



## The Effect of PENEMIA (Prevention of Anemia) Video-Based Education on Anemic Pregnant Women on Changes in Knowledge and Attitudes

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### ABSTRACT

Pregnant women are a group that is very vulnerable to nutritional problems including anemia. around 41.8% of pregnant women are anemic worldwide. Lack of knowledge and attitudes are the main causes of anemia. This study aims to determine the effect of PENEMIA (Prevention of Anemia) video-based education for anemic pregnant women on changes in knowledge and attitudes at the Harapan Baru Community Health Center, Samarinda City. The research is a quasi-experimental design with one group pre-test post-test design carried out in May - June 2023 in the working area of the Harapan Baru Health Center, Samarinda City, East Kalimantan, Indonesia. A total of 36 anemic pregnant women were involved as respondents by determining inclusion and exclusion criteria. The data was then collected and analyzed using the Wilcoxon test. Our findings show that the difference in the level of knowledge of pregnant women before and after being given PENEMIA education obtained a p-value of 0.000. This means that there is an influence of PENEMIA education on pregnant women's knowledge. The attitudes show differences in the attitudes of pregnant women before and after being given education with a p-value of 0.000, which means there is an influence of nutritional education on the attitudes of pregnant women. PENEMIA educational videos are very effective in increasing the knowledge and attitudes of pregnant women. It is hoped that this education will continue in society.

### Key Messages:

- PENEMIA (Prevention of Anemia) educational videos are effective in increasing the knowledge and attitudes of pregnant women

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### Introduction

Iron Deficiency Anemia (IDA) causes a huge burden of disease worldwide. Globally, there were more than 1-2 billion cases of IDA in 2016. IDA is one of the five biggest causes of global health experienced over the years among women in 35 countries (1). Anemia, according to the World Health Organization (WHO) definition, is a condition where the red blood cell count and/or hemoglobin concentration is lower than normal (2). Anemia is a global health problem in all age groups. According to WHO, about 40% of pregnant women suffer from anemia. Iron deficiency anemia in general is caused by malnutrition [2]. WHO classifies anemia in pregnant women if the Hb concentration drops <7 g / dL is called severe anemia, 7.0 - 9.9 g / dL is called moderate, 10.0 - 10.9 d / dL is called mild, and 11 - >11 g / dL is called normal (3).

Anemia is one of the major public health problems globally with mixed consequences (4). Anemia during pregnancy is associated with some adverse effects for the mother and her fetus (5). This problem is also related to the high rates of maternal and infant morbidity and mortality globally, especially in developing countries (4). Anemia is a multifactorial disease. Maternal anemia is associated with maternal and child morbidity and mortality such as an increased risk of miscarriage, stillbirth, prematurity, and low birth weight in infants (6,7). Other impacts will affect the physical health and cognitive development of individuals leading to low productivity and poor economic development of a country (4).

Indonesia, based on the Basic Health Research Report (Riskesdas) in 2018 shows 48.9% of anemia in pregnant women. This figure experienced a high increase compared to the results of Riskesdas in 2013 of 37.1% (8). Meanwhile, provincially, the anemia rate in pregnant women in East Kalimantan in 2021 reached 17.3%. Based on data from the Health Health Office of Samarinda City the provincial capital in 2021, shows that 86.2% of the 14,803 pregnant women have received Blood Add Tablet. In addition, data was found that 10.6% of 14,803 pregnant women experienced anemia. The highest number of anemia pregnant women in Samarinda City is in Public Health Center Harapan Baru, which is 33.6% of 652 pregnant women. Studies suggest factors associated with anemia are knowledge, education, socioeconomic status, malaria, place of residence, birth distance, and delayed antenatal examination (4,9,10). Various efforts have been made to prevent and treat the occurrence of anemia in pregnant women but have not shown a significant decrease in anemia rates, one of the basic factors that cause anemia is still high is the low knowledge of pregnant women related to anemia so that it has a bad effect on the behaviour of pregnant women.

A person's or community's health behaviour is influenced by knowledge and attitudes. Good knowledge and a positive attitude can support the behaviour of pregnant women in making efforts to prevent anemia. Education about the prevention of anemia is one of the efforts that can increase knowledge and change attitudes in a positive so that in the end pregnant women can make various efforts to prevent anemia (11). Educational media is known in 2 methods, namely print media and audio-visual media. This is an example of media that can be used in nutrition education programs because this media can help the process of delivering information and receiving information for extension targets (12).

In this study, we used education in the form of videos called PENEMIA. PENEMIA is an abbreviation of Indonesian "Prevention of Anemia". This is a showcase of works and ideas named by the author. Preliminary studies on Video media have been carried out during the class of pregnant women at the Air Putih Health Center. Video is displayed through LCD on 20 mothers pregnant. In addition, pre-test and post-test were also carried out, it was found that there were significant differences. Based on the background description above, refers to the prevalence of anemia deficiency iron and its effects and prevention efforts. Therefore, researchers are interested in creating educational media through video media by researching the effect of PENEMIA (Prevention of Anemia) video education on anemic pregnant women towards changes in knowledge and attitudes at the Public Health Center Harapan Baru Kota Samarinda.

## **Methods**

A quasi-experimental study with one group pre-test post-test design where subjects were given a pretest first before being given an intervention and then ended with giving a post-test again after the intervention. The intervention carried out on the subject was the provision of education about anemia of pregnant women using the PENEMIA (Anemia Prevention) video for 5 minutes. This research will be conducted in May - June 2023. The research site was carried out in the working area of the Harapan Baru Health Center.

The population in this study was 40 anemic pregnant women in the working area of the new Harapan health centre. While the total sample was 36 pregnant women. Sampling-based on purposive sampling is to set special criteria for the population so that it is suitable as a sample. These criteria are known as inclusion and exclusion criteria. The inclusion criteria are anemic pregnant women who are domiciled in the Harapan Baru Health Center work area and anemic pregnant women whose gestational age is under 38 weeks and who are willing to be respondents. The exclusion criteria are anemic pregnant women who are sick and anemic pregnant women who are not willing to be respondents.

This study measured the impact of education on the knowledge and attitudes of pregnant women with anemia. Variables in this study include dependent variables and independent variables. The dependent variable in this study was the knowledge and attitude of pregnant women towards anemia, while the independent variable was developed using video media research methods. The knowledge of pregnant women studied in this study is the understanding of pregnant women about anemia, including various understandings of anemia, symptoms, signs, and how to prevent anemia. Use questionnaires to gain knowledge, if >76% then the score is higher, if 60-75% then enough, if <60% then less. While the attitude of pregnant women reflects the strong response or reaction of pregnant women to counselling material obtained through questionnaires, with scores of 76-100% good, 56-75% good, and <55% good. poor. Educational videos display the message or information that the communicator wants to convey during the socialization event.

Educational videos are works developed directly by the author based on ideas, concepts, and community needs. In Indonesian it is called "anemia" which stands for "prevention of anemia". The idea

is based on the author's desire to intervene differently from others. Therefore, the name of this education was patented as "Prevention of Anemia" as proof of work. This 5-minute video contains information about anemia. PENEMIA is a video of local products produced by the author for the benefit and needs of the wider community.

Univariate analysis is carried out from each variable from the results of the study in the form of frequency and percentage of each variable. The bivariate analysis uses a paired-T test on normally distributed data while non-normally distributed data uses the Wilcoxon test.

**Ethical Clearance:** Health Polytechnic Research Ethics Commission, Ministry of Health, East Kalimantan with number: DP.04.03/7.1/7843/2023.

## Results

Table 1 shows the characteristics of respondents based on age, dominated by the age range of 20-35 years, as many as 26 respondents (72%). The majority of respondents are not at risk of parity at 28 people (78%). The most pregnancy distance category is found over 2 years, namely 22 people (61%). While the most gestational age in the 3rd trimester is 18 people (50%). And the highest level of education in undergraduates is 14 people (39%). Finally, most respondents were found who did not work/become housewife, namely 21 people (58%).

**Table 1 Characteristics of Pregnant Women**

Characteristic	n	%
<b>Age Category</b>		
Be risk (<20 and >35 Years old)	10	28
No risk (20-35 Years old)	26	72
<b>Parity Category</b>		
Be Risk ( $\geq 4$ )	8	22
No Risk (<4)	28	78
<b>Pregnancy Spacing Category</b>		
<2 Years	14	39
>2 Years	22	61
<b>Gestational Age Category</b>		
Trimesters 1	6	17
Trimesters 2	12	33
Trimesters 3	18	50
<b>Category Education</b>		
Elementary/Junior High School	12	33
Senior High School	10	28
D3/D4/S1	14	39
<b>Job Category</b>		
Housewife	21	58
Self-employed	4	11
Private	7	19
Civil servants	4	11
<b>Total</b>	<b>36</b>	<b>100</b>

Table 2 shows that there is an increase in knowledge and attitudes in pregnant women before and after education. This is illustrated in the highest frequency when the pre-test is in the sufficient category, namely with 22 respondents (61%), the less category as many as 6 respondents (17%) and the good category as many as 8 respondents (22%), after education there was a change in the knowledge score about anemia of pregnant women which was categorized as sufficient, namely with 4 respondents (11%) and the good category as many as 32 respondents (89%). As for attitudes, it was found that the highest frequency during the pre-test was in the sufficient category, namely with 22 respondents (61%), the less category with as many as 6 respondents (17%) and the good category with as many as 8 respondents (22%), after education, there was a change in attitude scores regarding anemia of pregnant women which was categorized as sufficient, namely with 5 respondents (14%) and the good category as many as 31 respondents (86%).

**Table 2 Distribution of frequency of knowledge and attitudes of pregnant women**

Variable Distribution	Pre-test		Post-test	
	n	%	n	%
<b>Knowledge</b>				
Less	6	17	0	0
Enough	22	61	4	11
Good	8	22	32	89
<b>Attitude</b>				
Less	6	17	0	0
Enough	22	61	5	14
Good	8	22	31	86
<b>Total</b>	<b>36</b>	<b>100</b>	<b>36</b>	<b>100</b>

Table 3 describes the influence of educational variables on knowledge and attitude variables in pregnant women. Based on the test results, Wilcoxon Analysis on pre-test and post-test knowledge scores showed a value of  $p = 0.000$  which showed  $H_a$  was accepted and  $H_o$  was rejected. This shows that there is an influence of providing nutritional education using PENEMIA video media on the knowledge of pregnant women. Meanwhile, the attitude based on the results of the Wilcoxon Analysis test on the score showed that the value of  $p = 0.000$   $H_a$  was accepted and  $H_o$  was rejected, which means that there is an influence on providing nutrition education using PENEMIA video media on the attitude of pregnant women in the working area of the Harapan Baru health centre in Samarinda city.

**Table 3 Differences between the two variables of pre-test and post-test PENEMIA education**

Research Variables	Mean $\pm$ Std. Deviation		p
	Pre-test	Post-test	
Knowledge of Anemia of Pregnant Women	66.78 $\pm$ 11. 0 09	85.86 $\pm$ 6.355	0.000
Attitude of Anemic Pregnant Women	66.78 $\pm$ 11. 0 09	85.86 $\pm$ 8.926	0.000

## Discussion

The nutrition program at the Public Health Centre Harapan Baru is education or counselling about anemic pregnant women, chronic energy deficiency pregnant women (SEZ), monitoring stunting toddlers, malnourished toddlers, malnourished toddlers and so on. Public health center Harapan Baru has a class program for pregnant women but it has not been implemented because the funds needed have not been disbursed, so pregnant women are given education about Antenatal care. Some pregnant women do not routinely go to the Public health center due to administrative problems that make it difficult for the Public health center to record pregnant women, for that the researcher also took data from the Independent Practice Midwife who is still in the working area of the Harapan Baru Health Center. Video-based nutrition education is expected to contribute to increasing the knowledge and attitudes of pregnant women so that wrong perceptions can be corrected. Knowledge contributes greatly to the change in one's behaviour.

### The Effect of PENEMIA Education on the Knowledge of Pregnant Women

Knowledge is the result of knowing, occurring after people sense an object. The understanding of pregnant women about anemia assessed in this study includes understanding, symptoms, signs, and how to overcome anemia. Based on the results of the study, it is known that the average score before education is 66.78% which means enough, then after being given education using PENEMIA Video media, the knowledge of pregnant women increased by an average of 85.86%, which means there was an increase in knowledge by 19.08%. The results of the nonparametric analysis test using the Wilcoxon test obtained a p result of 0.000 which means education using PENEMIA Video media influences increased knowledge of pregnant women with anemia in the work area of the Harapan Baru Health Center. The results of this study are in line with the research of Retnaningtyas et al. (2022) in Malang which shows an increase in knowledge of pregnant women before and after education is carried out about their nutritional needs (13).

This result is corroborated by the distribution of knowledge of pregnant women obtained by the majority of pre-test results with sufficient categories (61%) while after the post-test the majority of knowledge becomes good (89%). Apart from that, we found that the category of maternal education

looks high, namely undergraduate (39%). According to the researchers' assumptions, the high level of education of pregnant women will give positive things to their knowledge. People with higher education levels are much more open to receiving information (14). Education level can affect a person's level of knowledge in accepting and understanding a topic. Acceptance of information received by a person who is highly educated is better and easily understands a given topic (15). This research is in line with the study of Mualifah et al. (2019) in Yogyakarta which shows higher education can affect greater knowledge resulting in the habit of maintaining better habits (14).

Knowledge is an important domain in shaping a person's behaviour. Behaviour based on good knowledge will produce good behaviour. A person's behaviour that is not based on knowledge makes it difficult to act and apply a healthy lifestyle, including meeting nutritional needs during pregnancy (13). Providing education in the form of information about the dangers and prevention of anemia, if pregnant women can understand anemia, their health behaviour will also increase so that they can avoid the risk of anemia during pregnancy (16).

In addition, we also assume an increase in knowledge of pregnant women based on their motivation and enthusiasm in participating in this counselling. The existence of video intervention builds a new cool atmosphere among pregnant women. This study uses tools in the form of PENEMIA Video media presented with images, dense sentences and accompanied by audio so as not to burden respondents in understanding it. This media was chosen as an educational tool because it has appeal in terms of audio and visual so that respondents are interested and expected to remember it. PENEMIA presents material and information that has been arranged well and interestingly so that it follows the needs of the research objectives. A recent study in Palangka Raya showed that video media is more effective in increasing the knowledge and attitudes of young women (17). Video is a medium that can be used to provide entertainment, documentation and education. In addition, videos can also be used to present information and explain and elaborate various things that can increase knowledge (18).

Pregnant women always need information to support decision-making regarding nutrition during pregnancy (19). Providing education in the form of information about the dangers and prevention of anemia, if pregnant women can understand anemia, their health behaviour will also increase so that they can avoid the risk of anemia during pregnancy (20). Anemia in pregnant women is a serious public health problem in developing countries, which has long-term consequences for women's health, the health of their children, and people's economic well-being (21). The Octaviana and Indrasari (2021) study states that the prevention and treatment of anemia in pregnant women by delivering important information to increase the knowledge of pregnant women to behave healthily so that anemia can be prevented as early as possible and if it has occurred, anemia can be treated immediately (22).

### **The Effect of PENEMIA Education on the Attitude of Pregnant Women**

Attitude is said to be an evaluative response. Evaluative response means that the form of reaction expressed as attitude is realized by the process of evaluation in the individual that gives conclusions to the stimulus in the form of good, bad, positive, negative, or unpleasant values (17). The results of the analysis using the Wilcoxon test showed a value of  $p = 0.000$ . This shows that there is a significant influence between the provision of nutrition education using PENEMIA Video media on the attitude of pregnant women in the work area of the Harapan Baru health centre. This research is in line with Herlinadiyaningsih and Arisani's (2021) research in Palangka Raya that there is a significant influence between education using videos on improving attitudes (17). The latest findings of Abu Baker et al. (2021) in Jordan show the influence of nutrition education on improving post-education attitudes (23).

This result was corroborated based on the distribution of variable frequencies obtained by the attitude response of pregnant women during the pre-test, the majority of which were in the sufficient category, namely with 22 respondents (61%), the less category as many as 6 respondents (17%) and the good category as many as 8 respondents (22%), after education there was a change in attitude scores regarding anemia of pregnant women, which was categorized as sufficient, namely with 5 respondents (14%) and the good category as many as 31 respondents (86%). There was an increase in the attitude category of pregnant women by 25% in the good category and no more responses were obtained from pregnant women with fewer categories. This research has proven the influence of nutrition education on knowledge in pregnant women. Good knowledge will manifest a good attitude as well. The Mualifah study (2019) suggests a change in attitudes in people who have gained knowledge (14).

In determining attitudes, knowledge, thoughts, beliefs, and emotions play an important role. This shows a relationship between changes in knowledge and attitudes where the higher a person's knowledge, the better his attitude will be (24). As in this study, when a higher knowledge score was obtained after counselling, the attitude assessment score of respondents was also higher. In determining

attitudes, knowledge, thoughts, beliefs, and emotions play an important role. This shows a relationship between changes in knowledge and attitudes where the higher a person's knowledge, the better his attitude will be (24). As in this study, when a higher knowledge score was obtained after counselling, the attitude assessment score of respondents was also higher.

This study aims to determine the influence of counselling using Video media on knowledge and attitudes in overcoming anemia problems in pregnant women at the Harapan Baru Health Center reason that pregnant women are the nation's asset for the creation of good future generations and the state of anemia has a bad impact, especially on fetal health so that knowledge about overcoming anemia problems is very important to be given so that Pregnant women know and have an attitude to prevent anemia problems in themselves. This anemia video media is given to increase the knowledge and attitude of respondents in overcoming anemia problems in pregnant women. Previous research has found that nutrition education in the form of videos on the prevention and treatment of anemia affects the attitudes of pregnant women (11).

At the time of the study, the use of Video media as an introduction to the material was well-received by respondents. The use of video media that is attractive clear and concise makes respondents easily understand the content of the message conveyed. This is shown by the difference in attitude scores between pre and post-education. Someone who has a good attitude towards nutrition will tend to behave well in meeting their nutritional needs, and vice versa. Less attitude towards the behavior of fulfilling nutritional needs if manifested in the form of behavior will lead to less nutritional intake which will be related to health problems. Whoever has an optimal pregnancy at this time is something very important, the health of the mother during pregnancy provides 2 benefits, for herself and her fetus (25).

Educational intervention is an effective method of continuous conduct (23). Videos are those that can be used to provide entertainment, documentation, and education. In addition, videos can also be used to present information, explain and elaborate various things, teach skills, abbreviate or extend time, to influence attitudes (18). A study concluded that nutrition education with Android-based application media affects attitudes (26).

In this study, in general, a change in attitudes can be caused by an increase in knowledge caused by the learning process. Information received as an attitude shaper because, with information, the object of information in this study is whether menarche can be received pleasantly or not. If the object is pleasantly received it will be believed and can further encourage good behavior. A person's exposure to information will affect knowledge and attitude formation (14). Education on the prevention and treatment of anemia in pregnant women is an effort to convey information about the importance of preventing and handling anemia can increase knowledge and attitudes to make it easier for pregnant women to behave healthily so that anemia can be prevented as early as possible and if anemia has occurred it can be handled immediately (11).

Providing education using PENEMIA Video media about pregnant women is a basic need needed by pregnant women to form their actions. In this study, the target who was educated using PENEMIA Video media was pregnant women with anemia problems and it was hoped that after a significant delay pregnant women could find out their condition while being able to prevent and overcome anemia with food planning following pregnancy conditions. Recent studies have shown that audio-visual-based education has a greater influence on knowledge change than other audiovisuals (18). Based on the Literature Review, it is stated that the provision of video nutrition education affects increasing knowledge of the media used in the delivery of nutrition education and can still be developed as needed so that the benefits are not only limited to cases of anemia (18).

Finally, we suggest that educational media that display images in the form of videos are more interesting and build an atmosphere of excitement in counselling. We observed the enthusiasm of the response during the counselling. Educational media by applying images and sound are better at providing information (20). Recent studies have shown that audio-visual-based education has a greater influence on knowledge change than other audiovisuals (18). Education is very effective in continuing to be developed among ordinary people. Technological advances, where all information can be accessed are not a guarantee for pregnant women to find health information. Nutrition education needs to be encouraged because it is key to increasing one's knowledge (27, 28).

Researchers realized that there were shortcomings in this study due to limitations that occurred when collecting data. The limitations experienced by researchers are data on pregnant women who experience anemia at the Harapan Baru health centre at the time of the study there are limited samples so researchers take data from the Independent Practice Midwife to increase the number of samples, but until the end of the study, the required samples were still not met. This results in the non-fulfilment of purposive sampling rules.

## Conclusion

There is an influence of nutrition education using PENEMIA video media on the knowledge and attitudes of pregnant women with anemia in the working area of the Public health centre Harapan Baru Kota Samarinda. This finding is empirical evidence that the education movement is still very much expected and needs to be promoted for the health and welfare of the community. We hope that education will be continued by the government.

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