

Correlation Between The Knowledge Level About Eating Patterns And The Incidence Of Anemia In Adolescents During Covid-19 Pandemic

1st Anik Sulistiyanti,
Diploma III Midwifery Study Program,
Faculty of Health Sciences, Duta Bangsa
University Surakarta, Central Java
Indonesia
anik_sulis@udb.ac.id

2nd Fany Dwi Yulianti,
Diploma III Midwifery Study Program,
Faculty of Health Sciences, Duta Bangsa
University Surakarta, Central Java
Indonesia
fanyd739@gmail.com

3rd Yulia Nur Khayati
Diploma III Midwifery Study Program,
Faculty of Health Sciences, Ngudi Waluyo
University Ungaran, Central Java
Indonesia
yulia.farras@gmail.com

Abstract—The World Health Organization (WHO) determined that on March 12, 2020, it would receive a threat as a world pandemic status due to Coronavirus Disease (Covid-19). Coronavirus Disease (Covid-19) has an impact on all structures of life, which is felt by adolescents, especially those whose lives are in difficult and / or disadvantaged conditions. Covid-19 has the potential to transmit the virus to other people, and in some cases teenagers have to be isolated in hospital because of serious conditions. Changes in the covid-19 pandemic can affect knowledge, psychosocial and consumption patterns of adolescents so that it can cause anemia. Anemia is a condition in which the hemoglobin level is below 12g%. The purpose of this study was to determine correlation between the knowledge level about eating patterns and the incidence of anemia in adolescents during Covid-19 pandemic. This type of research analytic observational study with a cross sectional study design. The study population was all adolescents in SMA N 3 Sragen. The research sample was 60 adolescents with proportional random sampling technique. Data collection using examination of haemoglobin levels and a closed questionnaire. Data analysis with univariate analysis and bivariate analysis using chi square statistical test. The results showed that the level of knowledge of adolescents about eating patterns was mostly respondents with the less category, namely as many as 33 respondents (55%). The result shows that the incidence of anemia is mostly respondents with anemia category as many as 36 respondents (60%). The results of the statistical tests with chi-square obtained value = 17.911 > 5.59 and p value = 0.000 < 0.05 then H_0 is rejected and H_a is accepted, which means statistically it can be concluded that there is a correlation between the level of adolescent knowledge about eating patterns with anemia in students of SMAN 3 Sragen. the result is 0.479 so that the close correlation between the level of knowledge of adolescents about eating patterns and the incidence of anemia is moderate. There is a correlation between the knowledge level about eating patterns and the incidence of anemia in adolescents during Covid-19 pandemic

keywords— *the knowledge level, eating patterns, anemia*

I. INTRODUCTION

The World Health Organization (WHO) determined that on March 12, 2020, it would receive a threat as a world pandemic status due to Coronavirus Disease (Covid-19). Coronavirus Disease (Covid-19) has an impact on all walks of life and is felt by adolescents, especially those whose lives are in difficult and / or disadvantaged conditions. Covid-19 has the potential to transmit the virus to other people, and in some cases teenagers have to be isolated in hospital because of serious conditions. Changes in the covid-19 pandemic can

affect the knowledge, psychosocial and consumption patterns of adolescents so that it can cause anemia.

The number of adolescents in many developing countries is growing rapidly. This group in the last five years is one of the main concerns because of the unique lifestyle of adolescents and is different from other age groups from the previous generation. Adolescence is a time when growth occurs rapidly, so that the nutritional needs of adolescence also increase. One of the nutrients whose needs are increasing is iron.

According to the World Health Organization (WHO) anemia is a hemoglobin level below 12g% in women. Iron deficiency anemia is the most common type of anemia. Indonesia is listed as one of the countries where the number of sufferers of anemia is quite large, consisting of 26.4% children, 12.4% men aged 13-18 years, 16.6% men over 15 years, 22.7 % women aged 13-18 years, 22.7% women aged 15-49 years, and 37.1% pregnant women.

As many as 93% of Indonesian adolescents live in unhealthy conditions, due to unhealthy eating patterns in daily life and not balanced with exercise. The high percentage is due to adolescents following the trend of consuming fast food that contains lots of fat but is low in good nutritional coverage (Adhyaksa, 2007). Incorrect food intake causes deficiency of *bezi*. *Bezi* substance itself is one of the nutrients that is needed by the body to prevent anemia (Arisman, 2010; p. 77)

Anemia is a reduction to below normal red blood cells, hemoglobin quantity, and volume of hematocrit per 100 ml of blood. Because the number of red blood cells decreases, oxygen delivery to the tissues decreases (Price, 2014). During adolescence, there is rapid growth accompanied by physiological and mental changes so that nutritional needs are closely related to the growth period.

Anemia is one of the nutritional problems in Indonesia that must be addressed seriously, especially iron nutritional anemia. Anemia is a condition in which hemoglobin levels are lower than normal. Normal hemoglobin in men is 14-18 g%, while women are 12-16 g%.

The world's population of 100 adolescents, 52 of whom are declared anemic (WHO. 1993-2005). In the household health survey in Indonesia in 2005, there were 66.5% of adolescents suffering from anemia, while those with nutritional problems were 3.5 million adolescents in Indonesia. This is supported by the explanation that as many as 26.5% of adolescent girls and 20% of boys suffer from iron deficiency.

The author has conducted a preliminary study at SMA N 3 Sragen that the SMA has never been conducted before. The results of the preliminary study that have been carried out, were obtained by 9 people from SMA N 3 Sragen. After conducting interviews with 9 people, data has been obtained that 9 people do not know the types of foods that contain iron so they complain of symptoms of anemia such as headaches, weakness, lethargy, insomnia, difficulty concentrating, easily tired when doing physical activities such as sports and activities. other.

Based on the description above, the authors are interested in examining the relationship between the level of knowledge about diet and the incidence of anemia in adolescents during the Covid-19 pandemic at SMAN 3 Sragen.

II. METHOD

This research uses analytic observational research, which is research that tries to explore how and why health phenomena occur, then analyzes the dynamics of the correlation between the good phenomena between the independent variables and the dependent variable, between the independent variables. The research design was cross sectional. The study population was all young women in SMA N 3 Sragen. The research sample was 60 young women with a proportional random sampling technique. Data collection using primary data is data or material that is collected by the researcher himself when conducting research. Data were collected using a closed questionnaire about adolescent diet and hemoglobin examination in adolescents.

Data analysis using univariate analysis and bivariate analysis using chi square statistical test.

III. RESULT

Univariate analysis

1. Adolescent Knowledge Level About Eating Patterns

Table 1. Frequency Distribution Adolescent Knowledge Level About Eating Patterns

No	Knowledge Level	N	%
1	Good	13	21,7
2	Moderate	14	23,3
3	Low	33	55
Amount		60	100,0

From table 1, it is found that the level of knowledge of adolescents about eating patterns is the majority of respondents in the poor category, namely as many as 33 respondents (55%).

2. The Incidence of Anemia in Adolescents

Table 2. Frequency Distribution The Incidence of Anemia

No	The Incidence of Anemia	N	%
1	Anemia	36	60
2	Normal	24	40
Total		60	100,0

From table 2, it is found that the incidence of anemia is mostly respondents with anemia category as many as 36 respondents (60%).

Bivariate Analysis

1. Correlation between the level of knowledge of adolescents about eating patterns and the incidence of anemia

Table 3. Cross Table Silang the level of knowledge of adolescents about eating patterns and the incidence of anemia

Knowl edge Level	anemia		Normal		Amount		χ^2	p-value
	N	%	N	%	N	%		
Good	2	3.3	11	18.3	13	21.7	17.9	0.00
Moderate	7	11.7	7	11.7	14	23.3	11	0
Low	27	45	6	10	33	55		

From the table above it can be seen that the knowledge of adolescents about a good diet is 13 adolescents (21.7%), namely 2 adolescents who have anemia (3.3%), and 11 adolescents who do not have anemia (18.3%) knowledge is sufficient there are 14 adolescents (23.3%), namely 7 adolescents who have anemia (11.7%), and 7 adolescents who do not experience anemia (11.7%), and with insufficient knowledge there are 33 adolescents (55%) , namely 27 adolescents with anemia (45%) and 6 adolescents without anemia (10%).

The results of statistical tests with chi-square obtained value = 17.911 > 5.59 and p value = 0.000 < 0.05, so H_0 is rejected and H_a is accepted, which means statistically it can be concluded that there is a correlation between the level of adolescent knowledge about eating patterns and the incidence of anemia

2. Contingency Coefficient

The contingency coefficient (KK) is a method used to measure the closeness of the relationship (association and correlation). In this study the coefficient is as follows:

$$KK = \sqrt{\frac{X^2}{N + X^2}}$$

$$= \sqrt{\frac{17,911}{60 + 17,911}}$$

$$= 0,479$$

Based on the calculation of the contingency coefficient above, the result is 0.479 so that the close relationship between the level of adolescent knowledge about eating patterns and the incidence of anemia is moderate.

IV. DISCUSSION

1. Adolescent Knowledge Level About Eating Patterns

From the research results, it can be seen that the majority of adolescents' knowledge is lacking, namely as many as 33 students (55%), 14 students (21.7%) who have good knowledge, 13 students (23.3%) have good knowledge.

According to the theory presented by Emilia (2009; p. 2). The more adolescents get information, the better their knowledge will be, because one's knowledge is a very important dominant in shaping one's actions, adolescents who have good knowledge of nutrition will choose food according to their needs.

Based on the results of this study, it was found that the majority of adolescents had less knowledge about a good diet, namely 33 respondents (55%). This is due to several factors, namely because the teaching and learning process was not given material about a good diet for adolescents and from health workers did not provide education about good nutrition during adolescence.

According to research from Sara, 2020, the results show that the diet that occurred among young women in Saudi Arabia during Covid -19 includes intake from the category of fat, the amount of food, consumption of sugary foods and regular habits with fast food intake. consumption of fatty and sweet foods affects the knowledge and psychology of adolescents to get a proper diet.

Research from Miranda, 2020, states that the results of a study measuring MyPlate Knowledge level were assessed with 3 questions asking how many plates in a typical food should be (1) fruit and vegetables, (2) whole grains, and (3) protein. The short food frequency questionnaire measured the intake of fruits, vegetables, candy, salty snacks, fast food, and sugar-sweetened drinks (SSB) over the past 7 days. Students self-rated the quality of their diet as poor, moderate, good, or very good. The results showed that only 11% of students answered all MyPlate questions correctly. MyPlate knowledge was associated with a 65% higher chance of not consuming SSB, but a 46% lower chance of not eating candy. MyPlate knowledge is not associated with perceptions of adolescent diet quality or intake of salty snacks, fruits or vegetables, so it can be concluded that the level of knowledge has an effect on information technology from the MyPlate diet guide icon.

Meanwhile, there were 13 students who had good knowledge (21.7%) and 14 respondents (23.3%) had sufficient knowledge. Knowledge is not only obtained from material provided by teachers in schools and counseling from health personnel, SMAN 3 Sragen has a hot spot area that makes it easier for students to access the internet about good nutrition as a teenager as well as increasing one's knowledge.

2. The Incidence of Anemia in Adolescents

Based on the table above, from 60 respondents, it was found that there were still many respondents who had anemia as many as 36 respondents (60%), 24 respondents (40%) who did not experience anemia.

The theory states that one of the factors that cause anemia in adolescents, namely the wrong food intake can cause iron deficiency. Iron itself is one of the nutrients the body needs to prevent anemia (Arisman, 2010; p. 77).

Nutritional anemia in Indonesian children and adolescents is generally considered and treated as iron deficiency anemia, as is the case with individuals in other age groups. (Juffrie, 2020)

Based on the results of the study, there were more people experiencing anemia than those without anemia. There are 36 adolescents who have anemia (60%), of which 27 respondents (45%) have insufficient knowledge about good nutrition so that adolescents do not know the consumption of healthy foods that can prevent anemia, 7 respondents (11.7%) have knowledge 2 respondents (3.3%) had sufficient knowledge and the wrong diet that could cause anemia was not only due to lack of knowledge about good nutrition during adolescence but also because of a person's economic status.

Because someone with a high family economic status will choose healthy food for himself. And there are 24 adolescents who do not experience anemia, there are 24 adolescents (40%), 11 adolescents (18.3%) have good knowledge, 7 adolescents (11.7%) have sufficient knowledge, and 6 adolescents (10%) have less knowledge. can also be caused by the lack of family support. Family support is needed because it can indirectly affect the choice of healthy food consumption for the family.

The incidence of anemia is also found in other studies, this is supported by research from Agustina, 2020 which states that the diet of adolescent girls who attend school as a whole in the study area has poor quality and low diversity, and several dietary variables, food quality and dietary diversity was associated with anemia and overweight.

Factors related to the incidence of anemia among young women are breakfast habits, nutritional status, protein intake, dietary patterns of iron absorption inhibitors and length of menstruation. Lack of consumption of animal foods, dietary habits to reduce body weight, and poverty that causes insufficient consumption of nutritional foods, which can lead to anemia.

3. Correlation between the level of knowledge of adolescents about eating patterns and the incidence of anemia

The results of statistical tests with chi-square obtained value = 17.911 > 5.59 and p value = 0.000 < 0.05, so H_0 is rejected and H_a is accepted, which means statistically it can be concluded that there is a correlation between the level of adolescent knowledge about eating patterns and anemia. While the closeness of the relationship is moderate 0.479

According to Al-Isa, 2018 In adolescence, food contributes 30% or more of the total daily calorie intake. Teens should be encouraged to take responsibility for healthy eating choices. Poor diet in adolescents can lead to malnutrition, one of which is iron which can cause anemia.

The results of the study were 33 respondents (55%) had a low level of knowledge, 14 respondents (23.3%) had sufficient knowledge, and 13 respondents (21.7%) had good knowledge. And the incidence of anemia was found in 36 respondents (60%) who did not have anemia, 24 respondents (40%). Adolescent knowledge about diet is very influential in choosing healthy food consumption as a teenager to meet nutritional needs, especially iron which can prevent anemia.

In particular, findings on food consumption patterns are often constrained by data scarcity, particularly on school-age children. This knowledge gap has been reported by the United Nations Children's Fund (UNICEF), which states that age cohorts of school-age children are frequently missing from health and nutrition surveys.

Iron intake and iron ID are poor in Canada, especially in women of reproductive age. Data from provincial nutrition surveys indicate that the prevalence of inadequate iron intake (and low absorbable iron intake) in women under 50 years of age is more than 10%, which may reflect poor iron status. Adolescent girls are at risk of experiencing low iron stores because of the accelerated growth of adolescents and the onset of menstruation; those who are vegetarian have a greater risk.

It is in line with this research that is similar to research

conducted in Tunisia, Italy, Greece, Australia and Brazil, which revealed that nutrition research on adolescents with family members and inclusive teachers was effective in increasing knowledge, attitudes and practices towards physical education, health makers, assistance school meals and social cognitive mediators. In line with this, nutrition research in Michigan involving youth, teachers, and state education boards is effective in increasing student food intake. The results of this study indicate that there is a strong parental influence on adolescents. So that knowledge of adolescents get support and parental involvement to increase knowledge and overcome anemia in adolescents.

Apart from that, from the results of research from Ayoub 2020, from the results of his research, many factors can affect the diet of children and adolescents. It consists of individual and socio-cultural factors as well as economic and environmental factors. At the individual level, poor nutrition knowledge may be linked to unhealthy dietary practices. Studies conducted in regional countries have documented significant nutritional knowledge gaps in children and adolescents, particularly with regard to nutritional sources, identification of healthy snacks and diet-disease relationships. Other factors such as personal preferences, taste preferences, self-efficacy and body image can also play an important role in shaping dietary practices in this age group. Children and adolescents are also particularly affected by the food environment, including affordability, availability and access to food. The marketing and advertising of ultra-processed foods with high fat, sugar and / or salt content to children and adolescents is also recognized as a factor driving suboptimal diets among children and adolescents.

According to research from Niba, 2016 that the majority (84%) of the study sample had sufficient knowledge about the prevention of iron deficiency anemia, so it is advisable to provide educational programs for young women about iron deficiency anemia.

The results of this study are also supported according to research from Hesty, 2018 which states that anemia in adolescent girls is deficient in protein, iron and other micronutrient deficiencies, exacerbated by a lack of knowledge related to nutrition that can affect behavior. Balci, et al. 2012 reported that 59% of the incidence of anemia was caused by iron deficiency and 41% was a combination of iron and vitamin B12 deficiency (6). The data states that in urban areas, about 60% of adolescent girls and around 76% in rural areas lack protein intake. Statistics The results of the analysis show a correlation between protein intake and the incidence of anemia in adolescent girls. Lack of animal protein intake and combined with single consumption of staple foods results in lower iron intake (7). Knowledge tests conducted on anemic adolescent women showed 39% of them had low results regarding nutritional knowledge.

The impact that occurs if a person has low hemoglobin levels will trigger anemia which can have a negative impact in the future, such as high low birth weight (LBW) and high morality in mothers and babies (Priyanto, 2018).

V. CONCLUSION

Based on the results of the research above, the level of knowledge about eating patterns and the incidence of anemia in adolescents can be concluded as follows: There is a

correlation between the level of knowledge about eating patterns and the incidence of anemia in adolescents

REFERENCES

- [1] Agustina R, Nadiya K, Andini EA, Setianingsih AA, Sadariskar AA, Prafiatini E, et al. (2020) Associations of meal patterning, dietary quality and diversity with anemia and overweight-obesity among Indonesian school-going adolescent girls in West Java. *PLoS ONE* 15(4): e0231519. <https://doi.org/10.1371/journal.pone.0231519>
- [2] Al-Jawaldeh, A.; Taktouk, M.; Nasreddine, L. Food Consumption Patterns and Nutrient Intakes of Children and Adolescents in the Eastern Mediterranean Region: A Call for Policy Action. *Nutrients* **2020**, *12*, 3345. <https://doi.org/10.3390/nu12113345>
- [3] Al-Isa, A. Nutritional Knowledge among High School Male Students in Kuwait. *J. Community Med. Health Educ.* **2018**, *8*.
- [4] Al-Yateem, N.; Rossiter, R. Nutritional knowledge and habits of adolescents aged 9 to 13 years in Sharjah, United Arab Emirates: A crosssectional study. *East. Mediterr. Health J.* **2017**, *23*, 551–558
- [5] Charles Shapu R, Ismail S, Ahmad N, Lim PY, Abubakar Njodi I. Systematic Review: Effect of Health Education Intervention on Improving Knowledge, Attitudes and Practices of Adolescents on Malnutrition. *Nutrients*. **2020**; *12*(8):2426. <https://doi.org/10.3390/nu12082426>
- [6] WHO. Worldwide Prevalence of Anemia. Geneva: World Health Organization 2018.
- [7] Jufri, Mohammad, Helmyati, Siti, Hakimi, Mohammad. Nutritional anemia in Indonesia children and adolescents: Diagnostic reliability for appropriate management. *Asia Pacific Journal of Clinical Nutrition* . 2020 Supplement, Vol. 29, pS18-S31. 14p.
- [8] Hesty Permata Sari, Novita Puri Subardjo, Ibnu Zaki. Nutrition education, hemoglobin levels, and nutrition knowledge of adolescent girls in Banyumas district. *Indonesian Journal of Nutrition and Dietetics*. Vol.6, No.3, 2018:107-112.
- [9] Marcia J. Cooper, Kevin A. Cockell, and Mary R. L'abbé. The Iron Status of Canadian Adolescents and Adults: Current Knowledge and Practical Implications. *Canadian Journal of Dietetic Practice and Research*. 12 February 2007. <https://doi.org/10.3148/67.3.2006.130>
- [10] Miranda Westpall, Sarah E. Roth, et al. Exploring the relationship between myplate knowledge, Perceived diet quality, and healthy eating behaviors among adolescents. *American Journal of Health Promotion*. January 31, 2020.
- [11] Nabhani-Zeidan, M.; Naja, F.; Nasreddine, L. Dietary intake and nutrition-related knowledge in a sample of Lebanese adolescents of contrasting socioeconomic status. *Food Nutr. Bull.* **2011**, *32*, 75–83
- [12] Nanik D S, Riyanti E, Indraswari R. Factors Related To Young Women Eating Behavior In The Prevention Of Anemia In The Work Area Of Ngeplak Simongan Public Health Center, Diponegoro University, 2017
- [13] Niba Johnson, Noufeena D. Y., Parvathi, Priya Joseph, Priya Reshma Aranha, Asha P. Shetty. A Study On Knowledge Regarding Prevention Of Iron Deficiency Anemia Among Adolescent Girls In Selected Pre-University Colleges Of Mangaluru. *International Journal of Current Research and Review*. Vol 08 Issue 18, September, 2016
- [14] Priyanto, L. D. The Relationship of Age, Educational Background, and Physical Activity on Female Students with Anemia. *Jurnal Berkala Epidemiologi*, *6*(2), 139. **2018**. <https://doi.org/10.20473/jbe.v6i22018.139-146>
- [15] Sara Al-Musharaf. Prevalence and Predictors of Emotional Eating among Healthy Young Saudi Women during the COVID-19 Pandemic. *MPDI Journals Nutrients Switzerland*. September 2020.
- [16] UNICEF-GAIN. Food Systems for Children and Adolescents. In Working Together to Secure Nutritious Diets; UNICEF Office of Research: Rome, Italy, 2018.