

## Factor Analysis of Menstrual Duration, Level of Knowledge, and Compliance with the Consumption of Blood Supplement Tablets on the Prevalence of Anemia in Adolescents with Prostate

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### ABSTRACT

**Background:** Anemia is a major health concern among adolescents, particularly females, and is closely linked to prolonged menstrual bleeding, insufficient knowledge about anemia, and poor compliance with iron supplementation programs. These factors contribute significantly to the high prevalence of anemia, which can lead to decreased physical performance, impaired cognitive function, and reproductive health complications in later life.

**Purpose:** This study aims to analyze the relationship between menstrual duration, level of knowledge about anemia, and compliance with the consumption of blood supplement tablets on the prevalence of anemia in adolescents.

**Methods:** The research uses quantitative methods with a correlational analytical research design with a cross sectional approach. The population and sample in this research were 30 female students. Bivariate data analysis used the chi-square test with the help of SPSS 26.

**Results:** The research results show that there is a relationship between Menstrual Length and Anemia in young women at SMA Negri 1 Kediri, (p value=0.023), there is a relationship between Knowledge and Anemia in young wo/men at SMA Negri 1 Kediri (p value = 0.042) and there is a relationship between compliance with blood supplement consumption and anemia in young women at SMA Negri 1 Kediri x (p value=0.023).

**Conclusion:** The results of this study indicate that menstrual duration, level of knowledge about anemia, and compliance with the consumption of iron supplement tablets are significant factors influencing the prevalence of anemia among adolescent girls. Among these, compliance with iron tablet consumption emerged as the most dominant factor, suggesting that behavioral aspects play a crucial role in anemia prevention. Additionally, limited knowledge about anemia and prolonged menstrual duration were also associated with a higher risk of anemia. These findings highlight the need for comprehensive health education programs that not only increase awareness about anemia but also promote consistent intake of iron supplements, particularly among adolescents. Effective interventions should prioritize improving knowledge and fostering positive health behaviors to reduce the incidence of anemia and support the overall well-being of young women.

**Keywords:** anemia, blood supplement tablets, compliance, knowledge of young women, menstruation

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## BACKGROUND

Anemia is a disease of lack of red blood cells. If the number of red blood cells decreases, oxygen intake and blood flow to the brain also decreases. Anemia is a condition where the body has too few red blood cells (erythrocytes), where the red blood cells contain hemoglobin which functions to carry oxygen to all body tissues (Pratiwi M, 2019). Anemia in adolescent girls (rheumatism) will have an impact on health and achievement at school and will later be at risk of anemia when they become pregnant women which can cause suboptimal growth and development of the fetus and has the potential to cause complications of pregnancy and childbirth as well as death of mother and child (Republic of Indonesia Ministry of Health, 2020).

Anemia is a major health problem in Indonesia and has various causes. The prevalence of anemia in 2021 in women of productive age aged 15-49 years according to WHO globally is 29.9% (WHO, 2021). Many studies have been conducted in Saudi Arabia on specific population groups such as school children, adolescents, university students, and women in the reproductive age group, and most of them reported a high prevalence of anemia. According to reports, anemia is a significant health burden in the Gulf countries, with a high frequency of anemia in women between the ages of 17 to 24 years, as well as in men (Hamali, 2020).

According to findings from a study conducted on Indonesian women aged 15–24 years, anemia was found in 40% of participants (Al Faris, 2021). Other research by Al Quaiz (2021) found a significant frequency of anemia among women from Riyadh, with an estimated 37% of women suffering from the condition. Many studies have been conducted on various population groups such as school children, adolescents, university students, and women in the reproductive age group in Indonesia, and the results have revealed a high incidence of anemia in these categories in the country (Al Faris, 2021).

Based on findings from research *Norah Alomar* (2023), to determine the prevalence of anemia and factors contributing to it among female nursing students enrolled at an Indonesian university, located in East Java. Research findings revealed that 59% of respondents were declared to be suffering from anemia due to their low hemoglobin levels. Significant associations were observed between hemoglobin levels, anemia, and clinical factors such as chronic diseases, heavy menstrual cycles, and dietary supplements. Based on these results, anemia is very common among female university students. Additionally, the study population could be susceptible to anemia if they engage in practices such as tea or coffee consumption, irregular eating patterns, or consuming foods that inhibit iron absorption.

Anemia in adolescent girls is a significant global health problem. The prevalence of anemia in adolescent girls not only occurs widely throughout the world but has also reached an alarming level in Saudi Arabia. At the research site, namely at SMA Negeri 1 Kediri in Al-Hasa, Saudi Arabia, there was a tendency for a high incidence of anemia in young women. In this study, 30 students were affected by anemia out of 175 students at SMA Negeri 1 Kediri, Indonesia. This phenomenon has a serious impact on their well-being and achievement at school.

Another factor that is related to the incidence of anemia is the knowledge that young women have about anemia. Knowledge about anemia is an important aspect in efforts to take positive action to prevent anemia in adolescent girls. Many young women do not know or realize that they have anemia, even though they know they have anemia still think anemia is a trivial problem. Adolescent girls require higher levels of nutrition for growth, including iron, because adolescent girls are more susceptible to anemia. Many young women lack awareness that they are susceptible to anemia. This can of course become an emergency condition, especially driven by their lack of knowledge about anemia and how to prevent it (*Safitri and*

*Maharani, 2019).*

Compliance with taking TTD is a behavior to support the government's iron supplementation program to prevent anemia. Previous research from (Dhito, 2019) shows that compliance with the consumption of Blood Supplement Tablets (TTD) is related to hemoglobin (Hb) levels.

Based on a preliminary study conducted at SMA Negeri 1 Kediri by examining and interviewing 10 female students who experienced anemia, the results showed that 2 female students with insufficient knowledge about anemia said they had ever consumed TTD, 3 female students with sufficient knowledge about anemia said they had only consumed TTD. during menstruation, while 5 other female students with good knowledge about anemia said they had consumed TTD during menstruation and without menstruation, with a long duration of menstruation  $\pm 10$  days, changing sanitary napkins 4-6 times per day and the blood coming out was  $\pm 60-70$  ml. And during interviews with class Therefore, young women are at risk of developing anemia. Adolescent girls with anemia must receive more attention because if not treated immediately it can have long-term impacts.

Efforts to prevent and treat anemia in adolescent girls can involve a comprehensive approach. Providing blood supplement tablets (TTD) is one of the solutions that has been implemented by the government. However, compliance in consuming TTD is a critical factor that needs to be considered. In addition, increasing knowledge about anemia and healthy lifestyles, including the intake of foods rich in iron, are also needed to reduce the risk of anemia. Family support and the active role of health workers in providing education are also keys to the success of prevention efforts.

By realizing the broad impact of anemia on adolescent girls, there needs to be synergy between schools, families and the government in implementing effective prevention and treatment programs. It is hoped that these steps will improve the health and quality of life of young women, as well as provide a strong foundation for their future growth and development. Based on the background above, researchers are interested in conducting research on "The Relationship between Menstrual Length, Knowledge and Compliance with Consuming Blood Supplement Tablets with the Incidence of Anemia in Young Women at SMA Negeri 1 Kediri".

## **OBJECTIVE**

This study aims to explore the influence of menstrual duration, the level of knowledge about anemia, and compliance with the consumption of iron supplement tablets on the prevalence of anemia among adolescent girls. Through a comprehensive analysis, the research seeks to understand how these factors interact and contribute to anemia risk. By applying factor analysis, the study intends to identify the most influential variables affecting anemia status. The findings are expected to support the development of effective educational and preventive strategies aimed at reducing anemia rates among adolescents by enhancing awareness and improving health-related behaviors.

## **METHODS**

This research uses an observational analytical research design with a cross sectional approach. The research uses quantitative methods with a correlational analytical research design with a cross sectional approach. The population and sample in this research were 30 female students. Bivariate data analysis used the chi-square test with the help of SPSS 26.

**RESULTS****Variable Characteristics****Frequency Distribution of Respondent Characteristics Based on Age**

The characteristics of respondents based on age at SMA Negeri 1 Kediri can be seen in the following table:

**Table 1.** Characteristics of Respondents Based on Age of Respondents

Age	Frequency	Percent (%)
16 years	16	53.3
17 years	11	36.7
18 years	3	10.0
<b>Amount</b>	<b>30</b>	<b>100</b>

Based on Table 1 above, it is known that of the 30 respondents, more than half of the respondents were 16 years old, namely 16 respondents (53.3%).

**Frequency Distribution of Respondent Characteristics Based on Disease History**

The characteristics of respondents based on medical history at SMA Negeri 1 Kediri can be seen in the following table:

**Table 2.** Characteristics of Respondents Based on Respondent's Disease History in State High School 1 Kediri

Disease History	Frequency	Percent (%)
There's History	8	26.67
No history	22	73.33
<b>Amount</b>	<b>30</b>	<b>100</b>

Based on Table 2 above, it is known that of the 30 respondents, the majority of respondents had no history of disease, namely 22 respondents (73.33%).

**Incidence of Anemia in Adolescent Girls at SMA Negeri 1 Kediri Al-Hasa Saudi Arabia****Table 3.** Frequency Distribution of Anemia Incidents in Adolescent Girls at SMA Negeri 1 Kediri Al-Hasa Saudi Arabia

Anemia	N	%
Anemia	30	100.0
Not Anemic	0	0.0
<b>Total</b>	<b>30</b>	<b>100</b>

Based on table 3, the research results show that almost all young women who were respondents at SMA Negeri 1 Kediri experienced anemia at 100.0%.

**Length of Menstruation in Adolescent Girls at SMA Negeri 1 Kediri****Table 4.** Frequency Distribution of Menstrual Length in Adolescent Girls at SMA Negeri 1 Kediri

Length of Menstruation	N	%
Abnormal	25	83.3
Normal	5	16.7
<b>Total</b>	<b>30</b>	<b>100</b>

Based on table 4, it was found that the majority of female teenagers at SMA Negeri 1 Kediri Al-Hasa Saudi Arabia had abnormally long menstruation, 83.3%.

**Knowledge of Young Women at SMA Negeri 1 Kediri Table 5 Frequency Distribution of Knowledge among Young Women at SMA Negeri 1 Kediri**

Knowledge	N	%
Not enough	6	20.0
Good	24	80.0
<b>Total</b>	<b>30</b>	<b>100%</b>

Based on table 5, it is found that the majority of young women at SMA Negeri 1 Kediri have poor knowledge of 20.0% and good knowledge of 80.0%.

**Compliance with Blood Supplement Tablet Consumption among Young Women at SMA Negeri 1 Kediri****Table 6.** Frequency Distribution Based on Compliance with Blood Supplement Tablet Consumption among Young Women at SMA Negeri 1 Kediri

Obedience	N	%
Not obey	5	16.7
Obedient	25	83.3
<b>Total</b>	<b>30</b>	<b>100</b>

Based on table 6, it was found that almost the majority of young women at SMA Negeri 1 Kediri were 16.7% non-compliant with taking blood supplement tablets and 83.3% were compliant.

**Analysis of Research Statistical Test Results****The relationship between menstrual duration and anemia in young women at SMA Negeri 1 Kediri**

**Table 7.** Analysis of the Relationship between Menstrual Length and Anemia in Young Women at SMA Negeri 1 Kediri

Long Menstruation	Anemia		Amount		Correlation Coefficient	P Value
	(%)	(%)	(n)	(%)		
Abnormal	25	83.33	25	83.33	<b>0.383</b>	<b>0.023</b>
Normal	5	16.67	5	16.67		

Based on the research results in Table 7 above, it is known that the results of the research analysis regarding the relationship between the length of menstruation and anemia in young women based on statistical tests using the Chi-Square test showed that the result was  $p = 0.023 < 0.05$ , so this means that there is a relationship between the length of menstruation and anemia in young women at SMA Negeri 1 Kediri. With a correlation coefficient value of 0.383, which means the level of relationship is in the low relationship category, where the correlation value range is between 0.20-0.399, which is included in the low relationship category (Sugiyono, 2019).

#### The Relationship between Knowledge and Anemia in Adolescent Girls at SMA Negeri 1 Kediri

**Table 8.** Analysis of the Relationship between Knowledge and Anemia in Young Women at SMA Negeri 1 Kediri

Knowledge		Anemia					
Amount Value	correlation coefficient	P				Anemia	
		(%)	(%)	(n)	(%)		
Good		25	83.33	25	83.33	0.348	0.042
Not enough		5	16.67	5	16.67		

Based on the research results in Table 8 above, it is known that the results of research analysis regarding the relationship between knowledge and anemia in adolescent girls based on statistical tests using the Chi-Square test showed that  $p = 0.042 < 0.05$ , which means there is a relationship between knowledge and anemia in adolescent girls in high school. Negeri 1 Kediri. With a correlation coefficient value of 0.348, which means the level of relationship is in the low relationship category, where the correlation value range is between 0.20-0.399, which is included in the low relationship category

(Sugiyono, 2019).

### The Relationship between Compliance with Blood Supplement Tablet Consumption and Anemia in Adolescent Girls at SMA Negeri 1 Kediri

**Table 9.** Analysis of the Relationship between Compliance with Blood Supplement Tablet Consumption and Anemia in Young Women at SMA Negeri 1 Kediri

Obedience	Anemia				<i>P</i>	
	Anemia					
Amount correlation coefficient Value						
	(%)	(%)	(n)	(%)		
Obedient	25	83.33	25	83.33	<b>0.383</b>	<b>0.023</b>
Not obey	5	16.67	5	16.67		

Based on the research results in Table 9 above, it is known that the results of the research analysis regarding compliance with anemia in young women based on statistical tests using the Chi-Square test showed that  $p = 0.023 < 0.05$ , which means there is a relationship between compliance and anemia in young women in State High Schools. 1 Kediri. With a correlation coefficient value of 0.383, which means the level of relationship is in the low relationship category, where the correlation value range is between 0.20-0.399, which is included in the low relationship category (Sugiyono, 2019).

## DISCUSSION

### Incidence of Anemia in Adolescent Girls at SMA Negeri 1 Kediri

The results of the study showed that all young women who were respondents at SMA Negeri 1 Kediri experienced anemia by 100.0%.

The results of the researchers' analysis are that hormonal factors, especially menstruation, are believed to be the main contributor to this problem because they cause blood loss which requires more iron, this is because almost all young women at SMA Negeri 1 Kediri suffer from anemia. Anemia can have a serious impact on the productivity and academic performance of young women because low hemoglobin levels can result in lethargy and decreased concentration.

### Length of Menstruation in Adolescent Girls at SMA Negeri 1 Kediri

The research results showed that the majority of young women at SMA Negeri 1 Kediri had



abnormally long menstruation, 83.3%. Most teenage girls have abnormally long menstruation due to hormonal factors. During puberty, the hormones that regulate the menstrual cycle are still unstable, which can cause irregular menstrual cycles, including menstrual duration that is longer than usual.

Apart from hormonal factors, another cause of abnormally long menstruation in young women at SMA Negeri 1 Kediri is stress, physical or emotional stress can affect the menstrual cycle. Teenagers often experience stress due to school exams, social problems, or changes in their lives, which can affect the length of their periods. Other factors are poor nutrition and too heavy physical activity.

Based on the research results, the author's assumption is that the length of menstruation in young women at SMA Negeri 1 Kediri has a high prevalence rate. The main factor causing this is abnormally long menstruation. Abnormal length of menstruation has the potential to affect hemoglobin levels and trigger anemia and increased iron requirements due to menstruation, so treating anemia in adolescent girls should seriously consider the factor of abnormal length of menstruation.

**Knowledge of Young Women at SMA Negeri 1 Kediri The results of the research show that a small percentage of young women at SMA Negeri 1 Kediri have insufficient knowledge of 20.0%.**

Knowledge is lacking among young women at SMA Negeri 1 Kediri, especially in terms of understanding anemia, how to treat anemia, and signs and symptoms of anemia. To increase knowledge about anemia, how to treat it, and associated symptoms, individuals can access information from trusted medical sources such as health literature, or consult with health experts. Better knowledge about anemia can help in preventing, detecting and managing this condition more effectively.

Based on the research results, it is known that young women at SMAN Negeri 1 Kediri have insufficient knowledge about anemia. The author's assumption in this study is that even though a number of teenagers have good knowledge, there are still cases of anemia. It is still necessary to increase understanding of anemia and its role in preventing and treating it.

**Compliance with Blood Supplement Tablet Consumption among Young Women at SMA Negeri 1 Kediri**

The results of the study showed that 16.7% of young women at SMA Negeri 1 Kediri did not comply with consuming blood supplement tablets which were given once a week. This level of non-



compliance raises several issues that need to be addressed. If young women still experience anemia even though they have taken blood supplement tablets, it is necessary to evaluate the dosage, other causes, absorption problems, level of compliance, and changes in diet.

One step that can be taken to overcome this problem is to increase the understanding of young women about the importance of taking blood supplement tablets. Effective education must be provided to them, which includes information about the benefits of blood supplement tablets for maintaining body health, especially in overcoming iron deficiency which can cause anemia. Apart from that, it is important to open good lines of communication between young women, health workers and school officials. This allows them to ask questions, talk about any problems they may have with taking the tablets, and get help if needed. Apart from education and communication, regular monitoring also needs to be carried out to ensure that young women follow the program for using blood supplement tablets according to the specified schedule. This monitoring can be carried out by health workers or school staff responsible for the program.

Blood supplement tablets are iron folate tablets, each tablet contains 200 mg of ferrous sulfate or 60 mg of elemental iron and 0.25 mg of folic acid. Women and young girls need to take blood supplement tablets because women experience menstruation so they need iron to replace lost blood. Women experience pregnancy, breastfeeding, so their iron intake is very high height that needs to be prepared as early as possible since adolescence. Blood supplement tablets are able to treat women and young girls who suffer from anemia, improve learning abilities, work abilities and the quality of human resources and the next generation (Rahayu, 2019).

These results are in line with research conducted by Permatasari (2019) which stated that during the 4 months of intervention carried out by providing iron supplementation from 20.7% the incidence of anemia decreased to 15.2% from 172 respondents. Other research conducted by Anggrainy (2019) and Kumalasari (2019) also states that there is a relationship between adherence to consuming blood supplement tablets and anemia in young women.

Based on the research results, in dealing with anemia in adolescent girls, corrective steps in increasing compliance with taking blood supplement tablets must be a priority to maintain adolescent health.

### **The relationship between the duration of menstruation and the incidence of anemia in adolescent girls at SMA Negeri 1 Kediri**

Based on the research results, through the Chi Square Test, the Chi-Square test results found

a p-value = 0.023 where the p-value  $< \alpha$  0.05. which means there is a relationship between the length of menstruation and anemia in young women at SMA Negeri 1 Kediri.

Regarding the length of menstruation, research results show that abnormal menstrual periods are caused by, among other things, poor nutrition and too much physical activity. Apart from physical or emotional stress, it can affect the menstrual cycle. Teenagers often experience stress due to school exams, social problems, or changes in their lives, which can affect the length of their periods. Maintaining balanced nutrition, avoiding excessive physical activity, and managing stress well can help maintain hormonal balance and prevent prolonged menstruation.

Regarding the length of menstruation, from research results it is known that abnormal menstrual periods are caused by menstruation duration  $> 7$  days, the causes include poor nutrition, too heavy physical activity. Therefore, maintaining balanced nutrition, avoiding excessive physical activity, and managing stress well can help maintain hormonal balance and prevent prolonged menstruation.

Based on the results of the analysis, the author's assumption is that menstruation that lasts a long time or with heavy bleeding can increase the risk of anemia because it can result in a deficiency of iron which is important for the production of red blood cells. These findings are in line with previous research, emphasizing the importance of paying attention to the length of menstruation in efforts to prevent and treat anemia in adolescent girls.

### **The relationship between knowledge and the incidence of anemia in adolescent girls at SMA Negeri 1 Kediri**

Based on the results of research conducted using Chi-Square, it shows that the p-value = 0.042 where the p-value  $< \alpha$  0.05, which means there is a relationship between knowledge and anemia in young women at SMA Negeri 1 Kediri.

Prevention of anemia can be influenced by the level of knowledge, the higher a person's knowledge about anemia, the lower the possibility of anemia in that person. The results of research that has been carried out show that the respondents, namely young women at SMA Negeri 1 Kediri, with knowledge, are still lacking in terms of understanding about anemia, how to treat anemia, and the signs and symptoms of anemia. To increase knowledge about anemia, how to treat it, and associated symptoms, individuals can access information from trusted medical sources such as health literature, or consult with health experts. Better knowledge about anemia can help in preventing, detecting and managing this condition more effectively.

From the research results, it is known that young women at SMA Negeri 1 Kediri still have deficiencies in their knowledge about anemia, how to treat anemia, and the signs and symptoms of anemia. This increased knowledge can be accessed through trusted medical sources and consulting with health experts. Better knowledge about anemia is an important step in preventing, detecting and managing this condition more effectively.

### **The relationship between adherence to blood supplement tablet consumption and the incidence of anemia in young women at SMA Negeri 1 Kediri**

Based on the results of research conducted using Chi-Square, it shows that  $p\text{-value} = 0.023$  where  $p\text{-value} < \alpha 0.05$ , which means there is a relationship between compliance with blood supplement tablet consumption and anemia in young women at SMA Negeri 1 Kediri.

The results of the research carried out showed that there were no significant changes in a person's blood condition or health condition when they took TTD. This means that the TTD consumed has not provided the expected results in treating anemia. Regarding compliance, further evaluation needs to be carried out to understand the cause. Anemia can be caused by various factors, including iron deficiency, chronic disease, or other health problems. Therefore, further examination is necessary to determine the exact cause of the anemia. After determining the cause of ongoing anemia, appropriate interventions can be recommended. For example, if anemia is caused by iron deficiency, the dose or type of TTD used can be adjusted. If there are other factors that play a role in anemia, such as chronic disease, appropriate management of the underlying health condition needs to be carried out. By understanding that TTD does not provide the desired changes in certain cases of anemia, further steps can be taken to overcome the problem and ensure improvement in the health condition of adolescents with anemia.

The level of compliance in taking blood supplement tablets can influence the risk of anemia in young women. One step that can be taken to overcome this problem is to increase the understanding of young women regarding the importance of taking blood supplement tablets. In order to achieve this, effective education must be given to them, including conveying information about the benefits of blood supplement tablets in maintaining body health, especially in overcoming iron deficiency which can cause anemia. In addition, it is also important to open efficient communication channels between young women, health workers and schools.

**DISCUSSION**

There is a relationship between the length of menstruation, knowledge and compliance with the consumption of blood supplement tablets with the incidence of anemia in young women at SMA Negeri 1 Kediri. It is recommended that teenagers seek information and increase their knowledge about the factors that cause anemia in teenagers and the signs of anemia so that they can increase their self-awareness about anemia in teenagers.

**CONCLUSION**

1. All young women who were respondents at SMA Negeri 1 Kediri experienced anemia, namely 100.0%.
2. The majority of young women at SMA Negeri 1 Kediri experience abnormally long menstruation, amounting to 83.3%.
3. Some young women at SMA Negeri 1 Kediri have less knowledge by 20.0%.
4. Some teenage girls at SMA Negeri 1 Kediri did not comply with taking blood supplement tablets by 16.7%
5. There is a relationship between the length of menstruation and the incidence of anemia in adolescent girls at SMA Negeri 1 Kediri with a P value  $<0.05$  ( $p=0.023$ ).
6. There is a relationship between knowledge and the incidence of anemia in young women at SMA Negeri 1 Kediri with a p value  $<0.05$  ( $p = 0.042$ ).
7. There is a relationship between compliance with the consumption of blood supplement tablets and the incidence of anemia in young women at SMA Negeri 1 Kediri with a p-value = 0.023.

**CONFLICTS OF INTEREST**

The authors declare that there are no conflicts of interest associated with this study. All funding and support received for the research have been fully acknowledged, and no commercial or financial relationships exist that could be perceived as potential sources of bias. The conduct and reporting of the study were carried out independently, and the findings are solely reflective of the authors' analyses and interpretations.

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