, and bureaucratic structure. Therefore, intervention strategies must be tailored to regional characteristics to maximize the effectiveness of anemia prevention in adolescent girls in Indonesia.*

How to Cite **Silvi Ariyanti, Misnaniarti, Haerawati Idris/A Systematic Review of Barriers to the Implementation of Iron Tablet Distribution in Indonesia, Vol. 4, No. 12, 2025**
DOI https://doi.org/10.54543/kesans.v4i12.438
e-ISSN/p-ISSN **2808-7178 / 2808-7380**
Published by **CV Rifainstitut/KESANS: International Journal of Health and Science**

Introduction

Anemia is a significant public health problem worldwide, especially in adolescents who are experiencing rapid growth and development (Nadiyah et al., 2022; Pangaribuan et al., 2022). This condition is characterized by low levels of hemoglobin or iron in the blood, which results in decreased physical capacity, impaired cognitive function, and has a negative impact on academic achievement and quality of life of adolescents (Brugnara, 2023). In Indonesia, based on 2018 Riskesdas data, the prevalence of anemia reached 48.9% and is projected to increase to 50% by 2024 if no effective intervention is carried out (Batul et al., 2024). The prevalence of adolescent anemia globally ranges from 23-27%, with higher rates found in developing countries. The global prevalence of anemia in adolescents ranges from 23-27%, with higher rates found in developing countries. In Indonesia, according to the 2024 Basic Health Research (Riskesdas), the prevalence of anemia among adolescents aged 15-24 years reached 32%, higher than the national average (Kemenkes RI, 2024).

One of the government's efforts to combat anemia is through the Iron Supplement (TTD) program. Iron Supplement (TTD) is an iron supplement containing 60 mg of iron and 0.4 mg of folic acid, designed to prevent and treat anemia, particularly in adolescent girls, pregnant women, and women of childbearing age (Anggraini et al., 2024). The World Health Organization (WHO) recommends that pregnant women take up to 90 TTD tablets during pregnancy, while young women should take them once a week (Lestari et al., 2024). Geographically and socially, regional characteristics significantly influence anemia prevalence and intervention implementation. Banyuasin Regency, a rural area with challenging geographic conditions such as swamps and peatlands, reported a low anemia prevalence of around 6.39% (Dinas Kesehatan Sumsel, 2024).

(Lestari et al., 2024) emphasized the important role of village health cadres in education and distribution of iron supplements (TTD) in this area, although access challenges remain a major obstacle. Kusumawardani et al. (2023) recommended innovative use of communication technology and empowerment of local cadres as adaptation strategies to existing geographic barriers. In contrast, Palembang City, as an urban area, shows a high prevalence of anemia, at 37.74%. Influencing factors include consumption patterns of low-nutritious fast food, high stress levels, and dense settlements that facilitate the spread of parasitic infections (Dinkes Provinsi Sumsel, 2024; Rahmi et al., 2024; Utami & Prasetyo, 2023). This social and environmental complexity demands different approaches and intervention strategies from rural areas.

The Indonesian government has implemented various policies and programs to prevent anemia, particularly through iron supplementation programs, specifically iron tablets (TTD), targeting vulnerable groups such as adolescent girls and pregnant women. These programs are implemented through regional health networks, with support from across sectors, including government, education, and the community. However, program implementation is often hampered by geographic, sociocultural, logistical, and public awareness factors (Kemenkes RI, 2023; WHO, 2023).

The role of communities and non-governmental organizations is also crucial in complementing the success of interventions. Participatory approaches involving health workers, schools, and community organizations have proven effective in increasing the provision of nutrition education and the acceptance of iron supplements (Meliyani et al., 2023; Kusumawardani et al., 2023). However, the differences in characteristics between urban and rural areas present unique challenges in the distribution of iron tablets, including accessibility, stock availability, and oversight and monitoring of distribution.

The effectiveness of the iron tablet program depends heavily on a sound distribution system. Iron tablet distribution is the process of delivering the tablets from distribution centers to various levels of health institutions until they reach their intended target. (Rustiawan & Pratiwi, 2022). This process involves coordination between provincial and district/city health offices, community health centers, and village-level health workers. Various distribution issues can hamper the program's success. Uneven distribution of iron tablets has led to stockpiles in some areas, while others face shortages.(Rahmandhanti et al., 2024) Conducting an evaluation of the Iron Supplement Tablet program every three months to monitor distribution effectiveness and avoid stockpiling that could lead to tablet damage.

Initial survey results indicated several major challenges in the distribution of iron tablets in rural and urban areas, including: geographical factors with difficult-to-reach locations, limited health workers, and access to health services, as well as socioeconomic conditions. Furthermore, a suboptimal distribution recording and monitoring system also made it difficult to evaluate the program's success. Analyzing the distribution problem of Iron Supplement Tablets comprehensively, this study uses George C. Edward III's Policy Implementation Theory which emphasizes four critical variables in the implementation of public policy, namely communication, resources, disposition, and bureaucratic structure (Afiqoh, 2024). Edward III's theory offers a comprehensive analytical framework for identifying obstacles in the implementation of the Iron Tablet distribution policy, as well as providing a basis for formulating recommendations for improving the distribution system by considering the specific characteristics of urban and rural areas.

Method

Research Design

This study used a systematic review design following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Secondary data was obtained from scientific publications, government reports, and articles indexed in databases such as Google Scholar, PubMed, ScienceDirect, and DOAJ.

Literature Search Strategy

The article search was conducted in three electronic databases: PubMed, Scopus, and Google Scholar. The keywords used were: "iron supplement," "iron supplement tablets," "distribution," and "anemia prevention" The Boolean operators AND and OR were used to combine keywords. The publication range was limited to January 2020–June 2025. The languages of the articles were limited to English and Indonesian.

Inclusion Criteria :

1. Primary research articles (quantitative, qualitative, or mixed).
2. Publication between 2020 and 2025.
3. Contain data or analysis on iron tablet distribution, anemia program implementation, or evaluation in urban and rural areas.

Exclusion Criteria :

1. Non-systematic reviews, editorials, commentaries, or short reports without numerical data.
2. Studies focusing on non-iron tablet interventions.
3. Reports with incomplete data or no distribution indicators.

Study Selection

Initial search results were imported into reference software to remove duplications. The first stage was screening titles and abstracts based on inclusion/exclusion criteria. Eligible articles proceeded to full-text review. The selection process followed the PRISMA flowchart. The selection process was conducted in three stages:

1. Title and abstract screening
2. Full-text review
3. Determining eligibility based on inclusion and exclusion criteria.

Data Synthesis

The analysis was conducted descriptively and thematically, by grouping the findings based on the variables of George C. Edward III's Policy Implementation Theory (communication, resources, disposition, bureaucratic structure) to compare the results in urban and rural areas.

Results and Discussion

A literature search in PubMed, Google Scholar, DOAJ, and the Garuda Portal yielded 43 articles published between 2020 and 2025. After deduplication (n = 12), 31 articles remained for title and abstract screening. A total of 17 articles were eliminated for non-relevance to the inclusion criteria, such as studies not conducted in Indonesia, not focusing on adolescent populations, or not discussing iron supplementation (TTD/IFA) implementation. Fourteen articles were read in full text, and four were excluded for not reporting data on program coverage, distribution, or adherence. Thus, 10 articles that met the inclusion criteria were selected and analyzed in this systematic review. The following are the results of the systematic review conducted from the 10 selected research journals:

Table 1
Systematic Review Research Results

No	Authors and years	Research Methods	Outcome of Analysis	Summary of results
1	(Christiansi, 2025)	This study used a quasi-experimental design by designing one pre-test and post-test group.	Health education improves the knowledge and attitudes of adolescent girls and their parents regarding iron supplement consumption.	Nutrition and anemia education interventions increased knowledge (from 22.4% to 44.9%) and positive attitudes (from 30% to 51.6%).
2	(Abdillah et al., 2023)	Quasi-experimental research method with one-group pretest-posttest design. The research subjects were 30 people with random sampling technique. Data collection techniques using knowledge and attitude questionnaires.	Health education significantly impacts the knowledge and attitudes of adolescent girls.	Knowledge increased significantly (p=0.00) and attitudes significantly improved (p=0.019) after education related to anemia and iron supplementation.
3	(Utami & Sudaryanto, 2025)	The type of research is an analytical survey with a quantitative approach. The research	Low compliance is correlated with the incidence of anemia in adolescent girls	Adolescent girls with low compliance have a prevalence of anemia of 25%; there is a significant relationship

		design used was cross-sectional with 100 respondents		between compliance and anemia (p<0.001)
4	(Parumpu, 2024)	This research method uses a non-experimental descriptive design and a cross-sectional approach with a purposive sampling technique.	Many young women with irregular iron supplement consumption behavior, some show symptoms of anemia even though they are taking iron supplement.	The incidence of suspected anemia in adolescent girls in Palu City is still high and therefore attention is needed to pay attention to several behavioral factors regarding the consumption of iron tablets in adolescent girls.
5	(Wahyudi, 2023)	This research method is a descriptive observational study with a cross-sectional approach. The research period was October 2023. The sample size was 83 adolescent girls (total population).	The results showed that most respondents had a low level of compliance and 25% respondents had anemia. Statistical tests with Pearson Correlation showed that the p-value between compliance with iron supplement consumption and the incidence of anemia was <0.001	There is a significant relationship between adherence to iron supplementation and the incidence of anemia, particularly in adolescent girls at SMAN 1 Sragen. Health education is needed to reduce the incidence of anemia.
6	(Nurbaiti et al., 2025)	This study used a pre-experimental pretest posttest group design. The sample was selected using purposive sampling techniques, totaling 36 respondents.	The results of the study showed that the implementation of the Education Model was effective in increasing knowledge (p-value=0.001) and compliance with TTD consumption (p-value=0.032).	The study concluded that the comprehensive education model was proven effective in increasing knowledge and compliance with TTD consumption in adolescent girls.
7	(Asikin & Nurfaidah, 2024)	The type of research used is a pre-experimental one group pre-test – post-test design using a pre-test.	The research results obtained showed that education about anemia and the provision of Iron Supplement Tablets (TTD) to adolescent girls had an impact on increasing knowledge of stunting prevention in the Moncobalang Community Health Center area, Gowa Regency.	Health workers can use educational methods regarding anemia and provide iron tablets to adolescent girls to increase knowledge about preventing stunting.
8	(Rosmanely et al., 2023)	This research uses an experimental method by providing pocket books and iron tablets.	Providing TTD accompanied by a pocket book significantly increased knowledge of anemia in Parenreng Village.	The distribution of 19 Pocket Books and 200 Iron Supplement Tablets (TTD) to young women significantly increased knowledge of anemia in Parenreng Village.
9	(Sayda et al., 2024)	This research was conducted cross-sectionally;	Some respondents still have poor knowledge regarding dosage, time	Some knowledge needs to be improved, especially regarding the correct dosage

		descriptively, with an accidental sampling technique using a questionnaire instrument.	of taking, and drinks that are prohibited to be taken with iron tablets, as well as regarding how to check for anemia and Hb levels in anemia.	for TTD, anemia Hb levels, and how to check for anemia which is classified as low with the number of wrong respondent answers being greater than the number of correct respondent answers.
10	(Dermawan et al., 2025)	A systematic literature search was conducted to identify relevant articles in 3 main databases (Scopus, PubMed, and Google Scholars). Studies on the consumption of iron-boosting tablets for meeting micronutrient needs in stunting cases require a systematic review with inclusion criteria limited to articles published between 2015-2024, free full text, in Indonesian and English	Of the 10 articles analyzed, most showed that consumption of Iron-Boosting Tablets (TTD) in pregnant women can increase hemoglobin levels and reduce the risk of anemia, which contributes to the prevention of stunting in children. However, the compliance rate of pregnant women in consuming TTD is still low due to side effects and lack of awareness. Additionally, socio-economic factors also play a role in children's nutritional status, where families with low incomes have a higher risk of anemia and stunting.	TTD supplementation plays an important role in the prevention of anemia and stunting in children. However, its effectiveness is greatly influenced by the level of consumption compliance and socio-economic factors. Therefore, more intensive education and multi-sectoral policies are needed to improve accessibility and compliance with TTD consumption in stunting prevention efforts in Indonesia.

An analysis of 10 journals that met the inclusion criteria showed that health education and community empowerment consistently increased knowledge and positive attitudes among adolescent girls toward iron supplementation (ITP) consumption. Although iron supplementation distribution is well-established in most regions, adherence remains low, particularly in urban areas, driven by negative perceptions of side effects, lack of motivation, and dietary patterns that do not support anemia prevention. In rural areas, the main obstacle lies in access to distribution due to limited transportation and health worker resources, although support from families, teachers, and cadres has been shown to improve adherence. Socioeconomic factors, environmental support, and the availability of appropriate educational media are important determinants of program success. Overall, the success of the iron supplementation program is strongly influenced by the quality of communication, the availability of resources, the commitment of field implementers, and the effectiveness of the bureaucratic structure in ensuring equitable and timely distribution.

Several studies with quasi-experimental designs have demonstrated significant improvements in knowledge and attitudes following educational interventions, both conducted through schools and involving parents. This indicates that structured and planned communication plays a significant role in improving the understanding of the target population. However, despite increased knowledge, adherence to iron

supplementation remains a challenge in some areas. Most respondents do not take iron supplementation according to the recommended schedule, citing discomfort from the taste, perceived side effects, and a lack of regular supervision. Distribution barriers also differ between urban and rural areas. Limited access to transportation, long travel distances, and a limited number of health workers are factors hindering equitable iron supplement distribution. Furthermore, environmental support, such as from teachers, cadres, and family, has been shown to be a contributing factor to the program's success. The presence of social support can increase the motivation of adolescent girls to take iron supplementation regularly. The success of an iron supplementation program depends not only on distribution but also on socio-economic factors and ongoing monitoring strategies. Based on the results above, the implementation of the TTD program can be analyzed through four Edward III variables:

1. Communication: Structured education, both in schools and through cadres, improves knowledge and attitudes, but attention must be paid to message segmentation to address negative perceptions and misconceptions about dosage and consumption times.
2. Resources: Rural areas require transportation support and additional health workers to reach targets, while urban areas require optimization of behavioral resources (motivation, social support).
3. Disposition: The commitment of program implementers, such as village cadres and teachers, contributes to smooth distribution and educational success.
4. Bureaucratic Structure: Distribution mechanisms work well in areas with easy access, but in difficult areas, specific SOPs and flexible distribution schedules are needed to avoid delays.

Thus, an approach tailored to regional characteristics is needed: in urban areas, interventions should focus on increasing compliance and changing behavior; while in rural areas, efforts should be directed at improving distribution access and optimizing the role of cadres.

Conclusion

A systematic review of ten studies from 2020–2025 showed that health education, cadre empowerment, and school environmental support effectively improved knowledge, attitudes, and some adherence to iron supplementation (TTD) among adolescent girls. The main obstacle in urban areas was low adherence due to perceived side effects and unsupportive dietary patterns, while in rural areas, the main challenges were limited access to distribution and health worker resources. Program success is strongly influenced by communication, resources, implementer disposition, and bureaucratic structure, so intervention strategies must be tailored to regional characteristics to maximize anemia prevention.

Reference

Abdillah, M. A. I., Triawanti, T., Rosida, A., Noor, M. S., & Muthmainah, N. (2023). Pengaruh Penyuluhan Terhadap Pengetahuan Dan Sikap Mengonsumsi Tablet Tambah Darah. *Homeostasis*, *5*(3). Https://Doi.Org/10.20527/Ht.V5i3.7739

Afiqoh, N. A. A. (2024). Evaluasi Program Pemberian Tablet Tambah Darah Pada Remaja Putri Di Wilayah Kerja Puskesmas Kebonsari Kabupaten Madiun. *Jurnal Gizi Universitas Negeri Surabaya*, *2*(3), 147–158.

Anggraini, N., Lisnawati, L., Juita, D., & Hariyanti, E. T. (2024). Compliance To Blood Supplement Tablets Consumption Among Teenagers High School As An Effort To Prevent Anemia In Indonesia. *Jurnal Keperawatan Ppni Jawa Barat*, *2*(1).

Asikin, A. M., & Nurfaidah, N. (2024). Pengaruh Edukasi Anemia Serta Pemberian Tablet Tambah Darah (Ttd) Kepada Remaja Putri Terhadap Peningkatan Pengetahuan Pencegahan Stunting. *Jurnal Kesehatan*, *17*(2). Https://Doi.Org/10.58294/Jbk.V17i2.195

Batul, F. Z., Makani, M., & Irawan, Y. (2024). Analisis Tingkat Pengetahuan Terhadap Perilaku Ibu Hamil Pada Penggunaan Obat Tambah Darah Di Puskesmas Arut Selatan. *Jurnal Kesehatan Unggul Gemilang*, *8*(10).

Christiansi, W. Y. (2025). Pengaruh Pemberian Edukasi Kepatuhan Konsumsi Tablet Tambah Darah (Ttd) Terhadap Peningkatan Pengetahuan Dan Sikap Remaja Putri Dan Orang Tua Di Kabupaten Bangkalan. *Perilaku Dan Promosi Kesehatan: Indonesian Journal Of Health Promotion And Behavior*, *6*(2). Https://Doi.Org/10.47034/Ppk.V6i2.1086

Dermawan, Z., Permana, I., Setiatjahjati, S., & Ghifari, U. Al. (2025). Hubungan Suplemen Tablet Tambah Darah Sebagai Pemenuhan Gizi Mikro Terhadap Potensi Stunting Di Negara Indonesia ; Tinjauan Sistematis Literatur Program Kesehatan Yang Komprehensif Dan Berbasis Pada Data Yang Akurat . Program Pemberian Terhadap Potensi St. *Calory Journal : Medical Laboratory Journal*, *3*(1).

Lestari, D. T., Sari, N. P., Djide, N. A. N., Khatimah, H., & Pebriani, R. (2024). Evaluation Of The Program Of Giving Blood Tablets To Female Teens At Sman 18 Makassar. *In Nhihc: Nani Hasanuddin International Health Conference, 2*(1).

Nadiyah, N., Sitoayu, L., & Dewanti, L. P. (2022). Remaja Putri Pedesaan Di Indonesia Berisiko Anemia Dua Kali Lebih Tinggi. *Gizi Indonesia*, *45*(1).

Nurbaiti, A., Santoso, B., & Supriyadi. (2025). Model Edukasi Meningkatkan Pengetahuan Dan Kepatuhan Konsumsi Tablet Tambah Darah Pada Remaja Putri. *Jurnal Sains Kebidanan*, *7*(1). Https://Doi.Org/10.31983/Jsk.V7i1.12849

Pangaribuan, B. N., P., K., D., I., Wasono, H. A., & Triwahyuni, T. (2022). Studi Literatur Tentang Hubungan Tingkat Pengetahuan Dengan Kejadian Anemia Pada Remaja Putri Di Beberapa Wilayah Indonesia. *Malahayati Nursing Journal*, *4*(6).

Parumpu. (2024). Gambaran Status Suspek Anemia Dan Perilaku Konsumsi Tablet Tambah Darah Remaja Putri Di Kota Palu. *Acta Pharmaceutica Indonesia* |, *49*(2). Https://Journals.Itb.Ac.Id/Index.Php/Acta/Article/Download/22588/6803/87045

Rosmanely, S., Rahmadani, S., Arista, E., Rombedatu, A., Pasudi, C., Putri, A., & Wira, Y. (2023). Pembagian Buku Saku Dan Tablet Tambah Darah Pada Remaja Putri Di Desa Parenreng. *Batara Wisnu Journal : Indonesian Journal Of Community Services*, *3*(1).

Rustiawan, A., & Pratiwi, A. (2022). Evaluasi Program Pemberian Tablet Tambah Darah Pada Ibu Hamil Di Puskesmas Gedongtengen. *Abdi Geomedisains*.

Sayda, R. Y. P., Azzahra, A., Aisya Nur Ulinnuha, B., Mariskha Afra, H., Septian Margono, M., Amir Hasan, M., Maulydia Shafa, N., Rafika Sari, R., Putri Hasti Azhari, S., Shafira Maharani, S., Adhiestanya Imani, S., Widi Astuti, S., & Priyandani, Y. (2024). Pengetahuan Ibu Hamil Tentang Konsumsi Tablet Tambah Darah Sebagai Upaya Pencegahan Stunting Di Surabaya Timur. *Jurnal Farmasi Komunitas*, *11*(1). Https://Orcid.Org/0000-0002-6023-9326

Stoffel, N. U., V., Siebenthal, H. K., Moretti, D., & Zimmermann, M. B. (2020). Oral iron supplementation in iron-deficient women: How much and how often? *Molecular Aspects of Medicine*.

Utami, A. P., & Sudaryanto, A. (2025). Kepatuhan Konsumsi Tablet Tambah Darah Dengan Kejadian Anemia Pada Remaja Putri Compliance With Consumption Of Blood Supply Tablets With The Incidence Of Anemia In Adolescents. *Jurnal Ilmu Kesehatan*, *9*(1).

Wahyudi, N. (2023). Konsumsi Tablet Tambah Darah Pada Remaja Putri Blood Increasing Tablet Consumption Behavior In. *Jurnal Andragogi Kesehatan*, *3*(2).

Wulandari, R., Rahman, S., & Putri, A. (2024). Ethical considerations in public health research. *Health Research Ethics Journal*, *7*(1).