



Effect of Video Counseling about Prevention of Anemia on Adolescent Girls Behavior in Supporting the First 1000 Days of Life

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Abstract

BACKGROUND: Lack of knowledge, attitudes, and behavior awareness to prevent anemia among adolescent girls in supporting 1000 HPK has resulted in high anemia incidence in Indonesia. Multimedia counseling is a method of learning that involves audio, visual, and discussion to make it more interesting and easy to understand.

AIM: This study analyzed the effect of multimedia counseling about prevention of anemia on adolescent girls behavior to prevent anemia.

MATERIALS AND METHODS: This study used pre-test–post-test with control group design, with a quasi-experimental design using the case–control method. The study population was 259, the samples were 90 respondents who were assigned to two groups, namely, 45 people in anemia group and 45 in non-anemia group. The samples were selected by simple random sampling. Respondents were given multimedia counseling about anemia prevention, behavioral questionnaire and food frequency questionnaire (FFQ). Capillary blood test was conducted using Quik-Check, and the respondents were followed up every week and evaluated for 5 weeks. Results were tested using t-test and linear regression.

RESULTS: Multimedia counseling had an effect on knowledge ($t = 3.097$; $CI = 95\%$; $2.229–10.215$; $p = 0.003$), attitude ($t = 9.56$; $CI = 95\%$; $10.055–15.331$; $p = 0.001$), behavior ($t = -2.22$; $CI = 95\%$; $-4.628–0.260$; $p = 0.029$), FFQ ($t = -2.18$; $CI = 95\%$; $-4.883–-0.227$; $p = 0.032$), and BMI ($t = -10.40$; $CI = 95\%$; $-5.094–-3.460$; $p = 0.001$) among adolescent girls in preventing anemia with R-Square of 0.952 (95%).

CONCLUSION: There was an effect of multimedia counseling on the increase in knowledge, attitudes, and behavior in preventing adolescent anemia. Provision of ongoing multimedia counseling and monitoring of female careers in preventing adolescent anemia needs to be improved. Therefore, the role of health-care providers for monitoring and evaluation is very necessary.

Edited by: Sasho Stoleski

Citation: Agustiani MD, Sudargo T, Nugraheny E, Kasjono H, Gunarmi G. Effect of Video Counseling about Prevention of Anemia on Adolescent Girls Behavior in Supporting the First 1000 Days of Life. Open Access Maced J Med Sci. 2022 Aug 03; 10(E):1359-1363. <https://doi.org/10.3889/oamjms.2022.9735>

Keywords: Adolescent anemia; Behavior; Multimedia; 1000 HPK; Hemoglobin levels

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Received: 10-Apr-2022

Revised: 30-May-2022

Accepted: 24-Jul-2022

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Funding: This research did not receive any financial support

Competing Interests: The authors have declared that no competing interests exist

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Introduction

Adolescent girls at puberty are very at risk of developing iron nutrient anemia. This is due to the amount of iron lost during menstruation. It is also exacerbated by the lack of intake of iron nutrients the body needs to accelerate growth and development [1]. In Indonesia, the incidence of anemia was 21.7% with the anemia prevalence among women of 23.9%. Anemia occurred in the age range of 5–14 years at 26.4% and at the age of 15–24 years at 18.4% [2]. The effect of adolescent anemia is very influential in the future life cycle of women. The history of anemia is very influential on the female mortality and morbidity and the survival of her generation (perinatal death and low birth weight infants). Adolescent anemia also affects the quality of life and learning concentration of women [3], [4].

Efforts in reducing the incidence of adolescent anemia are actively carried out. Several efforts conducted by the government include the First 1000 Days of Life (HPK) nutrition program, PKPR (Youth Friendly Health Services), and the administration of iron tablets for adolescent girls. Guidelines for nutrition program planning at 1000 HPK explain that there are two types of activities, one of which is a nutritional sensitive intervention. Nutritional sensitive interventions are various activities targeting the general public which. If it is carried out specifically and integrated with specific 1000 HPK activities, it will have a better impact on the safety of the growth and development process of 1000 HPK group. Sensitive nutrition interventions include interventions for adolescent girls, one of which is by giving iron tablets. There are lots of study and counseling on nutrition to prevent anemia [5].

A study on the prevention and control program for iron nutrition anemia (PPAGB) in Bogor district in

junior and senior high school students was considered to be ineffective since adolescent compliance level in consuming tablets added blood was still low. A study conducted by Tashara in 2015 showed that knowledge had an effect on adolescent compliance in consuming iron tablets. The study also explained that 58% of adolescents did not know about anemia, the dangers of anemia, and how to prevent it [6]. There were 50% of adolescents who did not know the nutrition needed by adolescents, the effect of malnutrition [7], anemia, and consumption of iron tablets [8]. In a study conducted by Caesarina at 2017 and Syakir at 2018 explained that the use of video in health education is very effective compared to the use of one media. Periodic evaluation or follow-up needs to be done to know the success of research and counseling that has been done. Research conducted by Tashara at 2015.

In 2015, out of 1800 students consisting 72% experienced anemia. Data on anemia in Yogyakarta Special Region showed that the incidence anemia was 30.81% with the highest incidence was in Gunungkidul District of 16.77% [9]. Some factors that influenced the success of the administration of iron tablets included support from teachers, low level of adherence, and education about the importance of balanced nutrition and how to consume iron tablets appropriately. The program of providing iron tablets to schoolgirls was inadequate and it needs to be improved and the factors of knowledge and awareness about the dangers of adolescent anemia on an ongoing basis should be considered [10].

Materials and Methods

The study design used a pre-post-test with a control group design, with a quasi-experimental design using the case-control method. The population of this study was 256 respondents. The samples were 90 students of SMPN 1 Karangmojo in Gunungkidul City (a city in Yogyakarta province, Indonesia) in 2019. This study used a random sampling technique to select a school with 45 anemic adolescents and 45 with non-anemic adolescents. In this study the researchers collaborated with the Community health center to assess the hemoglobin levels among adolescent girls using capillary blood test. Blood test used the Quik-Check brand, which was produced in 2015. Body weight was assessed using digital scale of GEA EB9830 AKL 10901616277 which was produced in 2019. In this study, we tested the variables of knowledge, attitudes, behavior, and hemoglobin levels before and after counseling using multimedia. All students in selected junior high school were considered recruited if they (a) could fill out all questionnaires, (b) students who presented during counseling, (c) students who did not

experience menstruation during the initial blood test, and (d) students who did not suffer from worms and those who did not have tuberculosis. The researchers explained unclear questions and provided information to all participants. The results were tested using *t*-test and linear regression

Data were collected using a questionnaire consisting of five parts: (a) Student identity and characteristics, (b) knowledge evaluation questionnaire, (c) attitude evaluation questionnaire, (d) practice evaluation questionnaire, and (e) food frequency questionnaire (FFQ). The evaluation and validation of the questionnaire were based on the results of the Cronbach alpha test using a computer program, and the average Cronbach alpha was 0.74. Respondents were given multimedia counseling about anemia prevention, behavioral questionnaire, and FFQ. Capillary blood test was conducted using Quik-Check, and the respondents were followed up every week and evaluated for 5 weeks.

Results and Discussion

The results of the independent *t*-test on the post knowledge showed that the *t* value of the *t* test was positive of 3.097. Thus, it can be concluded that the value in anemia group was higher than the value in non-anemia group. Based on statistical tests, it was shown a significant difference between the knowledge of the anemia group and the non-anemia group with a $p = 0.003$ (Table 1).

Table 1: One effect of multimedia counseling

Independent <i>t</i> -test	F	t	p-value ^{a)}	95% Confidence Interval of The Difference	
				Lower	Upper
Post knowledge	0.73	3.09	0.003	2.229	10.215
Post attitude	0.47	9.56	0.000	10.055	15.331
Post behavior	0.43	-2.22	0.029	-4.628	-0.260
Post HB	0.01	-3.33	0.001	-1.224	-0.309
Post FFQ	0.21	-2.18	0.032	-4.883	-0.227
BMI	0.29	-10.4	0.000	-5.094	-3.460
Length of Menstrual period	0.02	3.44	0.001	0.421	1.579

^{a)}Independent *t*-test.

The *t*-test result for attitude was positive of 9.566. Thus, it can be concluded that the value of the attitude in anemia group was higher than in non-anemia group. There was a difference between the anemia group and the non-anemia group with $p = 0.000 < 0.05$.

The *t*-test result for behavior was $t = -2.224$. The *t* test value was negative then it can be assumed that the behavior value in the anemia group was lower than the non-anemia group. There was a difference between the anemia and non-anemia groups with $p = 0.029 < 0.05$.

The *t*-test result for hemoglobin levels in this study was $t = -3.344$. The *t*-test value was negative, so that it can be assumed that the hemoglobin value in the anemia group was lower than the value in the

non-anemia group. There was a difference between the anemia group and non-anemia group with $p = 0.001 < 0.05$.

The *t*-test result for FFQ score was negative of -2.182 . Thus, it can be assumed that the FFQ score in the anemia group was lower than the non-anemia group. There was a significant difference in the FFQ scores between the anemia group and the non-anemia group with $p = 0.032$.

The *t*-test for BMI was negative of -5.094 . Thus, it can be assumed that there were more respondents in the anemia group who experienced underweight in the anemia group compared to non-anemia group. There was a significant difference in mean BMI value between the anemia group and the non-anemia group with $p = 0.000$.

The *t*-test result for the length of menstrual period was positive of 3.440 which can be assumed that there were more respondents in the anemia group who had the length of menstrual period of > 7 days compared to the non-anemia group.

The results of the regression test obtained an adjusted $R^2 0.952$, which meant that there was an effect of knowledge, attitudes, behavior, FFQ, and BMI on hemoglobin levels of 95%. The Table 2 showed that the effect of each variable was different. The *t* value in the knowledge variable showed a value of 2.908 and sig value of 0.005 which can be assumed that knowledge had an effect on hemoglobin in the blood.

Table 2: Linear regression test for hemoglobin levels

Variable	Adjusted R ²	t	Sig
Post-knowledge	0.952	2.908	0.005
Post-attitude		8.752	0.000
Post-behavior		-2.221	0.037
Post-FFQ		-2.001	0.047
BMI		-5.545	0.000
Length of menstrual period		-1.468	0.146

Attitude variable had a *t* value of 8.752 and sig value of 0.000 , which meant that attitude had a positive effect on hemoglobin levels. On the results of the behavior sig, FFQ, BMI showed that $p < 0.005$ or it can be concluded that the behavior, FFQ and BMI had an effect on hemoglobin levels. Even so it appeared that the *t* count values of these variables were negative, namely *t* count for behavior of -2.221 , *t* count for FFQ of -2.001 , and *t* count for BMI of -5.545 . Based on the *t*-test results it can be assumed that the values in the non-anemia group were still higher than the values in the anemia group regarding the effect on the increase in hemoglobin levels. Meanwhile, the length of menstrual period did not significantly influence hemoglobin levels with $p = 0.146$.

Low body mass index is caused by lack of variety of food intake (lower dietary diversity). Diverse inadequate food intake can cause anemia in adolescents especially iron deficiency anemia [11]. Iron is found in several types of food sourced from animals and plants. Therefore, if the nutritional intake of food

is low it will have an impact on the lack of hemoglobin levels in the blood so that it can result in anemia [12].

Nutrition is an important role for adolescent growth and development. Imbalance between foods consumed with the needs of adolescents will lead to problems of under nutrition or over nutrition [13]. Malnutrition in adolescents will result in a decrease in the body's resistance to disease, increase the number of disease (morbidity), experience abnormal growth (short), the low level of intelligence, and retardation in the development of reproductive organs [14], [15].

The length of menstrual period experienced by adolescents may lead to anemia. There were 10 respondents with the length of menstrual period longer than 7 days in the anemia group. Losing a lot of blood can cause anemia because when the body loses a lot of blood the body will also lose red blood cells (RBC). The loss of RBC can cause anemia and can cause low levels of iron in the blood. Without sufficient iron in the blood, the body will make fewer RBC than what is needed by the body, and low RBC will cause the least levels of hemoglobin in the blood so that it can result in anemia [12].

The results of the study conducted obtained the results that the length of menstrual period had an effect on hemoglobin levels. Of 45 respondents with anemia, 10 (22.2%) had the length of menstrual period longer than 7 days with $p = 0.001$. The result of this study is reinforced by the result of a study conducted by Bernardi (2016) on the relationship between menstruation and iron deficiency anemia, which explained that the length of menstrual period was associated with anemia with $p = 0.021$. Research conducted by Utomo (2013) about the relationship of the length of menstrual period and the incidence of anemia in adolescents explained that there was a significant relationship between the length of menstrual period and the incidence of anemia and of 58 anemia respondents there were 16 (27.58) respondents who experienced menstruation for more than 7 days with $p = 0.028$.

Knowledge is the most important factor why a person chooses an attitude so that he does an action or behavior. The more people know, understand, and comprehend about science, it is expected that attitudes and behaviors or actions will lead to positive things. The thing that leads to the formation of attitudes is the perceptual component namely trusts with what is seen, felt, known, and information from others [16], [17], [18]. Low level of knowledge on adolescent anemia may result in anemia among adolescent girls. A study conducted in Ethiopia showed that adolescents who did not know about anemia had a 60% higher risk of developing anemia compared to adolescents who had already knew anemia [19], [20]. Knowledge is very influential on iron deficiency anemia, lack of knowledge of students showed 3 times greater risk for the incidence of anemia [10].

The use of multimedia in delivering messages was intended to make the respondents interested in changing their attitudes to be more positive. According to a study conducted by Syakir (2018), the use of multimedia had a positive impact in changing behavior with a mean pretest of 34.50 which increased to 36.07 with a $p = 0.0001$. In present study conducted by researchers, there was an increase in the mean value of 57.75–70.22 in the non-anemia group and 60.19–67.52 in the anemia group with $p 0.000$. The result evidenced that the multimedia used by researchers was more effective in changing the attitudes of respondents.

Experience must leave a strong impression to be the basis for forming attitudes. Attitudes are easily formed if it involves emotional factors since it will get more appreciation. The subjects in this study said that they had not been examined for hemoglobin levels and obtained health education about anemia that caused a strong impression (especially in the anemia group) as the basis for forming attitudes.

There was a weak correlation between knowledge and behavior [6]. This is understandable because behavior changes cannot be manifested in a short time. To make a behavior change it takes 18–66 days. The more frequent behavioral repetition, the faster the behavior change might occur [21], [22]. Even so strong knowledge would lead to better behavior in the prevention of nutritional deficiency anemia [6], [23].

The results of this study stated that there was an effect of knowledge, behavior, FFQ, and BMI on hemoglobin levels of 95%. Anemia is a condition that develops when the body lacks of hemoglobin levels in the blood. One cause of anemia is a lack of iron intake in the blood or commonly referred to as iron deficiency anemia. Counseling can affect the attitudes and behavior taken by individuals. There was a positive response to changes in attitudes and behavior after counseling in preventing anemia [24]. FFQ is a manifestation of the actual action or compliance of respondents to the behavior done.

This study revealed that multimedia counseling could influence respondents' knowledge, attitudes, behavior, and hemoglobin levels. It takes a strong and deep impression in conducting counseling so that respondents can understand and want to behave well. To give a deep, interested and motivating impression, researchers conducted a counseling using multimedia. Thus, counseling could run effectively and information or knowledge as a basis for someone to take a position in taking action in accordance with the information that had been given could be conveyed properly, more interesting and interactive [25], [26], [27].

Conclusions

There was an effect of multimedia counseling on the increase in knowledge, attitudes, behavior in preventing adolescent anemia. Provision of ongoing multimedia counseling and monitoring of female careers in preventing adolescent anemia needs to be improved. Therefore, the role of health-care providers for monitoring and evaluation is very necessary. Further studies are expected to conduct an examination of hemoglobin levels using venous blood and perform longer monitoring of evaluation (1 month, 3 months, and 6 months)

Acknowledgments

The researcher would like to express a sincere gratitude to the respondents and SMP N 1 and 2 Karangmojo for their contribution in this study.

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