The Effect of Education through TikTok Videos on Nutritional Knowledge of Anaemia and Iron Intake among Students at SMAN 44 Jakarta

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Abstract. The 2018 Riskesdas data indicates that the prevalence of anaemia in Indonesia remains high, with estimates of 26.8% among individuals aged 5-14 years and 32% among those aged 15-24 years. Anaemia can have detrimental consequences for adolescents, including impaired cognitive function, reduced concentration levels, and compromised physical and mental development. Additionally, it can adversely impact reproductive health. This study employs a quasi-experimental design, characterized by a one-group pretest post-test configuration. The objective of this study is to ascertain the impact of an intervention employing TikTok videos on the level of nutritional knowledge pertaining to anaemia and iron intake. This study was conducted from 9-19 June 2023 at SMAN 44 Jakarta. The participants of this study were female 10th and 11th grade students, aged 15-18 years old, who attended SMAN 44 Jakarta. The findings of this study demonstrated that there were substantial alterations in the anaemia nutrition knowledge scores ($p < 0.001$) and mean iron intake ($p = 0.013$) following the provision of educational content via TikTok videos. The utilization of TikTok videos as a medium for educational purposes has been shown to exert a significant influence on the enhancement of anaemia nutrition knowledge and the augmentation of mean iron intake, thereby exhibiting a marked discrepancy between the pre-intervention and post-intervention states.

Keywords: Anaemia, Adolescents, Knowledge, Intervention, Video, TikTok.

1 Introduction

Anaemia is a condition characterised by a decrease in the number of red blood cells or haemoglobin in the blood, resulting in levels that are below the normal parameters. This condition may arise due to decreased red blood cell production, alterations in red blood cell structure, or reduced haemoglobin levels (<12 g/dL). Haemoglobin is the protein responsible for transporting oxygen in the blood. In cases of inadequate red blood cell production, abnormal red blood cells, or insufficient haemoglobin, the blood's capacity

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to transport oxygen to the body's tissues is compromised. Anaemia predominantly affects children, adolescent girls, menstruating women, and pregnant and birthing women. According to the World Health Organization (WHO), approximately 40% of children aged 6-59 months, 37% of pregnant women, and 30% of women aged 15-49 years worldwide are anaemic. This constitutes a grave global health problem that merits heightened attention [1].

In 2018, Riskesdas data showed high anaemia rates in Indonesia. Anaemia prevalence was 26.8% in children aged 5-14, and 32% in those aged 15-24 [2]. In the province of DKI Jakarta, precisely in East Jakarta, the incidence of anaemia in adolescent girls is still very high. The high prevalence of anaemia among adolescents in East Jakarta may be attributable to a number of factors. One such factor is parental income, as increased income frequently results in alterations in lifestyle and diet. Adolescents from high-income households often transition from traditional diets to more convenient and ready-to-eat foods, which frequently possess inadequate nutritional value. This suboptimal diet can result in anaemia. Another factor is the lack of iron consumption, as iron is indispensable for haemoglobin production. Furthermore, irregular menstrual cycles in adolescent girls have been demonstrated to be a risk factor for anaemia, with a 2.537-fold increased likelihood of anaemia in those with irregular cycles compared to those with normal cycles, due to the prolonged nature of menstruation and the resultant increased blood loss and depletion of iron stores in the body, Approximately 48.6% in vocational high school girls and 61% in high school girls [3].

Anaemia in adolescent girls can have an impact on stunted physical growth because the reduction in the amount of haemoglobin in the body is the fundamental cause of this phenomenon, since it prevents organs and tissues from receiving a sufficient supply of oxygen, besides that anaemia can also affect the performance of these students because anaemia can weaken the ability of students to concentrate [4]. The high prevalence of anaemia can be attributed to a lack of awareness and knowledge of the condition. One potential solution to address this issue is to use educational audiovisual media, such as videos, to disseminate information about anaemia. This study explores the efficacy of TikTok, a social media platform prevalent among younger demographics, as a medium to deliver audio-visual nutrition education. The purpose of this study was to analyze the effect of TikTok videos on changes in the level of nutritional knowledge of anaemia and iron intake.

2 Methods

This study employed a quasi-experimental design using a one-group pre-test post-test approach [5] combined with a 24-hour food recall method [6]. Data collection involved administering a pre-test and a 24-hour food recall assessment before the intervention, followed by a post-test and a second 24-hour food recall assessment after the intervention to evaluate changes in nutritional knowledge of anemia and iron intake.

The research was conducted at SMAN 44 Jakarta from June 9 to June 19, 2023, and proceeded in three distinct phases. During the initial phase, participants completed a pre-test and were interviewed regarding their 24-hour food recall. Subsequently, they viewed a TikTok video designed as part of the intervention. In the second phase, participants were exposed to the TikTok video again without additional assessments. Finally, in the third phase, participants viewed the TikTok video once more, after which they completed a post-test and underwent a follow-up 24-hour food recall interview to assess any changes in their nutritional knowledge and dietary intake.

This research received ethical approval from the Health Research Ethics Commission of Syarif Hidayatullah State Islamic University Jakarta under approval number Un.01/F.10/KP.01.1/KE.SP/05.08.034/2023. The study population comprised 10th and 11th-grade students aged 15–18 years enrolled at SMAN 44 Jakarta. A random sampling method was employed, yielding a final sample size of 56 participants. The statistical analysis involved a paired sample t-test, conducted using Jamovi software, to compare pre-test and post-test results. The paired t-test was chosen as it aligns with the study's objective of examining differences in the mean values of two related variables within a single group. This test is particularly useful in detecting significant variations between paired or dependent samples. Additionally, the application and analysis of the 24-hour food recall data were conducted using NutriSurvey software to assess dietary intake and nutrient composition.

3 Result

Between June 9 and June 19, 2023, a total of 60 respondents met the inclusion criteria for this study. However, four respondents were absent, resulting in a final sample size of 56 participants for analysis. The average age of the respondents was approximately 17 years, and all participants were female.

Prior to the TikTok video intervention, the majority of participants had sufficient knowledge of anemia (48.2%), while iron intake was predominantly deficient (89.3%). The mean pre-test score for nutritional knowledge was 73.98, and the mean iron intake before the intervention was 4.83 mg (Table 1 & Figure 1).

Table 1. Nutrition knowledge of anaemia and iron intake before the TikTok video intervention

Variable	N	%
Pre-test Score		
Good	25	44,6
Fair	27	48,2
Less	4	7,1
Iron Intake Before Intervention		

Good	0	0
Fair	6	10,7
Less	50	89,3

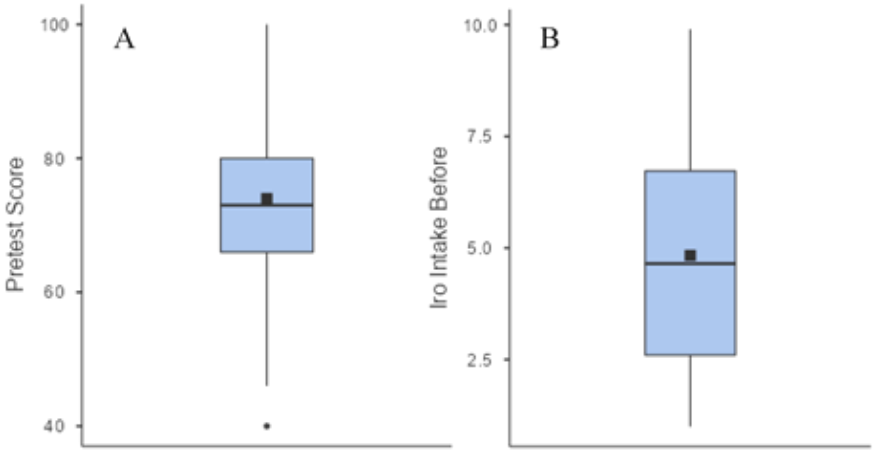

Fig. 1. Plot Pre-test Score and Plot Iron Intake Before Intervention

Following the intervention, there was a notable improvement in anemia-related knowledge and iron intake among the respondents. The majority (89.3%, n = 50) demonstrated good nutritional knowledge of anemia. Although iron intake remained predominantly in the deficient category, a slight improvement was observed. Specifically, 2 respondents (3.6%) achieved good iron intake, 5 respondents (8.9%) had sufficient intake, while the majority (49 respondents, 87.5%) continued to have deficient iron intake. The mean post-test score for nutritional knowledge increased to 93.32, while the mean iron intake after the intervention improved to 5.83 mg (Table 2 & Figure 2).

Table 2. Nutrition knowledge of anaemia and iron intake after TikTok video intervention

Variable	**N**	**%**
Post-test Score		
Good	50	89,3
Fair	6	10,7
Less	0	0
Iron Intake after Intervention		
Good	2	3,6
Fair	5	8,9
Less	49	87,5

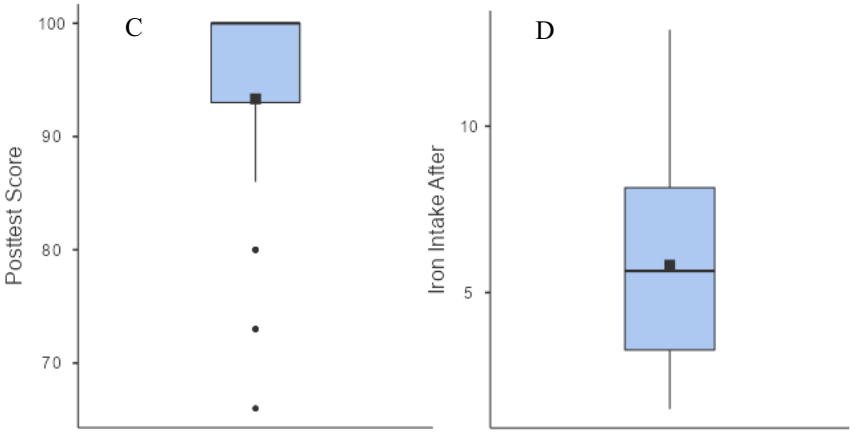

Fig. 2. Plot Post-test Score and Plot Iron Intake After Intervention

The findings indicate a significant improvement in nutritional knowledge of anemia and iron intake following the TikTok video intervention. A comparison of mean scores revealed an increase in nutritional knowledge, with the pre-test mean score of 73.98 rising to 93.32 in the post-test. Similarly, mean iron intake improved from 4.83 mg before the intervention to 5.83 mg afterward. Statistical analysis further confirmed these differences, with a p-value < 0.001 for nutritional knowledge and 0.013 for iron intake ($p < 0.05$), indicating a statistically significant improvement in both variables following the intervention (Table 3).

Table 3. Differences in nutrition knowledge of anaemia and iron intake before and after the TikTok video intervention

Variable	N	Mean	SD	Sig.
Nutrition Knowledge of Anaemia				
Pretest-Posttest Score	56	73,98 93,32	12,53 10,01	<0,001
Iron Intake				
Iron intake before intervention- Iron intake after intervention	56	4,83 mg 5,83 mg	2,51 3,03	0,013

A comparison of nutritional knowledge scores on anemia revealed a notable increase after the intervention. The degree of variation in knowledge scores was comparable between the pre-test and post-test, with no overlap between score intervals, indicating

a statistically significant difference between the two measures. In contrast, the comparison of iron intake showed overlapping intake intervals, suggesting similarity in intake levels before and after the intervention. However, despite this overlap, the mean iron intake following the intervention was higher than before, indicating a slight improvement (Figure 3).

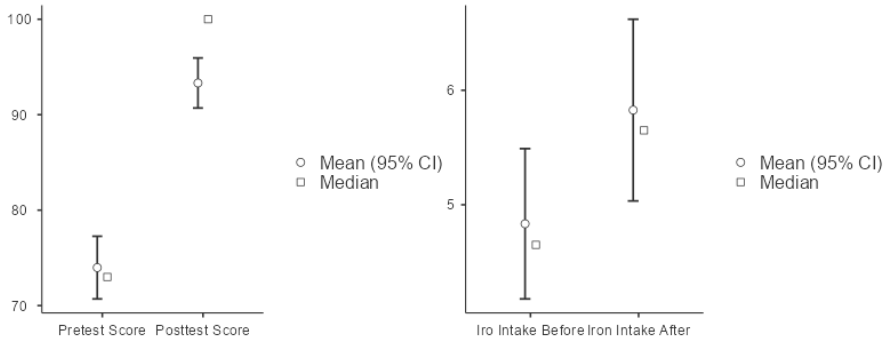

Fig. 3. Interval Plot Nutrition Knowledge About Anaemia And Iron Intake

4 Discussion

This study found a significant difference in nutritional knowledge of anemia and iron intake before and after the TikTok video intervention. Respondents who initially had poor or sufficient knowledge of anemia demonstrated improved nutritional knowledge, with the majority reaching the good category after the intervention. Although iron intake remained within the insufficient category, there was a measurable increase in the mean intake. Statistical analysis showed a p-value < 0.001 for nutritional knowledge, indicating a significant improvement after the intervention. Regarding iron intake, the mean difference before and after the intervention yielded a p-value of 0.013 ($p < 0.05$), confirming a statistically significant increase in iron intake following the intervention. These findings are consistent with previous research conducted among adolescents in Jakarta, Bantul, and Denpasar, where video-based educational interventions resulted in increased anemia-related nutritional knowledge and iron intake. Similarly, a study on adolescents in Turikale, Maros Regency, demonstrated that video interventions effectively influenced changes in fat and iron intake among adolescent girls [7–11].

Adolescent girls are a group that is particularly susceptible to anaemia due to their monthly menstruation, which results in significant blood loss. If left untreated, anaemia in adolescent girls can hinder their physical growth and lead to behavioral and emotional disorders [12]. One of the causes of the high prevalence of anaemia is the lack of knowledge about anaemia itself, One way to overcome this is to provide nutrition education about anaemia through the media [13, 14]. One of the educational media that can be used is audiovisual media such as videos, this can happen because audiovisual media

such as videos will involve many sensory organs in a person where the more sensory organs involved, the easier it is for someone to receive and process information [15]. According to Mahmud et al., the media must stimulate the senses and allow for information input. The more senses stimulated, the easier the input of information and the more senses involved or used in the reception and use of information. the more senses are involved or used in the reception and processing of information, the more likely the information content will be obtained and understood [16].

This research uses TikTok as an educational medium, which has a large user base ranging from teenagers to adults, in Indonesia, the user base of this app is mostly teenagers. According to audience reach figures from TikTok's self-service tools, the app has 106.9 million users in Indonesia by 2022, with an average age of 18 years and above [17, 18]. TikTok has the potential to be an effective tool for educational purposes because in addition to being widely popular TikTok is also easy to use which makes it easy for users to find the desired information, besides that TikTok has a friendly user interface [19, 20].

The applicability of this study remains limited, as it primarily focuses on changes in nutritional knowledge of anemia and iron intake, rather than direct health outcomes. Reducing the incidence of anemia in adolescents requires not only improved knowledge but also its practical application in daily dietary habits. Therefore, further research is necessary to assess the long-term effectiveness of such interventions in practice and to evaluate their actual impact on anemia prevalence and adolescent health outcomes.

5 Conclusions

Video-based interventions have been shown to effectively enhance nutritional knowledge of anemia and iron intake among adolescents. The majority of respondents demonstrated a notable improvement in their mean scores for anemia-related nutritional knowledge and iron intake following the intervention. This suggests that video media can serve as an effective educational tool for promoting nutritional awareness and dietary behavior changes in adolescents.

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