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The Relationship of Behavior Towards Nutrient Intake and the Incidence of Anemia in Pancar Bakti Middle School Students

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ABSTRACT

Anemia is a condition characterized by a decrease in the number of red blood cells or a decrease in the amount of hemoglobin in the blood. Anemia is a significant health problem among adolescents. This study aims to determine the relationship between anemia behavior and iron intake in Pancar Bakti Middle School female students. This research used a cross-sectional approach which was carried out from January to February 2024. The research was conducted on female students at Pancar Bakti Middle School, Bogor with a sampling technique using total sampling, namely 41 female students. All female students had their knowledge, attitudes, and behavior measured using a questionnaire and Hb (Hemoglobin) was measured using the Easy Touch GCHb. Univariate analysis based on respondent characteristics showed that of the 41 female students, most were 17 years old (41.5%), mother's education was junior high school graduate (41.5%), the father's education was junior high school graduate (48.8%), mother's employment status was housewife (85.4%), the father's employment status is self-employed (85.4), the source of information about anemia is that most people get it from the family (39.0), then there are 35 female students (85.36%) experiencing anemia, while 6 female students (14.64%) did not experience anemia. Bivariate analysis using the chi-square statistical test showed insignificant results with a p-value> 0.05 for the variable, namely the mother's level of knowledge regarding anemia (p = 0.646). Significant results with a p-value <0.05 were obtained for the variables, namely attitudes regarding anemia (p = 0.024), and actions towards anemia (p = 0.000). Conclusion is the level of education, economy, and sources of information about anemia that influence the incidence of anemia in adolescents. There is a relationship between attitudes and actions and the incidence of anemia. There is no relationship between knowledge and the incidence of anemia.

Keywords: anemia, teenagers, knowledge, attitudes, behavior

INTRODUCTION

Anemia is a widespread health problem affecting individuals of all ages, especially teenagers.[1,2] The prevalence of anemia in young women is quite high, caused by various factors, including behavioral patterns. According to Riskesdas in 2018, it was recorded at 26.8% of children. aged 5-14 years suffer from anemia and 32% of those aged 15-24 years.[3] According to the World Health Organization (WHO) anemia is defined as a condition characterized by a decrease in the number of red blood cells or

a decrease in the amount of hemoglobin in the blood.[4] This is often caused by inadequate iron intake, poor iron absorption, or increased iron requirements during periods of rapid growth or menstruation.[5]

Adolescent girls are more susceptible to anemia for several reasons. First, poor dietary habits and inadequate nutrition are common in this age group. Many girls eat foods that lack important nutrients, especially iron-rich foods such as red meat, green vegetables, and nuts. This deficiency can cause anemia over time.[2,3,6] Second, menstruation plays an important role in the development of anemia among adolescent girls. Blood loss during menstruation results in a loss of iron which needs to be replenished through proper food intake. However, lack of awareness and knowledge regarding the importance of iron-rich foods during menstruation often causes iron deficiency anemia.[7,8]

Additionally, certain behaviors can also contribute to the development of anemia. A sedentary lifestyle including a lack of physical activity or excessive screen time can lead to decreased appetite and reduced iron intake. In addition, unhealthy behaviors such as smoking and alcohol consumption can interfere with the absorption and use of iron in the body, thereby worsening the risk of anemia.[9,10] Anemia is a significant health problem among adolescent girls, including those attending Pancar Bakti Middle School. Poor dietary habits, inadequate nutrition, insufficient iron intake, and certain behavioral patterns contribute to the incidence of anemia in this demographic. Understanding the relationship between behavior and anemia can help develop targeted interventions and educational programs to promote healthier lifestyles and reduce the prevalence of anemia among middle school girls.

LITERATURE REVIEW

Anemia

Anemia is a health problem throughout the world, especially in developing countries where it is estimated that 30% of the world's population suffers from anemia. Anemia occurs frequently in society, especially in adolescents. Adolescent girls are one group that is prone to suffering from anemia. Therefore, the target of the nutritional anemia prevention program has been developed, namely to reach young women in middle school, high school, and equivalent, as well as women outside of school as a strategic effort to break the cycle of continuous nutritional problems.[11] Anemia is often called KD (insufficient blood), which is a condition where the Hemoglobin (Hb) level in the blood is less than normal (< 12 gr/dl) which results in a decrease in endurance, body fitness, learning ability, and concentration, and inhibits growth and development and is dangerous. pregnancy in the future.[12]

Anemia can be grouped into three categories, namely, mild anemia if the hemoglobin level in the blood is around 9-10 g%, moderate anemia if the hemoglobin level in the blood is around 7-8 g%, and severe anemia if the hemoglobin level in the blood is less than 12 g%. of 7 gr %. Morphologically (according to the size of the red blood cells and hemoglobin they contain), anemia can be grouped into: 1) Macrocytic, 2) Microcytic, and 3) Normocytic.[13] There are several factors that cause anemia in adolescent girls, including menstrual patterns, poor diet, worm infections, the habit of consuming tea or coffee after meals, sleep duration, lack of vitamin C intake, and economic factors.[14]

ymptoms of anemia are usually Lethargy, Weakness, Tiredness, Tiredness, Loss of sleep (5L), often complaining of dizziness and dizzy eyes. Further symptoms are that the eyelids, lips, tongue, skin and palms become pale. Apart from being characterized by weakness, fatigue, lethargy, shortness of breath, and pale face, anemia sufferers are also characterized by difficulty concentrating and fatigue or excessive tiredness. Symptoms of anemia in general are as follows: Fatigue quickly, Pale (skin, lips, gums, eyes, nails, and palms), Fast heartbeat when doing light activities, Shortness of breath when doing light activities, Pain in the

chest, Dizziness and cloudy eyes, Irritability (easily fussy in children) and Cold or numb hands and feet.[15]

Iron deficiency anemia is the end result of a long-lasting negative iron balance. If this negative iron balance persists, it will cause iron reserves to continue to decrease. The following are 3 stages of iron deficiency: 1) iron depletion or store iron deficiency, 2) iron deficient erythropoietin or iron limited erythropoiesis; 3) iron deficiency anemia.[16]

Fortification of substances or the addition of iron to foods generally consumed by the public is the backbone of several countries. This is very effective in helping overcome iron deficiency which often occurs in society.[17]

Anemia can cause effects such as: 1) Anemia causes the body's immune system to decrease. As a result, anemia sufferers will easily get infections. It's easy to get colds, flu, or get respiratory infections easily, the heart also gets tired easily, because it has to pump blood more strongly, 2) Anemia can disrupt the growth and development process and even the development of thinking will also be disrupted and make you susceptible to disease, 3) Impaired wound healing, 4) The ability to regulate body temperature decreases, 5) Reduces the ability to concentrate, 6) Reduce workability, 7) If pregnancy occurs, there is the potential to give birth to a baby with low birth weight (LBW) and also bleeding and death during childbirth.[18]

MATERIALS & METHODS

Research Types and Designs

The research was conducted using analytical methods with a cross-sectional approach.

Location and Time of Research

This research will be conducted in January-February 2024 at SMP Pancar Bakti Babakan Madang.

Research Population and Sample

Research Population

The research population is the entire research object or objects under study. The population used in this research were all Pancar Bakti Babakan Madang Middle School female students who had menstruated.

Research Sample

The sample used in this research was Pancar Bakti Babakan Madang Middle School students who met the inclusion criteria. The sampling technique used total sampling, this is because the population was less than 100, so the entire population was used as a research sample, namely 41 female students.

Sample Criteria

Inclusion Criteria

1. Willing to become a research subject by filling out informed consent
2. Female students who have experienced a menstrual cycle
3. Female students can read and write well

Exclusion Criteria

1. When the research was conducted, the female students did not attend school
2. Not taking blood tests
3. The answers to the questionnaire that the female students have filled out are incomplete or unclear

Data Analysis

This research uses one-variable analysis (univariate analysis) to determine the distribution and frequency of data and two-variable data analysis (bivariate analysis) to find out whether there is a relationship between the two variables. Using a two by two table and carrying out analysis using the chi square method through a computerized statistical data processing program.

RESULT

General description of the research site

Pancar Bakti Middle School is one of the junior high schools located in Babakan Madang District, Bogor Regency, West Java Province. This school has a total of 119 students. Divided into 3 class levels and grade 7 students are divided into 2 classes.

The sample population was taken at all levels but was limited to female students only, this

is because women are considered to be more at risk of experiencing anemia than men. The sample in this study were female students who met the inclusion criteria with a total of 41 female students.

To avoid bias in research, researchers did not group samples based on class level. Apart from that, in this study, the researchers did not get a large sample.

Univariate Analysis

Sample Characteristics

Based on univariate results that explain the characteristics of respondents with a total of 41 female students, namely age, parent's education, parent's employment status, and source of information about anemia

Table 1. Frequency Distribution Based on Characteristics of Female Students at Pancar Bakti Middle School, Bogor, West Java

Category	Characteristics of Female Students	n	%
Age	13 year	17	41.5
	14 year	12	29.3
	15 year	8	19.5
	16 year	4	9.8
Mother's Education	Finished elementary school	16	39.0
	Finished junior high school	17	41.5
	Finished high school	8	19.5
Father's Education	Finished elementary school	8	19.5
	Finished junior high school	20	48.8
	Finished high school	13	31.7
Mother's Employment Status	Housewife	35	85.4
	Private employees	2	4.9
	Self-employed	4	9.8
Father's Employment Status	Self-employed	22	53.7
	Private employees	13	31.7
	Honorary	6	14.6
Resources	Family	16	39.0
	Book	10	24.4
	Internet	8	19.5
	School work	5	12.2
	Friend	2	4.9
	Total	41	100

Anemia in Female Students

After checking Hb (hemoglobin) using the quick test method with the Easy Touch tool, the following results were obtained:

Table 2. Frequency Distribution of Anemia in Pancar Bakti Middle School Students, Bogor, West Java 2024

Anemia in Children	Frequency	Percentage (%)
Anemia	35	85.36%
Not Anemic	6	14.64%
Total	41	100%

Through the data above, it can be seen that of the total 41 children studied, there were 35 female students with a percentage of 85.36% experiencing anemia. Meanwhile, the remainder, namely 6 children with a percentage of 14.64%, did not experience anemia as a control variable. Therefore, it can be concluded that the sample in this study was students who experienced anemia**.**

Bivariate Analysis

Relationship between knowledge and the incidence of anemia

The following are the results of the analysis of the relationship between knowledge and the incidence of anemia in Pancar Bakti Middle School students, Bogor, West Java 2024.

Table 3. Results of the Relationship between Knowledge and the Incidence of Anemia in Pancar Bakti Middle School Students, Bogor, West Java 2024

Knowledge	Anemia Status				P Value	OR
	Anemia (%)		No Anemia (%)			
	N	Percentage (%)	N	Percentage (%)		
Not good	10	28.6	2	33,3	0,646	0,667
Not good	4	11,4	1	16,6		
Very good	21	60	3	50		
Total	35	100	6	100		

Based on the results of data analysis, it can be concluded that the majority of the total 35 respondents have very good knowledge about anemia, reaching 60% of the total. A total of 10 respondents, or around 28.6%, had poor knowledge about anemia. Meanwhile, only a small number of respondents, namely 4 out of 35 (around 11.4%), had poor knowledge about anemia. Therefore, there is no relationship between knowledge and the incidence of anemia, which can be seen from the p value of 0.646, namely >0.05

From these results, it appears that the majority of respondents have a good or very good understanding of anemia. However, the number of respondents who have poor knowledge is relatively small compared to those who have good or very good knowledge. This shows that the level of awareness about anemia tends to be high among respondents, but there is still room to improve understanding in certain areas. Then female students who have good knowledge tend to have a 0.667 risk of anemia compared to female students who are not good or not.

Relationship between attitude and incidence of anemia

The following are the results of an analysis of the relationship between attitudes and the incidence of anemia in Pancar Bakti Middle School students, Bogor, West Java 2024

Table 4. Results of the Relationship between Attitudes and the Incidence of Anemia in Pancar Bakti Middle School Students, Bogor, West Java 2024

Attitude	Anemia Status				P Value	OR
	Anemia (%)		No Anemia (%)			
	N	Percentage (%)	N	Percentage (%)		
Not good	7	20.0	2	33,3	0,024	0,104
Not good	5	14.2	1	16,6		
Very good	23	65.7	3	50		
Total	35	100	6	100		

Based on the results of the crosstab analysis, it can be concluded that the majority of the total 35 respondents showed a very good attitude towards anemia, with a percentage reaching 65.7%. A total of 7 respondents, or around 20.0%, showed an unfavorable attitude towards anemia. Meanwhile, the number of respondents who showed an unfavorable attitude towards anemia was 5 out of a total of 35 respondents, or around 14.3%. Therefore, attitude has a relationship with the incidence of anemia, which can be seen from the p value of 0.024, namely <0.05.

From these results, it can be seen that the majority of respondents have a very good attitude towards anemia, but there are still a small number who show an unfavorable or unfavorable attitude. This shows the need for efforts to increase awareness and understanding of anemia and the importance of attitudes that support its prevention and

treatment. Then female students who have a good attitude tend to have a 0.104 risk of anemia compared to female students who have an unfavorable and unfavorable attitude.

Relationship between Actions and Anemia

The following are the results of the analysis of the relationship between behavior and the incidence of anemia in Pancar Bakti Middle School students, Bogor, West Java 2024

Table 5. Results of the Relationship between Actions and the Incidence of Anemia in Pancar Bakti Middle School Students, West Java 2024

Action	Anemia Status				P Value	OR
	Anemia (%)		No Anemia (%)			
	N	Percentage (%)	N	Percentage (%)		
Not good	27	77.1	2	33,3	0,000	21.333
Not good	5	14.3	1	16,6		
Very good	3	8.6	3	50		
Total	35	100	6	100		

Based on the results of the analysis, it can be concluded that the majority of the total 35 respondents showed bad actions towards anemia, with a percentage reaching 77.1%. A total of 5 respondents, or around 14.3%, showed unfavorable behavior towards anemia. Meanwhile, the number of respondents who showed good behavior towards anemia was 3 out of a total of 35 respondents, or around 8.6%. Therefore, there is a relationship between action and the incidence of anemia, which can be seen from the p value of 0.000, namely <0.05.

From these results, it can be seen that the majority of respondents have bad behavior towards anemia, but there are still a small number who show good or very good behavior. This shows the importance of continuing to encourage and provide appropriate information to the community to encourage behavior that supports the prevention and treatment of anemia effectively. Then female students who have bad and less good actions tend to have a 21,333 risk of anemia compared to female students who have good actions.

DISCUSSION

In this research, the sample of students from each grade level cannot be grouped. Because the samples obtained were very limited. Therefore, female students in grades VII, VIII and IX were grouped into one group, namely students from Pancar Bakti Middle School, Babakan Madang. and here are the results

Relationship between student knowledge and anemia

In this test, the resulting p-value is 0.646. A p-value greater than the significance level set at 0.05 indicates that there is not enough evidence to reject the null hypothesis, which means there is no significant relationship between knowledge of anemia and the incidence of anemia. Through research conducted by Kusnadi, F. N., the results of his research show that there are levels in managing knowledge regarding the incidence of anemia in young women. Young women who have good knowledge tend to be more vigilant in preventing anemia compared to those who have less good knowledge. However, apart from the level of knowledge, there are other factors that also play a role in influencing the incidence of anemia in adolescent girls. For example, menstruation is a risk factor for anemia, as well as the desire of young women to have a slim stomach which can influence their eating patterns and nutritional needs.[1] Thus, while the level of knowledge about anemia can act as an important factor, these factors Other factors also need to be considered in efforts to prevent and treat anemia in adolescent girls

Apart from that, other research also related to the relationship between knowledge about anemia and the incidence of anemia in adolescents, which was conducted by Ellita

Alifia Nadiawati. The research results showed that female students at SMA Negeri 1 Godean had good knowledge about anemia, with 71 people (87.7%) of the total respondents. On the other hand, the majority of female students at SMA Negeri 1 Godean do not experience anemia, the number reaching 43 people (53.1%). Based on the results of the analysis using the Somers' d method, a p value of 0.779 ($p > 0.05$) was obtained. This indicates that there is no significant relationship between knowledge about adolescent anemia and the incidence of anemia in female students at SMA Negeri 1 Godean.[22]

Thus, the conclusion that can be drawn is that there is no significant relationship between the level of knowledge about adolescent anemia and the incidence of anemia in female students at SMA Negeri 1 Godean based on the results of this study.

Relationship between student attitudes and anemia

Based on the results of the crosstab analysis, it can be concluded that the majority of the total 35 respondents showed a very good attitude towards anemia, with a percentage reaching 65.7%. A total of 7 respondents, or around 20.0%, showed an unfavorable attitude towards anemia. Meanwhile, the number of respondents who showed an unfavorable attitude towards anemia was 5 out of a total of 35 respondents, or around 14.3%. Therefore, attitude has a relationship with the incidence of anemia, which can be seen from the p value of 0.024, namely <0.05.

Attitudes are not fixed and can sometimes change; this can be related to knowledge. Good knowledge will encourage someone to display an attitude that is in accordance with the knowledge they have obtained. The attitudes and presence of anemia in adolescents have significant implications for various aspects of their health and development. Anemia, caused by iron deficiency in the body, can have an impact that is not only limited to physical health, but also the mental and social well-being of adolescents. Anemia in teenagers can cause a decline in reproductive health, because it can disrupt the menstrual cycle in teenage girls, which in turn can affect their future fertility. Apart from that, this condition can also hinder teenagers' motor development, affecting their movement coordination and physical skills.[16, 18]

The impact of anemia can also be felt in terms of mental health, with symptoms such as fatigue, mood swings and difficulty concentrating possibly appearing. This can hinder teenagers' cognitive development, affecting their intelligence and learning achievement.[21]

Related research: Anemia in adolescents is not only an isolated health problem, but also has a significant impact on various aspects of their lives. According to research by Andriani & Wirjatmaji, the presence of anemia in adolescents can have unfavorable consequences. One of them is a decline in reproductive health, because anemia can disrupt the menstrual cycle in adolescent girls, which in turn can affect their future fertility. Apart from that, anemia can also affect teenagers' motor development, hampering their movement coordination and physical skills.[23]

Thus, it is important to remember that anemia is not just an isolated health problem, but also has far-reaching implications on the overall well-being and development of adolescents. Comprehensive prevention and treatment efforts need to be carried out to minimize the negative impact of anemia on adolescents and ensure that they can achieve their optimal health and development potential

Relationship Between Student Actions and Anemia

Based on the results of the analysis, it can be concluded that the majority of the total 35 respondents showed appropriate actions. Based on the results of data analysis, it can be concluded that the majority of the total 35 respondents showed bad actions towards anemia, with a percentage reaching 77.1%. A total of 5 respondents, or around 14.3%, showed unfavorable behavior towards anemia. Meanwhile, the number of respondents who showed good behavior

towards anemia was 3 out of a total of 35 respondents, or around 8.6%. With a p-value of 0.000 (<0.05), there is a significant relationship between action against anemia and the incidence of anemia.

From these results, it can be seen that the majority of respondents have bad actions towards anemia, but there are still a small number who show good actions. This emphasizes the importance of continuing to encourage and provide appropriate information to the public to encourage behavior that supports the prevention and treatment of anemia effectively, including consuming nutritious foods, supplements and iron that can be recommended by doctors or medical personnel, consuming foods high in vitamin C such as oranges, tomatoes, strawberries and peppers can help increase the effectiveness of iron absorption, prevention of infection and appropriate treatment for parasites, abstinence from foods that interfere with iron absorption and reducing consumption of these foods along with foods high in iron can help increase iron absorption in the body as well as Educational campaigns and promotion of proper nutrition can help reduce the risk of anemia in the population

Research conducted by Sa'adah, I. N. The results of the study show that there is a significant relationship between the actions taken and the incidence of anemia in young women. However, factors related to health measures have an important role in changing the behavior of adolescent girls in efforts to prevent anemia. Researchers highlight that young women generally tend to pay less attention to the quality of the food they consume. Most of them prefer food based on taste rather than considering nutritional value. Moreover, many of them often consume snacks outside the home, which tend to be nutritionally unhealthy.[24]

From these findings, it can be concluded that an approach that aims to change actions related to eating patterns and lifestyles to become healthier is very important in efforts to prevent anemia in adolescent girls. Education about the importance of nutrition, promotion of healthy eating patterns, and limiting consumption of snacks outside the home can be effective strategies in reducing the risk of anemia among young women.

Apart from that, research conducted by Sirait, A. W shows that there is a direct relationship between actions and the incidence of anemia. The research results show that young women never eat breakfast in the morning and consume less plant-based foods and vegetables and like to eat ready-to-eat food. 25 It is important to understand that this change in behavior has a long-term impact in encouraging better health and preventing anemia in the future. Therefore, education and public awareness efforts need to be increased to promote healthier eating patterns and lifestyles among young women

CONCLUSION

From the results of the research it can be concluded that: 1) The characteristics of respondents based on age were mostly found at the age of 13 years, namely 17 female students, then the employment status of the parents, the most respondents were found to be working as housewives, namely 25 people, then for sources of information about anemia obtained most of the resources from the family; 2) There is no relationship between knowledge and the incidence of anemia, 3) There is a relationship between attitudes and the incidence of anemia, and 4) There is a relationship between actions and the incidence of anemia

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