

# Proportion and Characteristics of Anemia in Adolescents Girl

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**Abstract:** Anemia in Indonesian adolescent girl has been increased, this can be seen from the RISKESDAS 2013 result where the prevalence of anemia in adolescent girl was 37.1% and 48.9% in 2018. This study aims to determine the proportion and characteristics of anemia in adolescent girl. This study using a cross-sectional study design. Data were collected by using a questionnaire as an interview instrument. Adolescents anemia status was obtained from the recognition of adolescents who had consulted with doctors or other health workers. The study location in Percut Sei Tuan, Deli Serdang, North Sumatra. Sampling selection by using C-Survey software, namely 210 female high school respondents in 14-18 years old. Data analysis used frequency distribution analysis with 95% CI range. The proportion of anemia incidence was 14.3%, anemic adolescents never consumed blood-booster tablets was 73.3%, abnormal menstrual frequency and range was 6.7% and 23.3%, anemic adolescents consumed less milk was 60%, anemic adolescents ever dieted was 74.4% and have a bad breakfast pattern was 40%. The anemia rate of adolescent girl in this study was high, most of the respondents had never consumed blood-booster tablets and unhealthy lifestyles could have an impact on the worsening of their anemia.

## 1 INTRODUCTION

According to WHO 2016, the prevalence of anemia in adolescents in developing countries is 27%, while in developed countries it is 6%. According to WHO 2016, if the prevalence of anemia is 40%, it is categorized as severe, moderate 20-39%, mild 5-19.9% and normal <5% (WHO, 2016).

While in Indonesia, anemia in adolescent girl has increased, this can be seen from the results Riskesdas in 2013 where the prevalence of anemia in adolescent girl was 37.1% and in 2018 it was 48.9%, with the proportion of anemia in the 15-24 years and 25-34 years age groups (KEMENKES RI, 2018).

Based on the health profile of North Sumatra in 2015, the incidence of anemia reached 57.1%, in 2016 it was 54.5%, and in 2017 it increased to 58.2%. Anemia in adolescent girl in Medan City is still a public health problem because its prevalence is more than 25%, which is 26.5%. This is comparable to the results of research conducted by Arianti (2016), that the incidence of anemia in class XI adolescent girl at SMA Negeri 17 Medan are 30 people (62.5%) (BPS, 2015).

Adolescents girl at puberty are prone to anemia due to the large amount of iron lost during menstruation, moreover there is a body image view that women who have thin and small bodies are considered beautiful, so that it becomes a challenge for anemia in adolescents girl in Indonesia. The impact of the occurrence of anemia experienced by adolescents girl, among others, is to reduce the body's resistance so that people with anemia are susceptible to infectious diseases, decrease fitness and thinking dexterity due to lack of oxygen to muscle cells and brain cells, and decreased learning achievement. Moreover, adolescent girl are prospective mothers who will become pregnant and give birth to a baby, thereby increasing the risk of maternal mortality, premature birth and low birth weight (LBW).

Several studies have shown that inadequate food intake, sleep disturbance or duration is correlated with iron metabolism which further increases the risk of anemia (Xiaoxue, L., Qiaofeng, S., Wanning, H., Xiaochen, H., Jianhui, G., Xiang, Z., Xizhu, W., & Shouling, W., 2018), (Hyungjo, K., Chol, S., & Good, I, 2016), (Khan, ZA, Khan, T., Anu, B., Aziz, SJ, & Sharma, S, 2018). Other studies suggest that dietary

patterns are currently considered the newest epidemiological approach to assess dietary factors and risk of anemia (Fengqing, Z., Tinashe, MT, & Jiangtao, G., 2018). Adolescent girls are a group that is prone to anemia due to increased iron needs to support growth and development and replace the iron needs lost due to menstruation (Ranganath & Debata, L, 2015). A study also found that skipping breakfast will increase the risk of low body mass index and will increase the risk of anemia (Li, L., Peipei, X., Titi, Y., Qian, G., Wei, C., Hui, P., Xu, J., Xiaoqi, H., & Qian, Z., 2018). The more consumption of milk will reduce the risk of anemia, and vice versa, adolescents who do not consumed milk and consumed less milk will be at risk of developing anemia (Zhonghai, Z., Sudfeld, C., Cheng, Y., Qi, Q., Shaoru, L., Elhoumed, M., Yang, W., Chang, S., Dibley, M., Zeng, L., & Fawzie, W., 2021)

Based on the description above, it can be seen that the unhealthy lifestyle of adolescent girl can lead to anemia. Therefore, this study is very important to study considering the many effects of anemia that can be caused.

## 2 METHODS

We hope you find the information in this template useful in the preparation of your submission The design of this study used a rapid survey method which was carried out in senior high schools in Percut Sei Tuan, Deli Serdang, North Sumatra in October to November 2019. The population in this study were 210 girls in high school. Sampling was carried out using the rapid survey method recommended by WHO using the help of C-Survey software, namely 30 clusters consisting of 7 samples per cluster. Data was collected by obtaining primary data through interviews and the assistance of research instruments in the form of questionnaires. Data processing is carried out after the questionnaires are collected by going through stage editing, coding, entry, cleaning, and scoring. Data analysis used frequency distribution analysis with 95% CI range.

## 3 RESULTS

Table 1: Characteristics of respondents (n=210)

Variable	n	%	95% CI
Age (in years)			
14	5	5.1	0-17.9
15	69	15.4	5.1-25.6
16	51	48,7	33.3-69.2
17	73	28.2	15.4-41.0
18	12	2.6	0– 7.7
Diagnosed with Anemia by Health Workers			
Yes	39	18.1	12.5-23.2
No	171	81.9	76.8- 87.5

Based on table 1, it can be seen that there are many anemia sufferers at the age of 17 years (28.2%, 95% CI: 15.4-41.0). However, it was also found at the age of 14 years (5.1%, 95% CI: 0-7.7). Respondents diagnosed with anemia (18.1%, 95% CI: 12.5-23.2).

Table 2: Description of Respondents with Anemia (n = 39)

Variable	Min	Max	Mean	CI 95%	
				Lower	Upper
Milk Consumption (day)	0	9.14	0.45	0.10	0.75
Menstrual Frequency (day)	3	10	5.69	5.15	6.43
Menstrual Range (day)	5	30	25.71	22.97	28.23
Breakfast Pattern (day)	0	1	0.47	0.34	0.62
Sleep Duration (hour)	3	18	0.45	6.85	8.74
Body Mass Index (Kg/m <sup>2</sup> )	24.32	45.39	32.047	30.55	33.43

Based on Table 2, it can be seen that the lifestyle of anemia sufferers such as the average consumption of milk (0.45/day, 95% CI: 0.10-0.75), menstrual frequency (6 days, 95% CI: 5.15-6.43), menstrual interval (26 days, 95% CI: 22.97-28.23), Breakfast pattern (0.47 days, 95% CI: 0.34-0.62), sleep duration (0.45/hour, 95% CI: 6.85-8.74) and BMI (32.04, 95% CI: 5.15 -6.43).

Table 3. Description of Respondents with Anemia (n = 39)

Variable	N	%	CI 95%
<b>Milk Consumption</b>			
Often (2 times/day)	5	12.8	2.6-23.1
Rarely (<2 times/day)	12	30.8	15.4-48.7
Never	22	56.4	41.0-66.7
<b>Menstrual Frequency (every menstrual cycle)</b>			
Normal (3-8 days)	38	97.4	87.2 – 100
Abnormal (<3 days or >8 days)	1	2.6	0 – 12.8
<b>Menstrual Range</b>			
Normal (21-35 days)	32	82.1	69.2-94.9
Abnormal (< 21 days or >35 days)	7	17.9	5.1-30.8
<b>Sleep Duration</b>			
Good (8-9 hours)	18	46,2	33.3-66.7
Bad (<8 hours or >9 hours)	21	53,3	33.3-66.7
<b>Type of Diet</b>			
Mayo	1	2.6	0 – 10.3
Keto	2	5.1	0 – 12.8
Karbo	3	7.7	0 – 17.9
Food Combining	2	5.1	0 – 12.8
Other	21	53.8	35.9-69.2
Never	10	25.6	12.8-43.6
<b>Body Mass Index Status</b>			
Obesity	34	87.2	76.9- 100
Fat	5	12.8	0 – 23.1
<b>Breakfast Pattern</b>			
Good	16	41.0	28.2 – 53.8
Bad	17	43.6	25.6– 59.0
Very Bad	6	15.4	5.1-30.8
<b>Blood-booster Tablets Consumption</b>			
Ever	14	35.9	48.7-79.5
Never	25	64.1	20.5-51.3

Based on Table 3, it is known that the respondent never consumed milk (56.4%, 95% CI: 41.0-66.7), abnormal menstrual frequency (97.4%, 95% CI: 87.2-100), abnormal menstrual range (17.9%, CI 95%: 69.2-94.9), bad sleep duration (53.3 %, 95% CI: 33.3-66.7), never dieted (25.6%, 95% CI: 12.8-43.6), obesity (87.2%, 95% CI: 76.9 -100) but found to be fat (12.8%, 95% CI: 0-23.1), breakfast pattern was very bad (15.4%, 95% CI: 5.1-30.8), never consumed blood-booster tablets (64.1%, 95% CI: 20.5-51.3), but those who had consumed tablets were still anemic (35.9%, 95% CI: 48.7-79.5).

## 4 DISCUSSION

This finding found that adolescents suffering from anemia never consumed milk (60%, 95% CI: 46.7-76.7). It was found that the average consumption of

milk (0.45/day, 95% CI: 0.10-0.75), berdasarkan penelitian Atma (2019) remaja anemia yang menderita anemia lebih sering mengkonsumsi susu yakni sebesar 68,8% dengan rata-rata kebiasaan onsumsi susu 1,42/hari (Atma, 2019). Based on the findings in the field showed that adolescent girl who never consumed milk because they do not like it, even though milk is very important for nutritional intake for adolescent girl such as a good source of calcium. High in milk also contains vitamin B12 which is good and useful for improving blood function. This is in line with research conducted by Damayanti that there is a relationship between vitamin B12 intake which has an influence on the incidence of anemia (Siallagan D, Swamilaksita PD, Angkasa D, 2016).

Milk is a source of protein that has high bioavailability and contains iron, phosphorus, and several vitamins such as vitamin A and vitamin D, meanwhile milk also contains calcium where calcium can inhibit iron absorption (Lynch SR, 2000) (El Menchawy, I., El Hamdouchi, A., El Kari, K., Saeid, N., Zahrou, FE, Benajiba, N., El Harchaoui, I., El Mzibri, M., El Haloui, N., & Aguenauou, H, 2015).

Atma's study in 2019 states that 40 mg of Calcium will not inhibit iron absorption (Atma W AF & Hidayati, IL, 2019). Lack of protein intake can result in inhibited iron absorption, besides that iron is also widely found in foods that are high in protein (Tejasari, 2016).

El Menchawary's study in 2015 also states that consuming milk should be given a break after mealtime so as not to interfere with iron absorption optimally (El Menchawy, I., El Hamdouchi, A., El Kari, K., Saeid, N., Zahrou, FE, Benajiba, N., El Harchaoui, I., El Mzibri, M., El Haloui, N., & Aguenauou, H, 2015).

Research evidence shows that milk consumption can reduce the incidence of anemia in adolescents with statistical analysis results obtained by OR = 0.68, which means that consuming milk can reduce the risk of anemia by 0.68 times compared to not consuming it (Zhu, Z., Sudfeld, CR, Cheng, Y., Qi, Q., Li, S., Elhoumed, M., Yang, W., Chang, S., Dibley, MJ, Zeng, L., & Fawzi , WW, 2021). This is in line with Akbar's research (2014) with statistical test results showing p-value = 0.044 (p <0.05) so that there is a relationship between milk consumption and the incidence of anemia (Akbar EH, 2014).

Good nutritional knowledge is related to the consumption of healthier food as a whole, in this case the role of the family is needed in the formation of adolescent knowledge from an early age to meet adequate nutritional needs.

Anemic adolescents had abnormal menstrual frequency (97.4%, 95% CI: 87.2-100). Average menstrual frequency (6 days, 95% CI: 5.15-6.43), Menstrual frequency is seen from how long the female adolescent cycle is in menstruation. This fact in the field occurs because it is a hereditary factor from the family. Adolescent girls are very susceptible to anemia because every month they experience menstruation and the iron is lost along with the cycle.

Genetic factors accounted for 39% of menstrual characteristic problems such as menstrual frequency and 55% for menstrual pain problems (Jahanfar, S, 2012). The normal menstrual cycle is the result of a complex and integrated process and requires coordination between hormonal secretions and signals in the hypothalamic-pituitary-ovarian axis, the disruption of these signals related to the final outcome of the menstrual cycle (Abusag, M, Ehrmann, DA & Hoffman, L, 2016).

Kumalasari's study in 2019 found that there was a relationship between the menstrual pattern and the incidence of anemia where the results of the analysis found an OR value = 8.886 (95% CI = 2.410 - 32.765) which means that adolescents with abnormal menstrual patterns have an 8.886 times chance of experiencing anemia compared with adolescent girl with normal menstrual patterns (Kumalasari, D., Kameliawati, F., Mukhlis, H., & Kristanti, DA, 2019). In line with this, Khairani's study in 2019 also found that there was a relationship between menstrual frequency and the incidence of anemia in adolescent girl at SMK Negeri 1 Yogyakarta with statistical test results showing p-value = 0.000 (Khairani, Fitri, DA, 2019). This is in line with Listiana's study which states that there is a significant relationship between menstruation and the incidence of anemia in adolescent girl at SMK Negeri 1 Terbanggi Besar, Central Lampung Regency with the results of the analysis that the value of OR = 2.349, meaning that menstruating girls have a risk of 2.349 times for suffer from anemia compared to adolescent girl who do not menstruate (Listiana, 2016).

The same result was shown by Permatasari's study with statistical test results showing the p-value of 0.06 ( $p < 0.05$ ) so that there was a relationship between the length of menstruation and the incidence of anemia in adolescent girl and had correlation coefficient, which means that the longer the menstruation period, the lower the hemoglobin level and the higher the incidence of anemia (Permatasari, Mahar W, 2016).

Irregular menstruation is influenced by several modifiable factors (Bae, Park, & Kwon, 2018). Studies have shown that changes in female hormones are related to stress (Sang Su Lee1, Kim, Lee, Han, &

Park, 2016). It is necessary to provide short courses on stress management techniques as an addition to the educational curriculum, as well as the provision of psychological counseling in schools to prevent higher stress levels.

This finding showed that those suffering from anemia had abnormal menstrual intervals (17.9%, 95% CI: 69.2-94.9). The average menstrual distance was found (26 days, 95% CI: 22.97-28.23). Ditemukan rata-rata jarak menstruasi (26 hari, CI 95%: 22.97-28.23). Penelitian ini sejalan dengan penelitian yang dilakukan oleh dian yang menyatakan bahwa terdapat 95% remaja dengan jarak menstruasi normal mengalami anemia dan artinya hanya 15% yang memiliki jarak menstruasi tidak normal dengan rata-rata jarak menstruasi 26.01 hari dan paling lama 29 hari (Irnayanti, Dian Kartika, Bantas, 2020). In the body, iron functions to support growth and sexual maturation and replace iron that is wasted along with menstrual blood (Syabani, Sumarmi S, 2016).

Changes in the distance between short and long periods of menstruation in adolescents are caused by hormonal changes during puberty, so it is hoped that adolescents can maintain balanced nutrition, not stress and maintain a healthy lifestyle to trigger significant hormonal changes that cause abnormal menstrual range (Fadila, Kurniawati H, 2018).

This is in line with Nofianti's study which states that there is a significant relationship between the distance of menstruation and the incidence of anemia in adolescents girl at SMP Negeri 2 Kerambitan, Tabanan Regency with the results of the analysis that the OR value = 36.08, meaning that adolescents girl who experience menstruation with a cycle that is abnormal will have a 36.08 times greater chance of experiencing anemia compared to adolescents girl who have a normal menstrual cycle (Nofianti, Juliasih, & Wahyudi, 2021).

This finding showed that the anemic patients had poor sleep duration (53.3%, 95% CI: 33.3-66.7) with an average sleep duration (0.45/hour, 95% CI: 6.85-8.74). Facts in the field show that adolescent girl often do not take the time to rest but instead use it to play. Penelitian ini didukung oleh penelitian Astuti tahun 2017 menyatakan bahwa durasi remaja yang menderita anemia rata-rata kurang dari 1 jam dan paling rendah ditemukan 0.45/hour (Astuti, 2017).

According to Musrah that sleep patterns are strongly influenced by lifestyle such as stress which leads to insomnia so that it will be difficult to sleep and worsen sleep problems. Sleep duration will determine the quality of sleep in a person. So that when a person's sleep quality is very good, it will stimulate the repair and renewal of cells including



blood cells and reduce the risk of anemia (Musrah AS & Putri, R, 2019).

Bad sleep duration can cause individuals to feel tired, this can be prevented by regulating good sleep patterns such as taking short naps and maintaining a healthy diet such as avoiding high-caffeinated drinks.

These findings indicate that those who have never done a diet program suffer from anemia (25.6%, 95% CI: 12.8-43.6). Based on the observation that adolescent girls do not pay attention to the food they eat which makes people who have never done a diet program suffer from anemia. Adolescent girl consumed more plant foods that contain little iron compared to animal foods so that the fulfillment of iron in the body is not fulfilled (Sartika & Anggreni, 2021).

Based on study conducted by Esti and Cahyaningtyas in 2021, adolescent girl prefers fast food and drinks such as noodles, meatballs, batagor, dumplings, tea and coffee and others. The choice of food is only based on fun, besides that, the density of activities at school and activities outside of school such as taking lessons (Estri, BA, & Cahyaningtyas, DK, 2021).

Diet programs can inhibit individuals from eating healthy foods, especially those who are on an unhealthy diet, therefore it is important to choose healthy and nutritious foods when doing a diet program and avoid fast food that is low in nutrients.

This finding showed that the anemic patients had a very poor breakfast pattern (15.4%, 95% CI: 5.1-30.8). The average breakfast pattern was found (0.47 days 95% CI: 0.34-0.62). However, it was also found in the good breakfast patterns there were still anemia (41.0%, 95% CI: 28.2-53.8). Facts in the field show that adolescent girl mostly do breakfast but do not pay attention to the type of food consumed. This research is in line with Umami's 2016 research stating that breakfast is very important because it serves to maintain body condition and increase learning concentration. Breakfast also serves as a source of energy to carry out activities (Kalsum U & Halim R, 2016).

The results of this study are in line with the research by Permaesih and Herman in 2013 which found a significant relationship between breakfast habits and the incidence of anemia in adolescents in Indonesia (P-value = 0.0057), where the relative risk was 1.6 times. This means that adolescents who do not eat breakfast have a risk of anemia that is almost twice as large as adolescents who have breakfast habits (Permaesih D, Herman S, 2013).

Wijiastuti's study in Tsanawiyah Cipondoh in 2015 also which found a significant relationship

between breakfast and incidence anemia in adolescent girl (Wijiastuti H, 2015). Lack of nutrient intake can cause disturbances in neurotransmitters which will directly affect learning concentration due to lack of energy and precursors needed (Astuti, Ari I, 2017).

According to an observational study in Yogyakarta on 196 grade 5 and grade 6 students, it was shown that children who do not regularly have breakfast have a risk of low hemoglobin levels 1.7 times compared to children who regularly eat breakfast.

Consumption of breakfast is very important to regulate energy intake in the body, thus causing a higher intake requirement if breakfast is skipped (Sila, et al., 2019), there are many bad effects that will occur if you skip breakfast, especially increasing the risk of obesity (Gibney, et al., 2018) (Monzani, et al., 2018) (Blondin, Anzman-Frasca, Djang, & Economos, 2016), which further increases the risk of anemia. It needs cooperation between children, parents and teachers in schools to promote the importance of breakfast, build knowledge about breakfast consumption and promote and provide healthy breakfasts in schools so that they can help children who skip breakfast at home.

This finding showed that the anemic patients were obese (87.2%, 95% CI: 76.9-100.0) but also obese female adolescents were anemic (12.8%, 95% CI: 0-23.1) with an average BMI (32.04, 95% CI: 5.15-6.43). This happens because they consumed foods that are not balanced with the body's needs such as more frequent consumption of foods that contain fat, high calories and lack of iron intake. Another assumption also shows that this is related to canteens in schools for adolescent girl who suffer from anemia who do not provide food that does not have high nutritional value.

School children have almost half a day at school, therefore the food sold at school contributes greatly to the growth and development of adolescents who are in the process of development. Things like this really need to be given an intervention in the form of a healthy canteen program that must be implemented in every high school (SMA). A healthy canteen is a place where the food needs of all school residents are available, where the available food and drinks are guaranteed safety, cleanliness and nutritional content and have safe facilities (Utama & Demu, 2021).

The cleanliness of the canteen must be maintained from the beginning of food processing to environmental conditions, apply the habit of washing hands before eating and provide closed and divided trash bins according to the type of waste. Meanwhile,

a nutritionally balanced diet is a combination of rice and the like, meat and beans, vegetables and fruits, and milk (Damayanti, D, 2013). Some of the menus include Hainanese chicken rice, sandwiches with various fillings, croquettes, risoles filled with vegetables, fruit pudding, mineral water, juice, and tea (Damayanti, D, 2011). If food is not fulfilled with sufficient nutrition, especially for school children, it is a risk of disease, one of which is obesity (Yuliatin, 2012).

Obesity has a negative effect on women's reproductive health and obesity is a factor causing menstrual disorders such as oligomenorrhea which is often experienced by women with obesity (Sudargo, LM, Rosiyani, & Kusmayanti, 2014). Oligomenorrhea is a menstrual cycle that exceeds 35 days per cycle and is usually ovulatory with a proliferative phase that is longer than the proliferative phase of the classical menstrual cycle (Hendrik, 2006). This is in line with the research conducted by Nead in 2004 where the opportunity to experience anemia occurs in children and adolescents who are at risk of obesity with OR = 2.0 (95% CI = 1.2-3.5), and OR = 2.3 (95% CI = 1.4-3.9) in obese children and adolescents (Nead KG, Haterman JS, Kaczorowski M, 2004).

This study is in line with Indah's research on adolescent girl at SMA Batik 1 Surakarta, showing that the percentage of overweight and obese nutritional status that occurred in the case group (31.4%) was higher than the control group (8.6%) (Noviandari, 2016). Showed that there was a relationship between nutritional status and menstrual cycle in adolescent girl at SMA Batik 1 Surakarta (p-value = 0.036).

Adequate nutrition is very important, because nutritional deficiencies can cause a decrease in the formation of red blood cells which can lead to reduced red blood cells in the body and cause anemia. From the results of this study, it can be seen that the better the nutritional status of the respondents, the less the risk of anemia. This is in line with the research conducted by Yu Qin in China which stated that hemoglobin levels tend to increase along with the increase in BMI (Yu Q, Alida MB, Xiaoqun P, Baojun Y, Yue D, Jinkou Z, 2013).

Body Mass Index is a simple measuring tool to monitor nutritional status. In the case of obesity, it is associated with anemia due to the accumulation of fat in adipose tissue, thereby inhibiting iron absorption. Therefore, it is important to maintain a normal BMI status through nutritional intake and physical activity to avoid anemia.

Adolescent girls need to take iron tablets in order to replace the blood lost during the menstrual process. According to Nuradhiani's study (2017), teacher support is related to the consumption of TTD in adolescents, because teachers are considered to be able to provide information about the TTD. Therefore, good cooperation between teachers and parents is needed to monitor TTD consumption in adolescent girl (Nuradhiani, Briawan, & Dwiriani, 2017).

These findings indicate that anemic patients with the status of never consumed blood-booster tablets (64.1%, 95% ci: 20.5-51.3), then it was also found that those who had consumed blood-booster tablets were still anemic (35.9%, 95% CI: 48.7-79.5). Facts in the field show that the provision of TTD has been carried out by health workers in every high school but only a small portion of the TTD is consumed. This is because there are still many adolescent girls who do not understand or have less knowledge about anemia and consumed blood-booster tablets. This is in line with Irianto's research which explains that the awareness of consuming FE tablets in adolescent girl cannot be separated from the information and knowledge they get, this is because knowledge is a factor that affects many problems including one's consumption behavior. Compliance in consuming blood-booster tablets or giving Fe tablets greatly affects changes in hemoglobin levels, where hemoglobin levels are normal, the anemia status will also be normal, so as to prevent and overcome iron deficiency anemia (Yuniarti, 2015).

Based on Putri's research in 2017 the most dominant variable relationship multivariate results obtained that adherence to Fe-added tablet consumption is the most dominant variable that affects the incidence of anemia in adolescent girl is that female adolescents who do not comply with consumed blood-booster tablets have a 61.55 times risk of suffering from anemia compared to adolescents. obedient daughter took the tablets. This means that the more female adolescents are obedient in consuming Fe tablets, the lower the chance of anemia. On the other hand, if the non-compliance with the consumption of Fe tablets is low, the chances of anemia will continue to increase among adolescent girl (Putri, Simanjuntak, & Kusdalinah, 2017)

This is in line with Putri's study in 2017 which states that consuming Fe tablets is very influential on the occurrence of anemia with the results of the analysis of OR = 61.55 which means that adolescent girl who do not consumed Fe tablets will have a 61.55 times greater risk of developing anemia compared to adolescent girls who do not consume Fe tablets.

routinely consuming Fe tablets (Putri, Simanjuntak, & Kusdalinah, 2017).

Several studies have explained that there are factors that cause the ineffectiveness of the consumption of blood-booster tablets even though they are consumed regularly, such as the quality of blood-booster tablets and the intake of nutrients given to adolescent girl (Permatasari, Briawan, & Madanijah, 2018).

## 5 CONCLUSIONS

Patients with high anemia at the age of 17 years (28.2%, 95% CI: 15.4-41.0). Anemic adolescent girl (18.1%, 95% CI: 12.5-23.2). Average milk consumption (0.45/day, 95% CI: 0.10-0.75), average menstrual frequency (6 days, 95% CI: 5.15-6.43), average menstrual interval (28 days, 95% CI: 22.97-28.23), average breakfast pattern (0.47 days 95% CI: 0.34-0.62), average sleep duration (0.45/hour, 95% CI: 6.85-8.74) and average BMI (32.04, CI 95%: 5.15-6.43). Respondents never consumed milk (56.4%, 95% CI: 41.0-66.7), Abnormal menstrual frequency (97.4%, 95% CI: 87.2-100), Abnormal menstrual distance (82.1 %, 95% CI: 69.2-94.9 ), poor sleep duration (53.3%, 95% CI: 33.3-66.7), never went on a diet (25.6%, 95% CI: 12.8-43.6), obese (87.2%, 95% CI: 76.9-100) but found obese (12.8%, 95% CI: 0-23.1), very poor breakfast pattern (15.4%, 95% CI: 5.1-30.8), never consumed blood-booster tablets (64.1%, 95% CI: 20.5-51.3), have ever consumed blood-booster tablets and still suffer from anemia (35.9%, 95% CI: 48.7-79.5).

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