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Enhancing Adolescent Girls' Knowledge about Anemia through Instagram: A Pre-Experimental Study

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ABSTRACT

Introduction: The prevalence of anemia among adolescent girls in Indonesia reaches 32%, necessitating effective measures to improve their knowledge about anemia. The use of Instagram, a social media platform, can be one strategy to provide relevant and important information about anemia. **Purpose**: To determine the influence of using Instagram as a social media platform on the knowledge of adolescent girls about anemia. **Methods**: The research design was a pre-experimental design with a one-group pre-test and post-test. A sample of 63 respondents was selected using simple random sampling. The data were analyzed using Paired T-Test and ANOVA. The educational media used on Instagram consisted of short videos and posters. **Results**: The results of the study revealed that the mean knowledge score of the students before the intervention was 42.4 with a standard deviation of 12.5, while the mean knowledge score after the intervention was 60.1 with a standard deviation of 16.8. There was a significant increase in knowledge by 17.7 points, with a p-value of <0.001, indicating the influence of education through Instagram on the improvement of students' knowledge about anemia. **Conclusion**: The active use of Instagram as a social media platform plays a crucial role in enhancing the knowledge of adolescent girls about anemia. In the context of health education, Instagram proves to be an effective medium for delivering information to a broader target audience.

INTRODUCTION

Anemia is a health issue that can affect infants, adolescents, pregnant women, and the elderly (Budiarti, Anik, & Wirani, 2021). Adolescent girls are particularly vulnerable to anemia, as evidenced by the higher prevalence of iron-deficiency anemia among them compared to adolescent boys (Sulistyawati & Nurjanah, 2018). Adolescent girls are at risk of anemia due to menstruation, and many of them are concerned about their body shape, leading to improper diets and food restrictions (Munir, Sari, & Hidayat, 2022).

The global prevalence of anemia ranges from 40-88%. According to the World Health Organization (WHO), the incidence of anemia among adolescent girls in developing countries is approximately 53.7% of all adolescent girls. Anemia often affects adolescent girls due to factors such as stress, menstruation, and inadequate nutrition (Kaimudin, Lestari, & Afa, 2017). In Indonesia, the prevalence of anemia among adolescents reaches 32%, meaning that 3-4 out of 10 adolescents suffer from anemia, indicating a high incidence of this condition (Kementerian Kesehatan R.I.,

2021). According to data from the Health Department of Central Sulawesi Province, the prevalence of anemia among adolescents aged 10-14 years is 0.13%, and among those aged 16-18 years, it is 0.14%. In 2015, there was an increase in anemia among adolescents aged 10-14 years, with 431 cases out of 264,915 individuals (0.16%), and among those aged 16-18 years, there were 454 cases out of 263,416 individuals (0.17%) (Nasruddin, Faisal Syamsu, & Permatasari, 2021).

Anemia in adolescent girls can be caused by various factors, such as menstrual bleeding (Turner, Parsi, & Badireddy, 2023; Chai, Huang, Rakočević, & Chung, 2021), inadequate intake of iron-rich and protein-rich foods (Sari, Judistiani, Herawati, Dhamayanti, & Hilmanto, 2022), improper diets (Setyaningsih, Mansur, & Naimah, 2022), and non-compliance with iron supplement intake (Humayrah & Putri, 2023; Sirupa, Wantania, & Suparman, 2016). These factors can negatively impact cognitive function, leading to fatigue, decreased concentration, and academic underperformance. Adolescent girls with anemia are also at risk of giving birth to low birth weight babies and experiencing stunting in the future (Sari et al., 2022; Tura, Egata, Fage, & Roba, 2020; Utami, Margawati, Pramono, & Wulandari, 2021), as well as experiencing decreased energy levels, weakened immunity, reduced physical fitness, and productivity (Khobibah, Nurhidayati, Ruspita, & Astyandini, 2021; Widaningsih, 2023).

The problem of anemia in adolescent girls is often attributed to their lack of knowledge about anemia, including recognizing its signs, symptoms, causes, impacts, and preventive measures. This lack of knowledge ultimately affects their dietary patterns and leads to insufficient consumption of iron-rich foods (Soekardy, 2023; Subratha & Ariyanti, 2020). Many adolescents tend to overlook the issue of anemia and its prevention due to a lack of awareness and inadequate information dissemination, as well as insufficient attention from parents, communities, and the government regarding adolescent health and suboptimal healthcare services for adolescents (Hearttalini, 2020). Previous studies have shown that the increasing prevalence of anemia among adolescents, which is associated with poor food choices, is related to low knowledge about anemia (Hasyim, Mutalazimah, & Muwakhidah, 2018; Laksmita & Yenie, 2018; Romandani & Rahmawati, 2020).

One approach to address the issue of anemia is through education. Various educational methods have been employed, including leaflets (Hannanti, Ibnu Malkan Bakhrul Ilmi, & Muh. Nur Hasan Syah, 2021), brochures, magazines, books, booklets, posters, videos (Fadhilah et al., 2022; Subratha & Ariyanti, 2020), and social media platforms (Baroroh, 2023; Rusdi, Helmizar, & Rahmy, 2021). In the current digital era, social media has become an integral part of adolescents' lives. Instagram, in particular, is a widely used and popular social media platform among adolescents, offering the potential as an effective tool for delivering health information to adolescent audiences. Instagram provides easy, visual, and interactive access to engaging content for adolescent girls. Therefore, the use of Instagram as an educational medium can be an effective strategy to improve the knowledge of adolescent girls about anemia (Laor, 2022; Nomiaji, Marsofely, Sumiati, Andeka, & ..., 2020). However, despite its potential, research on the influence of using Instagram as a social media platform on the improvement of knowledge among adolescent girls about anemia is still limited in Indonesia. Therefore, this study aims to determine the influence of using Instagram as an educational medium on the knowledge of adolescent girls about anemia.

METHODS

The research design was a pre-experimental design with a one-group pretest and posttest design. The research was conducted from April to May 2023 at SMAN 3 Poso. The population of this study consisted of 171 female students in grade X at SMAN 3 Poso. The sample for this research comprised 63 respondents, selected using a simple random sampling technique. The sample was drawn from 8 classes by randomly selecting students using a Random Number Generator application.

The variables of this research are the usage of Instagram media and the knowledge of adolescent girls regarding anemia. The utilization of Instagram social media is measured by examining the level of interaction carried out by Instagram users towards the content posted by the researcher, such as the number of likes, shares, or comments (Laor, 2022). The criteria are as follows: Inactive if the number of likes on the content is less than 3. Active if the number of likes on the content is 3 or more. The knowledge of adolescent girls refers to their comprehension of anemia, including understanding its definition, causes, symptoms, impacts, prevention, and treatment. The criteria are as follows: Good if the answer score is 76-100%, Sufficient if the answer score is 56-75%, Lacking if the answer score is 55 or less.

The data collection process begins with conducting a pretest to measure the level of knowledge of the female students about anemia. Next, we provide educational counseling through Instagram media using 6 content items consisting of 2 short videos (reels) and 4 posters. Instagram link: https://www.instagram.com/reel/CsX8VoVRABzImq3w6T4njg9NIwYL7zX4JIbNO00/?igshid=MzRlODBiNWFlZA== The videos are less than 2 minutes in duration and contain information about what anemia is, how anemia can affect adolescent girls, and ways to prevent anemia, such as increasing the consumption of iron-rich foods, using iron supplements like iron tablets, and actively participating in adolescent health center activities. After one week, the female students are given a posttest to measure their knowledge after attending the counseling. Data analysis will utilize the paired sample t-test to determine the difference in mean knowledge scores before and after the Instagram education, while ANOVA test will be used to determine the difference in mean number of likes based on the post knowledge categories.

RESULT

Based on the conducted research, the following results were obtained:

Table 1: Frequency distribution based on respondent characteristics

Variable	Number (n=63)	Percentage (%)
Age (years)		
14-15	22	34.9
16-17	41	65.1
Instagram usage		
Active	35	55.6
Inactive	28	44.4
Knowledge before		
Good	0	0
Sufficient	10	15.9
Lacking	53	84.1
Knowledge after		
Good	9	14.3
Sufficient	29	46.0
Lacking	25	39.7

Table 1 shows that respondent aged 16-17 years accounted for 65.1%, the number of active Instagram users was 55.6%, the knowledge before receiving education was 84.1%, and the knowledge about anemia after receiving education was 46.0%.

Table 2 Frequency Distribution of Respondents' Answers Based on Questions about Anemia

No	Question	Pre		Post	
		n	%	n	%
1.	What is anemia	20	31.7	39	61.9
2	Cause				
	a. Intenstinal worms, TB	8	12.7	26	41.3
	b. Menstruation	39	61.9	47	74.6
	c. Inadequate consumption of iron-rich foods	48	76.2	57	90.5
	d. Bleeding	26	41.3	37	58.7
	e. Inadequate consumption of protein-rich foods	33	52.4	36	57.1
	f. Too much fatty foods	6	9.5	15	23.8
	g. No idea	2	3.2	0	0.0
3.	How to identify anemia				
	a. Blood test to determine hemoglobin levels	38	60.3	50	79.4
	b. Observing physical characteristics (pale skin and palms)	35	55.6	46	73.0
	c. Frequent dizziness	53	84.1	58	92.1
	d. Frequent eye flashes	36	57.1	51	81.0
	e. Checking for red spots on the skin	4	6.3	19	30.2
	f. Frequent nausea	6	9.5	23	36.5
4.	Sources of dietary iron				
	a. Meat	32	50.8	42	66.7
	b. Fish	33	52.4	45	71.4
	c. Liver	42	66.7	43	68.3
	d. Chicken	40	63.5	41	65.1
	e. Eggs	34	54.0	41	65.1
	f. Potatoes	14	22.2	32	50.8
	g. Peanuts	16	25.4	38	60.3
	h. Cassava leaves	6	9.5	22	34.9
	i. Spinanch	21	33.3	39	61.9
	j. Guava	3	4.8	13	20.6
	k. Tomato	9	14.3	19	30.2
	l. Orange	6	9.5	29	46.0
	m. Carrots	9	14.3	22	34.9
5.	Symptoms of anemia				
	a. Dizziness	54	85.7	54	85.7
	b. Eye flashes	37	58.7	38	60.3
	c. Pale eyelids and skin	32	50.8	35	55.6
	d. Weakness	33	52.4	42	66.7
	e. Fatigue	44	69.8	50	79.4
	f. Tiredness	24	38.1	38	60.3
	g. Letarghy	30	47.6	40	63.5
	h. Forgetfulness	7	11.1	16	25.4
	i. Weight loss	6	9.5	21	33.3
	j. Red spots on the skin	0	0.0	14	22.2
	k. Bitter taste in the mouth	4	6.3	23	36.5
6.	Impact of anemia on learning achievement	50	79.4	62	98.4
7.	Anemia can be prevented	62	98.4	63	100.0

No	Question	Pre		Post	
		n	%	n	%
8.	Methods to prevent anemia				
	a. Eating fruits and vegetables rich in vitamin C	42	67.7	41	65.1
	b. Maintaining personal hygiene and cleanliness to avoid intestinal worms	10	16.1	20	31.7
	c. Consuming chicken, liver, eggs	36	58.1	41	65.1
	d. Taking Iron Supplement Tablets	52	83.9	57	90.5
	e. Regular exercise	30	48.4	40	63.5
	f. Reducing consumption of fatty foods	11	17.7	20	31.7
9.	Anemia can be treated	57	90.5	61	96.8
10.	Methods to treat anemia				
	a. Treating intestinal worms, malaria, and tuberculosis	7	12.3	23	37.7
	b. Increasing consumption of iron-rich foods	48	84.2	59	96.7
	c. Supplementing with iron tablets	38	66.7	51	83.6
	d. Regular exercise	35	61.4	41	67.2
	e. Adequate rest	44	77.2	43	70.5
	f. Limiting consumption of fatty foods	14	24.6	28	45.9

Based on Table 2, there is a significant improvement in the knowledge and understanding of the respondents about anemia after the intervention or educational program. Prior to the intervention, only a small percentage of respondents understood the definition of anemia, its causes, symptoms, sources of iron, impact, prevention, and treatment. The percentage of respondents who understood anemia significantly increased after the intervention, for example, from 31.7% to 61.9% in understanding the definition of anemia. Furthermore, question 2e (inadequate consumption of protein-rich foods) had a low percentage value in the pretest (52.4%). This indicates that most students had limited knowledge about the relationship between protein consumption and anemia before receiving education. Additionally, in questions 4j (guava) and 5j (red spots on the skin), no students answered correctly in the pretest, indicating very low knowledge about these aspects before receiving the intervention.

However, after receiving counseling and undergoing the posttest, there was a significant improvement in knowledge and understanding about the causes of anemia, sources of iron, symptoms of anemia, impact on learning achievement, prevention, and treatment of anemia. In question 2c (inadequate consumption of iron-rich foods), question 3e (checking for red spots on the skin), and question 5j (red spots on the skin), there was a significant increase in the percentage of correct answers in the posttest. This indicates that the educational program has successfully provided better information and improved the respondents' understanding of anemia, with understanding percentages increasing up to 90.5% in several aspects related to anemia.

Table 3. Difference in the number of likes based on knowledge about anemia after receiving education through Instagram social media

Knowledge	Mean	SD	p-value
Good	5	1.1	
Sufficient	2.5	0.9	<0.001
Lacking	1.7	2.0	

Table 3 shows that the mean number of likes on Instagram posts for good knowledge is 5, for sufficient knowledge is 2.5, and for poor knowledge is 1.7 likes.

Based on the ANOVA test, the p-value is <0.001, indicating that there is an influence of the number of likes on the knowledge of adolescent girls about anemia.

Table 4. Mean Differences in Knowledge about Anemia before and after Education through Instagram Social Media

Knowledge	Mean	SD	Mean Difference	p-value
Before	42.4	12.5	17.7	<0.001
after	60.1	16.8		

Table 4 shows that the mean knowledge of students before the intervention is 42.4 with a standard deviation of 12.5, while the mean knowledge after the intervention is 60.1 with a standard deviation of 16.8. There is an increase in knowledge of 17.7 points. Based on the paired t-test, the p-value is <0.001, indicating that there is an influence of education through Instagram on the improvement of students' knowledge about anemia.

DISCUSSION

The results of this study indicate that the use of Instagram, a social media platform, has an influence on the improvement of knowledge among adolescent girls regarding anemia. A total of 56% of the respondents actively use Instagram, and the researchers have uploaded 6 educational posts, including 2 videos and 4 image posters. Based on the number of likes received, it can be concluded that respondents who are active on Instagram have better knowledge about anemia. On the other hand, respondents who are not active on Instagram tend to have lesser knowledge. These findings are consistent with previous studies that have shown the effectiveness of social media, including Instagram, as a platform for health education (Rahmatini, 2021; Utari, 2017).

The knowledge of the respondents also improved after the intervention. Previously, the percentage of respondents with good knowledge was only 0%, but after the intervention, it increased to 14%. Conversely, the percentage of respondents with inadequate knowledge decreased from 84% to 40%. Knowledge of anemia among adolescent girls can be obtained from various sources of information, with media (electronic, print, internet) being one of the most commonly used sources (Firdaus & Hidayati, 2019; Nomiaji et al., 2020)

The results of this study also highlight the importance of iron intake in the prevention and treatment of anemia. The respondents have good knowledge about food sources that contain iron, such as meat, fish, liver, and eggs. They also recognize the importance of maintaining nutritional balance and consuming iron supplements as a way to prevent and treat anemia (Julaecha, 2020). In terms of the impact of anemia, respondents who experienced anemia described symptoms such as easy fatigue, decreased concentration in learning, dizziness, and fatigue (Sulistyawati & Nurjanah, 2018).

These findings are in line with previous research that emphasizes the importance of iron intake and the impact of anemia on health (Safitri, 2022; Subratha & Ariyanti, 2020). By using Instagram as an educational tool, information about anemia can be more easily accessed and can bring about changes in the attitudes, feelings, and behaviors of the respondents. According to a study by Hernianti et al., (2023), the use of Instagram as an educational media has been proven effective in improving knowledge, attitudes, and dietary patterns in the prevention of anemia among adolescent girls in Makassar, Indonesia. This study compared the influence of using

WhatsApp and Instagram as instructional media, and the results showed that education through Instagram had a better impact on improving knowledge, attitudes, and dietary patterns in the prevention of anemia among adolescent girls.

Based on these results, it can be concluded that active use of Instagram, a social media platform, plays a crucial role in improving the knowledge of adolescent girls about anemia. In the context of health education, Instagram is one of the effective media for delivering information to a wider target audience. Therefore, the development of visually appealing and easily understandable health education materials suitable for posting on Instagram is highly recommended.

CONCLUSION AND RECOMMENDATIONS

The use of Instagram, a social media platform, can enhance the knowledge of adolescent girls about anemia. In this study, Instagram media can be considered as an alternative source of information about anemia in schools. There is a need for the development of engaging and easily understandable health education materials in a visual format suitable for posting on Instagram. These materials should be developed while considering the target audience, using easily comprehensible language, and utilizing attractive formats such as images, infographics, or short videos.

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