

## THE RELATIONSHIP AMONG KNOWLEDGE, ATTITUDE, AND BEHAVIOR OF DIETARY, AND THE INCIDENCE OF ANEMIA ON ADOLESCENT GIRLS

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### Abstract

Anemia in adolescent girls is quite high. According to the World Health Organization (WHO), the prevalence of anemia in adolescent girls around 53,7%. The impact of anemia on adolescent girls is drowsy, lack of concentration, lethargic, and dizziness in the learning time. This study aimed to determine the relationship of dietary knowledge, attitudes, and behavior level and the incidence of anemia on adolescent girls in Kemala Bhayangkari Junior High School. The study design used quantitative analytic with a *cross-sectional* design. The sample was taken by the *consecutive sampling method*. The samples were 134 respondents. Data analysis used the *Spearman rank correlation* test. The results showed that adequate dietary knowledge (48.5%), positive dietary attitude (59.7%), positive dietary behavior (56.0%), and anemia (18.7%) with a value for knowledge  $p = 0.803$ , attitude  $p = 0.973$  and behavior  $p = 0.997$ . It can be concluded that there is no relationship among of dietary knowledge, attitudes, and behavior level and the incidence of anemia on adolescent girls with anemia in Kemala Bhayangkari Junior High School Bandung. It is suggested for adolescent girls that they needs to increase the consumption of nutritious foods, foods with high in iron, and consume iron supplements, especially during menstruation.

**Keywords:** Anemia, attitude, behavior, adolescent, diet, knowledge.

### INTRODUCTION

According to the *World Health Organization (WHO)* (2015), adolescence is a time of transition from childhood to adulthood, between the ages of 10 to 19 years. During the adolescent period, physical changes occur very quickly. High growth speeds cause teens to need high energy and protein (Stang & Story, 2005). This can affect the behavior and health status of adolescents themselves (Dwiranty, 2014).

Adolescent girls in Indonesia go on a diet by limiting eating to get the ideal body weight. By limiting food consumption and reducing energy intake, the body will lose iron (Adriani, 2014). As a result of limiting food consumption and reducing energy intake, it causes a lack of nutrition and low Hb levels in young women, so the body becomes iron deficient or known as anemia. (Arisman, 2010). Anemia in adolescent girls is quite high, the prevalence of anemia in adolescent girls around 53,7%. The health problem that is being faced by Indonesia is anemia, especially among adolescents. Anemia that occurs among adolescences is around 23% (Kemenkes, 2018). Based on data from the Bandung Health Service that the incidence of anemia in adolescent girls reaches 10,7% (Dinkes, 2018). The high incidence of anemia is due to

the need for iron absorption peaking at the age of 14-15 years in adolescent girls, and menstruation (WHO, 2011).

The effect of anemia can cause a lack of Hb levels that bind oxygen from the lungs throughout the body. If the oxygen needed is not enough, it will result in difficulty concentrating, easily tired, decreased physical activity, easy pain so rarely go to school, and result in decreased learning achievement (MOH, 2008). Another impact if you are pregnant in adolescence, the teenager will not be able to meet the needs of iron for himself and the fetus, and will experience complications, namely the risk of death in mothers with maternal mortality rates of 305 per 100,000 births (Kemenkes, 2016), the risk of death in infants with infant mortality in Indonesia is 32 per 1000 births (BKKBN, 2017), premature babies, low birth newborns (LBW) in Indonesia by 6.2% and stunting in Indonesia by 29.9% (Kemenkes, 2019b).

Adolescent girls are important to be given about health education by health workers who deal with good diets and anemia to be more insightful enough, so they can prevent anemia (Martini, 2015). Adolescent girls who have anemia by 51.4% on average of them have poor knowledge and eating patterns (Suryanti, 2017). Lack of knowledge in adolescence causes them to do misbehavior in terms of diet. They think that diet is reducing the frequency of eating or eating irregularly can make the body ideal. The fact, the wrong diet can cause the body to lack iron which ultimately leads to anemia.

According to data from the Bandung City Health Service that junior high school youth with a high rate of anemia in UPT Talaga Bodas Health Center as many as 92 young women (Dinkes, 2018). The results of a preliminary study conducted at the PHC Talaga Bodas that out of five VII grade SMPs in their working area, there was one SMP with a high incidence of anemia, namely Kemala Bhayangkari SMP as much as 62.3% of anemic female adolescents in class VII.

Based on the results of a preliminary study conducted on 10 young women in Kemala Bhayangkari Middle School on diet, 60% of people who know about diet, 20% of people have tried to go on a diet with them reducing their portion of food and stop snacking and 10% of them have anemia, they know anemia. Most of them said that they did not have breakfast because they were in a hurry and during school breaks they preferred to eat fast food such as meatballs, chicken noodles, seblak, fried foods, and fried instant noodles and they preferred to drink cold drinks like iced tea. Out of 10 young women who say that a good body for a woman is the ideal

body, only 60% of young women are interested in having an ideal body. They do not know the impact of the behavior they do can cause anemia.

The purpose of this study was to determine the relationship of the level of dietary knowledge, attitudes, and behavior and the incidence of anemia on adolescent girls in Kemala Bhayangkari Junior High School.

## **METHODS**

The study design used was quantitative analytic with *cross-sectional* design. The population in this study were class VII and VIII as many as 202 students. *Consecutive sampling technique* was used as 134 respondents, who met the inclusion criteria, they are, the respondents were junior high school students in class VII and VIII, had menstruated, were willing to become respondents, while for the exclusion criteria they were girls who were having menstruation, who are sick and who are not willing to be tested for hemoglobin levels.

The instrument used questionnaires for knowledge of attitudes, attitudes, and dietary behavior of young women. The knowledge questionnaire contains 15 questions about diet and anemia. Knowledge questionnaire is measured using the Guttman scale, if the respondent answers correctly given a value of 1 and if the answer is incorrectly given a value of 0. The measurement results of knowledge are categorized into 3 categories namely good, sufficient and less. Good category if able to answer correctly > 76% with coding number 1, enough if the question is answered correctly as much as 56-75% with coding number 2, and, less when answering questions <56% with coding number 3 (Arikunto, 2010). Critical attitude contains 10 statements about adolescent girls' dietary attitudes measured using a Likert scale with a score of 1-4. The measurement results are categorized into a positive attitude if the score  $\geq 25.4$  and a negative attitude if the score <25.4. Behavior questionnaire contains 11 statements about adolescent girls' dietary behavior as measured by a Likert scale of scores 1-4. The measurement results are categorized into positive behavior if the score  $\geq 32.2$  and negative behavior if the score <32.2.

Measurement of anemia through the results of hemoglobin tests using the mission<sup>R</sup> Hb tool. Then the results of the measurement of anemia are divided into 2 categories namely no anemia and anemia. The category is not anemic if Hb is 12-14 gr/dl with code number 1, anemia if Hb <12 gr/dl with code is 0. Beside, there are instruments about respondent characteristics that

contain age, occupation of parents, and the number of Fe tablets consumed. The instrument in this study used a questionnaire that had been tested for validity with the results of 36 valid question items and reliability value of 0.706, as well as an examination of hemoglobin levels.

Data collection was conducted on May 3, 2019 for 2 hours. Data is collected on respondents who meet the inclusion criteria in one room and then given an explanation of the purpose of the study and respondents who are willing to be given a questionnaire to be filled. After completing the questionnaire, respondents will be checked for hemoglobin levels carried out by researchers and assisted by two Talagabodas Community Health Center officials. Analysis test data used the *Spearman rank correlation*. This study was approved by the STIKes' Aisyiyah Bandung Study Ethics Committee number 02 / KEP.02 / STIKes-AB / V / 2019.

## RESULTS

Table 1 Frequency Distribution of Respondent Characteristics at Kemala Bhayangkari Junior High School in Bandung

Characteristics	Frequency	Percentage (%)
<b>Age of Respondents</b>		
12 years old	10	7.5
13 years old	58	43.3
14 years	61	45.5
15 years	5	3.7
<b>Parents' job</b>		
Labor	9	6.7
Private employees	30	22.4
Civil servants	12	9.0
entrepreneur	83	61.9
<b>The amount of consumed Fe tablets</b>		
1-4 tablets	104	77.6
5-8 tablets	13	9.7
9-12 tablets	17	12.7

Based on the frequency distribution table of the respondents 'characteristics above, most of the respondents were 14 years of age as many as 61 respondents (45.5%), the frequency distribution of parents' jobs were mostly entrepreneurs as much as 83 (61.9%) and the frequency distribution of the number of Fe tablets consumed was 1-4 tablets totaling 104 respondents (77.6%).

Table 2 Frequency Distribution of the Level of Knowledge, Attitudes, and Behavior about Diets with the Occurrence of Anemia in Kemala Bhayangkari Junior High School Bandung

Variable	Frequency	Percentage(%)
<b>Knowledge</b>		
Good	34	25.4
Moderate	65	48.5
Low	35	26.1
<b>Attitude</b>		
Positive attitude	80	59.7
Negative attitude	54	40.3
<b>Behavior</b>		
Positive Behavior	75	56.0
Negative Behavior	59	44.0
<b>Anemia</b>		
Anemia	25	18.7
No anemia	109	81.3

Based on the frequency distribution table, related to the level of dietary knowledge above, most of the respondents have enough dietary knowledge as 65 respondents (48.5%). In the frequency distribution of dietary attitudes, most of the respondents have a positive attitude as 80 respondents (59.7%). In the frequency distribution of dietary behavior, the majority of respondents had positive behaviors as 75 respondents (56.0%). In the frequency distribution of anemia, most of the respondents who did not experience anemia were 109 respondents (81.3%).

Table 3 Relationship between the level of dietary knowledge, attitudes, and behavior and the incidence of anemia in Kemala Bhayangkari Junior School, Bandung

Variable	Anemia				Total		P- value
	No anemia		Anemia		Frequency	%	
	Frequency	%	Frequency	%			
<b>Knowledge</b>							
Well	28	82.4	8	17.6	34	100	.803
Enough	53	81.5	12	18.5	65	100	
Less	28	80.0	7	20.0	35	100	
<b>Attitude</b>							
Positive attitude	65	81.2	15	18.8	80	100	.973
Negative attitude	44	81.5	10	18.5	54	100	
<b>Behavior</b>							
Positive Behavior	61	81.3	14	18.7	75	100	.997

Negative Behavior	48	81.4	11	18.6	59	100
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Based on the table above, there was more respondents in enough category of knowledge level who had anemia (18.5%). The results of test analysis *Spearman rank correlation* with the value of 0.803 showed that there was no relationship between the level of dietary knowledge on the adolescent girls and the occurrence of anemia in Kemala Bhayangkari Junior High School Bandung. The more respondents with positive attitude experienced anemia were as many as (18.8e %). The results of test analysis *Spearman rank correlation* with a p-value of 0.973 showed that there was no relationship between dietary attitudes on adolescent girls and anemia in Kemala Bhayangkari Junior High School Bandung. The respondents with positive behavior more experienced anemia as 14 (18.7%). The results of test analysis *Spearman rank correlation* with a p-value of 0.997, showed that there was no relationship between dietary behavior of adolescent girls and anemia in Kemala Bhayangkari Junior High School Bandung.

## DISCUSSION

The results showed that of 134 respondents who had hemoglobin levels with anemia were 18.7% or the adolescent girls who did not have anemia. From this data, it is known that most respondents did not experience anemia, because in Bhayangkari Middle School they had been given blood-added tablets by the public health center for 12 tablets per 3 months. In this study adolescents had a positive dietary behavior of 56% even though most Fe tablets were consumed only 1-4 tablets a month, so that this could prevent young women from the incidence of anemia.

Iron deficiency anemia is a low iron content in need, iron is needed for the synthesis of hemoglobin (Smeltzer & Bare, 2013). Anemia is directly affected by daily consumption of foods that contain less iron. If the food consumed has good nutritional value, then the nutritional status is also good, conversely if the food consumed is lacking in nutritional value, it will cause malnutrition and can cause anemia (Hapzah & Ramlah, 2012).

The results of the study concluded that based on the Spearman rank correlation test, it was found that the value of  $p = 0.803 > \alpha = 0.05$ , which indicates that there was no relationship between the level of dietary knowledge on adolescent girls and the incidence of anemia. This result was influenced by several things, including teenagers who were respondents who had

consumed Fe tablets for three months even though not all respondents consumed Fe tablets until they were used up. This research has a weakness by not examining the dietary patterns and nutritional status of respondents such as measuring the Basal Mass Index (BMI) and upper arm circumference (LLA).

Several factors influence knowledge if seen from the characteristics of respondents, namely the age of most respondents aged 14 years (45.5%), age can affect someone in terms of thinking and capturing information quickly. The more age increases, the more one's comprehension, and mindset develops so that the knowledge gained gets better (Notoadmodjo, 2007). Sufficient knowledge does not necessarily affect a person's attitude and behavior in food selection and consumption of Fe tablets. Sufficient knowledge can affect a person's nutritional and health status related to anemia because enough knowledge about anemia results in a lack of consumption of animal protein food sources. Anemia that occurs on adolescent girls is caused by several factors including absorption inhibitors, increased iron requirements due to physical growth, and menstruation. In addition to the knowledge factor, the other factors that influence the incidence of anemia are eating patterns, lack of food intake, and daily activities. Characteristics of unstable adolescents and the influence of association with peers because they want to slim down and a strict diet cause weight loss, fear of weight gain, and irregular eating habits that cause them to get anemia (Irawan & Safitri, 2014).

Factors of information obtained from electronic media can also influence adolescent knowledge. Lack of knowledge can increase the risk of adolescents affected by anemia, especially adolescent girls during menstruation who should consume additional iron intake (Martini, 2015). This showed that adequate dietary knowledge does not guarantee that the adolescences on a good diet are likely to suffer from anemia. Therefore, the incidence of anemia in enough category of knowledge was 18.5%. In line with a study conducted by Suria (2017) with the title "Relationship between Knowledge of Anemia, Consumption Level of Protein, Iron, and Vitamin C and Hemoglobin Levels on Students at SMAN 3 Ponorogo", the knowledge is not related to anemia with grades  $p\text{-value} = 0.613$ .

Enough knowledge may not change the pattern of attitudes of adolescent girls in preventing anemia. According to Notoadmodjo (2007) the level of knowledge that is "Know" is a low level of knowledge, to measure that people know about what is learned, among others: mention, describe, define, state, and so on. If the results know but are not able to understand well and

ultimately are not applied in daily life, the respondent is unable to prevent anemia such as consuming foods that contain lots of Fe, consuming Fe tablets, not drinking iced tea after eating, and exercising regularly (Soetjningsih, 2004).

The more information absorption is carried out, the more knowledge is gained, including health knowledge (Priyanto, 2018). An increase in knowledge about health will determine a person behave well in maintaining health and preventing illness. A behavior or habit based on knowledge, awareness, positive attitude then the habit will belong. Conversely, if not based on knowledge, habits will not last long (Notoadmodjo, 2007).

Based on the results of the study conducted on adolescent girls in Kemala Bhayangkari Junior High School, it could be analyzed that the majority of adolescent girls who have anemia have more positive attitudes as many as 15 adolescent girls (18.8%). Spearman rank correlation test results obtained that the value of  $p = 0.973 > \alpha = 0.05$  which indicates that there was no relationship between adolescent girls' dietary attitudes with the incidence of anemia. Several factors influence attitudes according to Notoadmodjo, those who are considered important such as parents and friends (Notoadmodjo, 2007). Other people who are around teenagers are one who can influence the attitudes of adolescents. At the age of 12 to 15 years on adolescents, according to Kusmiran (2011) at this stage adolescents tend to want to be closer to peers, because someone spends more time outside the home with peers. The influence caused by peers tends to be negatively coupled with social pressure so that adolescents are affected not to consume Fe tablets and trends in consuming fast food, dietary trends and school canteen food affect adolescent attitudes to prevent anemia (Firi, 2018). This causes the incidence of anemia in the category of positive attitudes to have more percentage compared to the percentage of negative attitudes. In line with a study conducted by Setyowati, Rianti and Indaswari (2017) with the title "Factors Associated with Adolescent Girls' Eating Behavior in Preventing Anemia in the Ngemplak Simongan Health Center Work Area" where attitudes are not related to anemia with  $p\text{-value} = 0.667$ , according to her positive attitude will affect someone in preventing anemia.

According to Palupi and Sawitri (2017) stated that attitudes can change because attitudes can be learned and attitudes can change in people if there are conditions with certain conditions. From the results of the study above, it can be concluded that attitude influences the formation of positive or negative behaviors. A positive attitude will manifest positive behavior as well so it is very important the role of health workers provide counseling related to anemia to



cause positive attitudes towards anemia. Likewise the role of the teacher is very important to include anemia prevention programs in school education as a knowledge so that it can rise a positive attitude in students.

Based on the results of a study conducted on adolescent girls in Kemala Bhayangkari Junior High School, it could be analyzed that the majority of adolescent girls who experienced anemia have more positive behaviors as many as 14 adolescent girls (18.7%). Spearman rank correlation test results obtained that the value of  $p = 0.997 > \alpha = 0.05$  which showed that there was no relationship between adolescent girls' dietary behavior and the incidence of anemia. This is due to several factors including when seen from the characteristics of respondents regarding the amount of Fe tablets consumed by respondents was 77.6% of consuming 1-4 tablets per 3 months.

According to Notoadmodjo (2007), the process of forming and changing behavior is influenced by several factors originating from within and outside the individual. Internal factors include knowledge, intelligence, perception, attitudes, emotions, and motivation that function to process stimuli from the outside. Factors from outside the individual include the surrounding environment, both physical and non-physical such as climate, human, social, economic, cultural, and so on.

The behavior of adolescent girls can be influenced by external factors, namely the family and the environment, based on the characteristics of the respondents, most of the respondents 'parents' jobs were as entrepreneurs (61.9%). Work is strongly related to income, family income is directly related to purchasing power, families with high incomes can buy food sources of iron sources such as meat, fish, eggs and others to be served (Rahayu & Dieny, 2012). The work of parents and the number of siblings affect economic status. The economic level of parents who are middle-up and above, tends to facilitate teenagers in accessing the information they need so that they can increase knowledge in adolescents (Setyowati et al., 2017).

As for other factors that can influence behavior and anemia, the role of parents in daily food choices influences adolescent girls to behave better. Adolescent girls follow their parents' eating habits because they have been patterned since childhood and also because adolescent girls still live with their parents so they are still very dependent on their parents, causing adolescent girls to have no choice but to follow their parents' eating habits, for example in terms of food type or frequency of eating (Mursiti, 2016). This caused the percentage incidence of anemia in the

category of positive behavior was greater than the negative behavior. In line with a study conducted by Yiunalis (2011) with the title "Relationship between Diet Behavior and the Incidence of Iron Deficiency Anemia on Adolescent Girls at SMAN 1 Sleman", the behavior was not related to anemia with Chi-Square ( $X^2$ ) value of 0.650. There was no relationship between behavior diet with iron deficiency anemia in this study including the low absorption of Fe in the body and the lack of regularity in consuming daily food. According to Lawrance Green in Notoadmodjo (2007), behavior does not always follow a certain sequence so that positive behavior is formed which is always influenced by knowledge and positive attitudes.

From this study and previous studies above, it was showed that the importance of good knowledge, positive attitudes and behaviors minimize the incidence of anemia that has an impact on their future such as the short-term impact of anemia that is not addressed will affect the learning process of adolescents that are marked by drowsiness, lack of concentration, lethargy, and dizziness in the learning time (Sediaoetama, 2007). Meanwhile, for the long-term effects of anemia that will occur if pregnant in adolescence, adolescents will not be able to meet the needs of iron for themselves and the fetus they contain and will experience complications such as the risk of death to the mother, the risk of death in infants, babies premature, low birth newborn (LBW) and stunting (Kemenkes, 2019a).

Achieving an optimal level of health on adolescent girls is important in providing health education related to a good diet and anemia to be more insightful and to prevent anemia. Considering the many adverse effects caused by anemia that occurs on adolescent girls, support from families, teachers, and health workers are also needed (Martini, 2015).

## **CONCLUSION**

Based on the results of the study, it can be concluded that the most respondents who are in enough category of dietary knowledge level on adolescent girls are 48.5%, the respondents who have dietary attitudes in the positive category are as much as 59.7%, the respondents who have behaved in the positive category are as much as 56.0% and the adolescent girls in Kemala Bhayangkari Junior High School who did not experience anemia are as much as 81.3%. Based on the results of data analysis, it can be concluded that there was no correlation between the level of dietary knowledge, attitudes, and behavior on adolescent girls and the incidence of anemia in Kemala Bhayangkari Junior High School, Bandung. Adolescent girls should consume nutritious

foods, foods containing iron and reduce junk food and contain flavor enhancers. Efforts to increase anemia prevention in the UKS program are needed girls in Kemala Bhayangkari Middle School in collaboration with institutions health. Public health center should provide Hb examinations for young women on a regular basis periodically, provide counseling about a good diet to prevent anemia, and the benefits of giving Fe tablets to young women.

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