ORIGINAL ARTICLE

Education using instagram on knowledge, attitudes and eating habits as prevention of anemia in adolescent girls in Makassar

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ABSTRACT

In Indonesia the prevalence of anemia is 58.8%, at the age of 5-14 years is 26.8% and at the age 0f 15-24 years is 30.2%. Government initiatives to prevent anemia by dispensing iron supplements without teaching have left adolescent girls with little knowledge of anemia, necessitating substantial informative efforts through social media. Instagram is less popular than Whatsapp as a tool for educating adolescent girls about anemia. The purpose of this study is to compare the effects of WhatsApp and Instagram as instructional media on knowledge, attitudes, and eating patterns among adolescent girls in order to prevent anemia. This study employed a control group and a pre-test post-test quasi-experimental design. In this study, participants (n = 60) were split into two groups: the intervention group (n = 30) used Instagram at Junior High School 30 Makassar, while the control group (n = 30) used WhatsApp at Junor High School 14 Makassar. A general questionnaire and a food frequency questionnaire were used to collect the data, which was then analyzed using the repeated ANOVA test to compare each group's results before and after the intervention and the unpaired t-test to compare the Instagram group to the WhatsApp group. The findings indicated that the Instagram group's knowledge (61.50+82.67 vs 82.67+11.651), attitude (81.93+8.682 vs 89.23+6.683), and eating behaviors (467.10+197.269 vs 486.45+212.911) had different values before and after the intervention. In the WhatsApp group, these differences were 54.17+10.093 vs. 60.83+13.714 for knowledge, 73.20+10.179 vs. 83.40+13.255 for attitude, and 553.10+204.985 vs. 518.28+161.929 for eating habits. With a p-value of 0.05, there were differences between the WhatsApp and Instagram groups in terms of knowledge (0.000), attitude (0.000), and eating habits (0.002). Therefore, this study's conclusion is that educating adolescents using Instagram as a medium is more effective in improving their knowledge, attitudes, and eating habits.

Key words:
Anemia health education; Instagram; knowledge; attitude; eating habits

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INTRODUCTION

Riskesdas 2018 reports that adolescents in the age groups of 5 to 14 years (26.8%) and 15 to 24 years (32.0%) have the highest rates of anemia in Indonesia. Women above the age of 15 should have hemoglobin levels of >12.0 g/dl (>7.5 mmol). According to the South Sulawesi Provincial Health Office in 2017, adolescent girls had a 13.4% anemia prevalence rate.[1] Based on a study done by Rahyu et al. in 2022, results showed that 34.5% of adolescent girls in Makassar had anemia (had hb level 12g/dl). According to the World Health Organization, 25% of students have iron deficiency anemia and the prevalence of IDA reported among the student and adolescent population ranges from 29.2 to 79.6%.[2] Increased bodily demands, a lack of red blood cells, social and economic standing, low iron content in the food ingested, low iron absorption, a lack of information about iron, and the existence of iron absorption inhibitors in the diet are just a few of the variables that can cause anemia.[3] Low iron concentration in meals can result in iron intake deficiencies, which, if they persist, can deplete body iron stores and alter the synthesis of hemoglobin.[4] Anemia impairs teenage physical development, performance, and immunity and may have long-term repercussions in older age groups, particularly among females throughout the childbearing years.[5]

To treat adolescent anemia, the government administers an iron supplementation program. Students in middle and high school receive weekly iron supplements. Due to pupils' poor iron tablet usage, this effort was viewed as less successful.[6] A study carried out in Malaysia revealed that following the intervention, undergraduate students' knowledge, attitudes, and habits toward healthy eating increased. Enhancing adolescent and youth nutrition attitudes, knowledge, and practices is crucial as this will raise awareness of healthier individual foods.[7] A strict and thorough informative intervention is required to prevent and address the issue of adolescent anemia. Through heavy use of social media, attempts are being undertaken to increase young women's knowledge, attitudes, and behavior surrounding anemia and young women's eating patterns. Because social media is widely used, can reach a large and diverse audience, and is very cost-efficient, it holds many benefits for public health intervention.[8]

According to the recommendations made at the International Conference on Health Promotion in Ottawa, social media can work with and enhance traditional health promotion efforts by increasing public access to health information and encouraging positive behavior change. A study was undertaken to compare the usage of Instagram and WhatsApp as educational media to avoid anemia in young women, since WhatsApp is more frequently used to provide anemia education to teenage girls than Instagram.

METHODS

This study used a quasi-experimental design with a pre-test, post-test and a control group. The population in this study at the junior high school 30 Makassar was 310 people, while the junior high school 14 Makassar was 269 people. The Lemeshow formula was used for sampling,[9] anticipating a drop out of 20%.[10] In this study, respondents (n=60) were divided into two groups, namely the intervention group (n=30) using Instagram at Junior High School 30 Makassar while the control group used WhatsApp (n=30) at Junior High School 14 Makassar. Samples were selected using purposive sampling that met the criteria. This research was

conducted in two different schools to avoid sample contamination. Inclusion criteria in this study; class VIII students; have Instagram and Whatsapp applications (active every day); never received anemia education before; working parents; signed the informant consent form and exclusion criteria; not willing to be research respondents. The knowledge and attitude questionnaires used in this study were validated by having 30 students from various local schools answer each question or statement; if the result value of each correct item was greater than the calculated *r* value, the question or statement was said to be valid, and if the Cronbach alpha value was greater than 0.6, it was said to be reliable.[11] All of the assertions and question points in this questionnaire are declared to be valid and reliable. Before the intervention was given, a pre-test was carried out by measuring knowledge and attitudes using a questionnaire that has been previously validated. In the knowledge questionnaire, 20 questions were given before the research was carried out to measure the level of knowledge of the respondents, as well as the attitude questionnaire which contained 20 statements (references: 2021 Ali Khomzan; Nutrition Knowledge Measurement Technique Book). In order to determine the frequency of eating habits among female students, this study also used a meal frequency questionnaire from the Ministry of Health. This approach is employed because it has a column of food portions that may quickly represent food intake over a lengthy time (days, weeks, or months). With the goal of comparing the Instagram group and the WhatsApp group for changes in knowledge, attitudes, and eating habits, this research was undertaken over the course of 10 weeks by presenting the information three times in three weeks and repeating it three times. In the Instagram group, the information was distributed using Instagram media in the form of animated videos that had been approved by media experts from week one to week three, using videos from the Ministry of Health from week four to week six, and using videos from UNICEF from week seven to week nine. This information includes topics like the definition of anemia, symptoms of anemia, the impact of anemia, and prevention of anemia. When giving education, the researcher exercised personal control and collaborated with the class president, homeroom teacher and parents to ensure that respondents watched the videos provided to them through their respective media. Activity diaries were provided for each respondent, so that when respondents watched, they will check the diary. In the control group the material was provided in a different video form than the intervention group but the content of the material in the video was the same. The post-test I was conducted five weeks after the pre-test, and the post-test II was conducted five weeks after the post-test I. Data retrieval such as when pre-test until post-test II are carried out offline to avoid cooperation between respondents and avoid errors in filling out the form. Ordinal scale data with repeated ANOVA test analysis was used as it required more than two measurements of the same subject to identify differences in knowledge, attitudes, and eating habits in the Instagram and WhatsApp groups before and after the intervention. The unpaired *t*-test was used to identify differences between the two groups. The Hasanuddin University Faculty of Medicine's ethics committee granted approval for this study under approval number 7007/UN4.14.1/TP.01.02/2022.

RESULT

According to Table 1, the majority of respondents were 13 years old both in the intervention group (83%) and in the control group (70%). In the intervention group, the majority of fathers were private workers in excess of 19 (63%) while the majority of fathers in the control group were private

workers in excess of 16 (57%). The majority of working mothers in the intervention group IRT have up to 21 individuals on average (70%) and the majority of working mothers in the control group IRT have up to 22 individuals on average (73%). In the intervention group, the majority of respondents weighed 40-50 kg, with 13 people (43%) and in the control group, there were 15 people (50%). The majority of respondents were 150-160 cm tall, and in the intervention group there were 12 people (40%) and in the control group there were 17 people (56%). The majority of respondents had pocket money of 5-10 thousand rupiah per day, in the intervention group, with 25 people (83%) and in the control group with as many as 22 people (74%). This demonstrates that prior to the study's conduct, there were no significant differences in the features of the Instagram group and the WhatsApp group.

Table 1. Distribution the characteristics of respondents in the WhatsApp and Instagram groups at SMPN 14 Makassar and SMPN 30 Makassar in 2022.

Variable	Category	Instagram Group		Whatsapp Group		p value
		n(30)	%	n(30)	%	
Age	13	25	83.0	21	70.0	.360
	14	5	17.0	9	30.0	
Father's line of work	Private sector	19	63.0	16	57.0	.244
	Civil servant	9	30.0	6	20.0	
	Laborer	2	7.0	7	23.0	
Mother's line of work	Housewife	21	70.0	22	73.0	.736
	Civil servant	6	20.0	6	20.0	
	Private sector	3	10.0	2	7.0	
Weight	30-40 kg	10	33.0	11	36.0	.603
	40-50 kg	13	43.0	15	50.0	
	50-55 kg	7	24.0	4	14.0	
Height	130-140 cm	1	3.0	1	3.0	.328
	140-150 cm	12	40.0	9	30.0	
	150-160 cm	12	40.0	17	56.0	
	160-165 cm	5	17.0	3	11.0	
Pocket money/day	5–10 thousand rupiah	25	83.0	22	74.0	.370
	10-20 thousand rupiah	3	11.0	4	13.0	
	20-30 thousand rupiah	2	6.0	4	13.0	

Source: Primary Data (2022)

Table 2 demonstrates the variation in knowledge levels in the WhatsApp and Instagram groups before and after the intervention. In the WhatsApp group, the scores following the pre-test and post-test were (54.17+10.093 vs. 60.83+13.714), while in the Instagram group, the results were (61.50+82.67 to 82.67+11.651). Given that the knowledge significance value is 0.000 < 0.05, there is a knowledge gap between the two groups.

Regarding the attitude variable, differences in attitudes are evident in the WhatsApp group and the Instagram group before and after the intervention. In the WhatsApp group, the scores following the pre-test and post-test were (73.20+10.179 vs. 83.40+13.255), while the scores

following the pre-test and post-test in the Instagram group were (81.93+8.682 vs. 89.23+6.683). The two groups' attitudes differ, as indicated by the attitude significance value of 0.000 < 0.05.

Regarding the eating habits variable, it is clear that while there are differences in the Instagram group before and after the intervention, there are none in the WhatsApp group. In the WhatsApp group, the value following the pre-test and post-test decreased (553.10+204.985 vs. 518.28+161.929), whereas the value following the pre-test and post-test increased (467.10+197.269 vs. 486.45+212,911) in the Instagram group. This indicates that there was no difference in eating habits from the first post-test to the second post-test. Eating habits have a significance value of 0.002 > 0.05 so it may be stated that education utilizing Instagram as a medium is more effective in developing knowledge, attitudes, and eating habits among adolescent girls. This is due to disparities in the two groups' eating habits.

Table 2. Analysis Knowledge, Attitudes, and Eating Patterns in Instagram and Whatsapp Groups at SMPN 30 Makassar and SMPN 14 Makassar in 2022 Before and After Education.

Variable	Groups	Pre	Post 1	Post 2	p value	p value pretest Ig & Wa	p value post2 Ig & Wa
		Mean ± SD					
Knowledge	Instagram	61.50 ±10.598	75.83 ±12.736	82.67 ±11.651	0.000*	0.960**	0.005**
	Whatsapp	54.17 ±10.093	65.00 ±12.106	60.83 ±13.714	0.001*		
Atittudes	Instagram	81.93 ±8.682	88.87 ±5.619	89.23 ±6.683	0.000*	0.448**	0.000**
	Whatsapp	73.20 ±10.179	81.43 ±15.580	83.40 ±13.255	0.004*		
Eating habits	Instagram	467.10 ±197.269	396.17 ±158.269	486.45 ±212.911	0.008*	0.735**	0.002**
	Whatsapp	553.10 ±204.985	541.90 ±178.962	518.28 ±161.929	0.278*		

*Source: Primary Data (2022) *Repeated Anova Test, **Unpaired T Test*

Figure 1. Education using animated videos about anemia in adolescent girls

DISCUSSION

Anemia is a health issue that frequently affects adolescents during this time of rapid growth and change in their lives.[12] At the age of adolescents, they need more food intake due to a period of rapid growth and experiencing menstrual periods so that they need more replacement iron which comes from the food they consume. Wrong eating habits, irregular and unbalanced with nutritional adequacy can affect the condition of hemoglobin and cause anemia. Consuming absorption inhibitors together with the main food is also one of the wrong eating habits. It can be said that good eating habits by meeting the need of balanced food intake in the body will prevent anemia in adolescent girls. Understanding anemia has an impact on teenage females' nutrient needs as well.[13] Adolescent girls' increased knowledge and awareness of nutrition improvement was linked to nutrition education, according to research done by Arora and Kochar in the Kurukshetra area of Haryana in 2016.[14] Various research efforts suggest that the use of social media is useful, such as bringing about changes in anthropometric measurements, awareness of specific health themes, or smoking status, according to a systematic review done by Seiler et al. in 2022.[15]

According to the study's findings, the knowledge levels in the WhatsApp and Instagram groups varied when the first pre-test and post-test were administered. A significant value of 0.960 > 0.05 was determined using the unpaired t test findings from the pre-test, indicating that there was no difference in knowledge between the WhatsApp and Instagram groups. It can be concluded that the use of Instagram media is more effective at raising adolescent knowledge about anemia because, at the time of the second post-test, a knowledge significance value of 0.000 was obtained, which is lower than 0.05. This indicates that there is a difference in knowledge between the WhatsApp group and the Instagram group.This is consistent with research done by Citrakesumasari et al. in 2019 which revealed that the target audience had more knowledge about balanced nutrition as measured by specified success indicators as a result of the activities.[16] A study done in 2020 by Sabaruddin et al. revealed that knowledge varied before and after an online education intervention and use of YouTube as a medium.[17] The research of Fadhilah et al. in 2022 revealed a substantial increase between the pre-test and post-test with a value of 0.05.[18] According to research by Vander Wyst et al. in New York in 2019, social media-based education was highly welcomed by participants but did not significantly alter food intake or understanding. This contradicts their findings because the respondent's 24-hour recall was only collected during the respondent's clinical visit in Vander Wyst's research, which limited the researcher's ability to analyze all the food and drinks consumed. As a result, there was a risk that the respondent might forget about some of the food or drink consumed.[19] However, study by Hijlis et al. in Saudi Arabia in 2021 demonstrates that social media can aid in disseminating knowledge to boost radiographers' familiarity with radiation safety.[20]

A systematic review conducted by Shapu et al. in 2020 revealed that the interventions in five studies may have had a favorable attitude effect on the significance of nutrition for health, the significance of establishing healthy eating habits, the consumption of iron and vitamin C, and the willingness to take precautions against iron deficiency anemia.[21] The findings of this study suggest that there were differences in attitudes between the WhatsApp group and the Instagram group

from the first to the second post-test. The unpaired *t* test findings from the pre-test showed a significance value of 0.448 > 0.05, indicating that there were no differences in attitudes between the WhatsApp and Instagram groups. The usage of Instagram media is better at boosting adolescent attitudes to be positive about anemia, as seen by the second post-test's p value of 0.000 < 0.05, which indicates that there are variations in attitudes between the WhatsApp group and the Instagram group. This is consistent with research by Dwianan and Eko in 2019 which found that dietary anemia counseling via motion video media had an impact on attitudes (p = 0.001).[22] Lestari et al. 2022 on social media research discovered a rise in positive views in Kuningan Regency about adolescent girls' dietary habits and the prevention of anemia, and according to Anderson et al. 2004 study in Dundee, Scotland, the intervention was able to change respondents' perceptions of the benefits of eating fruits and vegetables.[23]

Iron deficiency can be caused by a lack of intake of food sourced from animal and vegetable foods. Animal food sources can be absorbed by the body with a range of 20-30% and come from the liver, eggs, meat, chicken and fish. Meanwhile, vegetable food sources come from plants that are deep green and nuts. Consuming fruits that contain vitamin C along with main meals can also increase the absorption of iron in the body. Elaheebocus et al. noted in a 2018 systematic review study that by consistently using social media features, motivation and behavior can grow on social media.[24] A 2015 study in China by Wang et al. showed the effectiveness of well-designed nutrition education for modifying diet.[25] The study's findings revealed changes in eating patterns in the Instagram group between the pre-test, first post-test, and second post-test, but not in the WhatsApp group, which had no pre-test or post-test eating pattern differences. According to the results of the unpaired *t*-test at the time of the pre-test, a significance value of 0.735 > 0.05 was obtained, meaning there was no difference in eating habits between the WhatsApp and Instagram groups at that time. However, at the time of the post-test, a significant value of 0.002 < 0.05 was obtained, meaning there are differences in the eating habits of the Instagram and WhatsApp groups. This study is consistent with research done in 2022 utilizing online media by Aulia and Afifah demonstrating how milk drinking behavior is influenced by nutrition education.[26] Azra et al. in 2021 demonstrated that social media-based nutrition education was able to boost pupils' vitamin C intake.[27] Similarly, a 2018 systematic review study by Michelle et al. revealed that social media is a promising component for interventions in eating habits and nutrition among adolescents and young adults. According to the research of Annie et al. 1998 in Scotland, customers who are aware and highly driven are more likely to be influenced by enabling factors like cost and availability.[28]

CONCLUSION

Education using Instagram media is better for increasing knowledge, attitudes and eating habits in the prevention of anemia in adolescent girls.

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