

THE EFFECTIVENESS OF AN ANEMIA BOOKLET IN ENHANCING ADOLESCENT GIRLS' KNOWLEDGE OF IRON SUPPLEMENT CONSUMPTION AS A STRATEGY FOR STUNTING PREVENTION

Winasari Dewi¹, Yusni Ainurrahmah², Rany Yulianie³,
Yani Annisa Fauziah Bastian⁴
Universitas Bhakti Kencana^{1,2,3,4}
winasari.dewi@bku.ac.id¹

ABSTRACT

This study aims to determine and analyze the effect of anemia education using a booklet as a media tool on the knowledge of adolescent girls in efforts to prevent stunting. The method used is a quasi-experimental design with a one-group pretest-posttest approach. A questionnaire was used as the instrument to measure knowledge. The sample consisted of 35 adolescent girls selected using purposive sampling. Data analysis was conducted using the paired t-test. The results of the study show that an average increase in knowledge scores of 19.52 points after the educational intervention. Statistical analysis revealed a p-value of 0.000, indicating a significant effect of the anemia booklet on increasing adolescent girls' knowledge regarding the consumption of iron tablets as a means of preventing stunting. In conclusion, educational intervention using the anemia booklet effectively enhanced adolescent girls' knowledge regarding iron tablet consumption as a preventive measure against stunting.

Keywords: Anemia, Blood Supplement Tablets, Booklet, Stunting, Teenage Girls

INTRODUCTION

Nutritional issues remain a major public health concern in Indonesia, particularly among adolescent girls. This demographic is at heightened risk for iron deficiency anemia, a condition that can negatively impact reproductive health and future pregnancy outcomes (Adyani et al., 2024). One of the most severe consequences of chronic nutritional deficiencies, especially during early childhood, is stunting, a growth and development disorder that results from prolonged malnutrition and has long-term effects on physical stature, cognitive function, and economic productivity (Fitranier et al., 2025).

Recent data from the 2022 Indonesian Nutritional Status Survey (SSGI) indicate that 21.6% of Indonesian children are affected by stunting, a figure that still exceeds the WHO's acceptable limit of less than 20%. One often overlooked contributor to this problem is anemia among adolescent girls, who represent the future generation of mothers. More than 30% of adolescent girls in Indonesia reportedly suffer from anemia, particularly iron deficiency anemia, which is linked to high-risk pregnancies and adverse birth outcomes such as low birth weight (LBW) and preterm births, both of which are associated with stunting (Kemenkes, 2022).

Previous studies have shown that education plays a key role in influencing health behavior. For example Desti & Djamil (2024) demonstrated that health education through printed media like booklets can significantly improve adolescent knowledge and behavior regarding nutrition and health. Stellata et al., (2024) also found that poor knowledge and misconceptions about Iron and Folic Acid (IFA) tablets contribute to low compliance among adolescent girls, despite government programs promoting weekly IFA tablet consumption.

This research aims to assess the effectiveness of educational booklets in improving adolescent girls' knowledge about iron supplementation and its connection to stunting prevention. The objective is to evaluate whether a visual and easy-to-understand educational medium can enhance awareness and foster behavior change regarding anemia and iron intake among this vulnerable group.

The novelty of this study lies in its focus on using a targeted, visually engaging educational booklet to bridge the knowledge gap specifically related to anemia and its long-term implications for stunting, an area that has received limited attention in previous research. Unlike general nutrition education, this study links adolescent anemia directly to intergenerational impacts on child growth.

Conducting this research is important because it addresses a preventable root cause of stunting through early intervention and health education. The findings are expected to offer valuable insights for healthcare professionals, educators, and policymakers in developing more effective and sustainable strategies for improving adolescent health and ultimately breaking the cycle of malnutrition across generations.

RESEARCH METHODS

This study employs a quantitative approach with a quasi-experimental One Group Pretest-Posttest Design, aimed at evaluating the effectiveness of educational booklets in increasing adolescent girls' knowledge regarding Iron and Folic Acid (IFA) tablet consumption as a preventive measure against stunting. The research was carried out in several structured stages: 1) Initial preparation, including ethical clearance, coordination with local health officials and schools, and participant recruitment based on predetermined criteria; 2) Pretest, administered to measure baseline knowledge related to anemia, IFA tablet consumption, and the relationship between anemia and stunting; 3) Educational intervention, conducted by distributing a specially designed, visually engaging anemia education booklet to each participant, accompanied by a short explanation session, and 4) Posttest, given one week after the intervention using the same instrument to evaluate changes in knowledge. The study was conducted in Kelurahan Sukagalih, Garut Regency, over the period of February to March 2024. This location was chosen due to the high prevalence of anemia and limited access to adolescent health education programs in the area.

The instrument used for data collection was a structured questionnaire consisting of 24 closed-ended (multiple-choice) questions. These questions were developed to assess participants' knowledge about: the causes and symptoms of anemia, the benefits and usage of IFA tablets, and the connection between adolescent anemia and child stunting. The questionnaire was validated and tested for reliability before implementation, yielding a validity-approved set and a Cronbach's alpha of 0.696, indicating acceptable internal consistency. Data were collected directly from respondents through self-administered questionnaires during the pretest and posttest sessions. The collected data were then coded and entered into the SPSS statistical

software for analysis. The primary statistical method used was the Paired Sample T-Test, which was applied to assess the difference in mean knowledge scores before and after the intervention. This test is suitable for analyzing paired data and identifying significant changes within the same group over time. The level of statistical significance was set at $p < 0.05$.

RESULT

Table. 1
Frequency Distribution
of Respondents' Pretest Knowledge Scores

| Knowledge Category | Frequency | Percentage (%) |
|--------------------|-----------|----------------|
| Good | 4 | 11.4 |
| Moderate | 17 | 48.6 |
| Poor | 14 | 40 |
| Total | 35 | 100 |

The respondents' knowledge after receiving education through the anemia booklet media, as a stunting prevention effort among adolescent girls, was measured using posttest scores as follows.

Table. 2
Frequency Distribution
of Respondents' Posttest Knowledge Scores

| Knowledge Category | Frequency | Percentage (%) |
|--------------------|-----------|----------------|
| Good | 21 | 60 |
| Moderate | 9 | 25.7 |
| Poor | 5 | 14.3 |
| Total | 35 | 100 |

Based on the table above, a portion of the respondents (48.6%) demonstrated a moderate level of knowledge in the pretest results, while the majority (60%) showed a good level of knowledge in the posttest results. This indicates an improvement in the respondents' knowledge following the educational intervention. The average knowledge scores of the respondents before and after receiving education through the anemia booklet media as an effort to prevent stunting among adolescent girls are presented as follows.

Table. 3
Average Knowledge Scores of Respondents Before
and After the Educational Intervention

| Knowledge | N | Mean | SD |
|-----------|----|-------|--------|
| Pretest | 35 | 49.94 | 9,962 |
| Posttest | 35 | 69.46 | 11,001 |

Based on the table above, the average value in the pretest was 49.94, while the posttest average increased to 69.46, indicating a descriptive difference in scores. The mean difference between the pretest and posttest scores was 19.52, demonstrating an increase in respondents' knowledge after receiving education through booklet media.

To test the research hypothesis, a pretest-posttest score comparison was conducted. The first step involved testing for data normality. The normality test was carried out using the Shapiro-Wilk Test via the SPSS application. The significance values for both the pretest and posttest were found to be greater than 0.05, indicating that the data were normally distributed.

Table. 4
The Influence of Anemia Booklet Media
on Adolescent Girls as an Effort to Prevent Stunting

| Variables | N | Mean | SD | P |
|-----------|----|-------|--------|-------|
| Before | 35 | 49.94 | 9,962 | 0,000 |
| After | 35 | 69.46 | 11,001 | |

Based on the analysis of knowledge scores presented in the table above, the obtained p-value is 0.000 ($p < 0.05$). This indicates that the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted. In other words, there is a statistically significant influence of the anemia booklet media on the knowledge of adolescent girls. This result suggests that the educational intervention successfully increased their awareness and understanding, particularly regarding the consumption of iron tablets as a preventive measure against stunting.

DISCUSSION

This study is based on the understanding that individual health behaviors, especially among adolescents, are shaped by their knowledge, perceptions, and access to information (Mulianingsih et.al, 2024). Anemia and stunting are significant public health concerns that often arise from inadequate nutrition and low awareness about essential health practices, such as iron supplementation and balanced dietary intake. Adolescents, particularly girls, are at a vulnerable stage of growth and development, making them more susceptible to the long-term consequences of micronutrient deficiencies (Diani et al., 2024). When they lack information about the causes, symptoms, and consequences of anemia and stunting, they are less likely to take preventive actions. Therefore, health education interventions that clearly explain these conditions, their risks, and practical prevention strategies are essential. By improving knowledge and shaping positive attitudes toward iron intake and healthy eating, such interventions can promote early prevention efforts, reduce the risk of anemia, and help prevent growth delays that lead to stunting (Deliana et al., 2025).

Adolescent girls' decisions to take iron supplements are shaped by how seriously they perceive the threat of anemia and stunting, how beneficial they believe iron tablet consumption is, and how well they think they can overcome barriers such as myths about side effects (Riyanto et al., 2024). Enhancing knowledge through structured education, such as the use of booklet media, can influence these perceptions and thus foster preventive health behaviors (Nuraenah et al., 2025).

The relationship between anemia and stunting forms the basis of this framework. Anemia during adolescence, especially if unaddressed, increases the risk of complications during future pregnancies, such as low birth weight, premature birth, and intrauterine growth restriction. These are critical contributors to stunting in children (Purwitaningtyas & Paramitha, 2024). Therefore, increasing adolescent girls' knowledge about iron supplementation is a strategic and preventive approach to

breaking the cycle of malnutrition across generations.

This study utilized a quasi-experimental one-group pretest-posttest design, with 35 adolescent girls aged 16–18 years in Kelurahan Sukagalih, Garut Regency as participants. They received an educational intervention in the form of a booklet that covered anemia, the benefits and proper use of iron supplements, and the link between maternal nutrition and stunting. Knowledge scores were collected before and one week after the intervention using a validated questionnaire, and data were analyzed using the Paired Sample T-Test.

The findings are systematically presented by first describing baseline knowledge levels and demographic factors (age, information source), followed by the impact of the educational booklet, and finally, by discussing changes in knowledge scores with statistical backing and comparisons to prior research.

The pretest score average was 49.94, indicating low awareness among adolescent girls regarding anemia and iron tablet consumption. This aligns with Deliana et al., (2025) who identified that low knowledge is a major factor in adolescents' non-compliance with iron supplementation. Similarly, incomplete and fragmented information, particularly from social media sources (82.9% of respondents), has been linked to poor understanding, consistent with Syswianti & Roslan (2024) who emphasized the role of information completeness in shaping knowledge.

After the intervention, the mean score increased to 69.46, showing a statistically significant improvement (p-value 0.000). This supports research by Nuraenah et al., (2025) which found that booklet media effectively improved both knowledge and attitudes among adolescents regarding anemia prevention. The structured content, accessibility, and repeated usability of booklets make them more effective than oral counseling alone. Agustianingsih et al., (2024); Asyura et al., (2024) also reported that booklets improve learning retention due to visual support and learner-paced reading.

Furthermore, the age of respondents (mostly 16 years old) was positively correlated with higher post-intervention knowledge, confirming findings from Irola & Kalifia (2024) which suggest that cognitive development with age enhances comprehension of health information. Ultimately, increasing knowledge through targeted educational interventions can facilitate significant behavior change, particularly when the content addresses core determinants of individual health-related decision-making (Sarfika et al., 2024).

In the context of anemia and stunting, adolescent girls represent a high-risk group due to their increased nutritional demands and vulnerability to micronutrient deficiencies (Mulyani et al., 2025). Awareness of the consequences of anemia—such as chronic fatigue, impaired cognitive development, and reduced academic performance—and the irreversible impact of stunting on physical and mental growth can serve as a strong motivator for adopting preventive behaviors (Annisa et al., 2025). Educational strategies that emphasize the benefits of iron supplementation and balanced nutrition, while also addressing perceived barriers such as misconceptions about side effects or limited family support, are more likely to result in sustained behavioral change (Wahyuni, 2024). Therefore, delivering clear, contextually relevant, and practical information is essential not only to enhance knowledge but also to empower adolescents to engage in proactive health practices aimed at preventing anemia and stunting (Setyaningsih & Jumiatur, 2024).

CONCLUSION

The findings of this study demonstrate that educational interventions using anemia booklets are effective in significantly increasing adolescent girls' knowledge regarding the importance of consuming iron tablets (TTD) as a preventive measure against anemia and stunting. Booklets, as a health education tool, offer multiple advantages: they present information in a simple, engaging, and user-friendly format, enabling adolescents to absorb and review the content at their own pace. This facilitates better understanding and awareness of the importance of good nutritional practices from an early age. Improving the knowledge of adolescent girls about anemia and iron supplementation has important long-term implications for stunting prevention, considering their future role as mothers whose nutritional status directly influences the health of future generations. Accordingly, the use of booklet media is recommended as an effective strategy for school-based health promotion, particularly in nutrition education and anemia prevention programs targeting adolescent girls.

SUGGESTION

Considering the effectiveness and efficiency of booklet media as an educational tool, this intervention is strongly recommended for implementation in the UKS (School Health Unit) program, as well as in other health promotion activities targeting adolescents. However, to achieve sustainable behavioral change, the use of booklets should be complemented by additional intervention strategies. These may include counseling sessions, peer education, and active involvement of teachers and parents in monitoring and supporting the regular consumption of iron tablets. A multifaceted approach ensures not only an increase in knowledge but also the development of consistent, health-promoting behaviors among adolescents.

REFERENCE

- Adyani, K., Apriliana, S. D., & Susilowati, E. (2024). Pengaruh Media Edukasi terhadap Pengetahuan Remaja Putri tentang Anemia: Literature Review. *Faletehan Health Journal*, 11(02), 126-134. <https://doi.org/10.33746/fhj.v11i02.683>
- Agustianingsih, F., Rahma, N. R. S., & Rahayu, B. (2024). The Influence of JASA TAMI (Healthy Adolescents Without Anemia) Booklet Media on Adolescent Girls in Islamic Boarding Schools Mizanul 'Ulum Sanrobone In 2023. *Jurnal Kebidanan Kestra (JKK)*, 6(2), 195-204. <https://doi.org/10.35451/jkk.v6i2.2134>
- Asyura, R., Pujiyani, H., & Andini, D. P. (2024). Efektivitas Promosi Kesehatan Melalui Media E-Booklet terhadap Pengetahuan tentang Anemia pada Siswi di MTS Ihyaul Ulum Lamongan. *Jurnal Sains dan Teknologi Kesehatan*, 5(1). <https://doi.org/10.52234/jstk.v5i1.315>
- Annisa, Z. D., Lestari, A. P., & Anggraini, D. (2025). Hubungan Status Gizi dengan Kejadian Anemia pada Remaja. *Scientific Journal*, 4(2), 54-62. <https://doi.org/10.56260/sciena.v4i2.189>
- Deliana, A., Andriyani, A., & Lusida, N. (2025). Analisis Faktor-Faktor yang Mempengaruhi Kejadian Anemia pada Remaja Putri. *Health & Medical Sciences*, 2(3), 14. <https://doi.org/10.47134/phms.v2i3.413>
- Desti, E. Y., & Djamil, A. (2024). Pengaruh Edukasi Gizi dengan Media Booklet terhadap Tindakan Pencegahan Anemia Gizi Besi pada Remaja Putri di SMPN 4 Tulang Bawang Barat. *Jurnal Maternitas Kebidanan*, 9(2), 84-103.

- <https://doi.org/10.34012/jumkep.v9i2.5814>
- Diani, A. A. P., Amalia, R. B., Sudaryanti, L., & Lestari, P. (2024). Knowledge and Attitude with Adherence to Fe Tablet Consumption in Anemic Adolescent Girls. *Indonesian Midwifery and Health Sciences Journal*, 8(3), 250-259. <https://doi.org/10.20473/imhsj.v8i3.2024.250-259>
- Fitriani, I., Anita, A., & Yusnaini, Y. (2025). The effectiveness of Educational Media in Preventing Anemia Among Adolescent Girls. *Science Midwifery*, 13(2), 444-453. <https://doi.org/10.35335/midwifery.v13i2.1935>
- Irola, D., & Kalifia, A. D. (2024). Aspek Perkembangan Kognitif pada Masa Remaja. *Dewantara: Jurnal Pendidikan Sosial Humaniora*, 3(1), 128-132. <https://doi.org/10.30640/dewantara.v3i1.2111>
- Kemkes. (2022). *Survei Status Gizi Indonesia (SSGI) 2022*. <https://layanandata.kemkes.go.id/katalog-data/ssgi/ketersediaan-data/ssgi-2022>
- Mulianingsih, M., Suriah, S., Hidayanty, H., Amiruddin, R., Hadju, V., Wulandari, D., & Salmah, A. U. (2024). The Effectiveness of Booklet and Images Game Education in Anemia Adolescent Women on Anemia Prevention Knowledge, Attitudes and Behavior. *Pharmacognosy Journal*, 16(5). <http://dx.doi.org/10.5530/pj.2024.16.193>
- Mulyani, I., Faadilah, A., Junisa, D. E., & Anggraini, D. (2025). Pengaruh Kadar Hemoglobin terhadap Risiko Anemia dan Dampaknya pada Kesehatan Remaja Putri. *Scientific Journal*, 4(1), 15-22. <https://doi.org/10.56260/sciena.v4i1.187>
- Nuraenah, E., Kusumastuti, A., Nuraini, N., & Chasanah, U. (2025). Efektifitas Pendidikan Kesehatan Melalui Booklet Dibandingkan dengan E-Booklet terhadap Pengetahuan Remaja tentang Stunting. *Journal of Midwifery Science and Women's Health*, 5(2), 161–166. <https://doi.org/10.36082/jmswh.v5i2.2181>
- Purwitaningtyas, R., & Paramitha, I. A. (2024). Hubungan Riwayat Anemia dan Kekurangan Energi Kronis (KEK) Ibu pada Saat Hamil dengan Kejadian Stunting pada Balita di Wilayah Kerja Puskesmas Buaran Tahun 2023. *CENDEKIA: Jurnal Ilmu Pengetahuan*, 4(2), 115-123. <https://doi.org/10.51878/cendekia.v4i2.2820>
- Riyanto, R., Oktaviani, I., Sariyanto, I., & Mulyani, R. (2024). Edukasi Peningkatan Pengetahuan tentang Stunting, Skrining Anemia dan Pemberian Tablet Tambah Darah pada Remaja Putri. *Journal Of Human And Education (JAHE)*, 4(2), 306–315. <https://doi.org/10.31004/jh.v4i2.1159>
- Sarfika, R., Wenny, B. P., Putri, D. E., Refnandes, R., Fernandes, F., Freska, W., & Rahayuningsih, A. (2024). Pemberian Pendidikan Kesehatan Tumbuh Kembang Psikososial pada Remaja Sebagai Upaya Mencegah Masalah Kesehatan Mental. *JMM (Jurnal Masyarakat Mandiri)*, 8(1), 95-102. <https://doi.org/10.31764/jmm.v8i1.19619>
- Setyaningsih, P., & Jumiatur, J. (2024). Attitude and Motivation of Adolescents on Stunting Prevention in Female Students. *JKM (Jurnal Kebidanan Malahayati)*, 10(11), 1045-1051. <https://doi.org/10.33024/jkm.v10i11.18248>
- Solang, S. D., Tupan, H. A., & Kusmiyati, K. (2023). Efektivitas Audio Visual dan Modul terhadap Pengetahuan Remaja Putri tentang Anemia: Literatur Review. *Jurnal Gizi Kerja dan Produktivitas*, 4(1), 75-80. <https://dx.doi.org/10.62870/jgkp.v4i1.20457>

- Stellata, A. G., Kartikawati, S. L., Yusita, I., & Huwaida, H. S. (2024). Factors Associated with Adherence to Tablet FE Consumption in Adolescents. *International Journal of Midwifery and Health Sciences*, 2(1), 23–37. <https://doi.org/10.61777/ijmhs.v2i1.60>
- Syswianti, D., & Roslan, D. (2024). The Effect of Counseling on Adolescent Girls' Knowledge and Attitude Toward Anemia Prevention. *JKM (Jurnal Kebidanan Malahayati)*, 10(5), 453-458. doi:<https://doi.org/10.33024/jkm.v10i5.14957>
- Wahyuni, N. (2024). Hubungan Pola Makan, Gaya Hidup, dan Dukungan Keluarga terhadap Kejadian Anemia Pada Remaja Putri Di Madrasah Tsanawiah Tanwirian Cianjur. *Indonesian Scholar Journal of Nursing and Midwifery Science (ISJNMS)*, 3(10), 1435-1443. <https://doi.org/10.54402/isjnms.v3i10.497>