

Conference Paper

The Impact of Health Education Using Online Learning on Adolescent Knowledge of Anaemia

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Abstract

Anaemia is currently still a global health problem. About 26.8% of Indonesian adolescents suffer from anaemia. Most of them do not realize that they suffer from anaemia, neither do they understand the effects of it; this therefore warrants a need for health education by utilizing online technology. The purpose of this study was to determine the impact of health education through online learning on the knowledge level of adolescents about anaemia. This study is a quasi-experiment research with a pretest–posttest using a control-group design. The sampling technique used was stratified random sampling, with a total of 36 respondents who were divided into control and intervention groups. The respondents were screened using the Haemoglobin Test Strip Monitoring System and data were collected using a questionnaire. Data analysis in this study used the Wilcoxon and Mann–Whitney tests. The results showed that there was an increase in the mean knowledge value of anaemic adolescents ($p < 0.05$) based on the Wilcoxon test results, while based on the Mann–Whitney test, there was no difference between the intervention and control groups ($p > 0.05$). Health education through online learning media can be given to adolescents because through these media, adolescents can quickly get information related to anaemia anywhere and anytime, and there is a need for active interaction during activities.

Keywords: online learning, health education, anaemia, adolescents

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1. Introduction

Anaemia is still the global problem of health. Anaemia is also one of the issues that relate to nutrition that affect millions of people in countries of the developing and still be a challenge great for the health of human beings in the world (WHO, 2011). WHO data on the year 2011 showed that 43% of children, 38% of women ages productive, and 29% of women become pregnant experience anaemia as a global (WHO, 2011).

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Results of Research on Basic Health or Riset Kesehatan Dasar (RISKESDAS) in 2018 figures the incidence of anaemia in the year 2018 as 23.7%. the number has risen from the year before, namely in 2013 amounted to 2% of the original 21.7%. Figures that show that almost a quarter of the population of Indonesia experiencing anaemia. Figures rate of anaemia most a lot going on in women compared to men is at 27.2%. Percentage figures incidence of anaemia Based on groups of age at the age of 5-14 years which amounted to 26.8%. While at the age of 15-24 years amounted to 32.0% while by the place (Kementerian Kesehatan RI, 2018) live in rural figures incidence of anaemia amounted to 25.0%, the numbers are more substantial than in urban areas is 22.7% (Kemenkes RI, 2017).

The data indicate that the incidence of the still high number of anaemia in Indonesia, especially in adolescents. The data indicate that the incidence of the still high number of anaemia in Indonesia, especially in adolescents. One of the causes of the high number incidence of anaemia that is because they lack awareness of the public, especially teenagers, about the effort prevention of anaemia (Utari, Kostania, & Suroso, 2019) Efforts to overcome this, it is necessary to intervene in groups of adolescents and young adults by increasing adolescent knowledge about anaemia through health education (Purnomo, Murti, & Suriyasa, 2013). Education of health has a role that is very effective in improving the health of adolescents aged 14-16 years with increasing knowledge and changing attitudes they (Bandyopadhyay, Maiti, Dasgupta, & Paul, 2017; Purnomo et al., 2013).

Various attempts were made the government decrease the number of patients anaemia in adolescents includes the provision of Fe tablet, the establishment of counselling a friend of the same age in the program Services Health Care for Adolescents (PKPR) (Kemenkes RI, 2017) education and counselling nutrition (Fadila & Kurniawati, 2018). However, efforts have not been touched throughout adolescence because of the limited means and source power.

We can use the device application communication conference video for Health Education anaemia are online. The provision of information in the form of audio-visual through the media of social or are online (Siddiqui & Singh, 2016). It is in line with a research (Akram & Kumar, 2018) that the media social can provide knowledge in an easy and effective to their students, and the students were able to easily access the information or knowledge. So that makes it easier to provide information. The advantage of learning online is that it provides convenience and flexibility for teachers and students, especially to determine the schedule of learning online with not concerned with the location (Bower, Dalgarno, Kennedy, Lee, & Kenney, 2015).

Learning in the network (online) or online learning from home each is the choice, which is appropriate for students, especially amid the pandemic Covid-19's. It benefits, which can be obtained by students who do study it online, one of which can improve the performance of the students. Students are able to easily conduct a discussion that focuses on the topic of learning, such as classroom traditional or the like when the school (Davies & Graff, 2005). Based on the results of studies preliminary are done in SMP Al-Falah obtained by because the researchers are interested in doing research on the effect of educational health through the media online against the level of knowledge about anaemia in adolescent anaemia, especially in the junior Al-Falah Tlajung.

2. Method

The research used quantitative research with the design of a quasi-experimental with pretest-posttest control group design in April to June 2020 in the Junior High School of Al-Falah Tlajung. The population of the study is girls who suffered from anaemia (either mild, moderate, or severe). The population is obtained by doing the examination of blood haemoglobin levels using the Haemoglobin Test Strip Monitoring System on 63 female students. After obtaining the adolescent anaemia population as many as 49 people. Intake of the sample using the formula Lemeshow obtained samples of as many as 18 respondents, so the research is because researchers used two groups of the number of total samples as much as 36 respondents (1: 1 between the number of samples for a group intervention and control).

The division of samples of each class is done by using the technique of taking samples Proportionate stratified random sampling. Then, after obtaining the number of samples that will be taken in each class, next to taking samples of every class using Simple Random Sampling with agitation by random. After that, to determine or divide the group from the number of samples that have been obtained, the researcher uses systematic sampling by dividing it into 2, namely odd and even. Respondents with number sequences odd then include group intervention, and respondents with number sequences even included a group of control. For groups of intervention given the treatment in the form of education of health through the media online, while for group control are not given treatment. Previously, researchers made a WhatsApp group to make it easier to provide information related to research. Researchers provided research explanations and informed consent through the WhatsApp group. After the researchers did pretest at a time when that simultaneously and provide time for 10 minutes to do it. After the pretest was completed, the researchers provided health education through

online media, namely the application zoom meetings in the intervention group, while the control group was not given treatment. Then after finishing, a posttest was carried out in each group.

Techniques of collecting data on research is a questionnaire that made its own by the researchers, the questionnaire that has been created by researchers at the test by experts, and also do tests the validity and reliability. Validity test of instruments carried at Junior High School of Nurul Azman use-value Corrected item-total correlation each individual item questions reached a value of correlation > 0,361 valid based on the calculation of r table. Reliability test of a scale that is used in the knowledge of the Guttmat scale. Scale Guttmat is a form of scale dichotomy to test reliability use you Kruder Richardson (KR). The scale used in knowledge is the Guttmat scale. Reliability test results of 0.811. The data has been obtained by the investigators to be processed using SPSS software. Analysis Univariate on research this include the age of the respondents, history information, anaemia, value - average knowledge of respondents before and after the intervention. Analysis of data on the variable knowledge test Wilcoxon Sign Ranks with significance p-Value- < 0.05. Then, to test the two groups are not in pairs using the Mann-Whitney.

3. Findings and Discussions

3.1. Findings

The results of the study were based on the characteristics of the respondents

TABLE 1: Characteristics of respondents by age.

Group	Age	N	Mean	SD	Min--Max
Intervention	12	1	13	0.857	12–15
	13	5			
	14	8			
	15	4			
	Total	18			
Control	12	0	13	0.725	13–15
	13	5			
	14	9			
	15	4			
	Total	18			

Based on Table 1, the average age of respondents in the intervention and control groups is 13 years.

TABLE 2: Respondent characteristics based on historical information.

Question Items	Information	Group			
		Intervention i		Control	
		N	%	N	%
Health Education about <i>anaemia</i>	Ever	0	0	0	0
	Never	18	100	18	100
	Total	18	100	18	100

Based on Table 2, all respondents, both the intervention and control groups, have never received health education about anaemia.

TABLE 3: Haemoglobin levels (Hb) of respondent.

Group	Mean	SD	Min-Max
Intervention	11.4	0.3394	10.6–11.8
Control	11.4	0.3415	10.5–11.9

Based on Table 3, the average level of Haemoglobin (Hb) of respondents i.e. 11.4

TABLE 4: Distribution of anaemia level.

Variable	Category	Group			
		Intervention		Control	
		N	%	N	%
Anaemia	Light	16	88.9	16	88.9
	Moderate	2	11.1	2	11.1
	Weight	0	0	0	0
Total		18	100	18	100

Based on Table 4, In group intervention and control respondents who experienced anaemia light as much as 16 people (88.9%) and in the category of being in a group intervention and control respondents who experience anaemia as much as two people (11.1%).

Based on Table 5, in the intervention group and the control group, respondents who had less knowledge before being given intervention were 13 (72.2%), with sufficient knowledge as much as 5 (27.8%). Furthermore, after being given the intervention, it increased to 18 people (100%) in the intervention group. Whereas in the control group, respondents who had good knowledge after being given the intervention increased to 14 people (77.8%), while respondents who had sufficient knowledge in the control group after being given the intervention decreased to 4 people (22.2%).

Based on Table 6, the z value = -3,782 and the p-value = 0,000. It is demonstrated that Ho refused, and H1 accepted. So it can be concluded that there are differences

TABLE 5: Distribution of knowledge categories.

Group	Category				
		Before		After	
		N	%	N	%
Intervention	Well	0	0	18	100
	Enough	5	27.8	0	0
	Less	13	72.2	0	0
	Total	18	100	18	100
Control	Well	0	0	14	77.8
	Enough	5	27.8	4	22.2
	Less	13	72.8	0	0
	Total	18	100	18	100

TABLE 6: Results of analysis of intervention group.

Information	N	Mean	Z value	P-value
Pretest	18	8.67	-3.782	0.000
Posttest		13.56		

in the level of knowledge of adolescent anaemia at the time before (pretest) and after (posttest) do education health are meaningful (significant) in the group intervention.

TABLE 7: Results of analysis of control group.

Information	N	Mean	Z-value	P-value
Pretest	18	8.22	-3.750	0.000
Posttest		13.28		

Based on Table 7, the z value = -3,750 and the p-value = 0,000. It is demonstrated H_0 refused, and H_1 accepted. So it can be concluded that there are differences in the level of knowledge of adolescent anaemia at the time before (pretest) and after (posttest) do education health are meaningful (significant) in the group control.

TABLE 8: Results of analysis in the pretest and posttest.

Group	N	Mean rank	Z-value	P-value
Intervention	36	18.89	-0.231	0.817
Control		18.11		

Based on Table 8, it can be concluded is not any significant difference score of the average knowledge among groups of experimental and group control, in which a score of knowledge on a group experiment is higher than the group control and P-Value > 0.817 ($p > 0.005$).

3.2. Discussion

3.2.1. Respondent characteristics

According to (Widayatun, 1999) several factors affect knowledge of a person, one of which is a factor of age. Age effect on the power capture and patterns of thought someone. Further increases in the life of a person that is getting a lot of knowledge and experience are gained, increasing the maturity of the mental and intellectual. At the study's average age of respondents is 13 years in which the age of the entry into the category of age teens.

According to (Mubarak, Wahit, Nurul, & Supradi, 2007) some of the factors that affect the knowledge of one of them that information. (Notoatmodjo, 2018), states that knowledge is the result of sensing human, or results to know someone on the object through the senses that have (eyes, nose, ears, and so on). The results empirically and these whole respondents have not been getting the education of health-related anaemia.

Based on the research that is carried out by (Putri, 2018) required program giving tablet Fe, service extension either individuals, groups and communities especially teenage daughter by giving leaflets, advertisements or broadcast radio and television in the province of Jambi goal that respondents do not suffer from anaemia that serious that could life-threatening.

Based on the research (Mohamed, El-wahed, Tayel, & El-aziz, 2018) the results of the study show there is a relationship between the achievement of academic and anaemia are very significant, achievement academic students who suffer from anaemia 9.59 times much lower than students of non-anaemic or students who do not suffer from anaemia. Conditions have occurred since the functions of the body the first time exposed to the impact of the shortage of substances iron or anaemia is an enzyme of the brain that contributes to cognitive and behavioural (Soleimani & Abbaszadeh, 2011).

The study also showed the average percentile of IQ (16.0) of teens who deficiencies substance iron is deficient compared to compared with an average IQ (43.14) of adolescent non-anaemic non- deficiency of iron and differences in average IQ between 2 groups significant in statistics. Anaemia can affect adolescent cognitive function because neurochemical effects can affect the decline in learning, so that adolescents become less responsive and difficult to focus (Mohamed et al., 2018)

3.2.2. Knowledge

In tune with the research that is done by (Gafi, Hidayat, & Tarigan, 2020) showed that the results of the group given WhatsApp media treatment were 5.95 and after being treated with WhatsApp media became 6.95, which means that student knowledge increased after being treated with WhatsApp media. Increased knowledge after given educational health of anaemia is supported by the theory (Notoatmodjo, 2012), which suggests that the education of health is one of the factors that significantly influence knowledge. It is in accordance with Objective education health, namely that the change in attitude and behaviour of individuals, families, groups of specialists and people are getting an education of health in establishing and maintaining the behaviour of living healthy and contribute actively in efforts to realize and increase the degree of health that is optimal (Nursalam, 2015).

It is also supported by the theory of Edgar Dale who mentions that someone can absorb information from the visits and of what is heard as much as 50%, can be concluded that increasingly many senses are involved in the process of learning it will be more and much information that can be acquired and absorbed (Nurbadiyah & Wiwit, 2019).

3.2.3. Effect of health education to change knowledge respondents

It is caused due to the information that is submitted when the education of health delivered by the well so that the respondent can absorb the information that is given. Knowledge is very closely related to education, and improvement of knowledge is not obtained in education formal, will, however, also be obtained in education nonformal such as the provision of educational health by officers of health. Education affects the process of learning, is getting much information that is entered. It will be increasingly many also the knowledge that is gained about health (Budiman & Riyanto, 2013).

It is aligned with the research that is carried out by (Prasetya, Rochadi, & Lumongga, 2019) which shows the media social is significantly giving effect to the level of knowledge and attitude of students smokers towards prevention stain teeth by 68.4%, compared to teens who do not do the intervention with social media. This is in accordance with (Azwar, 2007), which states that training or health education can increase the value of knowledge and attitudes. This is also supported by Edgar Dale's theory which states that a person can absorb information from what is seen and from what is heard as much as 50%, thus concluded that even many senses are involved in the process of learning

it will be more and a lot of information that can be acquired and absorbed (Hidayah, Rusnaini, & Winarno, 2016).

3.2.4. Difference level knowledge in group intervention and control in the pretest and posttest

The condition is in accordance with the stage of development of children adolescents, according to Piaget, where past adolescence enter level operational formal. Teens would think the possibility of that happening the days in the future as a result of the actions of their (Wong, Hockenberry, Wilson, Winkelstein, & Schwartz, 2009) so that the teenager will look for information that occurs on himself using the facilities of learning it online as a way of self-reliance in learning (Muwardi, 2014).

It is aligned with research which takes place by (Salsabila, 2018) which provides education of health through the online messenger and WhatsApp messenger on the knowledge and attitude of the adolescent. The results of the research in the experimental group stated that there was a difference in the average score before and after being given treatment through the online Messenger media ($p < 0.001$) with an increase of 13.73 (pretest 8.85 and posttest 22.58). Meanwhile, the results of the study in the control group stated that there was a difference in the average score before and after being given treatment via WhatsApp Messenger ($p < 0.001$) with an increase of 11.88 (pretest 9.87 and posttest 21.75).

As well as the research that is carried out by (Kusuma, 2014), who performs interventions with the method or medium of different related anaemia. The results of the research are obtained values on average in the group of control experienced an increase although not significant, namely 17.05 into 17.16, while the value of the average in the group of experimental experienced an increase that is 16.3 becomes 18.6. It can be said that there is the addition of knowledge as doing counselling or education of health-related anaemia. The increase in respondents' knowledge and understanding was because respondents had received information in the form of health education. Information itself is one of the factors that can affect a person's knowledge (Mubarak et al., 2007).

4. Conclusion

Online learning using media zoom video conference/meeting can improve knowledge of adolescent anaemia amounted to 3.78, but after three weeks of study does not show

a difference which significant knowledge of adolescent anaemia amounted to 0.817 ($P > 0.05$) comparing to group control. Online learning is very appropriate given to support health education with remote location is spacious and participants that much to pay attention to the material and the characteristics of the participants as well as the need to do interactive during the activity takes place and cost effective. Further research needed careful about the methods of learning, strategies of communication teaching. It is also needed to test the posttest week 1 and week 2 to compare effectiveness of the online learning.

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