



Original Article

Effectiveness of Video-Based Education in Improving Adolescent Girls' Knowledge of Anemia

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ABSTRACT

Background: Anemia is a common health problem among adolescent girls and has an impact on concentration, academic performance, and quality of life. Limited knowledge about the causes, symptoms, and prevention of anemia highlights the importance of health education. This study aims to determine the effect of health education using video media on improving adolescent girls' knowledge about anemia.

Methods: This pre-experimental study with a one-group pretest-posttest design involved 64 eleventh-grade students of SMA Negeri 16 Samarinda selected through random sampling. The intervention consisted of a 5-minute educational video shown three times in one week. Knowledge data were collected using a 20-item multiple-choice questionnaire and analyzed with the Wilcoxon Signed Rank Test, as the Shapiro-Wilk test indicated that the data were not normally distributed.

Results: The average knowledge score increased from 41.6 ± 8.6 to 86.6 ± 5.9 , with $p = 0.000$ ($p < 0.05$), indicating a significant effect.

Conclusion: Educational videos are effective in improving adolescent girls' knowledge about anemia and serve as a practical tool for strengthening school-based health promotion efforts.



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INTRODUCTION

Adolescence is a crucial stage of human development in which individuals transition from childhood to adulthood. This phase is characterized by complex changes encompassing physical, psychological, emotional, and social aspects (Hardianti et al., 2023). During this period, adolescents experience accelerated growth and development that require adequate nutritional support (Arifah et al., 2022). Adolescent girls have higher iron needs due to monthly menstruation, making them more vulnerable to anemia, which can affect health and overall quality of life (E. Sari et al., 2024).

Anemia remains a major global public health problem, affecting 29.9% of women of reproductive age worldwide. The burden is even higher in Southeast Asia, with a prevalence of 41.9%. In Indonesia, anemia affects 22.3% of women, indicating a substantial national challenge that requires strengthened prevention efforts (World Health Organization, 2021).

At the regional level, East Kalimantan Province reported an anemia prevalence of 43.2% among adolescents, indicating a substantial risk among adolescent girls. Samarinda City recorded 1,087 cases in 2023, with the highest concentration in Samarinda Utara District. These data underscore the need for targeted interventions. In this context, assessing the use of video-based health education specifically in SMA Negeri 16 Samarinda provides clear novelty and local relevance to the study ([Dinas Kesehatan Kota Samarinda, 2023](#)).

The causes of anemia in adolescent girls are multifactorial ([World Health Organization, 2016](#)). In addition to blood loss during menstruation, low dietary iron intake, unbalanced eating patterns, and limited knowledge about anemia prevention are the main contributing factors ([Astuti, 2023](#); [Utami et al., 2024](#)). The impact of anemia is not limited to physical health problems such as chronic fatigue, weakness, and decreased immunity, but also affects cognitive ability, learning concentration, academic achievement, and productivity. Furthermore, among adolescents who become pregnant at a young age, anemia increases the risk of obstetric complications such as intrapartum hemorrhage, preterm birth, and low birth weight ([Kusnadi, 2021](#)).

Efforts to prevent anemia need to be carried out systematically and continuously, with health education serving as a key strategy to improve adolescents' knowledge and awareness ([Arifah et al., 2022](#)). The effectiveness of education is strongly influenced by the medium used. In the digital era, video offers an effective platform because it provides visual and auditory information that enhances engagement and retention ([Salsabilla et al., 2024](#)). This is supported by dual coding theory, which states that combining images and words improves memory, and by constructivist theory, which highlights the importance of meaningful learning experiences ([Hartati & Siregar, 2024](#); [Turnip & Arisman, 2022](#)).

Several studies have proven that video-based health education significantly improves adolescents' knowledge about anemia ([Farhan et al., 2024](#); [Maulina et al., 2023](#); [E. Sari et al., 2024](#)). Nevertheless, research focusing on the effectiveness of video media in increasing adolescent girls' knowledge about anemia at the local level, particularly in SMA Negeri 16 Samarinda, remains very limited.

Based on this, the present study was designed to analyze the effect of education using video media on improving adolescent girls' knowledge about anemia at SMA Negeri 16 Samarinda. The findings of this study are expected to contribute to the development of more creative and innovative health education programs tailored to the characteristics of young people, thereby helping reduce the incidence of anemia among adolescent girls.

METHODS

This study used a pre-experimental one-group pretest–posttest design to assess the effect of video-based education on adolescent girls' knowledge about anemia. Conducted at State Senior High School 16 Samarinda in January 2025, the study involved 64 randomly selected eleventh-grade female students who met the inclusion criteria. The 20-item questionnaire had valid item–total correlations and showed good reliability (Cronbach's $\alpha = 0.857$). The intervention consisted of three five-minute educational videos on anemia, developed from national guidelines and validated by experts. Pretest and posttest data were analyzed using the Wilcoxon Signed Rank Test due to non-normal distribution. Ethical approval was granted by the institutional Health Research Ethics Committee (No. DP.04.03/FXXXIV.25/324/2025).

RESULTS

The results of the study are presented in the following table:

Table 1. Distribution of Respondent Characteristic Based on Age and Menarche

Characteristics	f	%
Age		
15 years	5	7.8
16 years	13	20.3
17 years	46	71.9
Menarche Age		
10 years	15	23.4
11 years	24	37.5
12 years	14	21.9
13 years	11	17.2
Total	64	100

The respondent profile shows that most participants were late adolescents, and a notable proportion had early menarche, both of which are factors associated with higher iron requirements and increased anemia risk.

Table 2. Comparison of Participants' Knowledge Scores Before and After the Video-Based Educational Intervention

Variable	N	Mean $\pm$ Std. deviasi
Knowledge		
<i>Pretest</i>	64	41.6 $\pm$ 8.6
<i>Posttest</i>	64	86.6 $\pm$ 5.9

Table 2. presents the descriptive statistics of participants' knowledge scores before and after the video-based educational intervention. The mean knowledge score increased from 41.6 $\pm$ 8.6 at pretest to 86.6 $\pm$ 5.9 at posttest, indicating a substantial improvement in adolescents' knowledge of anemia following the intervention. To determine the appropriate statistical test, the normality of the data distribution was subsequently assessed using the Kolmogorov–Smirnov test.

Table 3. Kolmogorov-Smirnov Normality Test Results fo Pretest and Posttest Knowledge Scores

Variable	Statistic	df	Statistic
Knowledge			
<i>Pretest</i>	0.137	64	0.004
<i>Posttest</i>	0.183	64	0.000

Based on the results of the Kolmogorov-Smirnov test above, it was found that the significance value for the pretest data was 0.004 and for the posttest data was 0.000. Since both significance values were less than 0.05 ($p < 0.05$), it can be concluded that the data were not normally distributed. Therefore, further analysis was carried out using the non-parametric test, namely the Wilcoxon Signed Ranks Test

Table 4. Wilcoxon Signed Ranks Test Results for Differences in Pretest and Posttest Knowledge Scores

Variable	Mean	Standar Deviasi	P-Value
Knowledge			
PreTest	41.6	8.6	0.000
PostTest	86.6	5.9	

Based on Table 4. the results of the Wilcoxon test showed a p-value of 0.000 ($p < 0.05$), indicating a significant difference between knowledge scores before and after the intervention. This demonstrates that education using video media is effective in improving adolescent girls' knowledge about anemia.

DISCUSSION

The findings of this study showed that most respondents were late adolescents, a developmental stage characterized by increased nutritional needs due to rapid physical growth and regular menstrual blood loss. This aligns with previous research indicating that adolescents often have insufficient knowledge and dietary practices related to anemia prevention (Astuti, 2023; Kusnadi, 2021). Previous studies have also emphasized the importance of strengthening anemia prevention efforts among adolescent girls through health education and improved awareness (Arifah et al., 2022; Utami et al., 2024). Although many studies have examined anemia risk in different socioeconomic and geographical contexts, the present study reinforces the shared pattern that both physiological demands and limited awareness contribute substantially to anemia vulnerability among adolescent girls.

From a cognitive perspective, adolescents aged 15–17 years possess the capacity for abstract thinking, as described in Piaget's formal operational stage. This developmental readiness supports the effectiveness of video-based education, which requires learners to process integrated visual and auditory information. Mayer's Multimedia Learning Theory helps explain the significant increase in knowledge observed in this study: video media engage dual channels of learning, facilitating better comprehension and memory retention. This interpretation is supported by previous research demonstrating that video and animated video can effectively improve adolescents' understanding of anemia prevention (Fadhilah et al., 2022; Salsabilla et al., 2024; T. M. Sari et al., 2022). The findings also reflect the Stimulus–Organism–Response (S–O–R) framework, in which the video stimulus influences internal cognitive processing and leads to improved understanding. Evidence from educational research further suggests that video-based learning can facilitate conceptual understanding by presenting information through integrated visual and verbal components (Lusiana, D. A. M & Musthofa, S. B., 2025). Instead of viewing these theories separately, the present study demonstrates how they collectively support video as an effective learning modality for adolescents.

The improvement in post-intervention knowledge in this study is consistent with prior research showing that video-based education enhances adolescents' understanding of anemia. However, the findings of the current study add contextual relevance, as they demonstrate the applicability of video media in a local school setting with characteristics similar to many Indonesian secondary schools. This suggests that video content can be a practical and scalable strategy for adolescent health promotion (Fitri et al., 2025).

Despite its strengths, this study has several limitations. The one-group pretest–posttest design limits causal inference because there was no control group for comparison. The short duration of the intervention may also restrict the ability to observe long-term retention of knowledge. In addition, the use of a self-administered questionnaire introduces potential response bias, and the study's focus on one school limits generalizability to broader populations.

These findings have important implications for school-based health promotion and local policy. The demonstrated effectiveness of video media supports its integration into routine health education activities in schools, particularly for topics like anemia that require clear and engaging communication. Previous studies have similarly demonstrated the potential of video and animated media as educational tools for anemia prevention among adolescent girls ([Maesaroh et al., 2024](#); [Salsabila, 2023](#); [T. M. Sari et al., 2022](#)). Local health authorities and school administrators could incorporate video-based modules into adolescent health programs to strengthen awareness and prevention efforts. Furthermore, collaboration between schools and health facilities could facilitate wider implementation of audiovisual educational tools. Video-based education may also be integrated with broader anemia-prevention strategies, including nutritional education and promotion of appropriate iron intake, because improvement in knowledge alone does not necessarily guarantee changes in preventive behavior or physiological outcomes ([Hardianti et al., 2023](#); [Septiana et al., 2025](#); [Utami et al., 2024](#)). Future research should employ stronger experimental designs, larger samples, and longer follow-up periods to validate and expand upon the current findings, particularly by examining whether improvements in knowledge are sustained and translated into changes in anemia-prevention behaviors and, where appropriate, hemoglobin status.

CONCLUSION

In this small quasi-experimental study, mothers who consumed the combined moringa leaf and chayote preparation showed a more favorable distribution of expressed breast milk volume change and infant weight gain than the control group. The findings indicate an association within the study sample, not definitive evidence of causality or clinical effectiveness. Because of the small convenience sample, non-random allocation, incomplete documentation of interventions and measurements, uncontrolled confounding, and limited statistical reporting, the preparation should not yet be recommended as a stand-alone lactation treatment. Adequately powered randomized studies with a standardized protocol, objective outcome measurement, complete retention of participant-level data, and full effect estimates are required before routine implementation.

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Conflict of Interest: The authors declare that they have no conflicts of interest related to this study.

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REFERENCES

- Arifah, N., Anjalina, I., Febriana, A. I., Khairunnisa, E., Amir, N. P., Aprilisa, W., Muzhaffar, Z., & Manyullei, S. (2022). Penyuluhan Kesehatan tentang Anemia Pada Siswa di SMPN2 Galesong Selatan Kabupaten Takalar. *Jurnal Altifani Penelitian dan Pengabdian kepada Masyarakat*, 2(2), 176–182. <https://doi.org/10.25008/altifani.v2i2.222>
- Astuti, E. R. (2023). Literature Review: Faktor-Faktor Penyebab Anemia pada Remaja Putri. *Jambura Journal of Health Sciences and Research*, 5(2), 550–561. <https://doi.org/10.35971/jjhsr.v5i2.17341>
- Dinas Kesehatan Kota Samarinda. (2023). *Profil Kesehatan Kota Samarinda*. Dinas Kesehatan Kota Samarinda
- Fadhilah, T. M., Qinthara, F. Z., Pramudiya, F., Nurrohmah, F. S., Nurlaelani, H. P., Maylina, N., & Alfiraizy, N. (2022). Pengaruh Media Video Edukasi terhadap Peningkatan Pengetahuan Anemia pada Remaja Putri. *JPPM (Jurnal Pengabdian dan Pemberdayaan Masyarakat)*, 5(1), 159–165. <https://doi.org/10.30595/jppm.v5i1.9823>
- Farhan, K., Maulida, N. R., & Lestari, W. A. (2024). Pengaruh Edukasi Anemia melalui Media Video terhadap Pengetahuan, Sikap, serta Keberagaman Konsumsi Makanan Remaja Putri di SMP Negeri 86 Jakarta. *Journal of Nutrition College*, 13(2), 127–138. <https://doi.org/10.14710/jnc.v13i2.41172>
- Fitri, A. A., Rahfiludin, M. Z., & Agushybana, F. (2025). Digital Media Interventions for Anemia Prevention Among Adolescent Girls: A Scoping Review. *Media Publikasi Promosi Kesehatan Indonesia (MPPKI)*, 8(12), 1602–1616. <https://doi.org/10.56338/mppki.v8i12.8449>
- Hardianti, H., Corniawati, I., & Sinaga, E. G. (2023). Pengaruh Fe dan Kurma Terhadap Kadar Hemoglobin Remaja di SMAN 1 Tanjung Palas Tengah Tahun 2023. *SAINTEKES: Jurnal Sains, Teknologi dan Kesehatan*, 2(4), 562–573. <https://doi.org/10.55681/saintekes.v2i4.214>
- Hartati, S., & Siregar, S. A. (2024). Pemanfaatan Video Pembelajaran dalam Pembelajaran Kimia untuk Meningkatkan Pemahaman Konsep Kimia. *Journal of Chemistry Education and Integration*, 3(2), 111–119. <https://doi.org/10.24014/jcei.v3i2.32351>
- Kusnadi, F. N. (2021). Hubungan Tingkat Pengetahuan tentang Anemia dengan Kejadian Anemia pada Remaja Putri. *Jurnal Medika Utama*, 3(1), 1293–1298.
- Lusiana, D. A. M, N., S. A., & Musthofa, S. B. (2025). Effectiveness of educational media in preventing anemia among adolescent girl: A scoping review. *Media Penelitian dan Pengembangan Kesehatan*, 35(2). <https://doi.org/10.34011/jmp2k.v35i2.2834>
- Maesaroh, S., Sukini, T., & Chunaeni, S. (2024). The Influence of Health Education Using Video Media on The Level of Knowledge of Anemia Prevention in Adolescent Girls. *Midwifery and Nursing Research Journal*, 6(2).
- Maulina, W., Maryuni, S., & Sari, E. K. (2023). Pengaruh Pendidikan Kesehatan dengan Media Video terhadap Pengetahuan Remaja Putri tentang Pencegahan Anemia. *Jurnal Ilmu Kesehatan Indonesia (JIKSI)*, 4(1), 52–60.
- Salsabila, M. J. (2023). Pengaruh Edukasi Pencegahan Anemia terhadap Pengetahuan Remaja Putri Menggunakan Media Video Animasi. *Jurnal Kesehatan Siliwangi*, 3(3), 557–561. <https://doi.org/10.34011/jks.v3i3.1032>
- Salsabilla, F. H., Yanti, D. E., & Ekasari, F. (2024). Pendidikan Media Video Terhadap Pengetahuan Anemia Pada Remaja Putri. *Surya Medika: Jurnal Ilmiah Ilmu Keperawatan dan Ilmu Kesehatan Masyarakat*, 19(2), 91–95. <https://doi.org/10.32504/sm.v19i2.950>
- Sari, E., Sarumi, R., & Aifu, D. K. (2024). Pengaruh Edukasi Kesehatan Melalui Media Video terhadap Peningkatan Pengetahuan Remaja Putri tentang Anemia untuk Cegah Stunting. *Jurnal Riset Sains dan Kesehatan Indonesia*, 1(1), 24–29. <https://doi.org/10.69930/jrski.v1i1.11>

- Sari, T. M., Suprida, S., Amalia, R., & Yunola, S. (2022). Faktor-Faktor yang Berhubungan dengan Dismenore pada Remaja Putri di MAN 1 Ogan Komering Ulu Tahun 2021. *Jurnal Ilmu Kesehatan UMC*, 11(1), 42–50. <https://doi.org/10.32534/jik%2520umc.v11i1.3026>
- Septiana, K. S., Adnani, Q. E. S., Susiarno, H., Tarawan, V. M., Arya, I. F. D., & Anwar, R. (2025). The Influence of Anemia Education Media on Increasing Self-Awareness and Compliance in Consuming Iron Supplements in Adolescent Girls: A Systematic Review. *Int J Womens Health*, 23(17), 2277–2289. <https://doi.org/10.2147/ijwh.s532950>
- Turnip, M., & Arisman, Y. (2022). The Impact of the use of Video Through the Android Application as an Anemic Educational Media on Increasing Knowledge about Anemia On Adolescent Girls. *JURNAL KEBIDANAN KESTRA (JKK)*, 4(2), 52–57. <https://doi.org/10.35451/jkk.v4i2.973>
- Utami, K., Haryani, H., Albayani, M. I., & Supinganto, A. (2024). Pencegahan Anemia pada Remaja Putri. *Sasambo: Jurnal Abdimas (Journal of Community Service)*, 6(3), 408–416. <https://doi.org/10.36312/sasambo.v6i3.2003>
- World Health Organization. (2016). *Guideline: Daily iron supplementation in adult women and adolescent girls*. World Health Organization.
- World Health Organization. (2021). *World Health Statistics 2021: Monitoring health for the SDGs, sustainable development goals*. World Health Organization.