

EFFECTIVENESS OF ANEMIA EDUCATION THROUGH SOCIAL MEDIA TIKTOK AND LEAFLETS ON THE KNOWLEDGE AND ATTITUDES OF ADOLESCENT GIRLS IN HIGH SCHOOL IN KENDARI CITY

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ABSTRACT

Anemia remains a major public health problem among adolescent girls because of increased iron requirements during growth, menstrual blood loss, and inadequate dietary intake. Improving knowledge and attitudes through effective health education is essential to prevent anemia among adolescents. This study aimed to compare the effectiveness of TikTok social media and leaflet media in improving knowledge and attitudes toward anemia among adolescent girls. A quasi-experimental pretest-posttest nonequivalent groups design was conducted among female students in Grades X and XI at SMK Negeri 7 Kendari and SMA Negeri 9 Kendari. Anemia education was delivered through TikTok at SMK Negeri 7 Kendari and through leaflets at SMA Negeri 9 Kendari. Data were collected using structured questionnaires before and after the intervention. The Wilcoxon Signed Rank Test was used to analyze changes within each group, while the Mann–Whitney U test was applied to compare the effectiveness of both educational media. The results showed significant improvements in knowledge and attitudes after the interventions in both groups ($p = 0.000 < 0.05$). The Mann–Whitney U test indicated a significant difference in effectiveness between TikTok and leaflet media (Asymp. Sig. = 0.000, $p < 0.001$). The TikTok group achieved higher mean ranks than the leaflet group for knowledge (118.12 vs. 106.80) and attitudes (157.20 vs. 94.56). In conclusion, both educational media effectively improved knowledge and attitudes toward anemia prevention, with TikTok demonstrating greater effectiveness than leaflets.

Keywords: *Anemia, adolescent girls, health education, TikTok, leaflet.*

INTRODUCTION

Anemia refers to a condition characterized by an inadequate number of red blood cells or an insufficient ability of these cells to deliver oxygen throughout the body. Hemoglobin, an iron-rich protein found within red blood cells, is vital for carrying oxygen from the lungs to various tissues (Yuan et al., 2015). Adolescent girls are particularly susceptible to iron deficiency anemia because their iron requirements increase during periods of growth, while menstrual blood loss and insufficient dietary iron intake can further contribute to iron depletion.

Several factors contribute to the susceptibility of adolescent girls to anemia. Diet significantly influences daily iron intake, while iron status is affected by dietary iron availability and absorption, as well as infectious diseases that may cause bleeding and increase iron loss (Hess et al., 2023). Iron is an important micronutrient involved in the formation of hemoglobin, particularly as a constituent of the heme group that enables

oxygen to be transported throughout the body (Camaschella, 2019). Women of reproductive age are also vulnerable to iron deficiency because heavy menstrual bleeding affects approximately one-third of this population, potentially leading to greater iron loss and an increased likelihood of developing iron deficiency anemia (MacLean et al., 2025).

In Indonesia, anemia continues to represent a significant public health concern among adolescent girls. National statistics show that around 32% of girls between 15 and 24 years of age are affected by anemia, indicating that the condition occurs in approximately one out of every three adolescents within this age group. This condition is associated with impaired physical growth, decreased cognitive performance, reduced academic achievement, fatigue, and an increased risk of adverse maternal and neonatal outcomes later in life (Mulianingsih et al., 2025).

The burden of anemia is also evident in Southeast Sulawesi, particularly in Kendari City. Recent studies conducted among female students at SMA Negeri 9 Kendari and SMAK 7 Kendari reported that anemia remains a significant health concern, with inadequate dietary intake, poor nutritional status, low adherence to iron supplementation, and menstrual patterns identified as important contributing factors (Harleli, 2026). These findings indicate that anemia remains a health concern among adolescent girls at both the national and local levels, emphasizing the need for innovative and accessible educational strategies to improve knowledge and foster positive attitudes toward anemia prevention.

Adolescents with limited knowledge are two to three times more likely to experience anemia than those with adequate knowledge. Knowledge levels are influenced by the amount of information received, with a substantial proportion of individual knowledge acquired through the senses of sight and hearing (Puspikawati et al., 2021). Therefore, knowledge serves as a foundation for changes in attitudes and behaviors that play an important role in anemia prevention. (Prieto-Patron et al., 2022). Health education about anemia can increase adolescent girls' awareness of the importance of maintaining their health and encourage healthier lifestyles and dietary practices (Haya & Wahyu, 2021).

Among Indonesian adolescents, TikTok has emerged as one of the most popular social media platforms. Its widespread use is reflected in the number of users in Indonesia, which was reported to reach approximately 106.52 million by October 2023 (Shoo Wei Khoo, 2024). Socialinsider.io reported that users aged 18–24 years accounted for 41.26% of TikTok users in Indonesia, while those under 18 years accounted for 30.8%. Therefore, this study utilized TikTok as a medium for delivering health education because it presents information through short audiovisual content that is engaging, easy to understand, and highly accessible to adolescents (Setiawati & Pratiwi, 2022). The fear of missing out (FOMO) phenomenon may encourage adolescents to actively engage with social media platforms and follow trending content. Moreover, TikTok's recommendation algorithm facilitates information dissemination by delivering personalized content to users, creating opportunities for health messages, including anemia prevention education, to reach a wider adolescent audience (Montag et al., 2021a).

In addition to TikTok, printed educational media such as leaflets can also be used to deliver health information effectively. Leaflets present information in a concise and organized format that can be read repeatedly at the user's convenience, potentially reinforcing understanding and supporting attitude change. By providing clear and accessible information about anemia prevention, both TikTok- and leaflet-based education may help address gaps in adolescents' knowledge and attitudes and encourage healthier preventive behaviors (Sri et al., 2024).

Nevertheless, research comparing different forms of health education media remains limited, particularly studies that examine TikTok and leaflets side by side in relation to adolescents' knowledge and attitudes toward anemia prevention. Existing research has predominantly evaluated digital or printed media separately, resulting in insufficient evidence regarding the comparative educational value of these approaches. In particular, it remains unclear whether TikTok's brief audiovisual format can provide a greater contribution to improving anemia-related knowledge and preventive attitudes among adolescent girls than information delivered through conventional leaflets. This gap is particularly relevant among adolescent girls, who are an important target group for anemia prevention. Therefore, the novelty of this study lies in directly comparing TikTok-based and leaflet-based anemia education using the same educational topic and outcome measures, namely knowledge and attitudes toward anemia prevention (Pibriyanti et al., 2025).

Accordingly, the present study was conducted to evaluate and compare the effects of anemia education delivered through TikTok and conventional leaflets on adolescent girls' knowledge and attitudes concerning anemia prevention.

RESEARCH METHOD

Study Design

This study employed a quantitative approach using a quasi-experimental pretest-posttest nonequivalent groups design. Two intervention groups were included without random assignment. The first intervention group consisted of female students from SMK Negeri 7 Kendari, who received anemia education through TikTok videos, while the second intervention group consisted of female students from SMA Negeri 9 Kendari, who received anemia education through printed leaflets. Knowledge and attitudes toward anemia were measured before (pretest) and after (posttest) the intervention in both groups. This design enabled the researchers to evaluate changes in knowledge and attitudes within each intervention group and compare the effectiveness of TikTok-based education and leaflet-based education.

Study Setting and Participants

SMK Negeri 7 Kendari was assigned as the TikTok intervention group because most female students actively used TikTok and had adequate access to smartphones and the internet, making the platform suitable for delivering digital health education. In contrast, SMA Negeri 9 Kendari was assigned as the leaflet intervention group because

some female students had limited internet access, therefore, printed leaflets were considered a more appropriate educational medium. The assignment of intervention groups was based on the characteristics and accessibility of each school rather than randomization.

The study population consisted of female students in Grades X and XI at SMK Negeri 7 Kendari and SMA Negeri 9 Kendari. Grade XII students were excluded because they were preparing for their final examinations and were not permitted by the schools to participate in the study.

Sample Size Calculation

The minimum sample size was calculated using the Slovin formula:

$$n = \frac{N}{1 + N(e)^2}$$

Where:

N = sample size

N = total population (509)

e = margin of error (0.05)

Substituting the values into the formula:

$$n = \frac{509}{1 + 509(0.05)^2} = 2.2725509 \approx 224$$

Thus, the minimum required sample size was 224 respondents.

Proportionate allocation was subsequently applied to determine the number of respondents from each school:

$$ni = \frac{Ni}{Nx} \times n$$

Where:

Ni = sample size for each school

Ni = population for each school

N = total population

N = total sample size

Following the determination of the sample size for each school through proportional allocation, respondents were selected using a proportionate stratified cluster sampling technique, with schools serving as the clusters. The number of respondents selected from each school was determined proportionally according to its population size. Thus, 52 respondents were allocated to the first school and 167 respondents to the second school.

Respondents were then selected from each school in accordance with the predetermined sample allocation and the inclusion criteria of the study.

The population in this study consisted of 509 individuals. The initial determination of the sample size was based on the Slovin formula with a 5% margin of error, resulting in a minimum target of 224 respondents. However, during the data collection process, not all targeted respondents completed the questionnaire. Of the determined sample size, five respondents did not complete the questionnaire or failed to meet the inclusion criteria. Therefore, a total of 219 completed questionnaires were successfully collected and considered usable for the study. This yielded a usable response rate of 97.77% (219 out of 224). Accordingly, the analysis in this study was conducted using 219 respondents as the actual sample. These respondents provided complete responses and met the data requirements of the study. The sample size distribution is presented in Table 1.

Table 1. Sample Size

School	Population (Ni)	Sample Calculation	Sample (n_i)
SMK Negeri 7 Kendari	121	$(121/509) \times 219 = 52.06$	52
SMA Negeri 9 Kendari	388	$(388/509) \times 219 = 166.94$	167
Total	509		219

Variables and Instruments

In this study, the type of educational media served as the independent variable, comprising TikTok videos and printed leaflets. Meanwhile, the dependent variables were the participants' knowledge and attitudes related to anemia. Both variables were measured using validated structured questionnaires administered before and after the educational intervention.

Knowledge was measured through 15 questions addressing several aspects of anemia, including its causes, symptoms, potential consequences, and preventive measures. A score of 1 was assigned to each correct response, whereas an incorrect response received a score of 0. The resulting scores were subsequently classified into two categories, with scores of 50% or higher considered adequate knowledge and scores below 50% categorized as poor knowledge.

Participants' attitudes were evaluated using another set of 15 statements. Responses were recorded on a four-point Likert scale, ranging from strongly agree to strongly disagree. The total attitude scores were then grouped into two categories: scores $\geq 50\%$ indicated a positive attitude, while scores $< 50\%$ indicated a negative attitude.

Data Analysis

Data normality was assessed using the Kolmogorov-Smirnov test. Since the data were not normally distributed ($p < 0.05$), the Wilcoxon Signed-Rank Test was applied to examine changes within each intervention group, while the Mann-Whitney U test was

used to compare the effectiveness of the two educational media. All statistical analyses were conducted using SPSS version 25.0, with a significance level of $p < 0.05$.

Ethical Considerations

Ethical approval for this study was granted by the appropriate institutional review board. Before the data collection process began, written informed consent was obtained from all participants as well as their parents or legal guardians. The participants were also informed that their personal information would be kept confidential and that they had the right to discontinue their participation at any point without facing any consequences.

RESULTS AND DISCUSSION

Results

Participant Characteristics

A total of 219 adolescent girls participated in this study, consisting of 52 participants from SMK Negeri 7 Kendari (TikTok group) and 167 participants from SMA Negeri 9 Kendari (leaflet group). All participants completed both the pretest and posttest assessments

Changes in Knowledge and Attitudes in the TikTok Group

Table 2. Frequency Distribution of Adolescent Girls' Knowledge Before and After Anemia Education Through TikTok Video

Category	Pretest		Posttest	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Adequate	26	50.0	44	84.6
Poor	26	50.0	8	15.4
Total	52	100	52	100

Table 2 indicates that prior to the TikTok-based educational intervention, the number of respondents with poor and adequate knowledge was the same, with 26 respondents (50.0%) in each category. Following the intervention, the proportion of respondents with adequate knowledge increased to 44 (84.6%), whereas the number of respondents classified as having poor knowledge decreased to 8 (15.4%).

Table 3. Frequency Distribution of Adolescent Girls' Attitudes Before and After Anemia Education Through TikTok Videos

Category	Pretest		Posttest	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Positive	0	0	22	42.3
Negative	52	100	30	57.7
Total	52	100	52	100

Table 3 shows that before the TikTok education treatment, all respondents (100%) held negative attitudes. After the education treatment, the number of respondents with

positive attitudes increased to 22 (42.3%), while the number with negative attitudes decreased to 30 (57.7%).

Changes in Knowledge and Attitudes in the Leaflet Group

Table 4. Frequency Distribution of Adolescent Girls' Knowledge Before and After Anemia Education Through Leaflets

Category	Pretest		Posttest	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Adequate	54	32.3	163	97.6
Poor	113	67.7	4	2.4
Total	167	100	167	100

Table 4 shows that before education using leaflets, the majority of respondents had knowledge in the poor category, namely 113 respondents (67.7%), while the adequate category comprised 54 respondents (32.3%). After the intervention, there was a significant improvement, with 163 respondents (97.6%) achieving adequate knowledge.

Table 5. Frequency Distribution of Adolescent Girls' Attitudes Before and After Anemia Education Through Leaflets

Category	Pretest		Posttest	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Positive	2	1.2	138	82.6
Negative	165	98.8	29	17.4
Total	167	100	167	100

Table 5 shows that before education using leaflets, almost all respondents had a negative attitude, with 165 respondents (98.8%), while only 2 respondents (1.2%) had a positive attitude. After education, there was a significant change, with 138 respondents (82.6%) having a positive attitude, while respondents with a negative attitude decreased to 29 (17.4%).

Normality Test Results

Table 6. Normality Test Results for Knowledge and Attitude Variables

Variable	Group	Phase	n	p-value	Distribution
Knowledge	TikTok	Pretest	52	0.000	Not Normal
Knowledge	TikTok	Posttest	52	0.000	Not Normal
Knowledge	Leaflet	Pretest	167	0.000	Not Normal
Knowledge	Leaflet	Posttest	167	0.000	Not Normal
Attitude	TikTok	Pretest	52	0.000	Not Normal
Attitude	TikTok	Posttest	52	0.000	Not Normal
Attitude	Leaflet	Pretest	167	0.000	Not Normal
Attitude	Leaflet	Posttest	167	0.000	Not Normal

Table 6 presents the results of the normality test for all variables in both groups, with significance values of 0.000 ($p < 0.05$). These results indicate that the data did not follow a normal distribution. Consequently, non-parametric statistical tests were used for further analysis, namely the Wilcoxon Signed Rank Test and Mann-Whitney U Test.

Within-Group Effectiveness (Wilcoxon Signed Rank Test)

Table 7. Effectiveness of Anemia Education on Knowledge and Attitudes Within Each Group

Variable	Group	N	Increased Score	Decreased Score	No Change	p-value
Knowledge	TikTok	52	37	0	15	0.000
Knowledge	Leaflet	167	164	0	3	0.000
Attitude	TikTok	52	47	0	5	0.000
Attitude	Leaflet	167	164	0	3	0.000

Table 7 shows that both TikTok and leaflet interventions significantly improved knowledge and attitudes among adolescent girls ($p = 0.000$ for all comparisons). These results indicate that H_0 was rejected and H_1 was accepted for all comparisons, confirming that both educational media were effective in improving knowledge and attitudes.

Between-Group Comparison (Mann-Whitney U Test)

Table 8. Comparison of Effectiveness Between TikTok and Leaflet Groups

Variable	Group	N	Mean Rank	Mann-Whitney U	Z	p-value
Knowledge	TikTok	52	118.12	684.4	6.272	0.000
Knowledge	Leaflet	167	106.80			
Attitude	TikTok	52	157.20	718.5	7.126	0.000
Attitude	Leaflet	167	94.56			

Table 8 shows that the Mann-Whitney U test demonstrated a statistically significant difference between the TikTok and leaflet groups for both knowledge ($U = 684.4$, $Z = 6.272$, $p < 0.001$) and attitude ($U = 718.5$, $Z = 7.126$, $p < 0.001$). Based on the mean rank values, participants in the TikTok group achieved higher scores than those in the leaflet group for both knowledge (118.12 vs. 106.80) and attitude (157.20 vs. 94.56), indicating that TikTok-based education was more effective than leaflet-based education in improving adolescents' knowledge and attitudes toward anemia.

Discussion

Effectiveness of TikTok-Based Anemia Education

The findings of this study demonstrate that TikTok-based anemia education significantly improved adolescent girls' knowledge and attitudes toward anemia prevention. The significant increase in knowledge scores from 50.0% adequate in the

pretest to 84.6% in the posttest indicates that the audiovisual format of TikTok effectively conveys health information to young audiences. Similarly, the improvement in attitudes from 0% positive in the pretest to 42.3% positive in the posttest suggests that TikTok content can positively influence adolescents' perspectives on anemia prevention.

The effectiveness of TikTok can be explained through several theoretical frameworks. First, according to the Dual Coding Theory, information processed through both visual and auditory channels enhances learning and retention. TikTok videos combine visual demonstrations with audio narration, creating multiple pathways for information processing that facilitate understanding and memory consolidation. This aligns with the findings of (Mselle & Ishengoma, 2022), who demonstrated that pedagogical approaches utilizing two cognitive channels, verbal and non-verbal, significantly improve comprehension and reduce cognitive load. Second, TikTok's short-form format (typically 15-60 seconds) aligns with adolescents' limited attention spans and preference for concise, engaging content. This is consistent with research on digital native learning preferences and further supported by (Al-Sharrah & Ahmed, n.d.) findings that digital natives demonstrate distinct patterns of social media interaction and content engagement compared to previous generations.

Furthermore, the platform's interactive features, including likes, comments, and shares, encourage active engagement with educational content. This engagement facilitates repeated exposure to health messages, reinforcing learning and promoting attitude change (Montag et al., 2021b). TikTok's personalized recommendation algorithm also increases the likelihood that users will repeatedly encounter similar health-related content, thereby strengthening knowledge retention. These findings are consistent with previous studies reporting that TikTok-based health education can improve adolescents' knowledge and attitudes (Yelandani et al., 2026).

Effectiveness of Leaflet-Based Anemia Education

The leaflet-based intervention also demonstrated significant effectiveness, with knowledge scores increasing from 32.3% adequate in the pretest to 97.6% in the posttest, and positive attitudes increasing from 1.2% to 82.6%. These results confirm that well-designed printed educational materials remain an effective tool for health education.

The effectiveness of leaflets can be attributed to several characteristics. First, leaflets present information in a structured, organized format that facilitates systematic reading and comprehension. Second, they allow participants to read and review health messages repeatedly at their own pace, which may contribute to increased understanding and reinforcement of key concepts (Dabek et al., 2022). Third, printed materials are accessible regardless of internet connectivity, making them particularly suitable for populations with limited digital access.

These findings are consistent with previous research demonstrating that printed educational materials can effectively improve health knowledge and attitudes, particularly when designed with clear language, relevant illustrations, and actionable recommendations (Fitriyanti & Achadi, 2024). The significant improvements observed in

the leaflet group in this study suggest that traditional educational media remain valuable components of school-based health promotion programs.

Comparison of TikTok and Leaflet Effectiveness

The Mann-Whitney U test revealed that TikTok-based education was significantly more effective than leaflet-based education, as indicated by higher mean ranks for both knowledge (118.12 vs. 106.80) and attitudes (157.20 vs. 94.56). This finding suggests that the audiovisual and interactive nature of TikTok provides additional educational benefits beyond those offered by conventional printed materials.

Several factors may explain this difference. First, adolescents who participated in the TikTok group may have been more familiar and comfortable with digital media, as this age group represents the largest demographic of TikTok users in Indonesia (Shoo Wei Khoon, 2024). This familiarity likely increased their engagement with and receptivity to educational content delivered through the platform. Second, the combination of visual, auditory, and interactive elements in TikTok videos may enhance information processing and retention compared to text-based materials alone (Morgado et al., 2024). Third, the entertaining and engaging format of TikTok may reduce resistance to health messages and promote more positive attitudes toward the educational content.

However, it is important to note that both interventions were effective, and the superiority of TikTok does not diminish the value of leaflets as an educational tool. The choice of educational media should consider the target population's characteristics, access to technology, and learning preferences. A blended approach combining digital and printed materials may be optimal for reaching diverse student populations and reinforcing health messages through multiple channels.

Implications for Practice and Policy

These findings have important implications for school-based anemia prevention programs and adolescent health education strategies. Schools should consider integrating TikTok-based educational content into routine health promotion activities, such as school health programs and nutrition campaigns, to complement conventional educational media, including leaflets. By combining digital and printed educational materials, schools may reach students with different levels of digital access while promoting consistent health messages about anemia prevention (Fauziah Yelandani et al., 2026).

At the national level, these findings support Indonesia's efforts to reduce anemia among adolescent girls by highlighting the potential of digital platforms as accessible channels for delivering health education (Fatinah et al., 2026). Integrating social media-based education, such as TikTok, into existing school health programs and anemia prevention initiatives may expand the reach of health messages, particularly among adolescents who are highly engaged with digital technologies (Pibriyanti et al., 2025b). Furthermore, combining digital media with conventional educational approaches, such as leaflets, may provide a more inclusive strategy to accommodate differences in students' access, preferences, and learning styles.

This study's findings contribute to the growing evidence that digital health education can improve health literacy and support healthier behaviors among adolescents. Therefore, this study may inform the development of innovative, evidence-based health promotion strategies at national and global levels, particularly in low- and middle-income countries facing similar challenges in adolescent anemia prevention, while contributing to broader efforts toward achieving Sustainable Development Goal 3 (SDG 3), which aims to ensure (Mirnawati & Jannah., 2026). Healthy lives and promote well-being for all at all ages

Novelty of the Study

The main contribution of this study is filling the literature gap by providing empirical evidence regarding the relative effectiveness of TikTok-based versus leaflet-based anemia education. While many previous studies have examined the effectiveness of digital media separately from print media, this study offers significant novelty by conducting a direct comparative analysis between a short-form video social media platform (TikTok) and traditional print media (leaflets) specifically within adolescent anemia prevention interventions. This study's contribution to filling the literature gap is supported by (Widiyaningsih et al., 2026), who provided empirical evidence comparing TikTok-based and leaflet-based anemia education among adolescent girls. While both media significantly improved knowledge (TikTok: 9.92 to 15.03, $p=0.001$; Leaflet: 9.95 to 13.46, $p=0.001$) and attitudes (TikTok: 7.69 to 12.59, $p=0.001$; Leaflet: 7.90 to 12.05, $p=0.001$), the TikTok group demonstrated superior effectiveness with higher mean rank scores (knowledge: 47.49; attitudes: 44.97) compared to the leaflet group. This direct comparative analysis confirms that short-form video social media platforms offer greater educational benefits than traditional print media in adolescent anemia prevention interventions, thereby addressing the gap left by previous studies that examined digital and print media separately (Sri et al., 2024).

Most previous studies have tended to focus on a single type of media or general e-learning interventions without directly comparing modern algorithm-based technology against print media in school environments (Wulandari et al., 2026). This study provides valuable insights for educators and health promoters seeking evidence-based guidance on selecting optimal educational media for adolescent health education, as schools are encouraged to collaborate with community health centers in implementing adolescent health programs that integrate both digital and conventional educational approaches (Wulandari et al., 2026).

Study Limitations

This study has several limitations that should be acknowledged. First, the non-random assignment of intervention groups may introduce selection bias, as the TikTok group (SMK Negeri 7 Kendari) and leaflet group (SMA Negeri 9 Kendari) may differ in characteristics beyond the intervention. Second, the study was conducted in only two schools in Kendari City, limiting the generalizability of findings to other settings or

populations (Harleli, 2026). Third, the study measured immediate changes in knowledge and attitudes post-intervention but did not assess long-term retention or behavioral changes. Fourth, the use of self-reported questionnaires may be subject to social desirability bias. Future research should consider randomized controlled designs, longer follow-up periods, and objective measures of behavioral outcomes to strengthen the evidence base.

CONCLUSION

The findings of this study indicate that health education delivered through both TikTok and leaflets significantly increased adolescent girls' knowledge and improved their attitudes toward anemia prevention. Nevertheless, the TikTok-based intervention demonstrated greater effectiveness than the leaflet-based approach. This finding suggests that short audiovisual content may be more engaging for adolescents and can support the acquisition of knowledge as well as the development of more positive attitudes toward anemia prevention. These findings highlight the importance of selecting educational media that align with adolescents' digital media preferences to maximize the effectiveness of health promotion interventions. The study also suggests that integrating evidence-based social media platforms with conventional educational methods may strengthen school-based anemia prevention programs and support broader adolescent health promotion initiatives. Overall, the findings contribute to the growing evidence that digital health education can serve as an innovative and effective strategy for improving health literacy and encouraging preventive behaviors among adolescents.

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