Analysis of Breakfast Habits on The Incidence of Anemia

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Abstract   Anemia is a situation where the level of hemoglobin in the blood is less than normal. Anemia is a common nutritional problem in the world, especially in developing countries than developed countries. The prevalence of anemia is estimated to be 9% in developed countries, while in developing countries prevalence 43%. High-risk adolescents suffer from anemia. Increasing activities, social life, as well as a flurry of adolescents will affect their eating habits. Food consumption patterns are often irregular, often snacks, often not having breakfast, and not having lunch at all. The purpose of this research is to know the existence of a correlation between teens who have a habit of breakfast with the incidence of anemia. This study is an analytic observational study with a cohort approach. Data collection techniques with accidental sampling technique. Characteristics of respondents based on age, which is late adolescence 15-23 years. The measuring instrument used to measure anemia status (Hb level) using the Hb Sahli method, while to measure breakfast habits using a questionnaire measuring instrument. The measurement results using Fisher's Exact test obtained that the value of $\rho = 0.036$ ($\rho < 0.05$), so this means that there is a correlation between breakfast habits and the incidence of anemia. Based on the RR value is 1.24, so the risk of students not having breakfast for anemia is 1.2 times higher than students who have breakfast habits.

1 INTRODUCTION

Anemia is a condition in which the hemoglobin (Hb) level in the blood is less than normal (World Health Organization, 2014). Factors that cause iron nutritional anemia are nutritional status influenced by diet, family's socioeconomic status, environment and health status. Although anemia is caused by a variety of factors, more than 50% of the most anemia cases worldwide are directly caused by a lack of iron nutrient input (Masrizal, 2007). Anemia is a common nutritional problem in the world, especially in developing countries compared to developed countries. Anemia prevalence is estimated to be 9% in developed countries, while in developing countries the prevalence is 43%. Children and women of childbearing age (WUS) are the most at risk groups, with an estimated prevalence of anemia in infants by 47%, in 42% of pregnant women and in non-pregnant women aged 15-49 years at 30% (McLean et al., 2009). The World Health Organization (WHO) aims to reduce the prevalence of anemia in women of childbearing age by 50% by 2025 (World Health Organization, 2014). Based on the results of Riskesdas 2013,

showed that anemia presentation in women of childbearing age aged 15-44 years was 35.3% (Kementerian Kesehatan RI, 2013).

Anemia causes not enough blood to bind and transport oxygen from the lungs throughout the body. If the required oxygen is not enough, it will result in difficulty concentrating, so learning achievement decreases, low physical endurance so that it is easily tired, physical activity decreases, easy to get sick due to low body resistance, consequently rarely enter school / work (Suryani et al., 2015). In general, there are 3 (three) causes of iron deficiency anemia, which is 1) chronic blood loss (impact of chronic bleeding) as in peptic ulcer disease, hemorrhoids, parasitic infestations, and malignant diseases; 2) iron intake and absorption that are not strong; 3) an increase in iron requirements for the formation of red blood cells that commonly occur during infancy, puberty, pregnancy, and breastfeeding (Utami Tandirerung et al., 2013).

Teenagers are at high risk of suffering from anemia. Rapid growth, dramatic psychological changes and increased activity that characterizes adolescence, causing an increase in nutrient

requirements. The fulfillment and non-fulfillment of nutritional needs will affect the nutritional status of adolescents. Increased activity, social life, and the busyness of teenagers will affect their eating habits. Food consumption patterns are often irregular, often snacks, often not having breakfast, and not having lunch at all (Nursari, 2010).

Breakfast habits are eating/drinking activities in the morning before 09.00 in the morning and are usually done before leaving for activities. Breakfast habits are assessed based on the frequency of breakfast habits for 1 week (Amrin et al., 2014). The habit of not eating breakfast can be caused by the lack of appetite, habit of not having breakfast and not having enough time to do breakfast. In addition, it can also be caused by dish that is less attractive so that it cannot cause a break in breakfast (Aditian, 2009).

Young women generally have characteristics of unhealthy eating habits. Among other things the habit of not eating breakfast, lazy to drink water, an unhealthy diet because they want to slim (ignoring the source of protein, carbohydrates, vitamins, and minerals), the habit of snacking on low-nutrition foods and eating fast food. So that teenagers are not able to meet the diversity of nutrients needed by the body for the synthesis of hemoglobin formation (Hb). If this happens for a long time it will cause Hb levels to continue to decrease and cause anemia (Brown et al., 2004). Based on the description above, this study aims to determine the correlation between adolescents who have breakfast habits with the incidence of anemia.

2 METHOD

This study is an analytic observational study with a cohort approach, which compares groups exposed to groups that are not exposed to the onset of effects / diseases due to risk factors. Data retrieval techniques with accidental sampling technique, where respondents were deliberately encountered by the researcher made the respondent and in accordance with the characteristics of the study. Characteristics of respondents based on age, namely late adolescence, namely 15-23 years. The measuring instrument used to measure anemia status (Hb level) using the Sahli method, while the measuring instrument used to measure breakfast habits using a questionnaire. The subjects in this study were students of biology study program, Sunan Ampel Islamic University Surabaya with a total sample of 65 students.

The data in this study were univariate analysis to determine the frequency distribution of each variable and bivariate analysis using Fisher's Exact test to determine the relationship between breakfast habits and the incidence of anemia. Data analysis was carried out using the SPSS 16 for Windows computer program.

3 RESULTS AND DISCUSSION

Results

The data obtained from the research will be displayed in the form of frequency distribution tables with the data analyzed by univariate and bivariate. Univariate analysis that will be displayed is about age, nutritional status, breakfast habits, reasons for not having breakfast, and the incidence of anemia. Bivariate analysis in this study was conducted with Fisher's Exact test with a confidence level of $\alpha = 95\%$.

Univariate Analysis

Table 1: Frequency Distribution of Respondent Characteristics about Age

Age	Frequency	Percentage (%)
18	3	4.62
19	8	12.31
20	37	56.92
21	11	16.92
22	3	4.62
23	3	4.62
Total	65	100

Source: Primary Data, 2018

Based on table 1 above, it can be seen that most of the respondents' age is 20 years as many as 37 students (56.92%). At the age of 18, 22, and 23 years there were 3 students with a percentage of 4.62%.

Table 2: Distribution of Respondent Characteristic Frequency about Nutritional Status

Nutritional Status	Frequency	Percentage (%)
Thin	58	89,2
Normal	7	10,8
Fat	0	0
Total	65	100

Source: Primary Data, 2018

In table 2 shows that the majority of students have thin nutritional status as many as 58 students

(89.2%). The rest of the students have normal nutritional status with a total of 7 students (10.8%) and no students who have fat nutritional status.

Table 3: Frequency Distribution of Respondents' Characteristics about Breakfast Habits

	Frequency	Percentage (%)
Breakfast	36	55,4
No Breakfast	29	44,6
Total	65	100

Source: Primary Data, 2018

Based on table 3 the characteristics of respondents based on breakfast habits showed that more than half of the total respondents had breakfast habits as many as 36 students (55.4%). While respondents who did not have breakfast habits were 29 students (44.6%).

Table 4: Frequency Distribution of Characteristics of Respondents about Reasons for Not Breakfast

The Reason No Breakfast	Frequency	Percentage (%)
Lazy	24	36,9
No Time	33	50,8
No Food	8	12,3
Total	65	100

Source: Primary Data, 2018

Based on table 4, it can be found that more than half of the respondents did not eat breakfast with the reason that there were not 33 respondents (50.8%). While for lazy reasons as much as 36.9% and for the unavailability of food as much as 12.3%.

Table 5 Frequency Distribution of Characteristics of Respondents about The Incidence of Anemia

	Frequency	Percentage (%)
Anemia	56	86,2
No Anemia	9	13,8
Total	65	100

Source: Primary Data, 2018

In Table 5 the characteristics of respondents with the incidence of anemia were found to be mostly anemic, with 56 students with a percentage of 86.2%. While those who did not experience anemia were 9 students with a percentage of 13.8%.

Bivariat Analysis

Table 6: Fisher's Exact Test

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	4.746a	1	.029	
Continuity Correctionb	3.302	1	.069	
Likelihood Ratio	5.442	1	.020	
Fisher's Exact Test				.036
Linear-by-Linear Association	4.673	1	.031	
N of Valid Casesb	65			

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 4.02
b. Computed only for a 2x2 table

The results of the bivariate analysis of breakfast habits on the incidence of anemia were tested using the Fisher's Exact test shown in the table above that the value of $\rho = 0.036$ where ρ counts <0.05 which means that there is a relationship between breakfast habits and anemia

Table 7: Risk Estimate

	Estimate	95% Confidence Interval	
		Lower	Upper
Risk Ratio	1,2414	1,029	1,4976
Risk Difference	18,7739	3,6563	33,8916

Source: Primary Data, 2018

Based on table 7 about the estimated risk can be obtained data value of RR = 1.2414 with Confidence Interval (CI) lower = 1.029 and upper value = 1.4976.

Discussion

Teenagers are at high risk of suffering from anemia, especially iron deficiency because adolescents experience very fast growth. In growth, the body needs nutrients in large quantities, and among them is iron (Citrakesumasari, 2012). The age characteristics of respondents in this study were from the late 18-24 years of adolescence. The

highest number of respondents is 20 years old as many as 37 respondents (56.92%). Based on body mass index (BMI) obtained as many as 89.2% of respondents had thin nutritional status and 10.8% with normal nutritional status. Teenagers are said to be thin if BMI <18.5. Although many factors affect a person's nutritional status, adequate nutrition is the most dominant factor for normal nutritional status (Supariasa, 2014). This is consistent with research conducted by Shariff and Akbar which states that there is an influence between the level of nutritional consumption on anemic status of female students. Several factors that trigger the occurrence of nutritional problems in adolescence such as wrong eating habits, wrong understanding of nutrition about a slim body become the ideal of teenagers so that nutritional needs are not met, and excessive preference for certain foods. Anemia is directly affected by the consumption of daily foods that are less iron-containing, besides the infection factor as a trigger (Shariff and Akbar, 2018).

A good breakfast is always done in the morning and not in the afternoon and does not differentiate during work/school days with holidays (Pertiwi et al., 2014).

Based on the results of the study found that more than half of the total respondents (55.4%) had a breakfast habit. Whereas 44.6% of respondents did not do breakfast for various reasons because they did not have breakfast had a high percentage of 50.8%, then due to lazy reasons (36.9%) and unavailability of food (12.3%). The reason someone does not eat breakfast before going to school (activity) is because there is no food to eat, food is not interesting, the type of food provided is monotonous (boring), and there is not enough time (no time) because they have to leave early (Khomsan, 2005).

Breakfast is an important activity before doing any physical activity because breakfast contributes about 25% of the nutritional needs of a day, which is quite significant. School children doing breakfast can increase the concentration of learning and make it easier to receive knowledge so that learning achievement is better (Izah, 2011).

The measurement results using the *Fisher's Exact Test* showed that the value of $\rho = 0.036$ ($\rho < 0.05$), so this means that there is a correlation between breakfast habits and the incidence of anemia. Based on the RR value (Relative Risk) is 1.24 with the lower Confident Interval (CI) is 1.029 and upper 1.49 which does not exceed 1, so it can be concluded that the risk of students not having breakfast for anemia is 1.2 times more high

compared to students who have breakfast habits. Factors that influence anemia in adolescents are age, gender, education, area of residence, breakfast habits, complications, and weak body conditions (Permaesih and Herman, 2005).

In research conducted by Amrin stated that breakfast habits were significantly associated with hemoglobin status with a value of $\rho = 0.001$ (value $\rho < 0.05$) so it can be concluded that teenagers who have good breakfast habits tend to have normal hemoglobin status (Amrin et al., 2014). Research conducted by Kalsum and Raden showed that there was also a relationship between breakfast habits and the incidence of anemia ($\rho = 0.03$; OR = 2.05; and CI = 1.11-3.78). Teenagers who do not have breakfast habits are twice as likely to develop anemia as those who eat breakfast (Kalsum and Halim, 2016).

Energy is a source of erythrocyte formation, whereas hemoglobin is a part of erythrocytes so that when energy intake is less it will cause a decrease in erythocyte formation and result in decreased Hb levels (McLean et al., 2007).

Low energy intake can worsen the incidence of anemia. Conversely, many fiber intake contributes to anemia in adolescents. Fiber is found in vegetables and cereals contain high phytic acid as an iron inhibitor in the diet, then affect hemoglobin levels (Woodruff and Duffield, 2000).

Teenagers have many activities, such as school from morning to afternoon, then proceed with extra-curricular activities until the afternoon, and there are still lessons or additional activities. All these activities make teenagers do not have time to eat, especially thinking about the composition and nutritional content of food that enters the body, as a result teenagers often feel tired, weak and powerless. However, fatigue can also be caused by anemia or lack of blood (Suryani et al., 2015).

The wrong diet and the influence of association because you want to slim down and a strict diet causes weight loss. Consuming foods with balanced nutrition will provide enough energy, on the contrary will result in decreased ability of the brain, and decreased enthusiasm of teenagers in learning. Fear of rising weight and irregular eating habits cause teenage anemia (Balsi et al., 2012)

4   CONCLUSIONS

Based on the results of the study, it can be concluded that breakfast habits have an influence on the incidence of anemia. Teenagers who do not eat breakfast have an risk of anemia by 1.2 times than

those who do breakfast. For teenagers are expected to get used to breakfast so that teenagers are easy to concentrate, not easily tired, not easily sleepy and weak due to anemia.

REFERENCES

Aditian, N., 2009. Faktor-Faktor yang Mempengaruhi Kejadian Anemia Gizi Remaja Putri SMP 133 di Pulai Pramuka Kepulauan Seribu Tahun 2009 (Skripsi). Universita Indonesia, Jakarta.

Amrin, S.H., Indriasari, R., Najamuddin, U., 2014. Hubungan Kebiasaan Sarapan dan Konsumsi Suplemen dengan Status Hemoglobin pada Remaja Putri di SMAN 10 Makasar. UNHAS Repos.

Balsi, Y., Karabulut, A., Gürses, D., Ethem Çövüt, İ., 2012. Prevalence and Risk Factors of Anemia among Adolescents in Denizli, Turkey. Iran. J. Pediatr. 22, 77–81.

Brown, J., Isaacs, J., Krinke, U., Murtaugh, M., Stang, J., Wooldridge, N., 2004. Nutriton Traught the Life Cycle, Second Edition. ed. Thomson Wadsworth, USA.

Citrakesumasari, 2012. Anemia Gizi dan Pencegahannya. Kalikata, Yogyakarta.

Izah, S.N., 2011. Faktor-Faktor yang Berhubungan dengan Status Anemia Defisiensi Besi Anak Sekolah Kelas V dan VI di MI Negeri 02 Cempaka Putih Ciputat Timur Tangerang Selatan Tahun 2011 (Skripsi). Universitas Islam Negeri Syarif Hidayatullah, Jakarta.

Kalsum, U., Halim, R., 2016. Kebiasaan Sarapan Pagi Berhubungan dengan Kejadian Anemia pada Remaja di SMA Negeri 8 Muaro Jambi. J. Penelit. Univ. Jambi Seri Sains 18, 09–19.

Kementerian Kesehatan RI, 2013. Riset Kesehatan Dasar (Riskesdas) 2013. Badan Penelitian dan Pengembangan Kesehatan Kementerian Kesehatan RI, Jakarta.

Khomsan, 2005. Pangan dan Gizi untuk Kesehatan 2. Departemen Gizi Masyarakat, Fakultas Ekologi Manusia, Institut Pertanian Bogor, Bogor.

Masrizal, 2007. Anemia Defisiensi Besi (Studi Literatur). J. Kesehat. Masy. II.

McLean, E., Cogswell, M., Egli, I., Wojdyla, D., de Benoist, B., 2009. Worldwide prevalence of anaemia, WHO Vitamin and Mineral Nutrition Information System, 1993-2005. Public Health Nutr. 12, 444–454. https://doi.org/10.1017/S1368980008002401

McLean, E., Egli, I., Cogswell, M., de Benoist, B., Wojdyla, D., 2007. Worldwide Prevalence of Anemia in Preschool Aged Children, Pregnant Women and Non-Pregnant Women of Reproductive Age. Kraemer K Zimmermann MB Eds Nutr. Anemia Basel Sight LifePress 1–12.

Nursari, D., 2010. Gambaran Kejadian Anemia pada Remaja Putri SMP Negeri 18 Kota Bogor (Skripsi). Fakultas Kedokteran dan Ilmu Kesehatan Universitas Islam Negeri (UIN) Syarif Hidayatullah Jakarta, Bogor.

Permaesih, D., Herman, S., 2005. Faktor-Faktor yang Mempengaruhi Anemia pada Remaja. Bul. Penelit. Kesehat. 33. https://doi.org/10.22435/bpk.v33i4 Des.219.

Pertiwi, I., Sandjaja, Wiyono, S., 2014. Hubungan Sarapan, Kecukupan Energi dan Protein terhadap Status Gizi Remaja Usia 16-18 Tahun di Provinsi Lampung (Analisa Data Sekunder Riskesdas 2010). Nutr. Diaita J. 6.

Shariff, S.A., Akbar, N., 2018. Hubungan antara Status Gizi dan Pola Menstruasi dengan Kejadian Anemia pada Mahasiswi Prodi DIII Kebidanan Universitas Muslim Indonesia. J. Window Health 1, 34–39.

Supariasa, 2014. Penilaian Status Gizi. EGC, Jakarta.

Suryani, D., Hafiani, R., Junita, R., 2015. Analisis Pola Makan dan Anemia Gizi Besi pada Remaja Putri Kota Bengkulu. J. Kesehat. Masy. Andalas Program Studi S1 Kesehat. Masy. Fak. Kesehat. Masy. Univ. Andalas.

Utami Tandirerung, E., Mayulu, N., E. S. Kawengian, S., 2013. Hubungan Kebiasaan Makan Pagi dengan Kejadian Anemia pada Murid SD Negeri 3 Manado. J. E-Biomedik EBM 1, 53–58.

Woodruff, B., Duffield, A., 2000. Adolescents: Assessment of Nutritional Status in Emergencyaffected Populations. Bull. World Health Organ.

World Health Organization, 2014. WHO | Global Nutrition Targets 2025: Anaemia policy brief. World Health Organ.