

# Implementing Audiovisual Media and Group Discussions as an Educational Strategy for Anemia Prevention Among Adolescents in the Work Area of Public Health Center X, Magetan

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## ABSTRACT

**Background.** Anemia among adolescents remains a significant public health issue in Indonesia. Data from the 2021 Indonesian Nutritional Status Survey (SSGI) indicates that the prevalence of anemia among adolescents aged 15-24 years is 26.5%, with a higher proportion in adolescent girls (32.0%) compared to adolescent boys (20.3%). This condition has serious implications for reduced productivity and learning capacity. Conventional education is considered less effective for the adolescent group, necessitating innovative approaches tailored to the characteristics of Generation Z.

**Purpose.** To implement and evaluate the effectiveness of combining audiovisual media and group discussions in improving adolescents' knowledge and attitudes toward anemia prevention in the work area of Public Health Center X, Magetan.

**Method.** The activity was conducted with 25 adolescents, consisting of 7 anemic and 18 non-anemic adolescents. The intervention involved showing infographic animation videos on anemia prevention followed by guided group discussions. Data were collected using knowledge questionnaires (pre-test and post-test) and observation sheets to assess changes in participants' attitudes. Data analysis utilized the paired t-test with a significance level of  $p < 0.05$ .

**Results.** There was a significant increase in knowledge, with the average post-test score ( $85.2 \pm 7.1$ ) being higher than the pre-test ( $58.5 \pm 10.4$ ) at  $p < 0.001$ . Approximately 88% of participants demonstrated positive attitudes and a commitment to implementing balanced nutritional eating patterns and consuming iron-folic acid (IFA) tablets regularly. Observation results showed active participant engagement in group discussions and enthusiasm in following the audiovisual materials.

**Conclusion.** The combination of audiovisual media and group discussions is proven effective in increasing knowledge and fostering positive attitudes toward anemia prevention among adolescents. This method can be adopted as an innovative health education model for adolescents and is recommended for implementation in various primary healthcare settings.

## KEYWORDS

Adolescent, Anemia, Audiovisual, Health education

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## INTRODUCTION

Anemia among adolescents remains a critical global health challenge, with approximately 42% of adolescents worldwide suffering from this condition, predominantly affecting females in Southeast Asia. In Indonesia, recent national data reveals alarming statistics, showing a prevalence rate of 26.5% among adolescents aged 15-24.

Adolescent girls are disproportionately affected at a rate of 32.0%, compared to 20.3% among adolescent boys.

The impact of adolescent anemia extends beyond immediate health concerns, affecting cognitive development, academic performance, and long-term economic productivity (Mshida dkk., 2018). Research indicates that anemic adolescents demonstrate significantly lower academic performance and reduced concentration levels compared to their non-anemic peers (Abozaid dkk., 2025). Furthermore, the intergenerational impact of anemia cannot be overlooked, as anemic adolescents face an increased risk of maternal mortality and infant morbidity in their future reproductive years.

Traditional health education approaches for anemia prevention have largely relied on conventional methods such as lectures and pamphlet distribution (Bozzato dkk., 2012). Although these methods have been widely implemented, recent studies question their effectiveness for the adolescent population. Conventional health education methods show a much lower knowledge retention rate among adolescents after several weeks compared to the higher retention achieved through interactive digital media.

The emergence of Generation Z as digital natives has fundamentally changed the dynamics of education. Adolescents today process information differently, showing higher engagement with visual and interactive content compared to traditional text-based materials (Abujilban dkk., 2019). This generational shift necessitates a corresponding evolution in health education methodologies, particularly for critical issues such as anemia prevention.

Despite growing awareness of anemia's impact on adolescent health, there is a significant research gap regarding the integration of modern educational technology with participatory learning approaches (Atalell dkk., 2022). Previous studies have examined audiovisual interventions or group discussions in isolation, but few have explored their synergistic potential. There is limited research on how a combined technological and interactive approach can enhance health literacy among adolescents in resource-limited settings.

This study addresses this gap by developing and evaluating an integrated educational model that combines audiovisual media with guided group discussions. The novelty of this approach lies in its dual focus: utilizing digital technology for knowledge acquisition while leveraging social learning dynamics for attitude formation and behavioral change (Kibret dkk., 2019). This combination is particularly relevant for Generation Z learners who thrive in digital and social learning environments.

This community service initiative is adapted from social learning theory, which emphasizes the importance of observational learning and social reinforcement in behavior change (Grajéda dkk., 2019). Within this framework, audiovisual media serves as a tool for observational learning, while group discussions provide the social context for reinforcement and normative influence. This theoretical foundation distinguishes this approach from previous interventions that often focused solely on knowledge transfer without addressing social and behavioral dimensions.

The study aims to implement and evaluate the effectiveness of an integrated educational intervention combining audiovisual media and group discussions for anemia prevention among adolescents in Magetan, East Java. The specific objectives include: (1) assessing the improvement in knowledge through pre- and post-intervention evaluations; (2) analyzing changes in attitudes through structured observations; and (3) evaluating the feasibility of the model for replication in similar settings.

The initial hypothesis of this community service project states that the combined use of audiovisual media and group discussions will yield significantly better results in knowledge

acquisition and attitude formation compared to conventional educational methods (Odhiambo dkk., 2012). This research not only addresses an urgent public health need but also contributes to the broader field of health education by providing an evidence-based model that can be adapted for various health topics and populations.

## RESEARCH METHODOLOGY

This study employed a pre-experimental research design with a one-group pretest-posttest approach. The population consisted of adolescents aged 15-18 years in the work area of Public Health Center X, Magetan. A sample of 25 adolescents was selected through a purposive sampling technique based on specific inclusion criteria: (1) willingness to participate through informed consent, (2) ability to attend the entire intervention process, and (3) distribution into two groups, namely adolescents with confirmed anemia (7 individuals) and those without anemia (18 individuals). The demographic characteristics of the participants showed a composition of 64% female and 36% male, with an average age of 16.2 years ( $SD = 1.3$ ).

The research instrument consisted of an anemia knowledge questionnaire that had been tested for validity and reliability. This questionnaire comprised 20 multiple-choice items measuring knowledge of the definition of anemia, symptoms, causes, impacts, and prevention methods. Construct validity tests showed an Aiken's V value greater than 0.78, while reliability was measured with a Cronbach's Alpha coefficient of 0.85. The intervention material was developed as a 15-minute infographic animation video covering several key areas: (1) basic understanding of anemia, (2) risk factors, (3) health impacts, and (4) prevention strategies through balanced nutrition and iron-folic acid (IFA) supplementation. The video was validated by three subject matter experts and two media experts, resulting in a content validity score of 88%.

The study was conducted during May 2024 through several stages: (1) preparation and coordination with the public health center in the first week, (2) screening and selection of participants in the second week, followed by (3) the pre-test, (4) intervention implementation, and (5) post-test evaluation, all occurring in the third week. The intervention was carried out in a single 180-minute session with the following time allocation: 30 minutes for the pre-test, 15 minutes for the video screening, 90 minutes for guided group discussions, 30 minutes for the post-test, and 15 minutes for closing. The group discussions were facilitated by two trained facilitators using a standardized discussion guide.





Figure 1. Educational Activities and Discussion Sessions

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 25.0. Descriptive analysis was employed to describe participant characteristics and score distributions. The normality of the data was assessed using the Shapiro-Wilk test. Inferential analysis utilized the paired t-test to compare differences between pre-test and post-test scores with a significance level of  $\alpha = 0.05$ . The effect size was calculated using Cohen's  $d$  to determine the magnitude of the intervention's impact. Qualitative data from observations were analyzed thematically to understand participation patterns and participant responses during the intervention.

Several steps were taken to ensure the validity and reliability of the study. Internal validity was maintained through strict control of the intervention process and the use of standardized instruments (Jaber, 2014). External validity was supported by providing complete descriptions of participant characteristics and the research context. Reliability was guaranteed through consistency in intervention procedures and measurement. To reduce bias, blinding was implemented during the questionnaire scoring process, and facilitators underwent training to minimize variations in the delivery of the intervention.

Statistical analysis focused on comparing knowledge scores before and after the intervention. In addition to the overall sample analysis, subgroup analyses based on anemia status were also performed. The independent t-test was used to compare the increase in knowledge between the anemic and non-anemic groups. Analysis of covariance (ANCOVA) was utilized to control for the influence of demographic variables on the intervention outcomes. All statistical analyses were conducted with a 95% confidence level.

The scope of this research was limited to evaluating the effectiveness of the intervention in improving knowledge and attitudes regarding anemia prevention (Negash dkk., 2023). Acknowledged methodological limitations include: (1) the absence of a control group to compare the intervention's effectiveness, (2) a limited follow-up period to measure long-term knowledge retention, (3) a relatively small sample size limited to a single geographical area, and (4) the potential for social desirability bias inherent in self-reported knowledge measurements (Briand dkk., 2016). Nevertheless, the methodology employed provided a sufficient framework to evaluate the effectiveness of this innovative health education intervention.

## RESULT AND DISCUSSION

The research results demonstrated a significant increase in knowledge regarding anemia prevention among all participants following the intervention. The average knowledge score rose from 58.5 (SD = 10.4) at the pre-test to 85.2 (SD = 7.1) at the post-test. Statistical analysis using the paired t-test confirmed a statistically significant difference ( $t(24) = 15.32$ ,  $p < 0.001$ ) with a large effect size (Cohen's  $d = 2.98$ ). When analyzed based on anemia status, the anemic group showed an increase from 52.3 to 86.1, while the non-anemic group improved from 60.4 to 84.9.

Table 1. Comparison of Pre-test and Post-test Results Based on Anemia Status

Participant Group	Pre-test Score (Mean $\pm$ SD)	Post-test Score (Mean $\pm$ SD)	Mean Difference	p-value
Anemic Group (n=7)	52.3 $\pm$ 9.8	86.1 $\pm$ 6.5	33.8	< 0.001
Non-Anemic Group (n=18)	60.4 $\pm$ 10.2	84.9 $\pm$ 7.4	24.5	< 0.001
<b>Total Participants (N=25)</b>	<b>58.5 <math>\pm</math> 10.4</b>	<b>85.2 <math>\pm</math> 7.1</b>	<b>26.7</b>	<b>&lt; 0.001</b>

These findings support the effectiveness of a combined educational approach in enhancing health literacy regarding anemia. The more significant increase in knowledge scores within the anemic group (33.8 points) compared to the non-anemic group (24.5 points) indicates that the developed intervention is more effective for high-risk populations. This aligns with previous research suggesting that individuals with specific health conditions show a better response to targeted health education.

Audiovisual media serves as a catalyst for knowledge transfer, while group discussions facilitate the internalization of information through social learning processes. Observation data shows that 88% of participants actively engaged in discussions and demonstrated an improved understanding of key anemia prevention concepts. These findings are consistent with the Health Belief Model, which emphasizes the importance of perceived susceptibility and benefits in health behavior change.

The results reinforce existing evidence regarding the effectiveness of digital media in health education for Generation Z. However, this study provides an additional contribution by demonstrating that combining digital media with social interaction produces a stronger synergistic effect than using a single method alone. The 45.6% increase in knowledge scores observed in this study is higher than similar research using only audiovisual media (30.2%) or group discussions (28.7%) separately.

While the increase in knowledge was significant, other influencing factors must be considered. The Hawthorne effect may have played a role, where participants performed better because they felt observed. Nonetheless, the substantial effect size achieved ( $d = 2.98$ ) indicates that the intervention's impact was strong enough to overcome such potential bias.

This study offers practical implications for the development of adolescent health programs at public health centers (Yussif dkk., 2025). The intervention model proved feasible and effective for replication in primary healthcare settings with limited resources (Rambiritch dkk., 2021). Theoretically, this research supports the integration of social learning theory and the health belief model in developing public health interventions.

Several limitations must be acknowledged (Albertyn dkk., 2006). First, the absence of a control group limits the ability to make strong causal inferences. Second, the short follow-up period did not allow for the assessment of long-term knowledge retention. Third, measurements based on self-reported knowledge may not fully reflect actual behavioral changes.

For future research, it is recommended to: (1) include a control group in the research design; (2) conduct long-term follow-ups to measure knowledge retention; (3) integrate biomarker assessments to measure the impact on anemia status; and (4) explore mediating and moderating factors that influence intervention effectiveness.

## CONCLUSION

Based on the research findings, it can be concluded that the combined educational model of audiovisual media and group discussions is effective in improving adolescents' knowledge and attitudes regarding anemia prevention in the work area of Public Health Center X, Magetan. These findings not only confirm the effectiveness of innovative educational approaches for Generation Z but also contribute significantly to the development of public health intervention strategies that are more adaptive to modern adolescent characteristics.

The success of this intervention lies in its ability to integrate the power of visual media in delivering health information with a participatory approach that facilitates knowledge internalization through group dynamics. For health workers and policymakers, this model offers a practical solution that can be implemented in primary healthcare settings with limited resources, while opening opportunities for adaptation to other adolescent health topics. This study strengthens empirical evidence on the importance of educational approaches that match the characteristics of the digital generation in efforts to improve public health literacy, particularly in the context of preventing health issues with long-term impacts like adolescent anemia.

## AUTHORS' CONTRIBUTION

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.

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