

## DETERMINANTS OF ANEMIA OCCURRENCE IN FEMALE ADOLESCENTS IN HIGH SCHOOL IN MUARO JAMBI DISTRICT IN 2024

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### ABSTRACT

**Background:** Anemia in adolescent girls aged 15-24 years in Indonesia is one of the nutritional problems that need attention. The purpose of this study was to determine the factors associated with the incidence of anemia in adolescent girls

**Method:** This study used a cross-sectional design. It was conducted in September 2024 at Titian Teras High School, Muaro Jambi Regency, Jambi Province. The sample was 79 students in grades 10 and 11 aged 14-18 years. Sampling was carried out using the proportional sampling method, with the criteria, not menstruating when becoming a sample, not sick. This study used primary data through questionnaires, anemia status was measured using a portable Nessco Hb measuring instrument. Data was processed using a computer program. Data analysis was carried out using univariate and bivariate analysis with the chi-square test. to determine the significant relationship between the dependent variable (anemia status of adolescent girls) with the criteria of Hb levels <12 gr/dl) and the independent variables, namely knowledge, attitudes, and behavior of preventing anemia

**Result:** The results of the study showed that there was a significant relationship between knowledge, attitudes and behavior with the incidence of anemia with a p value = 0.000 ( $p < 0.05$ ).

**Conclusion:** From the results of the study, there is a significant relationship between knowledge, attitudes and behavior towards the occurrence of anemia. It is expected that female adolescent students will always increase their knowledge about the causes of anemia, signs and symptoms and their impact on health and the need to increase iron intake and iron supplements to prevent anemia.

**Keywords:** knowledge, attitude, behavior, anemia

### INTRODUCTION

Adolescence is a transition between childhood and adulthood, at that time physical growth and reproductive maturation occur, so the need for nutritional intake is greater. According to WHO and the Indonesian Ministry of Health Number 25 of 2014, BKKBN (UNFPA) it is said that adolescents are aged 10-18 years. (Susanti and Erwani, 2020). Riskesdas data for adolescent girls aged 10-19 years have menstruated. The process of blood loss that occurs every month will cause a

lot of red blood cells to come out, if the diet of adolescent girls is not considered, anemia will occur. The amount of physical activity, studying, at school also increases needs (Riskesdas Team 2018)

A teenage girl is said to have anemia if the hemoglobin (Hb) level is <12.0 g/dl. The function of Hb in the body is to carry oxygen throughout the body, if there is a lack of Hb, the function of sending oxygen throughout the body will be disrupted, so she will look tired, exhausted, and lethargic, impacting her productivity and creativity (Muthia, 2021)

Riskesdas Data, 2018 (Riskesdas Team 2018) The prevalence of anemia in Indonesia in 2013 was (37.1%), there was an increase to 48.9% in 2018, WHO's target in 2025 is to reduce the prevalence of anemia by half (50%) of the incidence of anemia in women of childbearing age (World Health Organization, 2017)

Various factors that cause anemia in adolescent girls are: lack of knowledge about anemia (Ahdiah, Heriyani and Istiana, 2018), Adolescent girls are less aware of anemia, its signs, effects, and how to prevent it (Astuti, 2023), adolescent girls do not know the types of foods that contain iron, especially animal foods such as liver, fish and meat (Linawati, Suhartini and ..., 2023) The cause of anemia is due to consumption of foods that do not contain iron (Tiaki, 2017) and consuming a lot of fast food, as a trigger for disrupted iron absorption, which can cause anemia (Ahdiah, Heriyani and Istiana, 2018)

Adolescent girls who experience anemia can have long-term impacts on reproductive health during pregnancy, difficult deliveries that do not go smoothly, the risk of giving birth to premature babies and low birth weight babies (LBW), so that it can interfere with growth, development and maternal and child mortality (Wahyudi and Gorontalo, 2023). Adolescent girls who suffer from anemia are more susceptible to stunting and will give birth to low birth weight babies (Ambado, 2022).

Implementation for anemia prevention includes paying attention to micronutrient-rich food intake, iron and folic acid supplementation (Amegah et al., 2019). (Ansari et al., 2021) Fortification of food ingredients by adding one or more nutrients (such as vitamins or minerals) to a food or beverage product to increase its nutritional content. (Sunarti, 2022), economic problems in society, not all teenagers can afford to buy and consume iron-rich foods because the price is relatively expensive, so they have to receive additional blood-boosting tablets to get iron (Jambi Provincial Health Office, 2022).

Giving iron tablets (TTD) is an effective way to overcome anemia problems. The purpose of giving TTD is to meet the iron intake of adolescent girls. Fulfilling iron intake as early as possible is expected to reduce the prevalence of anemia cases in pregnant women, minimize the incidence of bleeding during childbirth, prevent low birth weight, and reduce short toddlers (Fitriana and Dwi Pramardika, 2019)

This is also supported by the government through a program to provide iron supplements for young women as stated in the Regulation of the Minister of Health of the Republic of Indonesia No. 88 of 2014 concerning iron supplement standards for women of childbearing age and pregnant women<sup>11</sup> and Circular Letter (SE) of the Ministry of Health of the Republic of Indonesia No. HK.03.03/V/0595/2016 concerning the Provision of iron tablets for young women and women of childbearing age. Iron supplement provision is generally carried out on junior high school (SMP)/equivalent and senior high school (SMA)/equivalent students (Amir and Djokosujono, 2019) and determines the day to take iron supplements on the same day and together (Tonasih, Rahmatika and Irawan, 2019).

The reasons given by adolescent girls for not taking/finishing the Fe tablets obtained from school include only taking them during menstruation (2.88%), forgetting (20.28%), unpleasant taste and smell (48.13%), side effects (7.11%), not having finished the dosage (0.57%), feeling it was not necessary (18.45%), and others (2.59%) (Ministry of Health of the Republic of Indonesia, 2018).

The implementation of TTD provision in the field has not gone well, including lack of knowledge, lack of socialization, lack of parental support, stakeholder collaboration, lack of teacher support, lack of facilities and infrastructure, including promotional media, TTD supplementation cards, leaflets, and brochures. (Ministry of Health of the Republic

of Indonesia, 2018) One of the efforts to improve knowledge, attitudes and behavior in preventing anemia and compliance of adolescent girls in consuming TTD is by providing health education. This study aims to determine the factors associated with the incidence of anemia in adolescents at SMA Titian Teras Muaro Jambi.

## METHODS

This study used a cross-sectional design. It was conducted in September 2024 at Titian Teras High School, Muaro Jambi Regency, Jambi Province. The sample was 79 students in grades 10 and 11 aged 14-18 years. Sampling was carried out using the proportional sampling method, with the criteria, not menstruating when becoming a sample, not sick. This study used primary data through a questionnaire, anemia status was measured using an Hb measuring instrument, portable Nessco Data was processed using a computer program. Data analysis was carried out using univariate and bivariate analysis with the chi-square test. to determine the significant relationship between the dependent variable (anemia status of adolescent girls) with the criteria of Hb levels <12 gr / dl) and the independent variables, namely knowledge, attitudes, and behavior of preventing anemia. The instrument used was a questionnaire consisting of 10 questions tested for validity and reliability. Knowledge, attitudes, and behavior related to anemia are each said to be good if they have a score of  $\geq 76\%$ , and are said to be bad if they are  $<76\%$ .

## RESULTS AND DISCUSSION

### RESULTS

#### 3.1. The Relationship Between Knowledge of Adolescent Girls and The Incidence of Anemia At Titian Teras High School, Jambi City In 2024

The results of the analysis of knowledge variables with the incidence of anemia showed

that as many as 48 respondents had poor knowledge, this can be seen from the adolescents who were anemic, there were 32 (66.7%) respondents, and there were 16 (33.3%) respondents who were not anemic. While good knowledge was 31 respondents, those who were not anemic were 26 (83.9%) and only 5 (16.1%) respondents were anemic. The p-value was 0.000 which means there is a significant relationship between knowledge and the incidence of anemia.

**Table 1. Relationship between knowledge of adolescent girls and the incidence of anemia at Titian Teras High School, Jambi City in 2024**

Knowledge	Kejadian Anemia				Total		<i>p value</i>
	Anemia		Tidak Anemia				
	f	%	f	%	n	%	
Kurang baik	32	66.7	16	33.3	48	100	0,000
Baik	5	16.1	26	83.9	31	100	
Total	37	46.8	42	53.2	79	100	

#### 3.2. The Relationship between Attitudes of Adolescent Girls and the Incidence of Anemia at Titian Teras High School, Jambi City in 2024

**Table 2. Relationship between attitudes of Adolescent girls and the incidence of anemia at Titian Teras High School, Jambi City in 2024**

Attitude	Kejadian Anemia				Total		<i>p value</i>
	Anemia		Tidak Anemia				
	f	%	f	%	n	%	
Kurang baik	26	70.3	1	2.9	3	100	0,000
Baik	11	26.2	3	73.8	4	100	
Total	37	46.8	4	53.2	7	100	

The results of the analysis of the attitude variables of adolescent girls with the incidence of anemia showed that as many as 37 respondents had a bad attitude, this can be seen from the adolescent girls who were anemic, there were 26 (70.3%) respondents, and there were 11 (29.7%) respondents who were not anemic. However, there were 42 respondents

whose attitudes were good, there were 31 (73.8%) who were not anemic and only 11 (26.2%) respondents who were anemic. The results of the chi-square statistical test obtained a  $p$  value = 0.000 ( $p < 0.05$ ), this means that there is a significant relationship between the attitudes of adolescent girls and the incidence of anemia.

### 3.3. The Relationship Between The Behavior Of Adolescent Girls And The Incidence Of Anemia At Titian Teras High School, Jambi City In 2024

**Table 3. Relationship Between Adolescent Girls' Behavior And The Incidence Of Anemia At Titian Teras High School, Jambi City In 2024**

2024							<i>p value</i>
Behaviour	Kejadian Anemia				Total		
	Anemia		Tidak Anemia				
	f	%	f	%	n	%	
Kurang baik	26	76.5	8	23.5	34	100	0,000
Baik	11	24.4	34	75.6	45	100	
Total	37	46.8	42	46.0	79	100	

The results of the analysis of the attitude variables of adolescent girls with the incidence of anemia showed that as many as 34 respondents had bad behavior, this can be seen from 26 (76.5%) respondents, who had anemia, and there were 8 (23.5%) respondents who were not anemic. While good behavior was found in 45 respondents, who were not anemic 34 (75.6%) and only 11 (24.4%) respondents were anemic. The results of the chi-square statistical test obtained a  $p$  value = 0.000 ( $p < 0.05$ ), this means that there is a significant relationship between the behavior of adolescent girls and the incidence of anemia.

## DISCUSSION

The results of the analysis show that there is a significant relationship between knowledge and the incidence of anemia. The results of this study are in line with research conducted by (Ahdiah, Heriyani and Istiana, 2018) that there is a relationship between knowledge and the incidence of anemia in female adolescents in grades X and XI at SMA

Negeri 1 Polokarto, Sukoharjo Regency ( $p=0.03$ ). Caturiyantiningtyas concluded that someone with less knowledge has a higher risk of developing anemia, this is due to the lack of information and lessons learned about anemia

From the analysis of attitude variables, there is a significant relationship between attitudes and the incidence of anemia, the study is supported by the results of the study (Ahdiah, Heriyani and Istiana, 2018). However, it is contrary to the research of Aryansih (2014) which states that there is no relationship between attitudes and the incidence of anemia in adolescents at the Yatama Mandiri Pallangga Islamic Boarding School, Gowa Regency, while the research of Caturiyantiningtyas (2015) states that there is a relationship between attitudes and the incidence of anemia in adolescents at SMA Negeri 1 Polokarto, Sukoharjo Regency. Attitude is a response that is still closed to a stimulus or object (Izzara et al., 2023) but attitude will cause a person's tendency to act. Attitude is an encouragement that will be carried out by someone to lead to actions or practices directly consuming foods high in iron and drinking TTD which can increase hemoglobin levels, attitude is a factor that facilitates the formation of behavior to prevent anemia

The results of the analysis of behavioral variables show a significant relationship between behavior and the incidence of anemia. The study is in line with Caturiyantiningtyas that there is a relationship between behavior and the incidence of anemia in female adolescents at SMA Negeri 1 Polokarto, Sukoharjo Regency. Good behavior in a high-iron diet, consuming TTD, avoiding consumption that inhibits iron absorption. Good behavior in female adolescents will reduce the risk of anemia.

## CONCLUSION

The results of the study showed that there was a relationship between knowledge,

attitudes and behavior with the incidence of anemia. It is expected that female adolescent students will always increase their knowledge about the causes of anemia, signs and symptoms and their impact on health as well as the need to increase iron and iron supplement intake to prevent anemia.

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## CONFLICT OF INTEREST

This study has no conflict of interest related to funding, including names in published articles, and the data collection process.

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