

## THE EFFECTIVENESS OF ANEMIA EDUCATION WITH AUDIOVISUAL MEDIA ON THE BEHAVIOR OF ADOLESCENT GIRLS CONSUMING IRON TABLETS

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### Abstract

*Anemia in adolescents is a significant problem that occurs throughout the world. According to WHO (2018), the number of anemia sufferers among adolescent girls in the world is around 40-88%. Developing countries are around 53.7%. In Indonesia, 2018 32%, meaning 3-4 out of 10 adolescents suffer from anemia. In West Java, it reached 41.5%. Suboptimal nutritional intake habits and lack of physical activity influence this. This research aimed to determine the effectiveness of audiovisual media for anemia education and the behavior of adolescent girls who consume iron tablets. Research Design Pre-experimental one-group pretest-posttest. Population of adolescent girls, total sample 80 people, purposive sampling technique, standardized normality test, paired sample T-test hypothesis test. Results: Before receiving counseling on anemia through audiovisual media, the behavior of adolescent girls consuming iron tablets mostly fell in the poor category, namely 47 people (58.8%); after counseling, the behavior of adolescent girls consuming iron tablets was mostly the excellent category, namely 62 people (77.5%), Conclusion: Audio visual media is effective for educating about anemia on the behavior of adolescent girls consuming iron tablets, where the Sig value. (2-Tailed) 0.000 (< 0.05). The increase in behavior changes before and after counseling with audiovisual media was 19.68.*

**Keyword:** Anemia, Audio Visual Media

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### 1. Introduction

According to the World Health Organization (WHO), in 2018, adolescents aged between 10 and 19 years encompassed individuals. Conversely, as the Ministry of Health articulated, adolescence signifies a transition phase during which children undergo physical and psychological advancements,

marking the evolution into adulthood. Physical transformations, such as the onset of reproductive functions like menstruation in young women, symbolize pivotal milestones during this developmental stage. Referring to the 2022 population census data, Indonesia hosts a population of 22,176,543 adolescents, with a significant number of

adolescent girls estimated at 19.830 million [1]. Recognizing the intrinsic value of healthy teenagers to the nation's prospects, the Minister of Health underscored that investing in the health and nutritional well-being of adolescents represents an essential preparatory step towards harnessing Indonesia's demographic dividend by 2030, promoting the emergence of a proficient, inventive, and competitive generation [2]. Essential measures for adolescent well-being include ensuring optimal nutrition intake, physical robustness, balanced dietary practices, and regular exercise routines. The Minister of Health underscored the imperative for Indonesia's human development agenda to encompass physical, cognitive, psychological, and social dimensions. The harmonious integration of these facets is essential in perpetuating sustainable health development initiatives and attaining an elevated public health standard [3].

One prominent health concern prioritized by the government is addressing anemia among adolescent girls. Anemia is characterized by inadequate levels of hemoglobin (Hb) in red blood cells, falling below the standard average of (Hb < 12 gr/dl). In pregnant women, anemia can lead to suboptimal fetal growth, pregnancy complications, and maternal and infant mortality risks [4]. Adolescent girls are notably more susceptible to anemia compared to boys, primarily due to factors such as menstrual blood loss, accelerated body growth necessitating increased nutrient intake, deficient consumption of iron and protein-rich foods in daily diets, and a tendency towards fast food consumption for weight control [5].

According to global statistics from the WHO, in 2018, indicated that approximately 40-88% of adolescent girls worldwide suffer from anemia, with developing countries exhibiting a 53.7% prevalence rate. In Indonesia, data from the 2018 Basic Health Research (Riskesdas)

reported an overall anemia incidence of 32% among adolescents, translating to roughly 3-4 out of 10 adolescents affected by this condition. Specifically, West Java recorded a prevalence rate of 41.5% for anemia [6]. Further insights from the 2018 Riskesdas in Indonesia revealed concerning dietary and lifestyle patterns among young women, indicating that 65% of teenagers skipped breakfast, 97% fell short of consuming adequate amounts of fruits and vegetables, and exhibited low levels of physical activity while indulging in high sugar, salt, and fat (GGL) intake [7,8].

Findings from the 2019 Indonesian Demographic Health Survey (SDKI) disclosed varying prevalence rates of anemia among Indonesian adolescent girls, with percentages at 21.7% (age group 5-14 years), 18.4% (age group 10-19 years), and 18.4% (age group 15-24 years) [8]. In Indonesia, in 2022, 32% of young women suffer from anemia, with an average age of 15-24 years, equating to 3-4 out of 10 teenagers. In West Java, the rate is 21.8%, and in Bekasi Regency, it is 12.4%.

During the 65th World Health Assembly in 2016, spearheaded by the World Health Organization (WHO), a global initiative concerning maternal, infant, and child nutrition was established to significantly reduce anemia prevalence among women of childbearing age by 2025. Following this mandate, the Indonesian Ministry of Health issued directive No. HK.03.03/V/0595/2016 to enhance anemia prevention and management for adolescent girls and women of childbearing age, primarily by providing iron supplements to adolescent girls. A specific target of administering iron supplements to 30% of the target population by 2025 was set, with the distribution primarily channeled through educational institutions' student health units for girls aged 12-18 years. The recommended preventive regimen involves

weekly intake of an iron supplement tablet for 52 weeks [9,10].

Awareness regarding the importance of iron supplementation among adolescents needs enhancement. Therefore, promoting knowledge and education about anemia is crucial to decreasing its prevalence in this age group. This effort will support teenagers' optimal development and growth, ensuring that nutritional deficiencies do not impede their well-being. According to Rozy Afrial Jafar, the director of Nutrition International, 41.93% of adolescent girls in West Java suffer from anemia. However, merely 25.2% of them utilize iron supplements, falling short of the 52% target set for West Java. Moreover, only 16.7% of the girls taking iron supplements do so consistently [11].

The government's program to decrease anemia among adolescents still needs to meet the 90% target. Presently, just 32% of adolescents are taking iron supplements. In order to encourage adolescent girls to take iron supplements, health workers should participate in educational efforts. Utilizing audiovisual media for counseling proves to be a practical approach. Through these media channels, it is anticipated that young women will gain a deeper insight into the significance of iron supplement consumption [12].

Audiovisual media utilizes hearing and sight senses for learning purposes. Two types exist: pure audiovisual and impure audiovisual. Counseling examples comprise television, video, film, VTR, VCD, and DVD. Its role is to engage, elucidate concepts, and simplify the retention of information [13].

In 2020, a noteworthy prevalence of anemia among female students at SMAN 1 Cikarang Utara was documented, with up to 7% of the cohort experiencing this health condition among the 580 individuals administered iron tablets. Subsequently, in 2023, 420 female students were provided with iron supplements, leading to a

concerning 8% incidence of anemia, as evidenced by the latest hemoglobin assessments conducted by medical professionals in March 2023. Upon closer examination and meticulous scrutiny, it was revealed that the monotony and challenges associated with the weekly intake of iron tablets by the female students contributed to the escalated rates of anemia occurrence [14].

Significantly, Damanik's 2019 research underscored a tangible shift in young women's knowledge levels after engaging with educational material presented in the form of visual media such as booklets. These booklets yielded a discernible enhancement in the knowledge retention of the adolescent demographic, indicative of the efficacy of visual media tools like booklets in delivering comprehensive education to individuals afflicted with anemia [15].

Moreover, Fitriani's investigation in 2019 delineated a marked surge in the knowledge acquisition of adolescents after their exposure to anemia education through motion video media. The use of video clips facilitated the conveyance of anemia-related information in a manner that transitioned from intricate to simplistic, aligning with the cognitive capacities of teenagers and resulting in a notable augmentation in their knowledge scores post-education [13].

Furthermore, Fuaidah's 2019 inquiry corroborated the trend of amplified knowledge scores among adolescents following anemia education disseminated through audiovisual media, specifically in videos [10,16]. This study aimed to ascertain the effectiveness of leveraging audiovisual media tools for anemia education on the behavioral patterns of adolescent girls in their utilization of iron supplements.

## 2. Method

This study employs a pre-experimental research design, specifically

utilizing a one-group pretest-posttest design. This involves administering pretests and posttests to a single group without a control or comparison group. The population under study consists of all female students at SMAN 1 CIKARANG Utara in 2023, totaling 420 individuals.

### 3. Results and Discussion

#### Univariate

Table 1. Characteristic of Respondents

Characteristic	f	%
Age		
15-16	34	42.5
17-18	46	57.5
Religion		
Islam	69	86.2
Christian	11	13.8
Total	80	100

The analysis of the frequency distribution of the age characteristics of the respondents delineated in Table 1 indicates a notable prevalence of adolescent girls aged 17-18 years, comprising 46 individuals (57.5%) within the sample. Furthermore, regarding religious affiliation, most respondents identify as Muslim, accounting for 66 individuals (86.2%).

Table 2. Adolescents Girls' Behavior in Consuming Iron Supplement Before Given Anemia Education using Audiovisual Media

Consuming Iron Supplement	f	%
Poor	47	58.8
Excellent	33	41.2
Total	80	100

In Table 2, the data suggests that prior to receiving anemia education via audio-visual media, the behavioral pattern among adolescent girls concerning iron supplement consumption predominantly falls into the poor category, encompassing 47 individuals (58.8%), as opposed to the

excellent category, which includes 33 individuals (41.2%).

Table 3. Adolescents Girls' Behavior in Consuming Iron Supplement After Given Anemia Education using Audiovisual Media

Consuming Iron Supplement	f	%
Poor	18	22.5
Excellent	62	77.5
Total	80	100

Based on Table 3, it is evident that following anemia education via audiovisual media, the consumption behavior of adolescent girls towards iron supplements mostly falls within the excellent category, with 62 individuals (77.5%), as opposed to the poor category, comprising 18 individuals (22.5%).

#### Bivariate

Table 4. Normality Test of Behavioral of Adolescents Girls in the Consumption Iron Supplements Before and After Anemia Education Using Audiovisual Media

	Mean	SD	min-max	95% CI	Skewness	Standard Error
				57.6	-	
Pretest	59.38	7.688	45-70	6-61.09	0.471	0.859
				70.4	-	
Posttest	72.06	7.365	50-85	2-73.70	0.507	0.823

The normality assessment, as displayed in Table 4 through the skewness test and standard error, ascertains the distribution characteristics of adolescent girls' behavior pre and post anemia education via audio-visual media. The comparative analysis yielded skewness values divided by standard errors of  $-0.471/0.859 = -0.548$  and  $-0.507/0.823 = -0.616$ , both falling within the threshold of  $\leq 2$ , affirming the normal distribution of the data before and after the

intervention. On this premise of normality, the subsequent application of paired samples t-test was deemed appropriate, as elucidated in Table 4, to evaluate the impact of audio-visual media in educating adolescent girls about anemia. Utilizing a confidence level of 95% and an error rate of 5% with the assistance of SPSS for Windows software, the efficacy of such educational interventions was investigated.

**Table 5.** Effectiveness of AudioVisual Media on Anemia Education for Adolescent Girls about Consuming Iron Supplements

	<i>Mean</i>	<i>SD</i>	Min - Max	<i>Paired Sample T-test</i>
<i>Prestest</i>	59.38	7.688	45- 70	t = - 10.660 Sig. 2- tailed= 0.000
<i>Posttest</i>	72.06	7.365	50- 85	
Scale of increase	19.68			

Table 5 above illustrates the behavior of 80 adolescent girls before and after receiving anemia education through audio-visual media. Before the intervention, the mean value was 59.38 with a standard deviation of 7.688, which later increased to 72.06 with a standard deviation of 7.365. The improvement in behavior post-education is noted at 12.68. The paired sample T-test revealed a t-value of -10.660 and p-value of 0.000 ( $p < 0.05$ ), indicating that the use of audio-visual media for anemia education significantly impacted the behavior of adolescent girls in consuming iron supplements. The increase in iron supplement consumption before and after the education was 19.68.

### Characteristic of Respondents

In this study, a predominant number of young women, particularly 69 out of 80 participants (86.2%), identified as Muslim students, holding the belief that the consumption of pharmacological drugs, such as iron supplements, should be avoided due to the perceived harm caused by the chemicals present in these medications. Conversely, a minority group comprising 11 participants (13.8%) expressed that iron supplements are permissible and beneficial for the body. This dichotomy points to varying perceptions among young women regarding pharmacological interventions, highlighting the intricate interplay between religious beliefs and health-related decision-making.

The Great Indonesian Dictionary (KBBI) defines *religion* as a system or set of beliefs in a higher power, encompassing associated duties and responsibilities. Among teenagers, religion assumes a pivotal role in providing guidance and solace in navigating the myriad challenges encountered during adolescence. It serves as a moral compass, aiding teenagers in confronting and resolving complex issues. Religious education stands as a cornerstone in fostering national ethics and moral values, playing a foundational role in shaping the moral fabric of society. It constitutes an indispensable facet of youth education, albeit a challenging domain for parents to navigate, particularly concerning minority groups and their unique cultural backgrounds. The confluence of these factors underscores the complexity inherent in instilling religious values among young women, pivotal for nurturing virtuous and resilient personalities.

A study by Yolana (2019) revealed that a significant proportion of adolescents, specifically 84 out of 100 participants (84.0%), tend to adhere to the teachings prescribed by their respective religions, reflecting a commitment to religious guidelines. Conversely, a subset of adolescents comprising 16 participants

(16.0%) displayed a divergence from religious teachings, opting not to follow the precepts outlined by their faith traditions. The calculated p-value of  $p = 0.001$  signifies a statistically significant relationship between religious beliefs and adolescents' decision-making processes in their daily lives. This underscores the profound influence of religion on shaping the behavioral patterns of individuals, particularly teenagers embarking on a quest for identity and belief systems. Consequently, the formidable impact of religious convictions in reshaping adolescent behavior underscores the reluctance among teenagers to engage in the consumption of medication, including iron supplements, as guided by their religious principles

The demographic analysis reveals that a significant proportion of young women in the study fall within the age bracket of 17-18 years, signifying a phase where individuals are undergoing a transition towards increased maturity. This developmental stage often facilitates a heightened capacity among young women to comprehend and assimilate information, thereby influencing their inclination towards adopting healthy lifestyle practices. The amalgamation of information dissemination through audiovisual media serves as a catalyst in enhancing their understanding of the advantages associated with the regular consumption of iron supplements for anemia prevention. Furthermore, the participants recognize the indispensability of adhering to a consistent regimen of tablet consumption to avert the onset of other health complications stemming from iron deficiency in the bloodstream.

Age, defined as the temporal duration since an individual's inception, serves as a quantifiable metric for gauging developmental milestones from a chronological standpoint. Within the context of this study, individuals within the specified age range exhibit comparable

anatomical and physiological advancements, aligning with normative developmental trajectories [9].

According to the World Health Organization (2022), adolescence spans from 10 to 19 years, bridging childhood and adulthood. Conversely, per the Ministry of Health regulation in Indonesia No. 25, adolescents are defined as individuals aged 10 to 18.

Fitriani (2018) asserts that age influences cognitive abilities and thinking patterns. With advancing age, comprehension and cognitive abilities enhance. This proposition supports Marni's (2018) work, stating that abstract thinking abilities characterize middle adolescence. During this developmental stage, females can progress in knowledge acquisition in tandem with psychological and media advancements, expanding cognitive abilities and knowledge acquisition [10]. Previous studies suggested that adolescents become more responsive to health-related matters as adolescents age, despite religious restrictions. They employ logical reasoning and access media channels to discern beneficial and detrimental aspects. Consequently, adolescents can transform negative behaviors into positive ones by engaging in informed decision-making.

### **Effectiveness of Anemia Education Using Audiovisual Media on the Behavior of Adolescents Girls Taking Irona Supplements**

The results indicate that prior to receiving anemia education through audiovisual aids, the majority of respondents were categorized as having poor habits in taking iron supplements, with 47 female students (58.8%) falling into this group. Their reluctance to consume these supplements stemmed from the taste and smell, reminiscent of iron. Additionally, there was a belief that Islamic principles discouraged the use of pharmaceuticals due to their chemical composition. However, following

counseling via audio-visual means, the behavior of the majority of young women improved, with 62 students (77.5%) displaying positive changes. The analysis test results yielded an Asymp. Sig. (2-tailed) value of 0.000, which is  $<0.05$ , indicating that counseling utilizing audio-visual media significantly influenced the behavior of young women in consuming iron supplements. The disparity in results pre- and post-counseling was deemed noteworthy.

According to Notoatmodjo (2019), health behavior reflects an individual's reactions to their health status, lifestyle, and surroundings. One significant influencer of behavior is the information individuals acquire through audio-visual media, which serves multiple functions such as educational, social, economic, and cultural roles. Such media can effectively enhance knowledge and modify attitudes toward leading a healthy life.

Previous study [16], indicated a noticeable increase in behavioral patterns pre-education through audiovisual media and post-counseling via the same media among students. Audiovisual tools can serve as effective messengers to attain educational objectives. Media carries persuasive messages capable of stimulating thoughts, emotions, and aspirations of the audience or students, fostering an improved learning process [14].

In 2019, Maulana emphasized the importance of providing health education to empower teenagers to take charge of their well-being, consequently shaping their attitudes and conduct. Health education endeavors to disseminate health-related information to individuals, groups, and society, thereby enhancing health literacy that influences targeted behaviors [13]. A study involving high school teenagers in Pontianak City revealed positive behavioral changes following a two-month educational intervention utilizing audiovisual media in the form of videos. The findings suggest that videos or

audiovisual aids effectively support the enhancement of teens' compliance with iron supplement intake to prevent anemia [9].

Research on ninth-grade students at a girls' school in Delhi demonstrated a significant improvement in behavioral scores after a six-month intervention utilizing health education videos discussing the importance of preventing anemia through regular consumption of iron supplements provided by the school [12]. This study concludes that video-based education effectively enhances adolescent behaviors related to anemia. Through audiovisual means, female students can more profoundly grasp educational messages, enabling better comprehension of the information conveyed in the videos. According to Notoatmodjo, individuals absorb 83% of information through visual channels and 11% through auditory means. The impactful role of audiovisual media in imparting health-related information is evident as young women, initially skeptical about iron supplements, changed their perspective to a positive one after learning more about the benefits of iron supplements through audiovisual content. This shift in mindset resulted in increased iron supplement consumption among adolescent girls post exposure to audiovisual educational materials.

#### 4. Conclusion

Based on the research and discussions on the effectiveness of audiovisual media for educating young women about anemia and their consumption of iron supplements at SMAN 1 Cikarang Utara in 2023 with a sample size of 80 respondents, the following conclusions can be drawn:

Regarding the respondents' characteristics, the majority are in the age group of 17-18 years old, accounting for 46 (57.5%) of the sample. In terms of religion, most respondents are Muslims, representing 69 (86.2%) of the total. The

use of audiovisual media has been shown to be effective in educating adolescents girls about anemia and promoting the consumption of iron supplements, with a significant Sig value of 0.000 (p-value < 0.05). Moreover, there was a notable increase in the consumption of iron supplements following anemia education through audiovisual media, which amounted to 19.68

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