THE EFFECT OF NUTRITIONAL COUNSELING USING ONLINE MEDIA (*NUTRILOVE*) ON THE NUTRITIONAL KNOWLEDGE OF PREGNANT WOMEN

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ABSTRACT

Anemia in pregnant women is a nutritional problem that has not yet been solved. The cause of anemia is directly due to the unavailability of sufficient nutrients in the body and indirectly caused by a lack of knowledge of pregnant women. This study aimed to determine the difference in the knowledge of pregnant women with lecture method counseling using the educational media Nutrilove website. This type of research is a quasi-experimental non-randomized control group pre-test post-test design. The sample consisted of 24 pregnant women in Wandanpuro Bululawang Village who were divided into 2 groups, the control group consisted of 12 pregnant women who were not given any intervention and the intervention group consisted of 12 people who were given lectures using the Nutrilove website media. The knowledge score was carried out 2 times, before and 3 weeks after the intervention and grouped into 3 categories, good, sufficient, and poor. Statistical tests used paired sample t-test and independent t-test. There was a significant difference in knowledge before and after intervention (p=0.005) and a significant difference in the knowledge of pregnant women between the control group and the treatment group (p=0.001). The counseling method using the Nutrilove website media can increase pregnant women's knowledge about the importance of consuming iron and folic acid in preventing anemia.

Keywords: folic acid, iron, knowledge, pregnant women, website

INTRODUCTION

Meeting the nutritional needs of pregnant women needs to be done appropriately because pregnant women who lack nutritional intake will affect the fetus which will have a negative effect on both the mother and the fetus in the womb. Unmet nutrient intake for pregnant women will have harmful impacts on the mother, one of which can cause anemia. Anemia is a nutritional problem that can be experienced by all age groups ranging from toddlers, adolescents, pregnant women, and the elderly. Based on WHO data in 2019, the global prevalence of anemia is 36.5% in pregnant women. According to Riskesdas (2018), the prevalence of anemia in pregnant women in Indonesia reached 48.9%. This percentage increases when compared to Riskesdas data in 2013 which showed the percentage of anemia in pregnant women in Indonesia was 37.1%. The causative factors of anemia can be different for each age group. In general, anemia is caused by the unavailability of nutrients in the body that play a role in the formation of red blood cells. The biggest cause of anemia in Indonesia is lack of iron, folic acid, and vitamin B12 (Citrakesumasari, 2012).

Anemia is caused directly due to lack of consumption of nutrients, especially iron and folic acid. Indirectly, anemia is caused by lack of knowledge in pregnant women. Various efforts have been made in preventing and overcoming the occurrence of anemia in pregnant women. The government provides blood added tablets (TTD) which is prioritized for at least 90 days during pregnancy because the prevalence of anemia in pregnant women is still high. Another effort that has been made to prevent anemia in pregnant women is by providing counseling and education about nutrition for pregnant women to enable them to change eating habits to be healthier and more balanced. Counseling that has been carried out to increase knowledge in pregnant women uses leaflets, turning sheets, booklets, and animated videos.

As many as 30% of pregnant women in Wandanpuro Village are included in high-risk pregnant women, one of which is caused by anemia. Pregnant women have received counseling at posyandu with leaflet media about the importance of consuming blood-added tablets during pregnancy, but the number of pregnant women suffering from anemia has not decreased.

Based on the above background, researchers are interested in conducting research on differences in nutritional knowledge of pregnant women before and after counseling with *online media* (*nutrilove website*) about the importance of iron and folic acid consumption in preventing anemia in Wandanpuro Village, Bululawang District.

METHOD

This type of research is *quasi-experimental* with *a non-randomized control group pretest-posttest design*. The research was conducted in Wandanpuro Village, Bululawang, Malang Regency. The population in this study was all 31 pregnant women. The sample needed in this study was 24 people who were used using the Slovin formula. Sampling using *purposive sampling techniques* that meet the inclusion requirements is then taken randomly. Inclusion criteria include pregnant women with a gestational age of less than 36 weeks, having a smartphone that is able to access the internet, being able to read and communicate well, and being willing to follow the entire series of research. The exclusion criteria are pregnant women who are sick and cannot participate in research, move house, and drop out because they do not participate in complete activities.

The independent variable in this study is the knowledge of pregnant women, while the dependent variable is counseling using the Nutrilove website media. Data collection through interviews with the help of questionnaires includes data on the characteristics of pregnant women (name, mother's age, gestational age, mother's education, and mother's occupation) and knowledge of pregnant women. The mother's knowledge questionnaire consists of 30 questions. The level of knowledge of mothers is grouped into good if the respondent's score > mean

score + 1 SD, enough if the score is -1 SD < the respondent's score < the mean score + 1, and less if the respondent's score < the mean score - 1.

The data were analyzed using the paired t-test statistical test with a meaning limit of $\alpha=0.05$. The analysis was used to determine the difference in the value of knowledge before and after education was given in the treatment group and without education in the control group. Furthermore, an independent t-test was carried out to determine the difference in knowledge between the control group and the treatment group. This research has received ethical approval from the Poltekkes Research Ethics Commission of the Ministry of Health Malang Number 650/KEPK-POLKESMA/2022.

RESULTS AND DISCUSSION

The characteristics of pregnant women are seen in Table 1. The average age of the control group respondents was 29 years with the youngest pregnant women 23 years old and the oldest 36 years old. The treatment group had an average age of 29 years with the youngest pregnant women 24 years old and the oldest 38 years old. The majority of pregnant women aged 26-35 years in the control group were seven people (58.3%) and in the treatment group as many as nine people (75%).

The gestational age of pregnant women was mostly in the range of 25-35 weeks in the control group (50%) and balanced in the gestational age range of 13-24 weeks and 25-35 weeks in the treatment group (41.7%).

Most respondents had a high school education level with details of 58.3% in the control group of seven people and 50% in the treatment group of six people. The majority of pregnant women had jobs as housewives with details of 83.3% in the control group and 75% in the treatment group.

The distribution of knowledge levels of pregnant women before and after intervention can be seen in Table 2. The level of knowledge of respondents in the control group before treatment was given as many as three people with good knowledge (25%), seven people with sufficient knowledge (58.3%), and two people with less knowledge (16.7%). After three weeks without treatment, the level of knowledge of pregnant

Table 1. Characteristics of pregnant women respondents in Wandanpuro Bululawang Village

Characteristic	Control Group		Treatment Group	
	n	%	n	%
Mother's Age				
17-25	4	33.3	2	16.7
26-35	7	58.3	9	75
36-45	1	8.3	1	8.3
Sum	12	100	12	100
Gestational Age				
1-12 weeks	1	8.3	2	16.7
13-24 weeks	5	41.7	5	41.7
25-35 weeks	6	50	5	41.7
Sum	12	100	12	100
Mother's Last Education				
Graduated from elementary school	1	8.3	0	0
Graduated from Junior High School / equivalent	2	16.7	2	16.7
High school graduation/ equivalent	7	58.3	6	50
College	2	16.7	4	33,3
Sum	12	100	12	100
Mother's Work				
IRT	10	83.3	9	75
Teacher	0	0	1	8,3
Private	1	8.3	1	8,3
Self employed	1	8.3	1	8,3
Sum	12	100	12	100

women in the control group was in the good category of one person (8.3%), seven people with sufficient knowledge (58.3%), and four people with less knowledge (33.3%).

The level of knowledge of pregnant women in the treatment group before being given the intervention was good as much as one person (8.3%), enough as many as nine people (45%), and less as many as two people (16.7%). Meanwhile, after being treated in the form of education using the Nutrilove website media, an increase in knowledge was obtained in pregnant women, namely the number of pregnant women with good knowledge increased to six people (50%) and enough knowledge as many as six people (50%).

Increased knowledge before and after the intervention due to respondents' compliance in reading articles and understanding the material on the Nutrilove website provided. The increase in knowledge itself is influenced by several factors, namely, education, personal experience or others, mass media and the environment (Notoadmojo, 2012). Knowledge indicators are the results of obtaining information from all questions to pregnant women about the importance of iron and folic acid consumption listed on the questionnaire. Respondents' nutritional knowledge was assessed in answering 30 questions asked in the knowledge test. Each statement is given a score of 1 (one) if the respondent's answer is correct and 0 (zero) if the respondent's answer is incorrect. Once calculated, the correct score is divided by the total score and multiplied by 100. The highest score is 100 (if all respondents' answers are correct) and the lowest score is 0 (zero).

Questions are asked related to the understanding of anemia, the characteristics of anemia, how to overcome anemia, understanding iron and folic acid, the benefits of iron and folic acid, the need for iron and folic acid, foods containing iron and folic acid. Respondents' answers are scored and scored. The results are divided into three, namely good, sufficient, and less as can be seen in Table 2.

Before the intervention in both the control group and the treatment group of 24 people, respondents answered the most wrong questions about how to prevent anemia in pregnant women, foods that are not sources of folic acid, and the

Table 2. Distribution of knowledge of pregnant women before and after the intervention

Knowledge Level	Control Group				Treatment Group			
	Before		After		Before		After	
	n	%	n	%	n	%	n	%
Good	3	25	1	8.3	1	8.3	6	50
Enough	7	58.3	7	58.3	9	75	6	50
Less	2	16.7	4	33.3	2	16.7	0	0
Sum	12	100	12	100	12	100	12	100

adverse effects of folic acid deficiency during pregnancy. There were 21 mothers who answered incorrectly (87.5%) and only three mothers answered correctly (12.5%).

On the question of how to prevent anemia in pregnant women, mothers who answered incorrectly came from mothers with the age group of 17-25 years as many as five people (23.8%), 14 mothers came from the age group of 26-35 years (66.7%), and two came from the age group of 36-45 years (9.5%). On the question of food ingredients that are not sources of folic acid, mothers who answered incorrectly aged 17-25 years were five people (23.8%), 14 people aged 25-36 years (66.7%), and two aged 36-46 years (9.5%). On the question of the adverse effects of folic acid deficiency during pregnancy, mothers who answered incorrectly aged 17-25 years were as many as six people (28.6%), 26-35 years old 14 people (66.7%), and 36-46 years as many as two people (9.5%). An individual's actions or behavior will change with age. The older a person is, the more mature he will be in performing actions (Notoatmodjo, 2012).

Of the 21 respondents who answered incorrectly on the question of how to prevent anemia in pregnant women, one person had an elementary school education (4.8%), four people had a junior high school education (19%), 10 people had a high school education (47.6%), and six people had a college education (28.6%). On the question of food ingredients that do not contain folic acid, 21 respondents answered incorrectly as many as one person with elementary school education (4.8%), three people with junior high school education (14.3%), 11 people with high school education (52.3%), and six people with college education (28.6%). In the case of the adverse effects of folic acid deficiency on pregnant women, as many as one person with elementary school education (4.8%), four people with junior high school education (19%), 11 people with high school education (52.3%), and five people with college education (23.8%). The higher a person's knowledge, the better they will be compared to a low level of education (Notoatmodjo, 2012).

Pregnant women who answered incorrectly on the question of how to prevent anemia were mostly housewives as many as 16 people (76.2%), teachers

as many as one person (4.8%), private as many as two people (9.5%), and self-employed as many as two people (9.5%). In the matter of foodstuffs that are not sources of folic acid, the majority as housewives as many as 18 people (85.7%), teachers one person (4.8%), private one person (4.8%), and entrepreneurs one person (4.8%). The majority of mothers who answered incorrectly about the adverse effects of folic acid deficiency and pregnant women work as housewives as many as 17 people (81%), private as many as two people (9.5%), and self-employed as many as two people (9.5%).

After the intervention, there was an increase in knowledge in the treatment group. Of the 12 people in the treatment group, eight (66.7%) had an increase in correct answers. Pregnant women who experienced an increase in answering questions to be correct had a high school education of 6 people (50%), S1 as many as one person (8.3%), and S2 as many as one person (8.3%). The education level of respondents is one of the factors that affect the knowledge of pregnant women. According to Notoatmodjo (2014), the factor that has the greatest influence on a person's knowledge is education, because someone with a high education can give a more rational response to the information received (Damayanti & Sofyan, 2022).

However, the education level of respondents varies from elementary school, junior high school, high school, and college so that mothers' knowledge is not only influenced by education but also influenced by other things, one of which is individual experience, namely exposure to information provided through the Nutrilove website. Researchers conducted research for three weeks, every week researchers monitored pregnant women two times to ask whether they had read the content on the website and conducted questions and answers and discussions related to the content of the content at the end of the week. Through questions and answers and discussions carried out, these can help pregnant women to better understand the content on the website so that the level of knowledge of pregnant women in the treatment group increases.

Table 3 shows that the average knowledge score in the control group during the pre-test was 33.90 with a standard deviation of 12.709 and the

Table 3. Average knowledge score of respondents before and after counseling

Variable	Group	Pretest Average ± SD	Posttest Average ± SD	Δ1	P
Knowledge	Control	33.90 ± 12.709	31.66 ± 11.335	2.24	0.217
	Treatment	39.44 ± 11.530	53.34 ± 15.960	13.9	0.005
	Δ2	5.54	21.68		
	P	0.275	0.001		

post-test mean was 31.66 with a standard deviation of 11.335. The value of knowledge before and after without treatment decreased by 2.24. Based on the results of the paired t-test in the control group, there was no significant difference in the average knowledge score between the pre-test and post-test (p = 0.220).

The average knowledge score in the treatment group during the pre-test was 39.44 with a standard deviation of 11.530. After the intervention, the average knowledge score became 53.34 with a standard deviation of 15.960. The value of knowledge before and after the intervention using the Nutrilove website increased by 13.9.

The paired t-test results showed a significant difference in the average knowledge score between the pre-test and post-test (p = 0.005) in the treatment group. These results prove a significant difference before and after counseling with the Nutrilove website media on the knowledge of the importance of folic acid and iron consumption in preventing anemia in pregnant women.

The results of the independent t-test showed that, between the control group and the treatment group, there was no significant difference (p = 0.274) in the value of knowledge of pregnant women at the time of the pre-test with the difference in the pre-test value of the control group and treatment of 5.54. Meanwhile, during the post-test, the knowledge value of pregnant women between the control group and the treatment group showed a significant difference (p = 0.001) with a difference in knowledge value of 21.68. This shows a significant difference in knowledge between the treatment group given counseling with the Nutrilove website media and the control group.

Based on Table 3, there was no significant change in the knowledge value of pregnant women between pre-test and post-test in the control group because the control group was not given any

education by the researcher so that there was no change in knowledge in pregnant women. Pregnant women who are members of the control group may still not have awareness and interest in the questions given. This is due to the absence of stimulus given to the control group so that there is no learning process that can affect in increasing maternal knowledge. This was evidenced when conducting interviews, researchers offered and invited respondents to gather at the meeting place because there would be counseling about the importance of iron and folic acid consumption in preventing anemia but they were not willing because they were not interested in coming to participate in this counseling activity. Even after filling out the pre-test, respondents did not have the initiative to ask questions related to the questions asked in the pre-test questions.

Apart from the source of information on the Nutrilove website, the same information is also provided in other sources either through websites, booklets, or other information media that are already available. However, it is possible that, because the absence of awareness and interest affects low curiosity, the knowledge value of pregnant women in the control group has not changed significantly. Because there was no stimulus given to pregnant women in the control group carried out by researchers and there was no interest or initiative to seek information from other sources, the level of knowledge was still not reached.

The difference in knowledge with the Nutrilove website media in pregnant women on the importance of iron and folic acid consumption in preventing anemia in the treatment group and the significant difference between the knowledge of pregnant women in the control and treatment groups proves that the Nutrilove website can

affect the difference in the level of knowledge of pregnant women.

This is in line with research (Aljraiwi,2017) with female student respondents at Princess Nourah bint Abdulrahman University which stated that the use of website-based learning media makes it easier for respondents to learn because website applications can be accessed anytime and anywhere with various media   such as personal computers, smartphones, and tablets. The research also stated that respondents who used learning media with websites provided feedback and were good and more active in asking questions compared to respondents who study conventionally or without using websites. Likewise, in this study, the treatment group had greater initiative to ask questions than the control group.

In research by DeBar et al. (2008), as many as 50% of respondents used website media with the aim of finding information related to healthy diet and exercise for teenagers. This is characterized by increased calcium consumption and increased physical activity of respondents after utilizing website media. This is supported by research by Moradi et al. (2017) in female high school students who stated that the average score of students' knowledge and behavior increased after being given an intervention using website media about efforts to prevent anemia.

Astutik et al. (2021) also stated that there was a significant increase in the knowledge of postpartum mothers on infant and child feeding using the website in the Peristi Inpatient Room of RSUD Sidoarjo. This research is supported by (Farikhah,2021) who states that educational media that lined up infographics and web with balanced nutrition material show a good response rate as shown by changes in knowledge, intake, attitudes, and practices of balanced nutrition in IAIN Kudus students. The research is also in line with   Aisfa (2020) who states that there is an increase in the value of knowledge before and after education using the Stunting Early Detection (DDS) website on the knowledge of mothers about stunting under five at the Bareng Health Center. Ernawati et al. (2022) stated that there was an increase in knowledge, attitudes, and behavior among respondents of young women at SMA

12 Makassar using the website *She Smart* about anemia education.

This study is not in line with research by Abuidhail et al. (2019) which stated that there was no significant increase in knowledge in third trimester pregnant women who were given education using prenatal websites about breastfeeding education when compared to the control group. However, this prenatal website contributes to improving the self-efficacy of breastfeeding. This is not in line with research by Huang et al. (2007) which stated that pregnant women with a gestational age of 29-36 weeks who were given a website-based educational intervention had a higher knowledge score about breastfeeding compared to the control group who were not given the intervention. In addition, web-based breastfeeding education also has a significant influence on the attitude of pregnant women.

Counseling using the Nutrilove website media can help respondents understand the material because of the direct recognition of objects through the senses of the eyes and ears. Knowledge is the result of knowing that occurs after sensing a certain object (Notoadmodjo, 2014). The more senses used, then the better the object's acceptance of the material delivered (Wulandari, 2017 in Handayani et al., 2022). The introduction of material through the Nutrilove website is a stimulus that is then received by pregnant women into availability for action. Pregnant women in the treatment group have awareness and interest in participating in counseling activities. Because of the awareness and interest, they have curiosity and start learning because they feel they need the information provided in the article on the Nutrilove website. Finally, with the support of facilities in the form of this website, it has an effect on individuals in the form of changes in knowledge (Khomsan &; Firdaus, 2022).

These results were obtained because the counseling method with the Nutrilove website can help stimulate the sense of sight because it presents information that has been prepared to be conveyed and discussed together during the meeting. In addition, the existence of counseling media helps pregnant women respond to information according to the perceiving power of the five senses. Pregnant

women can also access the media provided, namely the Nutrilove website wherever they are so that the information received by mothers is maximized. This is evidenced by interviews through the WhatsApp application whether the website has been used by mothers at home and all mothers in the treatment group use the website well as evidenced by the activity of re-reading articles on the website when at home and questions and answers between pregnant women and researchers related to the information discussed on the Nutrilove website via WhatsApp.

According to Notoatmodjo (2012), educational media can generate interest in the intended target, achieve many targets, facilitate the provision of health information, facilitate the receipt of information appropriately by objects, motivate objects to carry out the messages that have been conveyed, and help to reinforce the knowledge gained so that it is stored longer in memory.

CONCLUSION

There is an influence of nutrition counseling on the knowledge of pregnant women between before and after intervention in the treatment group with the Nutrilove website media.

Suggestions: the posyandu can apply counseling using the Nutrilove website media as a new counseling medium in increasing the knowledge of pregnant women. In addition, it is necessary to conduct research on other variables such as attitudes, behavior, and consumption levels using the Nutrilove website extension media to determine their influence on these variables.

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