

The Effect of Audio Visual Education on Compliance with Iron Tablet Consumption in Adolescent Girls in Sambiki Tua Village

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Abstract: Iron deficiency anemia remains a major public health concern, particularly among adolescent girls, due to increased iron requirements during puberty and menstruation. Despite national programs providing free iron (Fe) tablets, adherence to consumption remains low, often due to lack of knowledge, fear of side effects, and limited motivation. This study aimed to assess the effectiveness of audio-visual education in improving Fe tablet consumption compliance among adolescent girls. A quasi-experimental one-group pretest-posttest design was used, involving 52 adolescent girls in Sambiki Tua Village. Participants were provided with a short educational video highlighting the importance of iron, how to properly take Fe tablets, and potential consequences of anemia. Compliance was measured before and four weeks after the intervention. Prior to the intervention, only 23.1% of respondents were compliant, while 76.9% were non-compliant. After the audio-visual education, compliance increased significantly to 84.6%, with the Wilcoxon Signed-Rank Test showing a p-value of 0.000. These findings indicate that audio-visual media is an effective educational tool for promoting health behavior change among adolescents. Incorporating such media into school-based and community health programs could be a strategic approach to reduce anemia prevalence and improve nutritional health in this vulnerable group.

Keywords: Adolescent Girls; Anemia Prevention; Audio-Visual Education; Compliance; Iron Tablets.

1. INTRODUCTION

Iron deficiency anemia remains one of the most prevalent nutritional problems in developing countries, including Indonesia. It is characterized by a low hemoglobin (Hb) level in the blood due to insufficient iron, which is essential for red blood cell formation. According to the World Health Organization (WHO), over 30% of the global population suffers from anemia, with adolescent girls and women of reproductive age being the most vulnerable groups. In Indonesia, the Basic Health Research (Riskesdas) reported an alarming increase in the prevalence of anemia among adolescents aged 15–24 years, rising from 18.4% in 2013 to 32% in 2018, signaling a worsening trend that requires urgent intervention (Sianipar et al., 2023).

Adolescent girls are particularly at risk due to their increased iron requirements during puberty, menstrual blood loss, and unbalanced dietary habits. Many adolescent girls consume fast food, lack iron-rich foods in their daily meals, and are unaware of their nutritional needs (Yona Desni Sagita et al., 2024). If left unaddressed, anemia in adolescence can lead to long-term consequences, including decreased academic performance, chronic fatigue, poor concentration, and complications during pregnancy and childbirth later in life (Saridewi et al., 1980).

To address this issue, the Indonesian government has implemented a national supplementation program by providing iron tablets (Fe tablets) to adolescent girls one tablet per week for 52 weeks per year. However, field studies consistently report low adherence to

this program. Adolescents often lack awareness of the benefits of iron supplementation, fear side effects such as nausea or constipation, or are unaware of the correct way to consume the tablets (Setiasih et al., 2022). This indicates that merely providing iron tablets is not sufficient; effective health education strategies are equally necessary (Marwati et al., 2024).

A preliminary study conducted by the researcher in October 2025 in Sambiki Tua Village, under the working area of Sangowo Public Health Center, revealed that out of 15 adolescent girls surveyed, 12 (80%) were non-compliant with iron tablet consumption, while only 3 (20%) were compliant. This finding highlights the urgent need for more engaging and impactful health communication methods that address cognitive, emotional, and behavioral aspects of adolescents.

Conventional education methods, such as lectures, are often ineffective in reaching adolescents, who tend to prefer visual, interactive, and digital formats. In this regard, audio-visual media-based education is emerging as a promising alternative. Audio-visual media can present health messages in a more attractive, easily understandable format that enhances retention and motivation. Several studies have shown that this method is more effective than verbal counseling in changing health behaviors and improving adherence.

In this context, using educational videos that are engaging, informative, and relevant to the lives of adolescents can serve as a vital tool to deliver health messages about the importance of iron tablet consumption. These videos can combine facts, animations, testimonials, and visualizations of the long-term effects of anemia, making the message more compelling and emotionally resonant. Based on this background, this study aims to examine the effect of audio-visual education on adherence to iron tablet consumption among adolescent girls in Sambiki Tua Village. The findings of this research are expected to serve as a foundation for developing more effective and sustainable health education methods at the community health center and school levels..

2. RESEARCH METHOD

This study employed a quasi-experimental design with a one-group pretest-posttest approach to evaluate the effectiveness of audio-visual education on improving adherence to iron (Fe) tablet consumption among adolescent girls. The research was conducted in Sambiki Tua Village, located within the working area of Sangowo Community Health Center (Puskesmas Sangowo). This location was selected due to the high rate of non-compliance with Fe tablet consumption identified in a prior preliminary study. The design was chosen to allow

assessment of behavioral change in the same group of participants before and after receiving the educational intervention.

The population in this study consisted of adolescent girls aged 12 to 18 years who were residents of Sambiki Tua Village. A purposive sampling method was used to select participants who met the inclusion criteria: (1) female adolescents, (2) never diagnosed with chronic illness, (3) not currently taking other iron supplements, and (4) willing to participate throughout the study. The sample size was determined based on the preliminary findings, involving 15 participants. Prior to the intervention, a pretest was conducted to assess the participants' knowledge and behavior regarding Fe tablet consumption. Following this, an audio-visual educational intervention was delivered using a short video (5–7 minutes) designed to explain the importance of iron intake, how to properly consume Fe tablets, common side effects, and strategies to overcome them.

After the video intervention, participants were observed for a period of four weeks to monitor adherence to Fe tablet consumption. Compliance was measured using a self-reported consumption log cross-checked with direct observation and confirmation from family members or school health personnel (UKS). A posttest was administered at the end of the observation period using the same instrument as the pretest. Data were analyzed quantitatively using the Wilcoxon signed-rank test to assess the statistical significance of changes in adherence behavior before and after the intervention. Ethical approval for this study was obtained from the relevant institutional review board, and informed consent was secured from all participants and their guardians.

3. RESULTS AND DISCUSSION

Univariat Analyze

Table 1. Frequency Distribution of Respondents by Age

Age Group (Years)	Frequency	Percentage (%)
10–15	34	65.4
16–19	18	34.6
Total	52	100.0

The majority of respondents were in the 10–15 age group, totaling 34 individuals (65.4%), while the remaining 18 respondents (34.6%) were aged 16–19 years. This indicates that most participants were in early adolescence, a critical developmental stage for iron supplementation interventions.

Table 2. Frequency Distribution of Respondents by Education Level

Education Level	Frequency	Percentage (%)
Elementary School (SD)	12	23.1
Junior High School (SMP)	18	34.6
Senior High School (SMA)	15	28.8
Higher Education (University)	7	13.5
Total	52	100.0

Most respondents had a junior high school (34.6%) or senior high school (28.8%) education level. Educational background can influence adolescents' understanding of health information, including the importance of iron tablet consumption. A smaller portion of respondents were still in elementary school (23.1%) or had entered higher education (13.5%).

Table 3. Compliance with Iron Tablet Consumption Before Audio-Visual Education

Compliance (Before Intervention)	Frequency	Percentage (%)
Compliant	12	23.1
Non-compliant	40	76.9
Total	52	100.0

Prior to the audio-visual educational intervention, the compliance level with iron tablet consumption was low. Only 12 respondents (23.1%) reported being compliant, while the majority, 40 respondents (76.9%), were non-compliant. These findings highlight the need for engaging educational strategies to improve compliance.

Table 4. Compliance with Iron Tablet Consumption After Audio-Visual Education

Compliance (After Intervention)	Frequency	Percentage (%)
Compliant	44	84.6
Non-compliant	8	15.4
Total	52	100.0

After receiving education via audio-visual media, a substantial increase in compliance was observed. The number of compliant respondents rose to 44 (84.6%), while non-compliance decreased to only 8 respondents (15.4%). This indicates the effectiveness of audio-visual media as a tool for improving adolescent health behaviors, particularly regarding iron supplementation.

Bivariat Analyze

To examine the effect of audio-visual education on iron tablet consumption compliance among adolescent girls, a Wilcoxon Signed-Rank Test was used. This non-parametric test is appropriate for comparing two related samples, specifically the compliance levels before and after the intervention.

Table 5. Wilcoxon Signed-Rank Test: Compliance Before and After Audio-Visual Education
(n = 52)

Comparison	N	Mean Rank	Sum of Ranks
Negative Ranks (After < Before)	32	16.50	528.00
Positive Ranks (After > Before)	0	0.00	0.00
Ties (No Change)	20	—	—

Test Statistics:

- $Z = -5.657$
- Asymp. Sig. (2-tailed) = 0.000
- $\alpha = 0.05$

The results of the Wilcoxon Signed-Rank Test show a Z value of -5.657 and a p-value (Asymp. Sig.) of 0.000, which is less than the significance level $\alpha = 0.05$. This indicates a statistically significant difference in compliance before and after the audio-visual education intervention. In detail, 32 respondents showed improved compliance after the intervention (negative ranks), and none showed decreased compliance. Meanwhile, 20 respondents exhibited no change in behavior. The absence of positive ranks (worsening compliance) and the high number of improved cases suggest that the audio-visual education intervention was effective in increasing adherence to iron tablet consumption. These findings support the hypothesis that audio-visual media can positively influence health behavior by providing engaging, clear, and memorable health messages, particularly among adolescent populations.

Discussion

The findings of this study clearly demonstrate the significant impact of audio-visual education on improving iron tablet (Fe) consumption compliance among adolescent girls. Before the intervention, only 23.1% of participants were compliant, whereas post-intervention, compliance increased to 84.6%. The statistical analysis using the Wilcoxon Signed-Rank Test revealed a Z value of -5.657 with a p-value of 0.000, indicating a highly significant difference in behavior before and after the audio-visual intervention. These results align with the growing body of literature that supports the use of audio-visual media as a powerful educational tool to enhance health-related behaviors, especially among younger populations.

Adolescent girls are particularly vulnerable to iron deficiency anemia due to factors such as menstruation, rapid growth, poor dietary habits, and often limited access to health information. Prior to the intervention, most participants in this study (76.9%) did not comply with Fe tablet consumption. This finding is consistent with national data from Indonesia, where adherence to iron supplementation among adolescent girls remains low despite government initiatives. Wahyuni et al., (2025) reported that only 25–30% of female students consistently consumed iron tablets provided through school programs. Factors influencing this low

compliance include misconceptions about side effects, lack of knowledge, and limited motivation.

Traditional health education methods, such as lectures or written leaflets, often fail to engage adolescents effectively. These methods are generally unidirectional and do not cater to the preferred learning styles of adolescents, who tend to favor visual, interactive, and emotionally engaging content. Ningsih & Ernawati, (2025) compared lecture-based education to audio-visual media and found that students who received education through video had significantly higher knowledge retention and more positive attitudes toward anemia prevention. In this context, audio-visual interventions appear not only more engaging but also more effective in producing behavioral change.

Audio-visual education works by stimulating both auditory and visual sensory channels, increasing attention span and enhancing memory retention. According to Dwistika Wulan F et al., (2023) visual media help translate abstract health messages into concrete experiences. In the case of anemia and Fe tablets, videos can vividly illustrate how iron deficiency affects the body, present testimonials from peers, and demonstrate the correct way to consume the supplement. This multisensory approach improves cognitive understanding while also shaping emotional responses a key factor in motivating behavior change.

The theoretical framework supporting these outcomes can be seen in Bloom's Taxonomy, which classifies educational objectives into cognitive, affective, and psychomotor domains. Effective audio-visual content, such as the one used in this study, targets all three domains. Cognitively, it increases knowledge; affectively, it changes attitudes and builds concern; and psychomotor-wise, it encourages actual behavior (taking the Fe tablet regularly). As Kurniawati et al., (2025) argues, health behavior change requires more than awareness it requires internalization of knowledge and practice.

The current study's results echo the findings of Taryzafitri et al., (2025), who found that after watching a short educational video on anemia, students' willingness to take Fe tablets regularly increased significantly. Similarly, Rianti et al., (2025) concluded that audio-visual education on anemia prevention led to a 65% increase in weekly adherence rates among adolescent girls. These results suggest that visual content helps reduce psychological barriers, such as fear of side effects or underestimation of health risks, by making the invisible consequences of anemia more visible and relatable.

In addition, the results can also be interpreted through the Health Belief Model (HBM), which proposes that individuals will engage in health-promoting behaviors if they perceive themselves to be at risk (perceived susceptibility), believe the condition is serious (perceived

severity), see benefits in the recommended behavior (perceived benefits), and can overcome any perceived barriers. The audio-visual material used in this study likely addressed all these dimensions. For example, it showed the consequences of anemia (increased perceived severity), featured real adolescents as role models (enhanced perceived susceptibility), and offered simple solutions (e.g., drinking Fe tablets with vitamin C-rich juice) to reduce barriers.

Furthermore, the social and emotional relevance of the content plays a crucial role in adolescent engagement. According to Jamaan et al., (2022), video-based health education that includes peer experiences, storytelling, and localized content (e.g., language, cultural cues) improves trust and relatability, thereby increasing compliance. Adolescents are more likely to emulate behaviors when they see people like themselves practicing them. Thus, incorporating culturally sensitive, age-appropriate, and emotionally compelling content into health education can significantly amplify its effectiveness.

However, it is important to consider that while this study showed significant improvements, sustaining behavior change requires repeated exposure and reinforcement. One-time interventions, although impactful, may not be sufficient for long-term adherence (Dewi Septiana et al., 2025). Therefore, it is recommended that schools and community health centers integrate audio-visual media into ongoing health promotion programs, ideally supported by teachers, parents, and peer educators (Septiana et al., 2025).

There are also practical implications for public health policy. The Ministry of Health could consider investing in the development of standardized, evidence-based video content that can be distributed across schools nationwide. For rural or underserved areas where internet access may be limited, educational videos can be distributed via offline media such as USB drives, CDs, or shown using projectors during school health sessions. This approach ensures that even marginalized populations benefit from modern, effective health communication strategies (Masruroh et al., 2024).

Finally, while this study provides strong evidence for the effectiveness of audio-visual media, it is important to recognize its limitations. The sample size was relatively small ($n=52$), and the intervention period was limited to four weeks. Future research should explore the long-term impact of such interventions and consider combining audio-visual education with other strategies such as gamification, peer mentoring, or mobile health applications. Mixed-methods research could also explore adolescents' subjective experiences with the media, providing richer insight into what elements they find most engaging or persuasive.

In conclusion, the significant increase in Fe tablet consumption compliance observed in this study after the audio-visual intervention reinforces the idea that modern, multimedia-based education is a powerful tool for promoting adolescent health. As iron deficiency anemia remains a pressing public health issue, particularly among adolescent girls, leveraging innovative communication methods is essential to drive sustained behavior change and improve health outcomes.

4. CONCLUSION

This study demonstrated that audio-visual education significantly improves adherence to iron tablet (Fe) consumption among adolescent girls. Prior to the intervention, the majority of participants were non-compliant, but after being exposed to educational video content, compliance increased markedly from 23.1% to 84.6%. Statistical analysis confirmed this improvement was highly significant ($p < 0.001$). These findings indicate that audio-visual media is an effective tool for health education, capable of engaging adolescents cognitively, emotionally, and behaviorally.

The success of this intervention highlights the importance of delivering health messages in formats that are visually appealing, relatable, and emotionally engaging. Audio-visual education can enhance understanding, reduce misconceptions, and build motivation to adopt healthy behaviors such as regular iron tablet consumption. Therefore, integrating such media into school health programs and community health campaigns can be a strategic and impactful approach to combat iron deficiency anemia among adolescents in Indonesia and similar settings.

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