

# Factors Related Of Anemia in Adolescence Girl

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## ABSTRACT

Anemia during adolescence has a negative effect on growth, cognitive abilities, performance abilities and has a serious impact throughout the reproductive years. The study aims to determine the factors associated with the incidence of anemia in adolescent girls. This type of research method is a cross-sectional study. The sample in this study were female students of class XI and XII at SMAS PGRI 2 Banjarmasin who met the inclusion criteria totaling 75 people. Sampling technique with Total Sampling. The research instrument used measurements and questionnaires consisting of Body Mass Index (BMI), Middle-Upper Arm Circumference (MUAC), menstrual patterns and eating patterns. Data analysis using a computer program. The results showed that the female adolescents in SMAS PGRI 2 Banjarmasin who did not experience anemia were (70.7%) while the female adolescents who had anemia were (29.3%). There is a relationship between BMI and the incidence of anemia in adolescent girls p-value 0.023 (<0.05), there is a relationship between MUAC and the incidence of anemia in adolescent girls p-value 0.012 (<0.05), there is a relationship between diet and the incidence of anemia in adolescent girls p-value 0.021 (<0.05), there is a relationship between menstrual patterns with the incidence of anemia in adolescent girls p-value 0.026 (<0.05). Preventive and promotive efforts need to be done by increasing the consumption of nutritious food and giving blood-supplementing tablets especially for female students.

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## INTRODUCTION

Anemia is defined as a condition in which the number of red blood cells and their oxygen-carrying capacity are not sufficient to meet the physiological needs of the body. This condition occurs when the red blood cell count is normal (<4.2 million/ $\mu$ l) or hemoglobin (Hb) <12 g/dl in women and <13 in men. Anemia during adolescence is a nutritional problem and has irreversible negative effects on growth, cognitive abilities, performance abilities and has a serious impact throughout the reproductive years and beyond (Mengistu et al., 2019).

Iron deficiency is the most common cause of anemia worldwide and affects about 1 billion people. The prevalence of iron deficiency in women ranges from 15% to 18% globally. Worldwide,

anemia is estimated to affect 29% of nonpregnant women and 38% of pregnant women. In the UK, approximately 46% of women develop anemia at some stage during pregnancy (Benson et al., 2021). In developing countries, iron deficiency is a common health problem affecting infants, preschool and school children due to rapid growth rates combined with depleted iron stores, poor living conditions and inadequate diet (Youssef et al., 2020).

Iron nutritional anemia in adolescent girls is at a higher risk because it causes a person to experience a decrease in body resistance so that they are susceptible to health problems. This is because young women experience menstruation every month and are in a period of growth so they need more iron intake. In addition, an imbalance in nutrient intake is also a cause of anemia in adolescents. One of the factors that trigger anemia is the condition of an abnormal menstrual cycle. Actual blood loss when experiencing excessive menstrual levels for more than 3-4 days, pads or tampons are always wet every hour and change them frequently (Herwandar & Soviyati, 2020).

The prevalence of iron nutritional anemia in pregnant women in Indonesia based on the results of the Basic Health Research in 2013 was 37.1%, increasing in 2018 to 48.9%. Anemia when viewed by age group in 2018 is as follows for the 15 until 24 years age group of 84.6% (Kemenkes RI, 2019). Therefore, the Government of Indonesia seeks to overcome this as stated in the 2020-2024 RPJMN, namely the first main target in the form of improving Maternal and Child Health (KIA), Family Planning (KB) and Reproductive Health. The effort made by the Indonesian government is to improve the nutrition of adolescent girls and pregnant women (Kemenkes RI, 2020).

Based on data from the Banjarmasin City Education Office (2018), PGRI 2 Private High School (SMAS) Banjarmasin has the third largest number of students out of nine PGRI SMAS in Banjarmasin. The results of a preliminary study conducted by researchers on 10 female students who were interviewed randomly, it was found that many female students skipped breakfast, they had breakfast during their first break at 10:00 WITA so that they sometimes lacked focus while studying. In addition, female students said they rarely eat vegetables and prefer fast food. According to the researcher's observations, 6 of the interviewed students looked thin and when the Upper Arm Circumference (LILA) was measured the result was <23.5 cm (Preliminary Study Interview Results, 2022).

SMAS PGRI 2 is one of the schools located in the same sub-district as the Abdi Persada School of Health Sciences (STIKes) Banjarmasin, so it is hoped that this research can provide benefits to the surrounding community. In addition, in order to realize the vision of the DIII Midwifery Study Program, STIKes Abdi Persada Banjarmasin, namely being able to carry out early detection of anemia in adolescents as a form of preventive effort in preparing adolescent reproductive health to face a healthy pregnancy without anemia

## RESEARCH METHOD

The research design used in this study was analytical observation with a cross sectional approach. The method of collecting data in this study is to use total sampling which means that all teenage girls in class XI and XII at SMAS PGRI 2 Banjarmasin who meet the inclusion criteria are entitled to become respondents. The total number of female students in class XI and XII was 87 people, but only 75 people met the research inclusion criteria. The variables in this study consisted of independent variables, namely the respondent's Body Mass Index (BMI), Middle Upper Arm Circumference (MUAC) of the respondent, the respondent's eating pattern and the respondent's menstrual pattern. Univariate analysis was performed to describe the frequency of each variable. Bivariate analysis using correlation test through contingency coefficient statistic from Chi-Square with computer program.

## RESULTS AND DISCUSSION

### RESULTS

#### Univariate Analysis

**Table 1.** Hasil Analisis Data Univariat dan Bivariat

Variabel	N	Anemia Status		P-Value	Odds Ratio	95% Confidence	
		Yes	No			Lower	Upper
<b>Body Mass Index (BMI)</b>							
Risk	41	17 (41,5%)	24 (58,5%)	0,023	4,108	1,321	12,774
No Risk	34	5 (14,7%)	29 (85,3%)				
<b>Middle-Upper Arm Circumference (MUAC)</b>							
Abnormal	43	18 (41,9%)	25 (58,1%)	0,012	5,040	1,503	16,905
Normal	32	4 (12,5%)	28 (87,5%)				
<b>Dietary Habit</b>							
Not Accordance	34	15 (44,1%)	19 (55,9%)	0,021	3,835	1,331	11,049
Accordance	41	7 (17,1%)	34 (82,9%)				
<b>Menstrual Pattern</b>							
Abnormal	45	18 (40%)	27 (60%)	0,026	4,333	1,296	14,530
Normal	30	4 (13,3%)	26 (86,7%)				

Based on the results of the study, it is known that 17 teenagers at SMA PGRI 2 Banjarmasin who have a BMI are at risk and experience anemia (17%), while there are 5 girls (14.7%) who have a BMI. The results of the chi-square statistical test showed a p-value of 0.023 (<0.05), which means that there is a relationship between BMI and the incidence of anemia in adolescent girls. The Odd Ratio value of 4.108 means that young women who have a BMI are at risk of having 4 times the risk of developing anemia compared to adolescents who have a BMI that is not at risk (OR 4.108 95% CI 1.321-12.774).

The results showed that there were 18 female students (41.9%) who had an abnormal LILA and experienced anemia, while the female adolescents who had a normal LILA and had anemia were as many as 5 students (12.5%). The results of the chi square statistical test showed a p-value of 0.012 (<0.05), meaning that there was a relationship between LILA and the incidence of anemia in adolescent girls. The Odd Ratio value of 5.040 means that young women who have an abnormal LILA have a 5 times risk of developing anemia compared to adolescents who have a normal LILA (OR 5.040 95% CI 1.503-16.905).

The results showed that 15 teenagers in SMA PGRI 2 Banjarmasin who had an inappropriate diet and experienced anemia (44.1%), while 7 female students who had an appropriate diet and experienced anemia (17.1%) had anemia. The results of the chi-square statistical test showed a p-value of 0.021 (<0.05), which means that there is a relationship between diet and the incidence of anemia in adolescent girls. The Odd Ratio value was obtained at 3.835, meaning that adolescent girls who have an inappropriate diet have 4 times the risk of experiencing anemia compared to adolescents who have an appropriate diet (OR 3.835 95% CI 1.331-11.049).

Based on the results of the study showed that there were 18 female students at SMA PGRI 2 Banjarmasin who had an abnormal menstrual pattern and experienced anemia (40.0%), while there were 4 female students who had normal menstrual patterns and experienced anemia (13.3%). The results of the chi-square statistical test showed a p-value of 0.026 (<0.05), meaning that there was a relationship between menstrual patterns and the incidence of anemia in adolescent girls. The Odd Ratio value of 4.333 means that adolescent girls who have an abnormal menstrual pattern have 4 times the risk of experiencing anemia compared to adolescents who have a normal menstrual pattern (OR 5.040 95% CI 1.292-14.530).

#### Discussion

- a. **Relationship between Body Mass Index (BMI) and the incidence of anemia in adolescent girls**

Based on the results of the study, it was found that there was a relationship between Body Mass Index (BMI) and the incidence of anemia in adolescent girls at SMAS PGRI 2 Banjarmasin. This is in line with the results of research (Sumarmi et al., 2016) that iron deficiency is more common in young women with underweight. The higher prevalence of underweight is evident in low- and middle-income countries compared to more developed countries. The incidence of anemia poses a serious problem, because nutritional status before pregnancy plays an important role for a healthy pregnancy, where BMI before pregnancy is a strong predictor of infant birth weight. Low BMI is also associated with intra-uterine growth restriction of the fetus.

The incidence of anemia is not only experienced by young women who have a thin BMI, but also experienced by young women who have an excessive BMI. This is in line with the results of research (Ali et al., 2021) that overweight and obesity are risk factors for anemia in adolescent girls. People who are overweight and obese have a 31% higher chance of developing iron deficiency. Obese individuals have higher iron requirements, increased intake of energy-dense foods, dilution and/or impaired iron absorption due to obesity-induced inflammation.

**b. Relationship of Middle-Upper Arm Circumference (MUAC) with Anemia Incidence in Adolescent Girls**

Based on the results of the study, it was found that there was a relationship between Middle-Upper Arm Circumference (MUAC) and the incidence of anemia in adolescent girls at SMAS PGRI 2 Banjarmasin. In line with the results of a study conducted (Nainggolan et al., 2022) it was found that the highest percentage of anemia was found in women who were underweight and low LILA. The results of another study from Ethiopia also reported that LILA > 23 cm reduced the incidence of anemia by 0.41 (Ghosh Id et al., 2019). It is necessary to strengthen health promotion activities to improve nutritional status and healthy living behavior, especially healthy eating patterns, it is important for women in Indonesia to reduce the prevalence of anemia and improve overall health status. There is a consistent relationship between the three measures of somatic growth, namely LILA, weight and height, on the incidence of anemia. Anemia is a deficiency of red blood cells, which has a half-life of about 120 days and is considered an acute event or a chronic event. There is a possibility that exposure from the time of conception onwards contributes to the incidence of anemia, so it is necessary to prevent anemia through various intervention approaches (Ahankari et al., 2020).

**c. Relationship between Dietaty Habit and anemia incidence in adolescent girls**

Based on the results of the study, it was found that there was a relationship between dietary habit and the incidence of anemia in adolescent girls at SMAS PGRI 2 Banjarmasin This is in line with the results of previous studies which found a significant relationship between energy nutrient intake and the incidence of anemia in adolescent girls at SMAN 6 Jambi (Utami et al., 2021). Another study conducted (Krishnan et al., 2021) found a longitudinal relationship between total iron intake/day and anemia in adolescent girls. Several cross-sectional studies have found that iron intake is significantly associated with anemia. Based on the current findings, this warrants an emphasis on creating a conducive school environment that encourages healthy eating with sufficient nutrition to halt bodily health and prevent malnutrition (Patil et al., 2020; Saeedi et al., 2018).

If the food consumed has good nutritional value, especially foods with high iron content, the nutritional status of adolescents will be high so that the risk of suffering from anemia will decrease and vice versa. Therefore, it is very important for young women to consume foods that contain carbohydrates, protein, fat, fiber, water, vitamins and minerals in sufficient quantities according to their respective needs so that nutritional status becomes better and avoids anemia (Martini, 2015).

**d. The Relationship between Menstrual Patterns and the Incidence of Anemia in Young Women**

Based on the results of the study, it was found that there was a relationship between Menstrual Pattern and the incidence of anemia in adolescent girls at SMAS PGRI 2 Banjarmasin.

Girls in the period of late school age and early adolescence are susceptible to iron deficiency. The lower total food or energy intake in adolescent girls compared to boys, coupled with blood loss due to menstruation causes adolescent girls to have a greater risk of anemia. Anemia in adolescents reduces cognitive function and adversely affects the learning achievement of girls entering adolescence (Mousa et al., 2016).

Similar findings from research (Agustina EE et al, 2017) found that there was a significant relationship between menstrual patterns and the incidence of anemia. Teenage girls need more iron to replace the iron lost during menstruation. Abnormal menstrual patterns are a major contributor to anemia in adolescent girls. So it needs immediate special attention from parents and health care providers to correct anemia according to its cause and improve the quality of life of young women to become healthy mothers in the future (Toheed et al., 2017).

## CONCLUSION

There is a relationship between Body Mass Index (BMI), Middle-Upper Arm Circumference (MUAC), menstrual patterns and eating patterns with the incidence of anemia in adolescent girls at SMAS PGRI 2 Banjarmasin. Prevention efforts need to be done by improving diet by consuming nutritious food and consuming Blood Add Tablets (TTD) and the school canteen can also provide menus according to the "Isi Piring Ku" concept so that the fulfillment of student nutrition is maximized considering that many female students skip breakfast.

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