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IMPLEMENTATION OF AUDIOVISUAL TO INCREASE KNOWLEDGE OF ANEMIA IN ADOLESCENT GIRLS: A CASE STUDY

Case Study

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ABSTRACT

Introduction: *Effective and efficient media is needed to support nutrition education so that the information conveyed can be well received by its targets. Knowledge about anemia in adolescent girls is often underestimated, so the potential for the development of this disease continues. Lack of understanding about anemia in adolescent girls causes them to have unhealthy eating habits. One of the interesting media is video which includes the use of animated images, videos, or sounds (audio). The aim study is to investigate the effect of Anemia Prevention Education Using Animated Videos on Knowledge about Adolescent Girls at SMA N 15 Semarang.* ***Methods:*** *The case study method uses a descriptive design with a nursing process approach. The interventions were pre- and post-tests with a sample size of 10 respondents. The educational intervention used animated video media which was played for ± 10 minutes with 2 animated video series. The subjects of this case study are young women who were taken using purposive sampling techniques under the specified inclusion and exclusion criteria. Evaluation is measured using Hb levels before and after the session.* ***Results:*** *There was a significant change in participants' knowledge after using animated videos, namely being in a good category (≥10.* ***Conclusions:*** *The results of this study show that providing education using animation media effectively increases knowledge and Hb levels.*

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INTRODUCTION

Adolescence is an important factor in the human life process (lifestyle), which will affect biological and psychological aspects. When teenagers grow and develop physically very quickly, they need adequate nutritional intake to optimize their growth, and development (Soetjiningsih & IG. N. Gde Ranuh, 2018). It is easy for young women to experience anemia due to the menstrual cycle and increasing age. When teenage girls start menstruating, they lose twice as much iron as teenage girls who have not menstruated. Apart from that, young women tend to take care of their bodies by limiting food intake, such as vegetarianism. Lack of nutritional requirements for energy intake, such as carbohydrates, fat, protein, vitamin C (including proline and nicotine), causes anemia in young women due to irregular eating habits (Hidayah et al., 2022). Previous studies conducted at SMA NW Mataram, West Nusa Tenggara showed that before the implementation of health education, 18 respondents (56%) had a poor level of knowledge and there was a change in knowledge after being given health education in 17 respondents (53.1%). This proves that health education method is an effective way to increase health knowledge (Fujiyanti et al., 2019).

The government has begun to promote anemia prevention programs aimed at young women at middle school, high school and the like, as well as women who do not attend school as an effort to prevent the emergence of anemia due to nutritional problems. Based on 2018 Riskesdas data, between 2013 and 2018, the total number of anemia cases among teenagers aged 15 to 24 years increased from 18.4% to 32% or 14.7 million people. This is influenced by poor eating habits and lack of physical activity (Riskesdas, 2018).

Knowledge about anemia can influence eating habits and nutritional status. Knowledge is one of the factors that gives rise to intrinsic motivation (motivation that arises from oneself without encouragement from others). Knowledge about anemia in adolescent girls is often underestimated, so the potential for the development of this disease continues. Lack of understanding about anemia in adolescent girls

causes them to have unhealthy eating habits (Dewanti et al., 2021). Anemia is a condition caused by a lack of red blood cells or a lower hemoglobin concentration in the body. Hemoglobin is a component of red blood cells whose function is to bind oxygen and then distribute oxygen throughout the human body's tissues. The body's organs need oxygen to carry out their functions. When the oxygen supply to the brain and muscle tissue decreases, it causes a decrease in the ability to concentrate and an inability to carry out activities (Kemenkes RI, 2019).

Complaints such as easy drowsiness, weakness, tiredness, and lameness as well as dizziness and vertigo, pallor visible on the palms, skin, tongue, lips, and eyelids are very often found in young women suffering from anemia. In the short term, it will have an impact on reducing productivity and learning ability, while in the long term, it will have an impact on pregnancy and childbearing. Teenage pregnant women usually have the potential to suffer from severe anemia because being pregnant requires complex nutrition and if not treated immediately, there is a risk of having a baby with low birth weight (LBW) and other dangerous complications. The presence of LBW can result in stunting in babies born with this condition immediately, there is a risk of having a baby with low birth weight (LBW) and other dangerous complications. The presence of LBW can result in stunting in babies born with this condition (Roche et al., 2018).

Various actions can be taken to avoid and treat anemia in adolescents. Providing nutritional supplements such as folic acid and iron is one of several strategies for preventing anemia in adolescents that has been recommended by the World Health Organization (WHO). Iron supplementation could be the main treatment option for young women suffering from anemia in Indonesia. Apart from that, other approaches used include managing the community food system, optimizing diet, and food additives, providing probiotics, and nutrition education. Nutrition education and outreach as a way to prevent adolescent anemia aims to provide information to the younger generation about their special energy and nutritional needs, as well as the benefits of a healthier diet and lifestyle (Roche et al., 2018).

To support nutrition education and socialization, effective and efficient mass media is needed so that the information conveyed can be received appropriately by the target group. One interesting media is video. By using materials such as animated images, video, or sound (audio), health education training can be more attractive and enjoyable. Previous findings prove that old media, such as leaflets, booklets, and flipcharts, are less effective in use by the current generation. They emphasized that educational video media and simulation methods can increase teenagers' knowledge about anemia more effectively than traditional media (Anggraeni et al., 2020). Educational media that use animated videos are reported to be effective in attracting participants' attention, increasing enjoyment, satisfaction, and knowledge, as well as influencing their behavior due to longer retention of information (Greenlaw et al., 2021; Vandormael et al., 2021).

This has been proven by research conducted by (Sari et al., 2022), that animated videos about balanced nutrition can be used as a medium to prevent anemia among students, especially young women, whose average knowledge score is higher than the control group (p=0.0001). The average attitude score of adolescent girls who received anemia prevention treatment was higher than the attitude score in the control group (p=0.0001). Another study by (Aisah et al., 2022a), found that animated educational videos that were played three times significantly increased the knowledge of the intervention group (average scores: pre-test, 94; post-test one, 99; post-test two, 102) and it was concluded that the animated educational video significantly increased knowledge about anemia. This is supported by research (Musniati & Fitria, 2022) in educational activities to prevent anemia, that there is an increase in knowledge which can be a result of the use of various media. The training went smoothly and was able to increase young women's knowledge about preventing anemia.

Based on the background above, the researchers is interested in conducting a study on the case "The Effect of Anemia Prevention Education Using Animated Videos on Knowledge About Adolescent Girls at SMA N 15 Semarang"

MATERIALS AND METHODS

The case study method uses a descriptive design with a nursing process approach, namely the assessment process, nursing diagnosis, nursing intervention, nursing implementation, and evaluation. This case study was carried out through an educational intervention using animated video media to increase knowledge about preventing anemia in adolescent girls. The variable measured was the independent variable education with animated videos and the dependent variable was the knowledge of young women about anemia before and after the test.

The subjects of this case study are teenage girls at SMA N 15 Semarang using a purposive sampling technique with several inclusion criteria as follows: 1) Teenage girls aged 14-19 years in high

school, 2) Teenage girls with symptoms of pale anemia (Pale is identified as an abnormal skin color on the conjunctiva, lips, tongue, nails and palms), 3) Adolescent girls who are menstruating, 3) Willing to be respondents. There is also an exclusion criterion of the respondent to not present/being sick when the case study took place. The number of samples in this study was 10 people. The results will be displayed based on the evaluation of Hb levels before and after education is given.

This case study instrument measures anemia knowledge consisting of 20 questions. The questionnaire consists of anemia prevention items that were adapted and modified from previous case studies (Musniati & Fitria, 2022). Each question is given a value of 1, if the x value is 10 then it is categorized as good, if the x value < 10 then it is categorized as poor. Knowledge tests are carried out before and after education is carried out. The participants/ clients were previously given informed consent or an agreement sheet of willingness to be a study subject and was available to provide the data or information required in the case study. The activity is divided into 3 stages: namely opening 5 minutes, carrying out a 10-minute pre-test and checking vital signs as well as checking Hb and knowledge using a questionnaire before the intervention, followed by presentation of an animated video for ± 10 minutes consisting of two series, in the first series duration of 4 minutes 35 seconds contains education about the definition of anemia, signs and symptoms of anemia, causes of anemia and types of anemia and pathophysiology of anemia. Then continued with the second series which lasted 6 minutes 31 seconds containing education about the impact of anemia on young women and how to prevent anemia (Aisah et al., 2022). Subsequently, the second knowledge test continued after providing education using a questionnaire. Then, to see knowledge retention on day 29, the 2nd HB examination was carried out and the 3rd measurement of knowledge was carried out by re-evaluating the respondent's level of knowledge.

The information provided is only used for case study purposes. Educational intervention using animated video media is useful in increasing knowledge about preventing anemia in adolescent girls. In this intervention, there are no practices that endanger study subjects and have an Ethical Clearance (EC) Letter issued by the Health Research Ethics Commission, Faculty of Nursing and Health Sciences, Muhammadiyah University, Semarang, No.125/KE/02/2024.

RESULTS

The table above shows that out of 10 clients, only 2 clients experienced mild anemia (11.0-11.9 g/dL) while 8 clients did not experience anemia (≥11.9 g/dL). The two clients who experience anemia have different ages when they first menstruate. The results of the physical examination showed that client 1 had a blood pressure of 90/70 mmHg, pulse 78x/minute, breathing 18x/minute, a temperature of 36.3 Celcius, and had entered menstruation on day 2. The second client, Ms. K obtained the results of the physical examination to have a blood pressure of 100/60 mmHg, pulse 78x/minute, breathing 18x/minute, and a temperature of 36.3 Celcius. Both clients experienced mild anemia and had signs of moderate anemia such as a pale color on the conjunctiva, nails, lips, tongue, and palms. Both clients said they often felt dizzy, tired easily, and had difficulty concentrating when studying. The results of the case study based on the characteristic data of the two subjects obtained the following data:

Table 1. Characteristics of Respondents

Respondent's Initial	Current Age (years)	Age of first menstruation (years)	*Pre*-Hemoglobin*	*Post* Hemoglobin 29 days after education*	Days of Menstrual
Klien 1	15	12	10.23 g/dL (Mild Anemia)	12.30 g/dL (Non-Anemia)	2
Klien 2	15	8	10.95 g/dL (Mild Anemia)	12.10 g/dL (Non-Anemia)	1
Klien 3	15	12	12.45 g/dL (Non-Anemia)	12.30 g/dL (Non-Anemia)	3
Klien 4	15	12	12.5 g/dL (Non-Anemia)	13.10 g/dL (Non-Anemia)	4
Klien 5	16	12	13.4 g/dL (Non-Anemia)	12.0 g/dL (Non-Anemia)	4
Klien 6	17	13	12.25 g/dL (Non-Anemia)	13.5 g/dL (Non-Anemia)	5
Klien 7	16	13	12.00 g/dL (Non-Anemia)	12.4 g/dL (Non-Anemia)	6
Klien 8	17	13	12.35 g/dL	12.25 g/dL	6

Respondent's Initial	Current Age (years)	Age of first menstruation (years)	*Pre*-Hemoglobin*	*Post* Hemoglobin 29 days after education*	Days of Menstrual
			(Non-Anemia)	(Non-Anemia)	
Klien 9	16	13	12.5 g/dL (Non-Anemia)	12.35 g/dL (Non-Anemia)	3
Klien 10	17	13	12.85 g/dL (Non-Anemia)	12.35 g/dL (Non-Anemia)	3

Nursing diagnoses

The main nursing diagnosis that is raised is readiness to increase knowledge (D.0113), which has a sufficient and complementary definition, namely developing cognitive knowledge related to certain topics to achieve health goals. (PPNI, 2018) stated that knowledge is the result of curiosity or a feeling of wanting to know about a particular object which is obtained through the five senses, especially the eyes and ears. Knowledge is also a trigger factor for the development of open behavior. This is by previous research that anemia prevention education has a significant effect on the knowledge of young women obtained using animated video media with a p-value of 0.001 < 0.05 (Jihan Salsabila, 2023).

The main output of the diagnosis of readiness to increase knowledge (D.0113) is the level of knowledge (L.12111), which has a definition of the adequacy of cognitive information related to the topic of preventing anemia in young women with increased expectations, for the criteria for the results to be achieved, namely verbalization of interest in learning increased (5), the ability to be able to explain one's knowledge of a topic increased (5), behavior according to one's knowledge increased (5), wrong perceptions when faced with problems decreased (5), questions about the problems faced decreased (5) (PPNI, 2018b).

Intervention

The intervention provided is health behavior education (I.12435), which is education that teaches and facilitates behavioral changes that support health. At the observation stage, readiness and ability to receive information are determined. At the therapy stage, health education materials and media are provided; health education is planned according to agreement; then treatment of health problems is explained during training; health programs are socialized and taught in everyday life, teaching to identify goals achieved and recommend using available health facilities (PPNI, 2018a).

Implementation

This case study applies education using animated video media compiled by (Aisah et al., 2022b). to increase knowledge of anemia prevention among young women. The animated video is played for a total time of ±10 minutes, consisting of two series, the first series is 4 minutes 35 seconds long and the second series is 6 minutes 31 seconds long. The video contains general information on anemia such as definition, pathophysiology, signs and symptoms, and etiology. This was then continued with the re-administration of the questionnaire and discussion between the presenter and the young women.

Evaluation

The evaluation obtained after conducting education using animated videos by re-distributing questionnaires showed that there was a significant change in students' level of knowledge. The evaluation results are presented in the form of Table 2 as follows:

Table 2. Educational evaluation using animated video media about preventing anemia in adolescent girls

Respondent's IInitial	Knowledge			Delta
	Pre	Post 1	Post 2	
Klien 1	3	16	20	17
Klien 2	7	17	20	13
Klien 3	6	19	17	11
Klien 4	7	20	19	12
Klien 5	9	18	18	9
Klien 6	10	18	18	8
Klien 7	9	17	19	10
Klien 8	6	19	20	14
Klien 9	7	19	19	12
Klien 10	6	17	20	14
Average	**7**	**18**	**20**	
Enhancement		**11**	**13**	

The response from clients after providing education using animated videos can be seen that clients are quite active in asking questions and responding when they have questions. Clients also say they understand better how to prevent anemia. The results of the questionnaire which showed an increase in knowledge in 10 clients after implementation using animated videos were in the good category (≥10), the highest knowledge scores were in client 1, client 8 and client 10. and the average score between pre and post increased by value 13.

DISCUSSION

The adolescent age group is an aggregate group that brings complex changes to a person's life. Adolescence is a time when a person begins to search for identity, tries new things and is independent and free from dependence on their parents (Junita & Wulansari, 2021). When in the process of searching for their identity, not all teenagers' conditions are stable, so experts describe this as a period of storm and stress (Jaji & Natosba, 2023). Adolescence is a time when the environment has a big influence, including eating patterns, especially for teenage girls. A poor diet will certainly have an impact on nutritional problems, one of which is common, namely anemia (Junita & Wulansari, 2021).

Anemia is a condition when the body has a hemoglobin concentration or number of red blood cells that is smaller than normal. Fatigue, tiredness, lethargy, decreased thinking ability and productivity are signs and symptoms of anemia. Anemia that occurs during adolescence will have a negative impact in adulthood so one of the risks is that it can give birth to a generation that has nutritional problems (Cia et al., 2022). The Ministry of Health has attempted to prevent anemia by carrying out specific interventions by administering Blood Supplement Tablets (TTD) to adolescent girls and pregnant women. (Sari et al., 2022).

One way to prevent anemia in young women is by providing health education. Health education requires media to be used as a tool to convey messages and stimulate students to learn (Widiyasanti & Ayriza, 2018). Media, according to the definition in communication, is a learning strategy in conveying messages, or distributors which are passed on to targets so that a learning process can occur. Health education requires mass media to make the messages given interesting and easy to understand so that the target will be able to learn the message and be able to behave more positively (Widiyasanti & Ayriza, 2018).

The results of this case study show that the client showed an increase in knowledge from poor to good after receiving education through animated video media. With the average pre-education score being 7, the 1st post after education with a score of 18, then the 2nd post with a score of 20. Meanwhile, the difference in scores for clients 1 and 2 who experienced anemia was only 1 point after being given education. This research is in line with previous research which states that education regarding anemia prevention uses animated video media in teaching lessons so that it can increase teenagers' knowledge and understanding (Jihan Salsabila, 2023).

There are many ways that can be used to provide health education to teenagers to increase knowledge and information about menstruation. This information can be obtained from printed magazines, electronic media, parents and health workers (Hartati et al., 2019). In this study, the material presented is related to anemia using animated video media. During health education, clients will discuss anemia and what they experience so that young women will have good and correct knowledge about anemia. The use of animated videos as a medium in learning is because they can bring out elements of sound, images, movement and color, thereby arousing curiosity and curiosity so that they can increase the knowledge of young women (Jihan Salsabila, 2023).

Health education using videos to convey information has its appeal among teenagers. In line with previous studies which state that health promotion in adolescents is more effective using media that combines text, moving images, animation, and sound because the delivery of the material will be more interesting, not monotonous, and stimulate the brain to more easily understand or capture the information conveyed. This is in line with previous research which states that animated video media can effectively increase student learning motivation. The increase in student learning motivation due to the use of video media with sound and moving images makes students more interested in paying attention. Apart from that, learning with animated video media will make students interested and enthusiastic in learning so that it is easier to understand the material (Widiyasanti & Ayriza, 2018).

Based on previous research conducted by (Sari et al., 2022), there was a change in the level of knowledge of young women regarding anemia before and after being given nutrition education using motion graphics. Previous research also showed that there were significant changes in the level of knowledge before and after being given nutrition education using animation media. Another study proves that educational animated

videos are successful in transferring information to young women, as evidenced by an increase in the average level of knowledge. Watching interesting and informative animated videos is also reported to improve children's knowledge, long-term memory, adherence to taking medication for secondary prevention, and self-efficacy (Aisah ety al., 2022b).

The limitation of this case study is that the time is limited to only around 30 minutes, while the education implementation takes 40 minutes, this is because the education is carried out in between class hours, apart from that the atmosphere in the room is not conducive because the audience is too busy. There was a mixing between male and female students, so that the focus and concentration of female students during education is divided. Future researchers can develop monitoring related to changes in adolescent girls' behavior and carry out hemoglobin checks after providing education over a longer period.

CONCLUSIONS

The results of this case study show that providing education using animation media can be used to increase the knowledge of young women about preventing anemia.

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AUTHORS' CONTRIBUTIONS

The first author is responsible for collecting data, submitting research ethics, revising articles. The second author is responsible for creating research concepts, analyzing data, compiling, and translating articles.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest related to this study.

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