

Determinants of Iron Supplementation Compliance Among Adolescent Girls in Kuningan Regency, Indonesia

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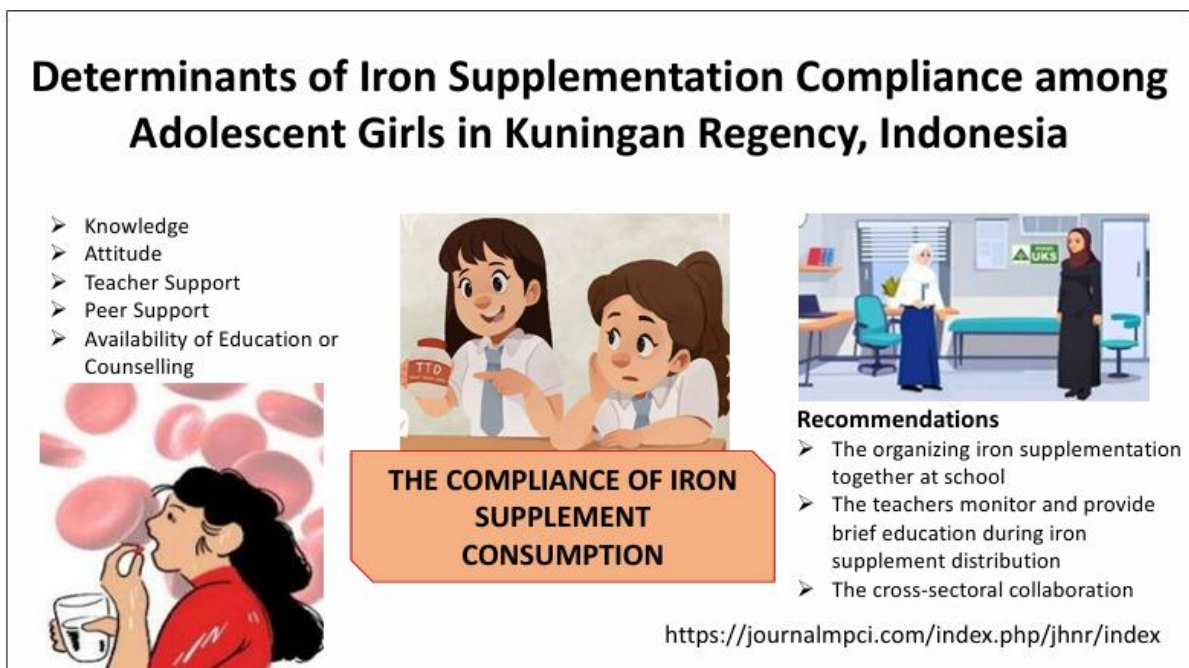
ABSTRACT

The iron supplementation program is one of the efforts to overcome anemia based on WHO recommendations. The compliance of iron supplement consumption is an indicator of the success of anemia prevention programs. This cross-sectional study aims to analyze factors related to compliance with iron supplement consumption among adolescent girls in health center areas in Kuningan Regency. The study involved 105 respondents selected using a proportional random sampling technique. Data were collected using a questionnaire for each variable. The data were analyzed using the chi-square statistical test. The results showed that only 21% of adolescent girls were found to be compliant in taking iron supplements. Approximately 62.9% of adolescent girls with good knowledge were compliant in taking iron supplements ($p=0.041$). 70.4% of adolescent girls with positive attitudes were compliant in taking iron supplements ($p=0.018$). Approximately 50.6% of adolescent girls lacked support from teachers ($p=0.019$), 71.1% lacked support from peers ($p=0.010$), and 62.7% lacked access to nutrition education or counseling at school ($p=0.010$). This study suggests the need of cross-sectoral support from both the health and education sectors to strengthen the implementation of the routine iron tablet consumption program as recommended.

Key Messages:

- The compliance with iron supplement consumption among adolescent girls in Kuningan Regency is still low, only 21%.
- The majority of adolescent girls who did not adhere to iron supplement consumption tended to lack support from teachers, peers and did not receive nutrition education.
- The implementation of iron tablet consumption at school together with all adolescent girls is recommended to be carried out more consistently, namely every week.
- The cross-sectoral support is needed for the implementation of the iron supplementation program for adolescent girls.

GRAPHICAL ABSTRACT



INTRODUCTION

One indicator of the poor nutritional quality and individual health is the issue of anemia. Anemia is a major nutritional and health issue, particularly among adolescent girls, women of reproductive age, pregnant women and children. Anemia is a condition where the body has a hemoglobin concentration below the normal range, based on gender, age group, and health condition (1). Most types of anemia commonly found in adolescent girls worldwide are iron deficiency anemia (2). Iron deficiency anemia is caused by a lack of iron in the body due to insufficient intake or absorption of iron from food. If iron deficiency persists over an extended period, it can lead to high mortality and morbidity rates among adolescent girls (3).

According to data from the 2023 Indonesian Health Survey, the prevalence of anemia among women was 18% and the prevalence of anemia in Indonesia among those aged 15–24 years was 15.5% (4). West Java is one of the provinces with a relatively high prevalence of anemia, at 41.93% in 2018, which falls into the category of severe public health issues ($\geq 40\%$) (5). Kuningan Regency is one of the areas in West Java with a relatively high prevalence of anemia among adolescent girls, at 30.36% in 2023 (6). Adolescent girls are at greater risk of anemia and iron deficiency than adolescent boys. Anemia that occurs during adolescence increases the risk of anemia during pregnancy and has negative effects on fetal development, such as giving birth to babies with low birth weight (LBW), premature babies, stunted babies and can even cause death in mothers and fetuses. Efforts to prevent and overcome anemia in adolescent girls include iron supplementation (7).

The weekly iron supplementation is one of the international and national health programs (8). This iron supplementation program aims to achieve the Global Nutrition Target of reducing anemia in women of childbearing age by 50% in 2025 and as a specific intervention to prevent stunting in Indonesia (9). According to the Indonesian Ministry of Health guidelines, the iron supplementation program is provided to adolescent girls aged 12–18 years who are enrolled in junior and senior high school, with a standard dose of 52 tablets during one school year. The one iron tablet is given to adolescent girls once a week (7). The iron supplementation can effectively increase iron stores and reduce the risk of anemia in adolescent girls (10,11).

One of the programs for providing iron tablets to adolescent girls can be implemented in schools (12). This iron supplementation program for adolescent girls in schools under the public health center

working area. Schools play an important role in distributing iron tablets. According to data from the 2023 Indonesia Health Survey, the primary source of iron tablets for adolescent girls aged 10–19 years is schools, accounting for 89.6%. However, the implementation of iron tablets in schools has not been fully effective, with several obstacles including low coverage of adolescent girls receiving iron tablets and low compliance with iron tablet consumption among adolescent girls (13,14).

Based on the 2023 Indonesian Health Survey, the percentage of adolescent girls in Indonesia who received and consumed ≥ 52 iron tablets during 1 year at school in 2023 was reported to be 6.1% and 3% (4). The national target for adolescent girls consuming iron tablets is 75% by 2023. The prevalence of adolescent girls consuming iron tablets in Kuningan District in 2023 is 78.8% (15). This prevalence has reached the 2023 national target ($>75\%$), but there is still a gap, as the prevalence of anemia in Kuningan Regency in 2023 is still above the target ($>30\%$) (6). In addition, findings in a preliminary study by researchers show that there are still >10 adolescent girls who did not consume iron tablets in the past week (16). Compliance is an indicator of the success of anemia prevention programs. Low compliance may indicate a high prevalence of anemia (17). Some studies show that compliance with iron tablet consumption is still low. The research in Ghana, Africa show low compliance among adolescent girls with iron supplement consumption, at only 26.2% (18). In addition, other studied show that only 9% and 18% of adolescent girls consume iron supplements at least once in East Nusa Tenggara and East Java (13). The compliance with taking iron supplements is one health behavior that can be influenced by several factors.

Factors related to compliance behavior are influenced by predisposing factors such as knowledge and attitude, reinforcing factors such as external support from teachers, peers and parents, enabling factors such as the availability of education/counseling, facilities and infrastructure (19). The primary reason adolescent girls consumed iron supplements are counseling from teachers, administrators and school staff, whereas the primary reasons why adolescent girls do not comply with iron supplementation were lack of perceived benefit, peer suggestion not to take iron supplementation and a reported history of side effects (20).

According to the initial observations conducted by researchers in Kuningan Regency, further research is needed on factors related to compliance in iron supplement consumption, in order to design appropriate programs or interventions to increase compliance with iron supplement consumption among adolescent girls. This study aims to analyze factors related to compliance with iron supplement consumption among adolescent girls in health center areas in Kuningan Regency.

METHODS

This research is a quantitative study using a cross-sectional research design, which aims to analyze factors related to compliance with iron supplement consumption among adolescent girls. The population in this study consisted of all female students in grade X at senior high or equivalent schools in the Health Center area in Kuningan Regency. The minimum sample size of female students in grade X in this study was based on the formula of Lemeshow (21). The minimum sample selection using the Lemeshow formula in this study was based on the coverage proportion of the iron supplementation program for adolescent girls in Kuningan Regency, which was 48.08%. The minimum sample size obtained using the Lemeshow formula.

The sampling technique used for the research location was probability sampling with cluster sampling, including health centers and schools as the cluster units. There are 37 health centers in Kuningan Regency and the selection of health centers was based on the minimum number of adolescent girl samples, which was 105 adolescent female samples. The selection of senior high or equivalent schools in each health center was also based on a minimum sample size of adolescent girl samples. The random selection of community health centers and schools, the resulting in two community health centers, namely the Puskesmas Ciawigebang and Puskesmas Lamepayung. In Puskesmas Ciawigebang, the selected school is SMKN 5 Kuningan with a total of 53 female students. Meanwhile at the Puskesmas Lamepayung, the selected school is SMAN 3 Kuningan with a total of 53 female students. The total number of subjects was 106 female students. But, during the study, there was an subject who dropped out as much as one female student, so the total number of adolescent girls became 105 adolescent girls at the end of the study. The sampling technique used in the selection of adolescent girls is a proportional random sampling.

The data collection used in this study was a questionnaire developed by the researcher. The questionnaire used in this study has been tested for validity and reliability. Before filling out the questionnaire, respondents must fill out an informed consent form for the study. The instruments used in this study consisted of seven sections, including questionnaire of individual characteristic, knowledge about anemia and iron supplementation, Attitudes toward anemia and iron supplements, teacher support, peer support, availability of education/counseling on anemia and iron supplements and compliance questionnaire of iron supplement consumption. The questionnaire of individual characteristics such as name, age, type of school, parent's education and parent's occupation. The knowledge questionnaire consists of 16 questions about anemia and iron supplements with low (<60), medium (60-80) and high (>80) categories. The attitude questionnaire consists of 9 questions about anemia and iron supplements with negative (<70), neutral (70-80) and positive (>80) categories. The teacher support questionnaire consists of 5 questions with poor (<median value) and good ($\geq$ median value) categories. The peer support questionnaire consists of 14 questions with poor (<median value) and good ($\geq$ median value). The all questionnaires were developed by the researcher and tested for validity and reliability. The reliability value of knowledge is 0.737, 0.642 for the reliability value of attitude, 0.866 for the reliability value of teacher support, 0.961 for the reliability value of peer support and 0.821 for the reliability value of nutrition education or counseling. The questionnaire of compliance was measured by asking adolescent girls who had taken iron supplements one week ago to indicate whether they were compliant, and those who had not taken supplements one week ago to indicate whether they were non-compliant.

The analysis method used bivariate analysis with the chi-square test. The bivariate analysis results showed a significant relationship between the independent and dependent variables if the p-value was <0.05. Data analysis was performed using SPSS software version 25.

CODE OF HEALTH ETHICS

Health Research Ethics Committee of the Faculty of Public Health Hasanuddin University, Makassar. The ethical certificate number is 533/UN4.14.1/TP.01.02/2025.

RESULTS

Based on Table 1, it shows that the adolescent girls involved in this study were aged between 14 and 17 years old, with around two-thirds of the total number of adolescent girls being 16 years old. The types of schools attended by the adolescent girls were senior high schools and vocational high schools, with a slightly higher proportion of adolescent girls attending senior high schools. Most of the fathers and mothers had a high school education, with nearly half of the mothers being high school graduates and more than a third of the fathers having a high school education. The occupations of the mothers of the adolescent girls were dominated by mothers who did not work or were housewives. As for the occupations of the fathers, about one-fifth were civil servants/private employees, about one-third were self-employed, and nearly one-third were laborers.

Table 1. Adolescent Girls' Characteristics

Characteristics	n	%
Age (Years Old)		
14	1	1.0
15	30	28.6
16	71	67.6
17	3	2.9
Type of schools		
Senior High School	53	50.4
Vocational High School	52	49.5
Mother's education		
Elementary School	38	36.2
Junior High School/Equivalent	25	23.8
Senior High School/Equivalent	26	24.8

Characteristics	n	%
College	16	15.2
Father's education		
Elementary School	39	37.1
Characteristics	n	%
Father's education		
Junior High School/Equivalent	10	9.5
Senior High School/Equivalent	34	32.4
College	22	21.0
Mother's Occupation		
Not working/Housewife	81	71.1
Civil servant/Private employee	7	6.7
Entrepreneur/Trader	9	8.6
Service provider	8	7.6
Father's Occupation		
Not working	7	6.7
Civil servant/Private employee	21	20.0
Entrepreneur/trader	39	37.1
Laborer	33	31.4
Service provider	5	4.8

Table 2 shows that only 22% of adolescent girls comply with iron supplement consumption, while 79% do not comply. This indicates that many adolescent girls are still not consuming iron tablets as recommended in the iron tablet guidelines. The main reasons adolescent girls are non-compliant in taking iron supplements are forgetting to take them, fear of side effects and the unpleasant taste of the tablets.

Table 2. Frequency Distribution of Compliance for Iron Supplement Consumption

Aspect	n	%
The Compliance with Iron Supplement Consumption (consumption in the last week)		
Not-compliant	83	79.0
Compliant	22	21.0
The reasons for taking iron supplements		
Advice from teachers	8	7.6
Recommendation from health workers	32	30.5
To prevent anemia	65	61.9
The reasons for non-compliance		
The tablets taste bad	22	21.0
Feeling healthy	1	1.0
Fear of side effects	34	32.4
Fear of adverse effect on health	10	9.5
Forgetfulness	35	33.3
Feeling unnecessary	1	1.0
Family disapproval	2	1.9

Table 3 shows the results obtained show a p-value <0.05 for all variables, indicating a significant relationship between knowledge, attitude, teacher support, peer support, availability of education or counseling, and compliance with iron tablet consumption. Approximately 68.8% of adolescent girls have high knowledge and 95.5% of adolescent girls have a positive attitude towards iron supplementation. However, adolescent girls who receive less support from teachers and peers and have limited access to nutrition education or counseling tend to be noncompliant in taking iron supplements, with percentages of 50.6%, 71.1%, and 62.7%, respectively.

Table 3. Determinants of Compliance to Iron Supplement Consumption

Variables	Compliance to Iron Supplement Consumption				Total		p-value
	Compliant		Non-compliant		n	%	
	n	%	n	%			
Knowledge about anemia and iron supplementation							
Low	2	9.1	25	30.1	27	25.7	0.041
Medium	5	22.7	25	30.1	30	28.6	
High	15	68.2	33	39.8	48	45.7	
Attitude about anemia and iron supplementation							
Negative	1	4.5	16	19.3	17	16.2	0.018
Neutral	0	0.0	13	15.7	13	12.4	
Positive	21	95.5	54	65.1	75	71.4	
Teacher Support							
Poor	5	22.7	42	50.6	47	44.8	0.019
Good	17	77.3	41	49.4	58	55.2	
Peer Support							
Poor	7	31.8	59	71.1	66	62.9	0.001
Good	15	68.2	24	28.9	39	37.1	
Availability of nutrition education or counseling							
Poor	5	22.7	52	62.7	57	54.3	0.001
Good	17	77.3	31	37.3	48	45.7	
Total	22	21	83	79	105	100	

DISCUSSION

Compliance to Iron Supplement Tablet Consumption among Adolescent Girls

The iron supplement tablet program is one of the government's intervention programs to prevent and combat anemia. Compliance with iron supplement tablet consumption is an important factor in the success of the iron supplement tablet program for adolescent girls. The rules for iron supplement tablet consumption for adolescent girls are once a week (7).

Based on this study, showed that only 21% of adolescent girls consumed iron supplements last week. This shows that many adolescent girls are still not consuming iron supplements as recommended in the iron supplement guidelines. This study is line with research by Apriningsih et al, which reported that compliance with iron supplement consumption among adolescent girls is still low at 37.2% (14). However, this study contrast with the results of research in Banawa, Donggala Regency which stated that adolescent girls were compliant with taking iron tablets with a percentage of 61% (22).

Most of the reasons why adolescent girls do not comply with taking iron tablets are forgetting to take them, fear of side effects, and the unpleasant taste of the tablets. This is in line with the results in Cianjur Regency, which states that most of the reasons for non-compliance among adolescent girls include concerns about side effects, the unpleasant taste of the tablets, and forgetting to take them. Meanwhile, 65% of the reasons why adolescent girls comply with taking iron supplements is to prevent anemia (23). This is similar to the findings in Tamale Metropolis of Ghana, who reported that approximately 48.3% of teenage girls take iron supplements to prevent anemia (18).

According to Green and Kreteur, factors that influence health behavior, including compliance, include predisposing factors, reinforcing factors and enabling factors (19). These factors were selected because several studies have explained that compliance is influenced by knowledge, attitude, teacher support, peer support and the availability of nutrition education or counseling. Good knowledge about anemia and iron tablet programs, positive attitudes toward anemia, and positive attitudes from teachers toward iron tablet consumption are also factors that support iron consumption compliance (18,24). According to Nuradhiani et al., teacher support can increase adolescent girls' compliance in taking iron tablets (25). This is in line with research in India by Dhikale et al., which found that 70.1% of adolescent

girls took iron tablets because they received support from their teachers (26). Adolescent girls will be more compliant in taking iron supplements if their peers share positive experiences about taking iron supplements. This is because adolescent girls are an age group that is vulnerable to the influence of their surroundings and they spend a lot of time with their friends (25,27). Based on research by Sudfeld et al., the main reason adolescent girls consume all the tablets given to them is because of counseling from teachers, principals, vice principals and other school staff (20). Research by Apriningsih et al., also shows that education or counseling about anemia and iron tablets is related to adherence to iron tablet consumption among adolescent girls (14).

Relationship Between Knowledge and Compliance with Iron Supplementation Consumption

Knowledge is one of the foundations for adolescent girls in consuming iron tablets. Most adolescent girls stated that the most influential factor in their attitude toward consuming iron supplements is knowledge about anemia and the benefits of iron supplements (14). A lack of knowledge about the benefits of iron supplements can affect adolescent girls' motivation to consume iron supplements (27).

Based on the bivariate test using the chi-square test in this study showed a p-value of 0.041, which means that there is a significant relationship between knowledge and compliance with iron supplement consumption because the p-value is < 0.05 . Adolescent girls with high levels of knowledge had the highest compliance rate at 68.2%. This is in line with research conducted by Thifal et al., which found a relationship between the knowledge variable and compliance in consuming iron supplements, with a p-value = 0.010, adolescent girls with good knowledge had a higher compliance rate of 75.2%, indicating that knowledge is related to compliance with iron supplement consumption (28). Good knowledge among adolescent girls is an important factor in understanding the importance of taking iron supplements (29). Low knowledge among adolescent girls about anemia and iron supplements can increase the risk of anemia in adolescent girls, because they are less exposed to information about anemia and iron supplements. Additionally, this lack of knowledge is also caused by the absence of education or information about anemia and iron supplements for adolescent girls (18).

However, this study diverges from the research Harlisa et al., reported that knowledge here was no relationship between knowledge and compliance with iron supplement consumption, with a p-value of 0.182 ($p > 0.05$) (30). Sometimes knowledge does not impact to drinking iron tablets. This is because changing behavior requires not only knowledge, but also other factors such as environmental support and self-efficacy (31).

Relationship Between Attitude and Compliance with Iron Supplementation Consumption

Attitude is one of the underlying factors for adolescent girls in their intention and practice of consuming iron tablets (32). According to Green and Kreuter, attitude is one of the predisposing factors that encourage a person to behave in a certain way (19). In this research, most adolescent girls have a positive attitude toward anemia and iron supplements. The positive attitudes among adolescent girls resulted in a higher percentage of compliance compared to non-compliance, with a percentage of 95.5%. This is similar to the research Khomsan et al, which reported most adolescent school girls have a positive attitude toward iron supplements (33). One reason adolescent girls have this positive attitude is because they believe that taking iron supplements can prevent anemia and overcome the side effects caused by anemia (34).

The research of the bivariate test analysis utilizing chi square, it shows that attitudes and compliance with iron supplement consumption have a p-value of 0.018, which means that there is a significant relationship between attitudes and compliance with iron supplement consumption. This research, similar to the study conducted by Biswas et al, which reported a relationship between attitudes and compliance with iron supplement consumption with a p-value < 0.001 , the results of the study showed that adolescent girls with positive attitudes had higher compliance rates, at 60.9%. A positive attitude toward anemia can influence compliance with iron supplement consumption (24).

According to research by Agustina et al, attitudes toward anemia can influence positive actions or behaviors to prevent anemia (35). These positive actions or behaviors can increase adolescent girls'

awareness of anemia and iron supplements, thereby reducing the prevalence of nutritional problems, including anemia (36). Therefore, it is necessary to strengthen both the knowledge and attitudes of adolescent girls towards the role of iron tablets as a means of preventing anemia and maintaining health (34). In order to reinforce positive attitudes among adolescent girls, schools need to play a role by implementing iron supplement consumption activities once a week at school. In addition, teachers' capacity in schools needs to be built up so that they understand the importance of consuming iron supplements and can educate their students accordingly (14).

This study is not in line with the study conducted by Putri and Astuti et al., reported the chi-square test results in this study indicate that there is no significant relationship between attitudes toward compliance with iron supplement consumption, where of the 17 respondents who had positive attitudes, only 6 respondents (35.3%) were compliant in consuming iron supplements, with a p-value of 0.293. Female students with negative attitudes and disobedience dominate over female students with positive attitudes and obedience (37).

Relationship Between Teacher Support and Compliance with Iron Supplementation Consumption

Teacher support is one of the reinforcing factors that influence compliance with iron tablet consumption (19). Teachers are an important factor in the compliance of adolescent girls in taking iron supplements, as students can gain more knowledge about health from their teachers (32). This teacher support involves the provision of information, motivation, and advice from teachers regarding iron tablet consumption at school. Teacher support at school can remind adolescent girls to consume iron tablets, thereby fostering a positive attitude toward iron tablet consumption among adolescent girls (38).

Based on bivariate test analysis utilizing chi square in this study, showed that there was a significant relationship between teacher support and compliance with iron supplement consumption, with a p-value of 0.019. The results of this study are in line with research conducted by Nuradhiani et al., which shows that there is a relationship between teacher support and compliance with iron supplement consumption (p value = 0.000). Teachers play an important role in ensuring that adolescent girls take their iron supplements, as they spend more time at school than at home (25).

However, in this study, around 50.6% of adolescent girls received insufficient support from teachers and did not comply with iron supplement consumption. This is similar to the study by Pou et al., which stated that most teachers did not support iron supplement consumption and that adolescent girls did not comply with iron supplement consumption, which was around 76.6% (39). Therefore, it is necessary to increase teacher support for the consumption of iron tablets at school, one of which is by providing information about iron tablets, because one of the reasons adolescent girls consume iron tablets is because they receive support from teachers (40).

This study does not align with the findings of Utomo et al, which reported a p-value of 0.061 ($p > 0.05$), it shows that there is no significant relationship between teacher support and iron supplement consumption. This may be due to a lack of supervision by teachers when the iron tablets are taken in class, resulting in many respondents not taking the tablets regularly (41). Therefore, teachers need to play a role in monitoring the distribution process until the iron tablets are consumed by adolescent girls (42).

Relationship Between Peer Support and Compliance with Iron Supplementation Consumption

The peer support is also one of the reinforcing factors that influence compliance with iron supplement consumption (19). Adolescent girls' consumption of iron supplements can be influenced by their surroundings. One of the environments that influences teenage girls to consume iron supplements is their friends. Peers can play a role in influencing the behavior or actions of adolescent girls, including their consumption of iron supplements (43). Peers also contribute more to the personal lives of adolescents. In many situations, peers are considered more capable of communicating and more likely to be understanding (32).

Based on the results of the chi square test, the p-value was 0.001 ($p < 0.05$), which means that there is a relationship between peer support and compliance with iron supplement consumption. In this study, peer support for taking iron tablets was still low, as seen from the percentage of peers who did not support

it and the higher rate of non-compliance among adolescent girls, which was 71.1%. This finding aligns with research of Ansari et al., which showed there is a relationship between peer support and compliance with iron supplement consumption, with a p-value of 0.03. The study also shows that peer support for taking iron tablets is still low, with non-compliance among adolescent girls around 63% (27). One reason of adolescent girls is willing to take iron supplements is when their close friends share positive experiences about iron supplement. Other studies have shown that some adolescent girls are pressured not to take iron supplements for various reasons, one of which is related to the side effects of taking iron supplements (24).

The distribution of iron supplements in schools by students can increase compliance in consuming iron supplements. This is in line with research by Jafari et al., which shows a relationship between exclusive distributors of iron supplements and the use of supplements by students (44). However, this study contrast with the findings of Nuradhiani, which reported there was no significant relationship between peer support and compliance to iron supplement consumption among adolescent girls, with a p-value of 0.117 ($p > 0.05$). The study showed that there were subjects who continued to take iron tablets according to the schedule and instructions even though their friends did not take iron tablets (45).

Relationship Between Availability of Nutrition Education or Counselling and Compliance with Iron Supplementation Consumption

Availability of nutrition education or counselling is one of the enabling factors that influence compliance with iron tablet consumption (19). Nutrition education or counseling provided by teachers or health workers regarding iron tablets is necessary so that adolescent girls understand the purpose of the iron tablet program (46). Low levels of nutrition education or counseling are factors contributing to adolescent girls' non-compliance with iron supplementation, with approximately 80.8% of girls not receiving nutrition counseling and high levels of non-compliance with iron supplementation (47). The most of adolescent girls receive inadequate nutrition education and counseling at school and do not comply with iron supplement consumption, with a percentage of 62.7%.

Based on bivariate test analysis utilizing chi square in this study, showed that the p-value was 0.001 ($p < 0.05$), which shows that there is a relationship between the availability of nutrition education and counseling and compliance with iron supplements. The results of this study are in line with research Rahayuningtyas et al., shows that there is a relationship between access to information and the practice of consuming iron tablets among adolescent girls, with a p-value of 0.04. In this study, 67.1% of information sources were obtained from schools and only 1.8% from health workers. Most of the reported sources of information were from the internet (48). In addition, research by Raihani et al., also states that educational media affects compliance with iron supplement consumption with a p value= 0.028. After the education was given, there was an increase in compliance with iron supplement consumption in the control group with a percentage of 20% and in the experimental group with a percentage of 60% (49).

Other studies shows that education or counseling can be effective in increasing knowledge and attitude to consume iron supplements among adolescent girls. The study showed an increase in knowledge and attitudes after education was provided, with a p-value < 0.005 . Knowledge and understanding can be gained through education, among other things. Through education, the information obtained can also encourage adolescents to have a positive attitude toward iron supplement consumption (50). Other studies also explain that another method of nutrition education that can be used is interpersonal communication. The findings of the study show that nutrition education using the interpersonal communication approach effectively improved the knowledge of adolescent girls regarding iron supplementation, The significant improvement, with a mean score increase from 5.00 to 8.46 ($p = 0.003$) (51). These findings prove that providing education through various methods is important in improving the knowledge and attitudes of adolescent girls regarding the consumption of iron supplements. Nutrition education or counseling about anemia and iron supplements can be done by teachers at school. The research of Sudfeld et al., reported that the primary reason adolescent girls consumed iron supplements were counseling from teachers, administrators and school staff (20).

The consistent implementation of health education and joint iron supplement consumption activities in schools can increase compliance with iron supplement consumption among adolescent girls.

This is in line with a study by Jafari et al., which showed a relationship between the implementation of health education in schools and sufficient time allocation with iron supplement consumption by students (P values<0.001) (44). However, this research is not in line with the study conducted by Nuradhiani, that indicating there was no significant relationship between exposure to information and compliance with iron supplement consumption, with p value of 0.215 (p >0.05). This is because adolescent girls who have been well informed about anemia and iron supplements are not guaranteed to comply with the rules for taking iron supplements (45).

CONCLUSION

The iron supplementation program is a program to prevent and treat anemia. This study shows that adolescent girls have a low level of compliance with iron supplementation, at 21%. This study found that the determinants of compliance with iron supplements include knowledge, attitude, teacher support, peer support, and the availability of nutrition education or counseling. Increasing compliance with iron supplement consumption remains a challenge in reducing the prevalence of anemia. It is hoped that there will be increased cross-sectoral support from both the health and education sectors to strengthen the implementation of the routine iron tablet consumption program as recommended. Therefore, the role of various parties, including schools, is important in consistently organizing joint iron supplement consumption activities at school. It is necessary to integrate activities from the health sector, such as the Health Office and Community Health Centers, and the education sector, such as the Education Office and schools, in the form of consistent implementation of iron tablet consumption activities and the inclusion of nutrition and health education in the school curriculum, the formation of UKS supervising teachers, joint supervision between community health center staff and teachers in schools in recording and reporting, and the provision of iron tablet consumption monitoring cards.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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