

# The relationship between knowledge level and compliance to blood supplement tablets consumption in adolescent girls

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## ABSTRACT

Anemia is one of the top 3 burdens of malnutrition in Southeast Asia. Globally, iron deficiency anemia is the leading cause of morbidity and mortality among adolescent girls aged 10-19 years. during the last 3 years the consumption coverage rate was only 44%. TTD Knowledge is one of the factors that can influence a person's TTD consumption behavior, because knowledge is the dominant factor in shaping a person's actions. To determine the relationship between knowledge level and compliance of TTD consumption among adolescent girls at SMPN 4 Tanjung Redeb, Berau Regency. This study used analytic descriptive quantitative research methods with a cross sectional research approach. With a total sample size of 76 people. Based on the results of the Spearman rank correlation test, the p value is 0.020, where this figure is <0.05, which means  $H_0$  is accepted and  $H_a$  is rejected, so it can be concluded that there is a relationship between knowledge and compliance of adolescents girls of SMPN 4 Tanjung Redeb in taking blood supplement tablets, There is a relationship between knowledge and compliance in adolescent girls in the consumption of TTD in adolescent girls.

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## INTRODUCTION

Anemia is one of the top 3 burdens of malnutrition in Southeast Asia (Cahaiantari et al., 2024). Globally, iron deficiency anemia is the leading cause of morbidity and mortality among adolescent girls aged 10-19 years (Pamela et al., 2022). Anemia during pregnancy can cause bad outcomes, such as bleeding, premature birth, LBW, perinatal deaths, and even death. Globally, iron deficiency anemia is the leading cause of morbidity and mortality among adolescent girls aged 10-19 years (Gosdin et al., 2021).

One of the SDGs (Sustainable Development Goals) targets is to end all forms of malnutrition, one of the agreed targets is to meet the nutritional needs of adolescent girls, pregnant and breastfeeding women (WHO, 2023). Young women are a population group at risk of anemia,

and in the future these young women will become mothers. For young women with anemia who do not receive comprehensive treatment, the anemia condition will continue until pregnancy (Hilamuhu, 2021; Oktavia et al., 2023).

Based on WHO data, the prevalence of anemia continues to increase the highest in the Southeast Asia Region, 46.6% in 2019. The prevalence of mild anemia increased slightly in the Southeast Asia Region from 21% in 2000 to 23.5% in 2019 and in the Mediterranean Region East from 18.4% to 19.6% (WHO, 2023). According to the Comprehensive National Nutrition report Comprehensive National Nutrition Survey (CNNS) 2016-2018 in India, 28.5% of adolescents aged 10-19 years were anemic and 41% of those suffering from anemia were adolescent girls. The CNNS report also highlights the link between Fe deficiency and anemia and estimates that 31% of all adolescent girls are anemic with Fe deficiency.

Basic Health Research data in 2018 shows that the prevalence of anemia in teenage girls reached 32%, which means 3 to 4 out of 10 teenagers in Indonesia experience anemia. The 15-24 year age group is the age group with the highest prevalence of anemia in East Kalimantan Province at 32.71% (Setianingsih, 2023). Based on data from the Berau District Health Service in 2023, through support from the Ministry of Health, it carried out anemia screening among young women attending school in class VII and class IX and data in November 2023 there were 49.6% with anemia. Meanwhile, data on pregnant women with anemia in 2023 until October is 24% of the total population of pregnant women in Berau Regency.

Teenager is someone aged 10-19 years. "Young Teen" refers to ages 10-14, while "older teens" refers to ages 15-19. Adolescence is the phase of life between childhood and adulthood, from 10 to 19 years old. This is a unique stage of human development and an important time for laying the foundations of good health. Adolescents experience rapid physical, cognitive and psychosocial growth. This influences the way they feel, think, make decisions and interact with the world around them (WHO, 2023). Adolescent girls during puberty are at high risk of experiencing iron deficiency anemia (Rizqiya & Elvira, 2022). This is due to the large amount of iron lost during menstruation, but it is also exacerbated by a lack of iron intake, where iron in young women is really needed by the body to accelerate growth and development (Ministry of Health, 2018).

One of the important nutritional services to be carried out at school is to consume blood supplement tablets (TTD) which contain 60 mg Fe and 0.4 mg folic acid. Providing blood tonic medication (TTD) to young women is (Meikawati et al., 2022). Since 2014, the TTD supplementation program for adolescent girls has been started and is a specific intervention carried out in an effort to reduce anemia (Ministry of Health, 2020). An indicator of the success of preventing and controlling anemia in adolescent girls and WUS is the coverage of the anemia program in adolescent girls, where there is compliance of adolescent girls in consuming TTD and it is hoped that there will be a reduction in the prevalence of anemia in adolescent girls (Ministry of Health, 2018).

Compliance with TTD consumption is related to factors such as lack of awareness and knowledge about anemia regarding TTD among adolescents. Therefore, interventions related to nutrition education are needed to increase the knowledge of young women regarding anemia and TTD (Rahmiwati et al., 2023). The lack of knowledge among young women regarding nutrition regarding anemia and TTD also influences the high prevalence of anemia (Alfiah & Dainy, 2023). Good nutritional knowledge about anemia will influence the tendency of young women to choose sources of iron in their food, avoid iron-inhibiting foods, and comply with consumption rules and comply with the consumption of TTD (Larasati et al., 2021).

Knowledge is one of the factors that can influence a person's TTD consumption behavior, because knowledge is the dominant factor in shaping a person's actions. Knowledge is all information that a person receives from outside and it emerges with an understanding of the information obtained (Nuradhiani et al., 2017). Adolescents' knowledge about blood supplements is important in determining their blood supplement consumption behavior. Teenagers' knowledge

will influence attitudes and behavior in choosing food at school and at home, which will determine whether or not it is easy for someone to understand the benefits of blood supplement tablets. Knowledge about the benefits of good TTD can influence the consumption of good food so as to achieve good nutritional status) (Sab'ngatun & Riawati, 2021).

Based on the results of research conducted by Nengah Runiari and Nyoman Hartati (2020), the results of this research show that the level of knowledge of most respondents is in the fairly good category at 44.3%, there are still 21.5% of respondents with poor knowledge. which means that there is a relationship between knowledge and compliance with consuming TTD. Another study conducted by (Pamangin, 2023) showed that there was a relationship between knowledge and the consumption of blood supplement tablets among young women ( $p= 0.039$ ) and there was no relationship between the perception of young women and the consumption of blood blood tablets ( $p= 0.429$ ).

Based on the background and previous research studies, researchers have conducted research on the relationship between the level of knowledge and compliance of young women in consuming blood supplement tablets at SMPN 4 Tanjung Redeb, Berau Regency. It is important for health workers to increase teenagers' knowledge of the importance of consuming TTD to prevent anemia in teenage girls, where this will later affect reproductive health conditions and productivity of teenage girls in studying.

## RESEARCH METHOD

This research uses quantitative research methods, namely carrying out research in a systematic, controlled and empirical way. A quantitative approach is an approach used to research a particular population or sample. This research is descriptive analytical and the research approach uses cross sectional. In this study the independent variable consisted of knowledge about TTD and anemia. Meanwhile, the dependent variable is TTD Consumption Compliance. The population in this study were all 219 teenage girls in grades VII, VII and IX at SMPN 4 Tanjung Redeb, Berau Regency with a sample size of 76 young female respondents. After all the data has been collected, it will then be analyzed using univariate and bivariate analysis with the SPSS program.

## RESULTS AND DISCUSSIONS

### Univariate Analysis

#### Respondent Characteristics

The respondents in this study were young women at SMPN 4 Tanjung Redeb, Berau Regency. The characteristics of the respondents were age, class, length of menstruation. With a frequency distribution as follows:

**Table 1.** Frequency distribution table based on characteristics

Characteristics	Frequency	Percentage (%)
Age		
12 years old	10	2.6
13 years old	22	14.5
14 years	24	30.3
15 years	19	31.6
16 years	0	19.7
17 years	1	1.3
Total	76	100
Class		
VII	24	31.6
VIII	25	32.8
IX	27	35.6
Total	76	100
Length of Menstruation		

Characteristics	Frequency	Percentage (%)
Normal	69	90.8
Abnormal	7	9.2
Total	76	100

Source: Primary Data 2024

### Respondent's Knowledge Level

The level of knowledge of respondents regarding Anemia and Blood Supplement Tablets in this study was categorized into 3 groups, namely good, sufficient and poor knowledge levels. With a frequency distribution as follows:

**Table 2.** Frequency distribution of respondents' level of knowledge

Knowledge level	Frequency (n)	Percentage (%)
Good	22	28.9
Enough	31	40.8
Not enough	23	30.3
Total	76	100

Source: Primary data 2024

### Respondents' TTD Consumption Compliance

The level of compliance with TTD consumption of respondents in this study was categorized into 3 groups, namely high, medium and low levels of compliance. With a frequency distribution as follows:

**Table 3.** Frequency distribution of respondents' compliance levels

Compliance Level	Frequency (n)	Percentage (%)
Tall	1	1.3
Currently	2	2.6
Low	73	96.1
Total	76	100

Source: Primary data 2024

### Bivariate Analysis

Bivariate analysis was carried out to identify the relationship between the independent variable, namely the level of knowledge, and the dependent variable, namely the compliance of young women in consuming blood supplement tablets.

**Table 4.** Bivariate analysis of the relationship between knowledge level and adolescent girls' compliance in consuming blood supplement tablets

Knowledge	TTD Consumption Compliance						Total		P value	rs
	Tall		Currently		Low		N	%		
	N	%	n	%	n	%				
Good	1	1.3	2	2.6	19	25.0	22	28.9	0.020	0.266
Enough	0	0	0	0	31	40.8	31	40.8		

Not enough	0	0	0	0	23	30.3	23	30.3
Total	1	1.3	2.6	54	73	96.1	76	100

Source: Primary data 2024

## Discussion

### Knowledge Level of Young Women

One of the aims of this research was to determine the level of knowledge of young women regarding anemia and blood supplement tablets. The findings from this study showed that the majority of respondents had good knowledge about anemia and blood supplement tablets, namely 31 people (41%) and the lowest were respondents with good knowledge, namely 22 people (29%). The results of this research show that respondents with insufficient and sufficient knowledge are greater than respondents who have good knowledge. Knowledge according to (Notoatmodjo, 2018), is the result of knowing and this occurs after a person senses a certain object. Sensing occurs through the five human senses, namely the senses of sight, hearing, smell, taste and touch. The results of research on the knowledge of young women at SMPN 4 Tanjung Redeb, Berau Regency show that more people have sufficient and low knowledge, this causes respondents' compliance with TTD consumption to be still low. The results of this study also show that most young women have limited knowledge about the causes, consequences, side effects and treatment of anemia. Where Young women (79%) do not know that about Discomfort in the pit of the stomach, nausea, vomiting, sometimes black stools are side effects of consuming blood supplement tablets.

These results are in line with research conducted by (Sethi et al., 2019), Where. Even though they did not experience side effects at week 1, 26% of teenagers did not take TTD, at week 2. Maybe it was due to the influence of peers who experienced side effects in the first week and stopped taking TTD the following week. The consumption of tablets is only for school program reasons. 79.8% of students reported two or more side effects when taking the tablets on an empty stomach. Eighty of 195 (41%) teenagers who experienced side effects in the second week did not take IFA in the 3rd week. Over three weeks, 1050 adolescents experienced at least one side effect (25%); Of these, 88% experienced it only once, 8% twice and only 4% reported experiencing side effects on all three consumptions. The most commonly reported side effects were stomach ache (80%), nausea (10%) and dizziness (8%). So teachers should be trained to ensure students are provided with information about the types of side effects, are advised on what to do, who to contact when side effects occur, and also provide tablets under supervision.

Some young women also do not know about the causes of anemia. This can be seen from several answers given by respondents that anemia can be caused by salmonella typhi (48%) and menstruation with excessive blood loss cannot cause anemia (47%). This is in line with research conducted by (Mengistu et al., 2019) which says that iron deficiency anemia can also be influenced by increased body needs, due to chronic diseases, blood loss due to the duration of menstruation, and intestinal parasite (worm) infections, which The results of research conducted on school girls aged between 10 and 19 years in rural towns in Hota Bahir Dar showed that adolescent girls who had a history of intestinal parasites in the last month were 2.7 times [AOR= 2, 7, 95% CI (1.19, 6.21)] were more likely to have anemia compared with those without a history of intestinal parasitic infection. Adolescent girls who experienced menstruation  $\geq 5$  days per cycle were 2.4 times [AOR=2.4, 95% CI% (1.08, 5.44)] more likely to experience anemia compared to those who experienced  $< 5$  days.

Apart from the causes of anemia, some respondents also don't know about the signs and symptoms of anemia (51%), where the signs of anemia are if the eyeballs are yellow, feeling tired and weak quickly, changes in heart rate, and difficulty concentrating. This is in accordance with research conducted by (Aksu & Unal, 2023) that older children and adolescents who are deficient

in iron may experience fatigue, chills, decreased cognitive function, and dizziness. If hemoglobin levels are too low, it can cause loss of appetite, restlessness, lethargy, tachycardia, and heart failure.

The results of this research are also in line with the case report research conducted by (Katakam et al., 2018), which states that vitamin B12 deficiency causes megaloblastic anemia. Vitamin B12, has an important role in DNA synthesis and erythropoiesis. Vitamin B12 deficiency causes impaired DNA synthesis due to inhibition of purine and thymidylate synthesis. Vitamin B12 deficiency causes a state of ineffective erythropoiesis, and subsequent symptoms lead to premature death of erythroblasts in the marrow and macrocytes in the peripheral circulation, leading to anemia. The results of the Mahakam case report research stated that respondents experienced yellowish discoloration of the eyes, skin and urine. This is a result of low vitamin B12 which can be the cause of these symptoms.

Providing blood supplement tablets is a supplement to treat anemia (42%). Where these results are in line with research conducted by (Gosdin et al., 2021) that supplementation with weekly IFA tablets in schools may have increased Hb levels and reduced anemia among adolescent girls in Ghana.

The results of this research are in line with research conducted by (Mengistu et al., 2019) which shows that young women who have less knowledge about the causes of anemia are (61.7%). Having less knowledge about the signs and symptoms of anemia by (58%), less knowledge about the impact of anemia by (53.7%), less knowledge about preventing anemia by (61.5%) and less knowledge about all things related to anemia by 56, 7%.

According to the researchers' assumption, there is still a lack of knowledge among young women at SMPN 4 Tanjung Redep, which could be caused by a lack of KIE (communication, information and education) regarding anemia and TTD in young women. Apart from that, the respondent's lack of knowledge can be caused by the respondent's lack of effort and motivation in searching for information about anemia and TTD themselves, either by asking health workers directly, finding out through books or by searching for themselves on social media or on Google.

#### **Adolescent Women's Compliance Level**

One of the other objectives of this research is to determine the level of compliance of young women in consuming TTD anemia. The findings from this study show that the majority of respondents had a low level of compliance in consuming Blood Supplement Tablets among young women, namely 73 people (96%) and the lowest was a respondent with a high level of compliance, namely 1 person (1%).

The results of this study related to adolescent girls' compliance with TTD consumption showed that the majority (96%) had low compliance, where most of the girls during the last 2 months (91%) and the last 2 weeks (84%) forgot to take additional tablets. blood that has been given. Apart from that, most of the respondents also forgot to bring blood supplement tablets (84%) when traveling or traveling, where on that day the respondent should have taken blood supplement tablets. And only (6%) respondents did not forget to drink the TTD they had been given last week. And there were still (80%) respondents who stopped taking the TTD given if they felt fine, this shows that respondents were not obedient to drinking TTD. These results are also in line with research conducted by (Lindawati, 2023), where the results of the research show that Most of the young women who did not comply with taking blood supplement tablets were 76 people (76.8%).

According to researchers' assumptions, low compliance among young women in SMPN 4 Tanjung Redep in TTD consumption, can be caused by the TTD distribution method. The teachers distributed blood supplement tablets at SMPN 4 Tanjung Redep for one month, so there was an excuse for not drinking because they didn't bring TTD. TTD should be distributed one tablet every week on Friday, so that it can be taken simultaneously after doing morning exercises. This condition is certainly not in line with the Indonesian Government's policy through the policy issued by the Ministry of Health that all young women are required to consume one tablet of TTD

every 1 (one) week, to prevent anemia in young women. Another cause based on observations is the absence of a PMO (medication taking officer) to accompany and remind respondents to take TTD so that the majority of respondents still sometimes forget to take TTD, apart from that they experience side effects and also influence respondent compliance.

### **The Relationship between the Level of Knowledge of Young Women and Compliance in Consuming Blood Supplement Tablets at SMPN 4 Tanjung Redeb**

Based on the results of the Spearman rank correlation test, a p value of 0.020 was obtained, where this number is  $<0.05$ , which means that  $H_a$  is accepted and  $H_o$  is rejected, so it can be concluded that there is a relationship between knowledge and compliance of young women at SMPN 4 Tanjung Redeb in consuming added tablets. blood, the coefficient of determination value from the results of this study is 0.266, which means that the relationship between knowledge and compliance of young women in consuming blood supplement tablets is a weak relationship.

The results of this research are based on respondents' statements in the questionnaire, the majority of young women (79%) do not know that regarding discomfort in the pit of the stomach, nausea, vomiting, sometimes black stools are side effects of consuming blood supplement tablets, apart from that, young women also do not know that anemia can be caused by salmonella typhi (48%), menstruation with blood that comes out regularly. Too much can cause anemia (53%), that one sign of anemia is if the eyeballs are yellow (51%) and blood supplement tablets are a supplement to treat anemia (42%). Apart from that, some young women think that anemia is not the cause of the decline in school achievement for anemia sufferers (53%). Where the results of this study show that the majority of young women also have limited knowledge about the causes, consequences, side effects and treatment of anemia.

These results are in line with the theory put forward by Notoadmodjo where a lack of knowledge about anemia in adolescents causes a lack of understanding in adolescents about anemia. Where the cognitive domain includes six levels of knowledge, namely knowing, understanding, applying, analyzing, synthesizing and evaluating. Young women's understanding of anemia is only at the knowing stage. not used in everyday life (Siyami et al., 2023).

Several studies have also shown that there is a relationship between adolescent girls' knowledge and compliance with TTD consumption, where previous research was conducted by (Antwi et al., 2020) states that education has a positive effect on increasing knowledge. Interventions around nutrition education show positive impacts on knowledge, attitudes and practices in school-aged children in Ghana. Research conducted on adolescent girls in Jordan shows that nutrition education can improve knowledge, attitudes and practices towards anemia. Increasing knowledge, attitudes and intentions towards iron supplementation programs has the potential to increase adolescent girls' compliance in consuming iron supplements.

The results of this research are in line with research conducted by (Hartati et al., 2020.), where the results of the study showed that the level of compliance of respondents in drinking TTD was 87 people (58.4%) with low compliance and 62 people (41.6%) with moderate compliance. The results of the analysis using Kendall Tau found a p value of 0.03, meaning there was a relationship between knowledge and compliance with taking blood supplement tablets.

Other research conducted by (Wahyuningsih et al., 2020) where the research results show that there is based on the results of the Chi Square test, the results were that there was a relationship between knowledge and compliance with the consumption of blood supplement tablets at SMP N 1 Karangnongko with a p value = 0.001 ( $p < 0.05$ ).

This research is also in line with research conducted by (Sab'ngatun & Riawati, 2021) where the results of this study showed that the majority of respondents with good knowledge about blood supplement tablets were 16 respondents (53%) and the majority of those who consumed blood supplement tablets were irregular as many as 19 respondents (63%). There is a relationship between knowledge and consumption of blood supplement tablets with a significant level of

0.01<0.05, so it can be concluded that there is a relationship between knowledge and compliance among young women in consuming blood supplement tablets.

From this study there were also 19 (25%) young women who had good knowledge but low compliance. This shows that the obedience of young women is not only due to knowledge factors. These results are in accordance with research conducted by Lismiana & Indarjo (2021) where the results of the research show that There was no relationship between knowledge ( $p= 0.93$ ) and compliance with blood supplement tablet consumption with a  $p$  value of 0.93. Where the level of knowledge may not influence behavior because the knowledge gained by young women regarding anemia does not have an adequate explanatory framework to motivate young women to consume blood supplement tablets to prevent anemia.

According to the researcher's assumptions based on the results of this research, it is known that good and sufficient knowledge is not able to make young women comply in consuming the blood supplement tablets that have been given, where it has been proven that there are still 96% of young women with low compliance. This is due to the lack of knowledge of respondents regarding the effects and benefits of blood supplement tablets, and most respondents do not like the effects caused by consuming blood supplement tablets (nausea, vomiting, heartburn). So there is a tendency for respondents who are not fully compliant with consuming blood supplement tablets. Apart from the lack of knowledge, forgetting also plays a big role in respondents' non-compliance. This may be because the respondents did not regulate the schedule for taking the TTD given, and in the absence of a PMO (Drug Taking Supervisor) for TTD, the role of teachers and parents is actually very large in increasing the compliance of young women in consuming TTD.

Apart from being influenced by behavioral and knowledge factors, consumption of blood-enhancing tablets among young women is also influenced by a lack of interest in consuming blood-enhancing tablets as a blood-enhancing supplement. This is because respondents feel they are not sick and do not need supplementation and they do not accept the side effects that usually arise from the blood supplement tablets they consume.

## CONCLUSION

The results of the study concluded that the majority of respondents had good knowledge about anemia and blood supplement tablets in young women, indicating that the majority of respondents had a low level of compliance in consuming Blood Addition Tablets in young women and there was a relationship between knowledge and compliance among young women at SMPN 4 Tanjung Redeb in consume blood increasing tablets. The limitations of this research are the limited number of variables, where the independent variable studied is only the knowledge factor, so that future research is expected to be able to examine other variables that influence adolescent girls' compliance with TTD consumption, both from family and teacher support. This research only analyzes the relationship between the independent and dependent variables. It is hoped that in the future other research can implement an intervention to reduce the rate of non-compliance in TTD consumption among young women. This study is only limited to knowing the relationship between the independent and dependent variables, it is hoped that in the future other studies can implement an intervention in reducing the rate of non-compliance in the consumption of TTD adolescent girls.

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