

## Effect of Group Discussion on Iron Supplement Consumption Adherence and Hemoglobin Levels in Female Students at SMAN 1 Senduro, Lumajang

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### Abstract:

Anemia is one of the health problems that still affects Indonesia. One of the causes of anemia is a lack of knowledge and iron supplement adherence, which can lead to anemia. This research aims to determine the effect of group discussion method education on iron supplement adherence and Hemoglobin levels in female students at SMAN 1 Senduro, Lumajang. This research was a quasi-experimental pretest-posttest quantitative with a non-probability total sampling technique. The sample used in this research was adolescent girls, with 41 students. Measurement of the level of adherence used the Morisky Medication Adherence Scale (MMAS-8) and given the intervention of pretest and post-test. Data was tested using the Wilcoxon Signed Rank Test. The results of this research showed that adolescents with iron supplement adherence before group discussions were in the low category 41 (100%). After the group discussion, the high category was 2 (4.9%), low 21 (51.2%); before the group discussion, the average Hb level was 10.65mg/dl; after the group discussion, the average Hb result was 11.37 mg/dl. The results of the Wilcoxon test obtained a p-value of 0.000 ( $p < 0.05$ ), which means that there is a significant effect of the provision of education on group discussion methods in adolescent girls. An increase influenced the increase in hemoglobin levels in the consumption of blood supplement tablets in adolescent girls, showing active participation and changes from before and after the group discussion. Respondents who remained anemic after the group discussion were due to a lack of iron needs and a lack of knowledge of consuming nutritious food.

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## INTRODUCTION

Anemia is one of the health problems that still attacks Indonesia. Anemia is a condition where the Hemoglobin (Hb) level in the blood is lower than the average value for the age group and gender (Adriana and Wirjadmadi, 2015). Adolescent girls during puberty are at high risk of experiencing anemia. This is due to the large amount of iron lost during menstruation. In addition, it is exacerbated by the lack of iron intake, where the body needs iron in adolescent girls to accelerate growth and development. Iron deficiency anemia can impact adolescent girls, including fatigue, decreased resistance to infectious diseases, decreased physical fitness, decreased concentration, and academic achievement (Runiari. et al., 2020).

Globally, in women of childbearing age (15-49 years), 30.2% or around 468 million people are affected by anemia. Meanwhile, in Southeast Asia, the prevalence of anemia is 14.9% (WHO, 2018). In Indonesia, based on Riskesdas data in 2018, the prevalence of anemia in the 15-24 age group

(18.4%) in 2013 increased to 32% (15-24 years old) in 2018 (Badan Penelitian dan Pengembangan Kesehatan Kementerian RI, 2018). In Lumajang Regency, the prevalence of anemia in female adolescents in 2018 was still relatively high, namely 30.9%. Based on a preliminary study conducted at SMAN 1 SENDURO which was carried out in March 2024, data was obtained that 41 female students had anemia with hemoglobin levels below normal (> 11 mg/dl).

Consumption of Iron Supplement Tablets (TTD) is an effective way to overcome the problem of anemia; if consumed routinely once a week, there will be an increase in Hb levels (Kemenkes RI, 2016). Compliance with iron supplements is a significant effort to increase hemoglobin (Hb) levels and prevent the occurrence of anemia among high school students. The effect of compliance in consuming blood-boosting tablets on hemoglobin levels in female students at SMA Negeri 01 Doro, Pekalongan Regency showed that 37 respondents who had been given blood-boosting tablets affected increasing Hb by 32.4% (Nurmasari, 2018). Another research study conducted by Andaruni and Nurbaety (2018) showed the effect of providing supplements, namely an increase in Hb levels in female students with an average increase in Hb after 2 weeks of 3.21% (0.35 gr / dL), then with a period of 4 weeks as much as 4.3% (50.48 gr / dL), and then 8 weeks by 7.29% (0.83 gr / dL).

Based on the background of the problem above, the researcher is interested in conducting a study on the effect of group discussion method education on compliance in taking blood-boosting tablets in female students at SMAN 1 Senduro, Lumajang.

**METHOD**

The design of this study was quantitative and quasi-experimental, using pre and post-tests through a cross-sectional approach. The population in this study were female students of SMAN 1 Senduro who experienced a decrease in hemoglobin levels in Lumajang Regency, totaling 41 students. The sampling technique used was total sampling. The questionnaire used was the Medication Adherence Scale Eight-item (MMAS-8), which was given pre-and post-tests and conducted for one month. Data analysis was performed using the Wilcoxon Signed Rank Test, interpreting H1 accepted if p-value ≤ α, with α = 0.05.

**RESULT**

**General Data of Respondents**

Table 1. Frequency distribution of respondent characteristics

Characteristics	Frequency	Percentage
Age		
15 years old	1	2.5
16 years old	24	58.5
17 years old	16	39
Grade		
Grade X	25	61
Grade XI	16	39
Menstruation Cycle		
Normal	37	90.2
Abnormal	4	9.8
Total	1000	100.00

The table above shows that most respondents are 16 years old, 24 people (58.5%), and come from class X, 25 people (61.0%). Most respondents have a regular menstrual cycle, 37 people (90.2%).

## Iron Supplement Consumption Adherence

Table 2. Frequency distribution of iron supplement consumption adherence before and after group discussion

Iron supplement consumption level	Pretest		Post-test	
	Frequency	Percentage	Frequency	Percentage
High	0	0	2	4.9
Medium	0	0	18	43.9
Low	41	100	21	51.2

Table 2 shows that 41 (100%) respondents had low adherence to taking iron tablets before being given education using the group discussion method. After providing education using the group method, the majority of respondents, 21 (51.2%), had low compliance with taking medication (blood-boosting tablets).

## Hemoglobin Levels

Table 3. Frequency distribution of hemoglobin levels before and after group discussion

Hemoglobin levels	Mean	Median (Min-Max)	Modus
Before	10.651	10.7 (9.8-11.3)	11
After	11.373	11.3 (10.2-12.9)	11.2

Table 3 shows that the average or mean value of the respondent's hemoglobin level data shows a figure of 10,651 mg/dL. The median hemoglobin value before education was 10.7 mg/dL with a minimum value of 9.8 mg/dL, a maximum value of 11.3 mg/dL, and the mode was 11 mg/dL. After providing education with the group discussion method, the mean value of the hemoglobin level data increased to 11.37 mg/dL. At the same time, the median hemoglobin value after education was 11.3 mg/dL, with a minimum value of 10.2 mg/dL and a maximum value of 12.9 mg/dL. With a mode of 11.2 mg/dL.

## The Effect of Providing Education Using Group Discussion Methods on Iron Supplement Consumption Adherence and Hemoglobin Levels

Table 4. Wilcoxon signed-rank test

Variable	P
Providing group method education regarding adherence to taking iron supplement tablets	0.000
Providing group method education regarding hemoglobin levels	0.000

Table 4 shows that based on the results of the Wilcoxon test, a p-value of 0.000 ( $p < 0.05$ ) was obtained, which means that there is a significant influence between providing education using the group discussion method for adolescent girls on compliance with taking iron tablets and hemoglobin levels.

## DISCUSSION

This study's results indicate that 41 (100%) respondents had low compliance in taking iron tablets before being given education using the group discussion method. This study aligns with research conducted by Nurjanah and Azinar (2023), which found that many female adolescents still need to consume iron tablets, according to junior high and high school recommendations. The results are also in line with research conducted by Runiari & Hartati (2020), which stated that the majority of respondents were at a low level of compliance of 87 people (58.4%), and there were no respondents with a high level of compliance in taking iron tablets.

The results of this study also show that the average or mean value of the respondents' hemoglobin levels is 10.65 mg/dL. The middle or median value of hemoglobin levels in the results of this study was 10.7 mg/dL, with a minimum value of 9.8 mg/dL, a maximum value of 11.3 mg/dL, and a mode value of 11 mg/dL. This is in line with research conducted by Dwistika et al. (2023), which stated that the results of the analysis of hemoglobin levels before the intervention showed that the majority of respondents, namely 11 (61.1%) had anemia and 7 (38.9%) did not have anemia with an average Hb level of 11.37 gr / dL. The results also align with research conducted by Nurfiana et al. (2024), which showed that the average hemoglobin level before the assistance of iron tablets was 11,378 mg / dL.

Anemia is a condition in which the number of red blood cells is insufficient to meet the physiological needs of the body, characterized by low levels of hemoglobin (Hb). This can be prevented and overcome by fulfilling iron. Iron tablets are supplements that contain iron. Iron is a mineral needed to form red blood cells (Hemoglobin). Iron is the most abundant micron mineral in the human body. Iron is a component of hemoglobin, myoglobin, cytochrome enzyme catalase, and peroxidase. Iron is the most abundant micron mineral in the human body, 3-5 grams in the adult body. Menstruating adolescent girls experience red blood cell dilution, so they need additional iron to increase the number of red blood cells. Adolescents face increased iron needs due to increased body mass and blood volume, which causes increased iron needs for myoglobin in muscles and hemoglobin in the blood. This continuous iron need needs to be met through iron supplements and choosing foods rich in iron (Hijriyati & Wulandari, 2023; Zalsabilla, et al., 2024).

Compliance is a form of behavior that arises from the interaction between health workers and patients so that patients understand the plan and all its consequences and agree to and implement it. Internal factors, such as level of knowledge, environmental factors at school, and factors of attitude and daily activities, can cause non-compliance in consuming iron tablets (TTD) in adolescent girls (Nurprastiwi, et al., 2024). According to Hijriyati and Wulandari 2023, the factors influencing compliance are age, gender, knowledge, family support, social support, and teacher support. Based on research conducted by Nuradhiani, the determinant of compliance with TTD consumption that has the most dominant influence on adolescent girls is teacher support.

The results of the Wilcoxon test in this study obtained a p-value of 0.000 ( $p < 0.05$ ) in the test of the effect on compliance with taking iron tablets, which means that there is a significant influence between providing education with the group discussion method in adolescent girls on compliance with taking iron tablets and hemoglobin levels in the blood. Of respondents who had low compliance with taking iron tablets before education was given, the majority were still in the low category, with as many as 21 (51.2%) respondents. Then, 2 (4.9%) respondents changed to the high category, and the remaining 18 (43.9%) changed to the medium category. Meanwhile, the difference in hemoglobin levels before and after education was given was -0.722 mg/dL, which showed an increase from before education to after education. The results of the study after the group discussion method education was carried out showed that 21 (51.2%) experienced low compliance; this was because

compliance in consuming iron tablets was influenced by several factors, both internally and externally. Factors that influence include age, gender, knowledge, family support, social support, and peer support or teacher support at school. Research conducted by Sitindaon et al. (2024) stated that there is a relationship between knowledge, parental support, teacher support, and peer support. Based on the observations, researchers found that there were still respondents who were not compliant with consuming iron tablets even after providing education that family support factors could influence. In this case, adolescent girls lack support from important people, personally and in groups, in comfort, attention, affection, gratitude, or help. This could be due to parents' need for knowledge and awareness regarding the importance of consuming iron tablets for their daughters. The level of compliance in taking iron tablets (TTD) after being given the group discussion method showed an optimal increase; this could happen because a comprehensive understanding arose from following the group discussion carefully.

There was an increase in understanding and also attitudes or behavior in compliance with taking medication in adolescent girls. This is in line with research conducted by Suryani (2020), where the results of the group discussion method showed an increasing difference in the sense of interest related to the goals, benefits, and dangerous impacts of not consuming iron tablets (TTD). This is the same as the research conducted, with the topic related to the negative impacts, namely the incidence of anemia. Research conducted by Purnamasari G. et al. at the Bogor Tengah Health Center in 2016 showed a high level of compliance in consuming iron tablets, namely 50.9%, affecting the incidence of anemia. Anemia that occurs in adolescent girls of puberty is susceptible to occur with their reproductive health status, which requires attention to the menarche process or menstrual cycle in adolescent girls, so it is necessary to consume iron or iron supplement tablets regularly. Anemia in adolescents can be overcome by prevention, namely by consuming iron tablets and increasing the consumption of foods rich in protein and carbohydrates; the nutritional aspect of adolescent girls during the menstrual cycle process is an essential aspect besides just consuming iron tablets. Other things that are done to promote health are related to compliance with the consumption of iron tablets (TTD) (Theresia et al., 2024).

Based on this, the researcher assumes that the level of compliance in taking iron tablets in female adolescents at SMAN 1 Senduro shows active participation and changes from before and after the intervention in the form of a group discussion method to increase the number of drug compliance and an increase in hemoglobin levels in female adolescents. The researcher found that respondents still experienced anemia after the group discussion was carried out due to a lack of iron requirements because, in the adolescent phase, there is an increase in iron requirements due to accelerated growth, which causes an increase in body mass where female adolescents experience menstruation and lack of consuming inappropriate foods such as lack of vitamins and protein in the body.

## CONCLUSION

The results of this study are expected to add information and knowledge related to the benefits of consuming iron tablets regularly for health, especially for women. The group discussion method is expected to be developed to increase compliance in consuming iron tablets, especially for young women, to prevent anemia.



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## CONFLICT OF INTEREST

The limitation of this study is the limited sample of female students with anemia. Researchers cannot control whether respondents take medication or not. Researchers cannot control respondents who do not want to take medication because of side effects such as nausea, lousy odor, and constipation.

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