

The Effectivity of Nutrition Education using E-Booklet on Knowledge and Attitude about Anemia among Adolescent Girls in Turen Malang

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ARTICLE INFO	ABSTRACT
<p>ORCID ID Author 1: https://orcid.org/0000-0001-5646-0661 Author 2: https://orcid.org/0009-0008-6569-1064 Author 3: https://orcid.org/0000-0003-2883-1191 Author 4: - Author 5: - Author 6: - Author 7: - Author 8: -</p>	<p>One of the nutritional problems of adolescent female in Southeast Asia is iron deficiency anemia, with an estimated 25-40 percent of adolescent female experiencing mild to severe anemia. The impact of this on teenagers is a decline in academic abilities at school due to a lack of enthusiasm for learning and concentration on learning. This research aims to determine the effect of e-booklet anemia prevention media on young women at SMAN 1 Turen. This research uses an experimental method, namely a pre-experimental design with a one group pretest-posttest approach. The subjects of this research were 50 female students. The results of the study showed that there was an influence of e-booklet anemia prevention media on the level of knowledge (p value is 0.000 less than 0.05) and attitudes (p value is 0.032 less than 0.05) of young women at SMAN 1 Turen. There was a significant influence on knowledge and attitudes before and after being given treatment in the form of education using e-booklet media</p>
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1. Introduction

One group of women at risk of anemia besides pregnant women is adolescent girls. Anemia in adolescent girls is caused by the greater need for nutrients and iron in adolescence and the presence of a monthly menstrual cycle. Indonesia and other developing countries are facing three nutritional problems (triple burden), namely stunting, wasting, obesity and micronutrient deficiencies such as anemia. If this problem is left untreated, it will increase the vulnerability to non-communicable diseases (Husnah et al., 2023). Adolescence is a period of physiological and psychological growth and is an important foundation for growing up. To support good growth and development in adolescence, adequate fulfillment of nutrients is needed. If there is a condition of deficiency in nutrient intake, one of which is iron in the long term, it can affect growth and general health in adolescents (Woodruff et al., 2006). Iron

deficiency can cause anemia, which is one of the main nutritional problems in Asia, including Indonesia. Anemia is a condition where the number of red blood cells (hemoglobin) in the blood is lower than the normal value, which is less than 12 g/dl (Astuti et al., 2023).

The 2018 Basic Health Research shows that the prevalence of anemia among 15-24 years old in Indonesia is 32% (Kemenkes, 2018). Adolescent girls are at higher risk of developing anemia compared to adolescent boys because adolescent girls experience the menstrual cycle every month and have the wrong eating habits (Erningtyas et al., 2023). The condition of anemia in adolescents can have a negative impact on cognitive performance and growth which affects adolescent intelligence and achievement (Ekasanti et al., 2020). Anemia causes adolescents to experience fatigue, fatigue, lethargy, weakness, decreased appetite, and drowsiness. This can have an impact on impaired learning concentration and susceptibility to disease. Anemia in adolescent female also has a long-term impact, which if carried into adulthood and entering pregnancy conditions can risk increasing premature rates and low baby weight (Astuti et al., 2023). Several efforts have been made to overcome the problem of anemia, including increasing the intake of iron-source foods, fortification of foodstuffs with iron and iron supplementation. Iron supplementation is done by giving Blood Addition Tablets (TTD) containing 60 mg of elemental iron given once a week for 3 months (Kemenkes, 2018)

Many factor are associated with anemia, such as appropriate knowledge regarding healthy nutrition for adolescent (Wurisastuti et al., 2024). Previous study show that less than half adolescent girls were knew about anemia (Gebreyesus et al., 2019). Knowledge is an important factor which is a cornerstone of attitude and practice change to prevent anemia. Limited access to knowledge is one the distal cause of increasing prevalence of anemia (Tran et al., 2019). Providing education to adolescent girl using media as a tools can be the alternative solution for preventing anemia. Electronic media such as digital pocket book or e-booklet increased the knowledge and attitude of adolescent girls about anemia (Nikmah et al., 2022; Septiani et al., 2023). Booklets are educational media that contain writing and combined with interesting image that stimulates readers to increasing knowledge. Using E-booklet is encourage the provision of information technology based nutrition education using e-booklets (Almuhdar et al., 2018).

State Senior High School 1 Turen (SMAN 1 Turen) is one of the public schools located in Sedayu Village, Turen District, Malang Regency. SMAN 1 Turen is one of the cooperation partners of the Faculty of Sport Sciences, State University of Malang in the field of Tridharma of Higher Education namely Education, Research and Community Service. Currently the number of students at SMAN 1 Turen is 1197 students with 484 boys and 713 girls. Based on the partner's problems, it is known that the results of anemia screening in adolescent girls in January 2023, showed that around 30 adolescent girls at SMAN 1 Turen were at risk of anemia. This could be due to the girls' reluctance to consume Blood Addition Tablet (TTD) which is routinely provided by the school. TTD consumption has several side effects, including nausea and black feces. The side effects of TTD consumption can affect the compliance of adolescent girls in consuming TTD. Efforts to conduct health promotion in the prevention of anemia in adolescent girls are important to do. This study aimed to investigating the effect of e booklet to knowledge and attitude among adolescent girl in SMAN 1 Turen.

2. Method

This was quantitative research using pre- experimental design with a one group pretest-posttest approach (single group pretest-final test). The flow of the research used, namely the research was given a pretest of knowledge and attitudes about anemia of adolescent girls then continued with the provision of treatment (X), namely the provision of e-booklets on anemia of adolescent girls after that given a posttest of knowledge and attitudes about anemia of adolescent girls. This study used questionnaire to measure knowledge and attitude about anemia. Statistical test used for knowledge and attitude variables was Paired Sample T-Test. This research was conducted at SMAN 1 Turen, Malang. This research was conducted in August 2023. The subjects of this study were 50 adolescent students of SMAN 1 Turen who meet inclusion criteria including willing to join this study and signing the informed consent and have smartphone. This research has been accepted by the Health Research Ethics Commission of the Faculty of Public Health, Universitas Airlangga with certificate number 174/EA/KEPK/2023.

3. Result and Discussion

Table 1 shows that the age of the majority of respondents is 16 years old as many as 23 people (46%). According to WHO, adolescents are residents in the age range of 10-19 years (Andriani et al., 2022). Adolescence is referred to as a transitional period because of growth, development and biological and psychological changes. Adolescent girls have a ten times greater risk of suffering from anemia because they experience menstruation every month and are in a period of growth that requires more iron intake (Adilla et al., 2022). Anemia in adolescent female can have long-term effects on them and their future children. The effects of anemia include impaired growth and development, increased susceptibility to infection due to a decreased immune system, and increased susceptibility to poisoning (Ruhayati et al., 2024).

Table 1. Respondent Characteristics

Characteristics	Frequency (n)	Percentage (%)
Age (Year)		
14	2	4
15	8	16
16	23	36
17	16	32
18	1	2
Class		
X	10	20
XI	23	46
XII	17	34
Total	50	100

Source: Primary Data, 2023

Based on table 2, the average knowledge score at pretest was 76.2 and at posttest was 90.8 from 50 respondents who were given counseling with E-Booklet media. This shows an increase in adolescent knowledge about anemia. These results are in line with other studies that show an increase in the average score of anemia prevention knowledge in adolescent girls after being given education using booklet media with a pretest score of 8.29 and a posttest of 10.64 (Adilla et al., 2022). Previous research stated that there was an increase in the average score of anemia prevention knowledge in adolescent girls after being given health counseling using booklet media with a pretest score of 28.9 and posttest 35.76 (Guswir, 2018). Furthermore, booklet media allows respondents to remember information more easily because it can be accessed repeatedly. Compared to using the lecture method, students can

study the booklet slowly so that the information obtained can be more easily understood (Imanuna, 2022). It is hoped that learning media will be able to help the learning process to raise attention to a particular health problem so that it can increase students' knowledge of that health problem (Nikmah et al., 2022). The use of learning media can be combined with the roles of teachers and family members. Parents or teachers can provide training to students so that students are more likely to gain new knowledge, ultimately influencing their attitudes and motivating their practice (Pardosi, 2019).

Table 2. Mean Knowledge of Adolescent Female on Anemia Before and After Given E-Booklet

Variable	Mean	N	Std. Deviation
Knowledge			
Pretest	76,2	50	9,344
Posttest	90,8	50	5,566

Source: Primary Data, 2023

Based on table 3, it was obtained that the average attitude score before was 33.12 and after 34.48 from 50 respondents who were given counseling with E-Booklet media. The results of the data analysis showed a difference in the average attitude before and after being given counseling with e-booklet media. This is in line with previous research which states that there

Table 3. Mean Attitude of Adolescent Female on Anemia Before and After Given E-Booklet

Variable	Mean	N	Std. Deviation
Attitude			
Pretest	33,12	50	2,939
Posttest	34,48	50	3,019

Source: Primary Data, 2023

Is an effect of booklet media on increasing the attitude of preventing anemia in adolescent girls with a pretest score of 20.6 and posttest 88.2 with $P < 0.000$ (Adilla et al., 2022). Another study showed differences in the attitudes of adolescent girls before and after nutrition education on iron supplementation programs with a p value < 0.05 . Attitude is influenced by knowledge, good knowledge will lead to a good attitude because of changes in perception when young women gain knowledge (Rahmiati et al., 2019). In addition, result of this study are consistent with other studies which state that there is an increase in attitude as indicated by an increase in the average pre-test value of 78.41 to 90.91 on a post-test with counseling interventions using booklets (Imanuna, 2022). E-booklets media proved better in increasing the attitude of anemia in young women compared to the lecture method only (without using e-booklet) with a p -value = 0.001 (Nikmah et al., 2022).

Based on table 4, it is known that the effect of e-booklets on the knowledge of adolescent girls is obtained with a p value = $0.000 \leq 0.05$, which means that there is an effect of e-booklet media on the knowledge of adolescent girls about anemia, while the effect of e-booklets on the attitude of adolescent girls is obtained p value = $0.032 \leq 0.05$, which means that there is an effect of e-booklet media on the attitude of adolescent girls about anemia. The results of this study are in line with previous research which states changes in knowledge after counseling

on anemia (Safitri, 2022). Another study stated that there was an influence in the form of changes in attitude after being given treatment in the form of counseling (Juniyanti et al., 2022).

Table 4. The Effect of E-Booklet as a Media Counseling on Anemia Knowledge and Attitude of Adolescent Girls of SMAN 1 Turen

Variable	N	Mean	Sig. (2-Tailed)
Knowledge	50	14,6	0,000
Attitude	50	1,36	0,032

Source: Primary Data, 2023

4. Conclusion

Based on the research "Development of Anemia Prevention Media for Adolescent Girls at SMAN 1 Turen" the effect of e-booklets on the knowledge of adolescent girls is obtained with a p value = $0.000 \leq 0.05$. It can be concluded that there is an influence of e-booklets as an outreach medium on the knowledge and attitudes of anemia among adolescent girls at SMAN 1 Turen. The limitation of the research is that the number of respondents was 50 female students, which is still insufficient to describe the real situation. Researchers recommend that future research take more research samples to produce more accurate data and use media other than e-booklets as a comparison. Furthermore, as a policy maker, the government must pay great attention to the importance of education on the anemia prevention in adolescent girls. The government may be able to include a curriculum for preventing and controlling anemia in the current education curriculum. It is hoped that the results of this research will add insight to all young women at SMAN 1 Turen.

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