(RESEARCH ARTICLE)

The use of anemia comics as the learning medium in Senior High School Students from Gresik, East Java, Indonesia

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Abstract

Media has a impactful role for the spread of wellness, which was essential to attract public awareness. Media can facilitate health communication which targetted many stakeholders including governments and public citizen. Anemia is an individual contion which the number of haemoglobin concentration is lower than normal value. This study was carried out in Menganti Senior High School, East Java, Indonesia. Anemia comics were distributed to female student in this school. A total of 75 students were participated in this study. Every student were given pretest and posttest to assess their knowledge about anemia, including the clinical manifestation of anemia, diagnosis of anemia, prevention of anemia, and also long impact of anemia. Anemia comics can be used as a learning medium for the prevention of anemia which targeted adolescent girls. This study shows the difference significant result between pretest and posstest of targeted group after get the intervention.

Keywords: Anemia; Blood loss; Adolescent girl; Hematology; Hemoglobin

1. Introduction

Media has a impactful role for the spread of wellness, which was essential to attract public awareness. Media can facilitate health communication which targetted many stakeholders including governments and public citizen. A unique media has a significant role to increase the public's eye on the consideration of health promotion substantive. Media can influence the behavior and also increasing the response of citizen (Balint and Bilandzic. 2017).

Anemia is an individual contion which the number of haemoglobin concentration is lower than normal value. Haemoglobin has an important role as the carrier of oxygen in human body. Individual with anaemia was experienced various clinical manifestations, such as weakness, fatigue, shortness of breath, and also dizziness. The prevalence of anemia across the global is around 24.8% (Leepile et al., 2021). Anemia is a serious health problem, which mostly affected adolescent girls and women. The prevalence of anemia in adolescent group is 30% across the global (Chaparro et al. 2019).

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Anemia frequently occurs in adolescent groups due to the some various factors, including limited access to animal-source foods, vegetables, and fruits. This can lead to the nutritional deficiencies, and affected the well-being of adolescent girls (WHO, 2020). The World Health Organization/WHO defined adolescent as the life period between 11 and 19 years old. Adolescent period is the culnerable group in developing anemia, which can lead to serious health consequences in long term (WHO, 2011).

Some of the risk factor of anemia in adolescent can be deciphered, such as underweight and malnourished adolescents, heavy menstrual blood loss (>80 mL), chronic ilness, obese/overweight adolescents, adolescent pregnancy, and low dietary intake (Deivita et al. 2021). However, iron deficiency is a common cause of nutritional deficiency. Blood loss was not only caused by heavy menstrual, but it can also caused by the parasitic infections, such as helminth infection, malaria infections, and protozoan infections. One of the things that can cause anemia in teenager is their nutritional status. One of the risk factors for anemia is malnutrition. Girls teenager frequently consume unhealthy foods like fast food and fried foods because they are careless about how much they eat (Helmer et al., 2022). Girls teenager frequently follow unhealthy diets, which can impede the body's ability to grow and absorb nutrients when done without a doctor's or nutritionist's supervision. Additionally, the majority of young women drink tea or coffee less than an hour after eating, which can affect hemoglobin levels by interfering with the absorption of iron. Based on the aforementioned problem, anemia should be prevent, and the use of interest method should be applied, such as anemia comics which elaborated in this study.

2. Methods

This study was carried out in Menganti Senior High School, East Java, Indonesia. Anemia comics were distributed to female student in this school. A total of 75 students were participated in this study. This research was quasi-experimental with a one-group pretest-posttest design (Siedlecki 2020). Every student were given pretest and posttest to assess their knowledge about anemia, including the clinical manifestation of anemia, diagnosis of anemia, prevention of anemia, and also long impact of anemia. We selected this school based on its recognition among the majority of locals in Menganti District as their preferred junior high school.

Figure 1 Cover Page of Anemia Comics which described the creator of this comics (Department of Public Health and Preventive Medicine, Faculty of Medicine, Universitas Airlangga)

The validity and reliability of this comics already assessed by three lecturers and two teachers as the validators. The assessment result is 0.81 and 0.82, shows its validity and reliability, respectively. The questionnaire were provided in Indonesian language. Anemia comics were provided in Indonesian language, and consisting of five pages, as described in Figure 1, 2, and 3 below as the representative page.
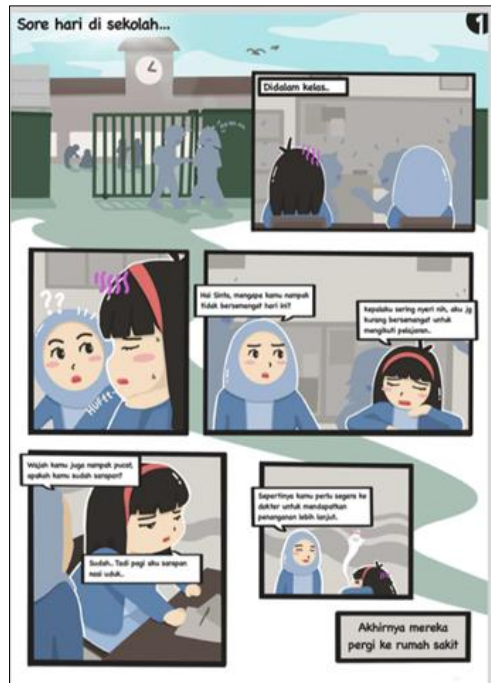
Figure 2 Second Page, which described a story of female teenagers which feel laziness and her face shows pale, her friends finally bring this teenagers to hospital


Figure 3 Third page, which described the clinical manifestation of anemia
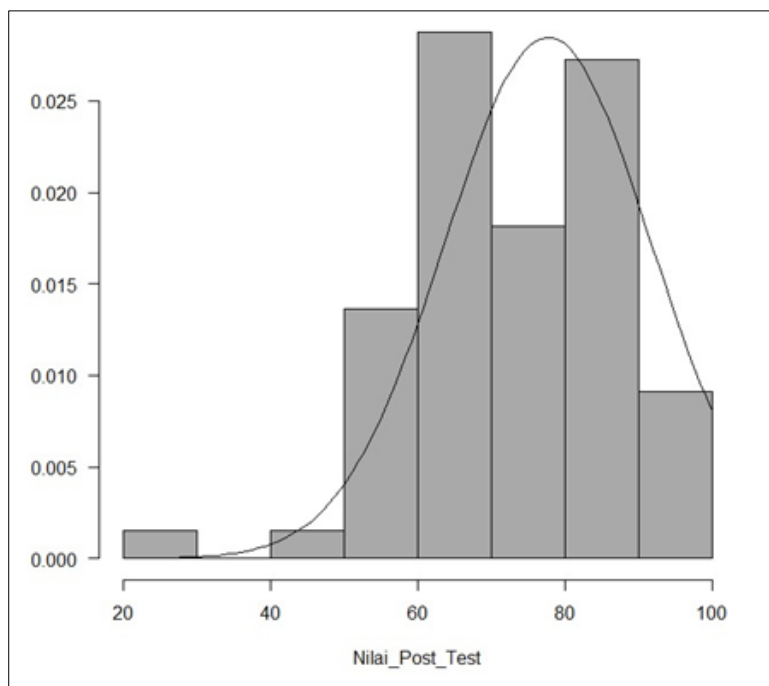
3. Results

This study indicates that there is a significant difference between pretest and posttest result. All of the participants were female teenager. Below are the demographic characteristics of the respondence. Our study shows that there is a difference in pre-test and post-test values using the Wilcoxon test with $p < 0.001$. The detail of the diagram of pretest and posttest result were shown in Figure 4 and Figure 5.

Table 1 Demographic Characteristics of The Respondence

Profiles	N	%
Age		
16 years old	20	26.67
17 years old	25	33.33
18 years old	30	40
Ethnicity		
Javanese	70	93.33
Maduranese	5	6.67
Grade		
10th grade	25	33.33
11th grade	25	33.33
12th grade	25	33.33
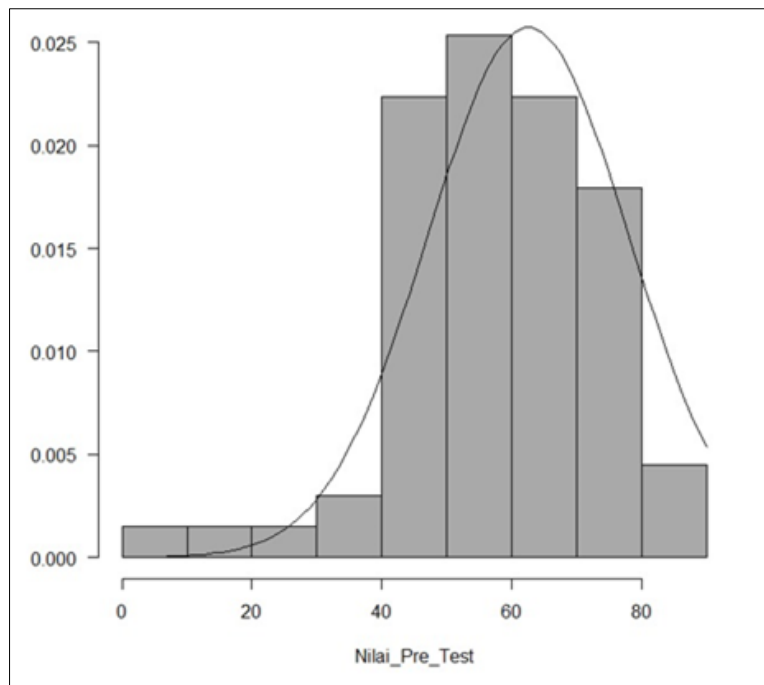
Figure 4 Diagram of Pretest Result

Figure 5 Diagram of Post-test Result

Table 2 Pretest and Postest Result from Student

	Lowest Value	Highest Value	95% CI	SD	Saphiro-Wilk Test	Wilcoxon Signed Rank Test
Pre-test	10	90	58.75 -66.31	15.5059	W= 0.9248; p=0.0006	P<0.001
Post-test	60	100	74.1-79.5	9.59	W= 0.86; p<0.0001	

4. Discussion

A third of the world's population suffers from anemia, which also impairs neurological development, lowers work productivity, and increases morbidity and mortality. Comprehending the diverse and intricate etiology of anemia is essential for creating efficacious interventions that target the context-specific causes of anemia and for overseeing anemia control initiatives. We provide definitions and classifications of anemia, explain the biological processes that lead to anemia, and go over the range of conditions that can cause anemia (Chaparro et al. 2019).

Poverty is a significant factor in determining nutrition and health, and low socioeconomic status is associated with a higher risk of anemia in women and children. Likewise, a higher risk of anemia is linked to a lower level of education (Balarajan et al. 2011). Anemia was found to be strongly correlated with maternal anemia, household wealth, maternal education, and low birth weight in a recent analysis of 53 demographic and health surveys using hemoglobin data (Wirth et al. 2017). In this study, we targeted adolescent girl as the intervention group due to the importance of their rules in the future. Adolescent girls' nutritional status has a significant impact on the health, low birth weight, and stunting of their future children.

Anemia is one of the health issues that affect teenagers or students. In particular, students who experience anemia during pregnancy in the future will be impacted if the prevalence of anemia in students is not addressed right away. Therefore, creating a learning model for students to prevent anemia is essential. From this study it can be indicated that there is a significant difference between pretest and posttest result from the 75 students regarding their knowledge about anemia.

Individuals between the ages of 10 and 19 who are going through a phase of gradual growth and development transition are referred to as adolescents. Teenage girls are particularly vulnerable to malnourishment and anemia (Budhathoki et al., 2021). Males and younger adolescents were more likely to be thin, and factors such as paternal occupation,

education, household income, geographic location, caste or ethnicity, and nutrition knowledge were linked to thinness. The results highlight how crucial it is to include teenagers, their parents, and their communities in interventions. Adolescent nutrition should be improved, but so should the growth environment for adolescents in order to promote better health and development (Van Tujil et al., 2021).

Adolescents' nutritional status, in this case, body mass index (BMI), is determined by the food they consume. Anemia and BMI as well as mid-upper arm circumference (MUAC) have been examined in a number of studies (Kumar et al., 2022). Regardless of their MUAC score, women who were overweight or obese in Indonesia had a lower risk of developing anemia than those with a normal BMI (Laghari et al., 2017). Menstruation, parents' income and educational attainment, and anthropometric measurements are all associated with anemia (Sales et al., 2021).

5. Conclusion

Anemia comics can be used as a learning medium for the prevention of anemia which targeted adolescent girls. This study shows the difference significant result between pretest and poss test of targeted group after get the intervention.

Compliance with ethical standards

Acknowledgments

Disclosure of conflict of interest

Authors declare that there's no conflict of interest.

Statement of informed consent

Each participant that participated in this study were given informed consent.

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