International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 06 June 2024
DOI: 10.47191/ijcsrr/V7-i6-61, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Analysis of Factors in Reducing the Incidence of Anemia in Adolescent Girls at Ummi Kulsum Banjaran SMP Bandung District

Fahmi Fuadah[1], Berlina D Saragih[2]
[1,2] Immanuel Health Institute

ABSTRACT: Adolescence is a transition period from childhood to adulthood. In Indonesia, around 90% of women menstruate every month, but the onset of menstruation can cause anemia for teenagers who experience it. This is caused by several things, of course because there is irregular bleeding, this is caused by the teenager's age itself. , parental factors, including education and work, each person's food intake/nutritional status, and also the menstrual cycle/length of menstruation experienced each month. This research aims to determine the factors associated with the occurrence of anemia in adolescent girls at Umi Kulsum Banjaran Middle School in 2022. The research method used is a quantitative analytical approach research design with a cross sectional research design. The research population was all 120 female students and the sample used was 55 people using the random sampling technique. Data collection was carried out by means of interviews and direct examination of respondents. Data analysis went through three stages, univariate (frequency distribution), bivariate (chi square) and multivariate analysis (Logistic Regression). The results of the research show that there are factors that are associated with the incidence of anemia in adolescent girls, including age, nutritional status and length of menstruation with a p-value <0.05. It is recommended that students increase their knowledge about reproductive health, especially those related to enstruation, educational institutions can optimize education about adolescent reproductive health by collaborating with health workers in the surrounding environment.

KEYWORDS: Adolescents, Nutritional Status, Anemia, Education, Reproductive Health

INTRODUCTION

Anemia is a major nutritional problem that occurs throughout the world. According to the World Health Organization (WHO), women aged 15-49 years suffer from anemia in six countries, namely, Africa, America, Asia, Europe, the Eastern Mediterranean, and the Western Pacific region, amounting to 409 - 595 million people. The prevalence in Asia, anemia in women aged 15-45 years reaches 191 million people and Indonesia ranks 8th out of 11 countries in Asia after Sri Lanka with a prevalence of anemia of 7.5 million people aged 10-19 years. 1 The prevalence of anemia in Indonesia is based on Riskesdas 2013 reached 37.1% and increased to 48.9% in the 15-24 year age group in 2018.2

Anemia is a condition where the concentration of hemoglobin (Hb) in the blood is lower than the normal value for the age group according to age and gender. 3 The cause of anemia in countries with anemia prevalence above 20% is Fe deficiency, anemia, or a combination of Fe deficiency. Anemia that occurs due to iron deficiency so that the formation of red blood cells and other functions in the body is disrupted is iron nutritional anemia. Sufficient amount of peripheral tissue (decreased Oxygen Carrying Capacity).

Adolescents have a high risk of anemia, especially iron deficiency anemia. This happens because adolescence requires higher levels of nutrients, including iron, for growth and development. Adolescent girls have a higher risk than adolescent boys, this is because adolescent girls experience menstruation (menstruation) every month. Apart from that, young women tend to really pay attention to their body shape, so they will limit their food intake and have many food restrictions such as following a vegetarian diet.4

The impact of anemia in teenagers can reduce concentration and learning achievement, as well as affect productivity among teenagers. 5 Apart from that, it can also reduce the body's resistance so that it is susceptible to infection. Anemia can affect a person's level of physical fitness. As a result of long-term iron deficiency anemia in adolescent girls who will later become pregnant, these adolescent girls are unable to fulfill the nutrients in themselves and their fetuses, which can increase the risk of maternal death, prematurity, LBW (Low Birth Weight) and perinatal death.6

There are several factors that can cause anemia, the first is parental income. This is in accordance with research by Basith et al in 2017 on adolescent girls showing that there is a relationship between parental income level and the incidence of anemia in adolescent girls. The results of this study showed that 52% of adolescent girls with low parental income levels experienced anemia. the 7 The

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results of this study best compare with Panyuluh et al's research on adolescents, which showed that there was no relationship between parental income level and the incidence of anemia in adolescent girls. The results of this study showed that 17.5% of adolescent girls with low levels of parental income did not experience anemia, compared to 12.5% of adolescent girls with high levels of parental income.8

Apart from parental income, another factor is the mother's education. Research shows that parental education has a positive impact on children's well-being, including nutritional status. Mother's education has twice the influence as the father's education. Several previous studies have shown that higher maternal education can increase the mother's ability to understand and respond to changes in nutritional behavior, thereby making it easier to accept alternative food preparation methods and read and interpret food labels correctly. This is in accordance with research by Basith et al in 2017 on adolescent girls showing that there is a relationship between the level of parental education and the incidence of anemia in adolescent girls. The results of this study showed that 42% of adolescent girls with low levels of parental education experienced anemia.7

Nutritional status is also an influencing factor in the incidence of anemia. This is in accordance with Sari's 2018 research on adolescent girls showing that there is a relationship between nutritional status and the incidence of anemia in adolescent girls. The results of this study showed that 76.4% of adolescent girls with underweight nutritional status experienced anemia. 9 This result is inversely proportional to Shariff's 2018 research on adolescent girls showing that there is no relationship between nutritional status and the incidence of anemia in adolescent girls. The results of this study showed that 61.3% of adolescent girls with normal nutritional status experienced anemia.10

Another factor is physical activity. This is in accordance with Aramico's 2017 research on adolescent girls showing that there is a relationship between physical activity and the incidence of anemia in adolescent girls. The results of this study showed that 58.1% of adolescent girls with heavy physical activity experienced anemia. the 11 The results of this study were inversely proportional to the research conducted by Briawan et al in 2011 on adolescent girls, showing that there was no relationship between physical activity and the incidence of anemia in adolescents. daughter. The results of this study showed that 49% of young women with heavy activity did not experience anemia. the 12 The final factor is the length of menstruation. This is in accordance with research by Basith et al in 2017 on adolescent girls showing that there is a relationship between the length of menstruation and the incidence of anemia in adolescent girls. The results of this study showed that 32% of adolescent girls with abnormal menstruation experienced anemia.7

METHOD

The type of research in this research is quantitative with a cross-sectional design, the total research population is 120 people, the sample size is 55 people, the sampling technique uses simple random sampling technique, and data collection is done by taking direct measurements on each teenage female student. Bivariate Data Analysis uses *Chi Square* and Multivariate Analysis uses *Regression Logistic Analysis*. This research was located at Umi Kulsum Banjaran Middle School, Bandung Regency, West Java Province - Indonesia.

RESULTS AND DISCUSSION

Factors that occur in adolescent women at Umi Kulsum Banjaran Middle School

Age	**Frequency**	**Percentage (%)**
1. Umur <14 tahun	31	56,4
2. Umur ≥ 14 tahun	24	43,6
Total	55	100.0
Nutritional Status	**Frequency**	**Percentage (%)**
1. Tin < 18,5	19	34,5
2. Normal 18,5 – 25,0	24	43,6
3. Fat > 25.0	12	21,8
Total	55	100.0

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Education	Frequency	Percentage (%)
1. Elementary School – Junior High School	36	65,5
2. Senior High School - College	19	34,5
Total	55	100.0
Long Menstruation	**Frequency**	**Percentage (%)**
1. Abnormal > 7 hari	24	43,6
2. Normal 3-7 hari	31	56,4
Total	55	100.0
Hemoglobin levels	**Frequency**	**Percentage (%)**
1. Anemia (Hb <12 mg)	29	52,7
2. Normal (Hb >12 mg)	26	47,3
Total	55	100.0

Based on the table above, it can be seen that the majority of young women are under 14 years old (56.4%), and a small portion are >14 years old (43.6%). The majority of young women have normal nutritional status (43.6%), and a small percentage have obese nutritional status (21.8%). Most of the parents' education for young women is elementary school - junior high school (65.5%) and a small number have high school–high school education (34.5%). The majority of teenage girls experience a normal menstrual period of 3-7 days (56.4%) and a small number experience a menstrual period of >7 days (43.6%). And the majority of young women experience anemia (52.7%) and a small percentage do not experience anemia (47.3%).

Relationship between Age and the Incidence of Anemia in Adolescent Girls at Umi Kulsum Banjaran Middle School

Age	*Haemoglobin*		Jumlah	P value
	< 12 gr/dl	≥ 12 gr/dl		
<14 th	19 (67,9%)	9 (32,1%)	28 (100%)	0,022
≥14 th	10 (37%)	17 (63%)	27 (100%)	
TOTAL	29 (52,7%)	26 (47,3%)	55 (100%)	

Relationship between Nutritional Status and the Incidence of Anemia in Adolescent Girls at Umi Kulsum Banjaran Middle School

Nutritional Status	*Haemoglobin*		Jumlah	P value
	< 12 gr/dl	≥ 12 gr/dl		
Thin	12 (63,2%)	7 (36,8%)	19 (100%)	0,000
Normal	6 (25%)	18 (75%)	24 (100%)	
Fat	11 (91,7%)	1 (8,3%)	12 (100%)	
TOTAL	29 (52,7%)	26 (47,3%)	55 (100%)	

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Relationship between Education and the Incidence of Anemia in Adolescent Girls at Umi Kulsum Banjaran Middle School

Education	*Haemoglobin*		Jumlah	P value
	< 12 gr/dl	≥ 12 gr/dl		
Elementary School -Junior High School	19 (52,8%)	17 (47,2%)	36 (100%)	0,992
Senior High School - College	10 (52,6%)	9 (47,4%)	19 (100%)	
TOTAL	29 (52,7%)	26 (47,4%)	55 (100%)	

Relationship between Long Menstruation and the Incidence of Anemia in Adolescent Girls at Umi Kulsum Banjaran Middle School

Long Menstruation	*Haemoglobin*		Jumlah	P value
	< 12 gr/dl	≥ 12 gr/dl		
Abnormal > 7 hari	17 (70,8%)	7 (29,2%)	24 (100%)	0,018
Normal 3-7 hari	12 (38,7%)	19 (61,3%)	31 (100%)	
TOTAL	29 (52,7%)	26 (47,3%)	55 (100%)	

Based on the table above, it shows that there is a relationship between the factors age, nutritional status, and duration of menstruation on the incidence of anemia in adolescent girls at Umi Kulsum Banjaran Middle School, Bandung Regency.

Adolescence is the age when children grow towards the process of adult human maturity. In adolescence, changes occur in a person's physical, biological, and psychological aspects and occur continuously throughout adolescence. An imbalance between nutritional intake and needs results in nutritional problems, both undernutrition and overnutrition (Briawan, 2013). Nutritional problems that occur in adolescence are a continuation of the nutritional problems that occurred when they were children. These problems include iron deficiency anemia, deficiency and excess body weight. Eating habits carried out during adolescence will have an impact on health conditions in the next phase of life. Adolescent girls need a lot of iron intake to replace the iron lost from blood during menstruation (Sya'bani & Sumarmi, 2016).

Consuming a diverse and nutritionally balanced diet influences the development of young reproductive organs. Based on the research conducted by Susanti (2012), it was concluded that excessive fat consumption is a risk factor for anemia. This excessive fat intake is influenced by limited information regarding the intake of food eaten, so that teenagers are interested in consuming processed foods, especially foods that contain fat. Weight gain is a factor consistently associated with the onset of sexual maturity in young adults and adolescents. Several retrospective studies have shown that adolescents who experience menarche before the age of 12 are heavier and fatter compared to adolescents who experience menarche later. (Shavilla, 2015)

According to Dr. E.A. Abioye-Kuteyi (2014) in his research explained that there is a significant relationship between nutritional status and the incidence of anemia, but in this case he did not determine whether the nutritional status was thin or fat. Therefore, there are similarities with the results carried out by the authors, namely, that there is a significant relationship between nutritional status and the incidence of anemia.

Factors that influence anemia in adolescents are quite diverse. According to Farida, in her research in Kudus, she found 36.8% cases of anemia in some female students who had parents with low levels of opinion and education. (Arsiyanti & Nontji, 2015).

Research by Simamora, Kartasurya & Pradigdo (2018) states that there are three factors behind the incidence of anemia, the first is the direct cause. The direct cause of anemia is a lack of iron levels in the blood and the condition of the body being infected with disease. Lack of iron in the body is caused by insufficient intake of foods that contain iron. Worms and malaria are infectious diseases that can increase a person's risk of anemia. The second cause is an indirect cause, namely, low family attention, high activity levels, and inaccurate food distribution patterns within the family. The third cause is the fundamental cause. The basic

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causes consist of low education, low income, low social status, and difficult geographical location of residence. Research by Simamora Kartasurya & Pradigdo (2018) adds that the level of education is one of the basic causes that can lead to anemia. This is because the level of education influences the level of knowledge regarding nutritional intake that must be met every day. A good understanding of adequate nutritional intake will have an impact on good eating patterns so that it can prevent the incidence of anemia in society, especially in young women as a group prone to anemia.

Young women are susceptible to anemia, because they menstruate every month and during their growth period, they need a lot of iron. Adolescent girls during menstruation will lose blood which contains iron. Iron is the main ingredient for the formation of hemoglobin. Menstruation in women has a distance from the first day of the previous menstruation to the next menstruation or what is usually called the menstrual cycle, normally 24-35 days. Menstruation lasts 4-7 days and normally blood loss is 30-80 ml/day.

If there is a disruption in the cycle, the length and volume of menstrual blood will affect the amount of blood that comes out. If there is a disturbance in the menstrual cycle, where the cycle becomes shorter than normal, more blood will come out. More iron comes out to the blood. 5 This causes hemoglobin levels in the blood to be low. Then, if the hemoglobin level falls below the normal value, anemia occurs. If there is a disturbance in the length of menstruation, namely, longer than normal, then more blood will come out. More iron will come out to the blood. This causes hemoglobin levels in the blood to be low.

Teenage girls whose menstruation is abnormally long are 7.556 times more likely to experience anemia compared to teenagers whose menstruation is normal. This is because adolescent girls whose menstruation lasts longer (> 6 days) tend to produce more blood. This is in accordance with the research by Prastika (2011) which shows that there is a relationship between the length of menstruation and the incidence of anemia in female students at SMA Negeri 1 Wonosari (p = 0.000). This is in accordance with the theory put forward by Arisman (2014: 66) which states that young women who have menstruated are at risk of developing iron deficiency anemia, because the amount of blood lost during one menstrual period is around 20-25 cc, this amount implies a loss of iron. iron is 12.5-15 mg/month, or approximately the same as 0.4-0.5 mg/day. If this amount is added to the basal loss, the total amount of iron lost is 1.25 mg/day.

Results Of Multivariate Analysis

Variabel	B	Wald	Sig.	Exp(B)	95% C.I. for EXP(B)	
					Lower	Upper
Age	1.184	3.364	.067	3.269	.922	11.589
Nutrition Statusi	-.940	3.777	.019	.391	.151	1.008
Long Menstruation	1.593	5.473	.052	4.921	1.295	18.698

The final results from the table above of the multivariate analysis show that the dominant variable is related to the incidence of anemia in adolescent girls at SMP Umi Kulsum, Banjaran District. Bandung, West Java Province in 2022 is the Menstrual Length variable after controlling for the Age and Nutritional Status variables.

CONCLUSION

1. Description of the age of adolescent girls, namely, 56.4% aged <14 years, 43.6% of adolescent girls who have normal nutritional status, 65.5% of adolescent girls' parental education at most, 65.5% of adolescent girls' menstrual period at >7 days, namely 56.4% and the results of hemoglobin examination in adolescent girls are at most < 12gr/dl, namely 52.7%
2. Based on the chi-square test, there is a relationship between age, nutritional status, and length of menstruation and the incidence of anemia in adolescent girls (p < 0.05)
3. Based on multivariate analysis, it is known that the dominant variable associated with the incidence of anemia in adolescent girls is the length of menstruation (OR 4.921) after controlling for the variables age and nutritional status.

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SUGGESTION

1. Kiangroke Community Health Center. It is hoped that they will provide regular counseling to schools to increase teenagers' knowledge and understanding of the importance of reproductive health
2. Parents / Students of Umi Kulsum Banjaran Middle School. Parents must pay more attention to their children's growth and development, especially their nutritional status, based on observing their eating patterns on average once a day. Always get students used to breakfast and provisions brought from home with quality foods high in carbohydrates and high in protein to reduce snacks sold around the school.
3. Umi Kulsum Banjaran Middle School.
   a. To always pay attention to the reproductive health of female students by providing education about reproductive health, especially about menstruation
   b. Increase physical activity (sports) for students so that the metabolic system in the body works well so that nutritional status is normal
   c. Can collaborate with health workers in the surrounding environment to provide education about adolescent reproductive health
4. Other Researchers. It is hoped that the results of this research can provide input and comparison of knowledge insights in carrying out further research to discuss other factors related to the incidence of anemia in adolescent girls.

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Cite this Article: Fahmi Fuada, Berlina D Saragih (2024). Analysis of Factors in Reducing the Incidence of Anemia in Adolescent Girls at Ummi Kulsum Banjaran SMP Bandung District. International Journal of Current Science Research and Review, 7(6), 4110-4115