



**RELATIONSHIP BETWEEN KNOWLEDGE AND COMPLIANCE OF IRON
TABLET CONSUMPTION DURING MENSTRUAL CYCLE AMONG NURSING
STUDENTS**

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ABSTRACT

Adolescence in girls is marked by increased iron requirements due to the development of sexual organs and menstruation, making them more susceptible to anemia. Increasing compliance with taking iron tablets is very important to reduce the risk of anemia and maintain the health of adolescent girls. The purpose of this study was to determine the relationship between knowledge and compliance with taking iron tablets during the menstrual cycle. The method used was quantitative observational analytical research with a cross-sectional approach, at the Muhammadiyah University of Surakarta in July 2024. The sampling technique was total sampling, namely 145 nursing students from the Muhammadiyah University of Surakarta class of 2023. Data collection was carried out using a demographic data questionnaire, knowledge of iron supplements and compliance with taking medication (MMAS-8). Univariate data analysis and bivariate statistical tests used Spearman rank. The results of data processing showed that the level of knowledge of the respondents was mostly in the moderate category with a percentage of 50.3% (73 respondents). The level of compliance was in the low category with a percentage of 66.2% (96 respondents). Based on the analysis using Spearman rank, a significance value of 0.001 was obtained, which means that there is a relationship between the level of knowledge about iron tablets and compliance in taking iron tablets during menstruation in female students, while the correlation coefficient is 0.282, which means that there is a significant relationship between the level of knowledge about iron tablets and compliance in taking iron tablets during menstruation in female students.

Keywords: compliance; female students; iron supplement; knowledge; menstruation

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INTRODUCTION

Adolescence is a transitional period full of changes, both physical and psychological, which brings its own challenges in adjustment. In adolescent girls, these changes include the development of sexual organs and menstruation, which increases the body's need for iron (H.M and Ngalimun, 2019). Teenage girls who experience long menstruation will lose more iron. The longer menstruation lasts, the more blood is lost, so that the iron reserves in the body are reduced. Normally, the amount of menstrual blood ranges from 25 to 60 ml. Therefore, women who lose more than 60 ml of menstrual blood will experience a decrease in iron and hemoglobin levels in the body (Sepduwiana and Sianipar, 2018)

As a result, adolescent girls are more susceptible to iron deficiency, which can lead to anemia. Anemia is a health problem where there is a decrease in the number of erythrocytes and hemoglobin, resulting in impaired oxygen distribution throughout the body. It is a serious global health problem, especially among adolescent girls (Azizah and Sulastris, 2023). Severe anemia is characterized by a hemoglobin (Hb) count below 7 g/dl, in the moderate category it is characterized by a Hb count between 7 and 9.9 g/dl. Mild anemia occurs when hemoglobin

levels range from 10.0 to 10.9 g/dl. Anemia is a significant global health problem (Sulastri, K and Nugraha, 2022).

Globally, anemia affects approximately 25-50% of the population, including 40% of children under five (6-59 months), 37% of pregnant women, and 30% of women (15-49 years). Data from 2019 states that the anemia rate in women of childbearing age reached 29.9%, with higher rates in pregnant women. In Indonesia, the anemia rate in adolescent girls is in the range of 32.4-61%, indicating a significant problem in this age group (Apriningsih et al., 2020). The facts of Riskesdas 2018 also point to the level of anemia occurring in the age range of 5-14 years and 15-24 years higher than other age groups (Kementrian Kesehatan Republik Indonesia, 2019). To address the problem of anemia, the Indonesian government launched a blood supplement tablet distribution program based on the Indonesian Ministry of Health Regulation No. 88 of 2014. The program is focused on adolescent girls and pregnant women with the aim of increasing their iron intake (Nurjanah and Azinar, 2023). Research data revealed variations in Fe tablet consumption compliance. Of the Fe tablet acceptance among adolescent girls with a percentage of 76.2%, 1.4% took more than 52 tablets per year, while 98.6% reported consuming less than the recommended amount (Kementrian Kesehatan Republik Indonesia, 2018).

Referring to data from the Central Java Provincial Health Office in December 2018, out of a total of 1,643,694 adolescents, only 929,007 received Fe tablets (56.52%). Meanwhile, July 2019 showed that out of 481,609 adolescent girls, only 226,967 received and took Fe tablets (47.13%). However, it is not known whether they only took them once during counseling or regularly every week (Dinas Kesehatan Provinsi Jawa Tengah, 2019). This problem is often caused by negative perceptions of Fe tablets, including its effects such as nausea, dizziness and headaches. This low compliance suggests the need for new strategies to improve the effectiveness of the TTD program (Widiastuti and Rusmini, 2019). A study conducted at SMA Negeri 1 Sewon, Bantul, showed that female students with a good level of knowledge related to anemia amounted to 13, sufficient category amounted to 25, and poor category amounted to 11. The level of compliance of female students in taking Fe tablets includes 47 students who are not compliant and 2 students who are compliant (Safitri and Ratnawati, 2022). Another study conducted at Dwijendra Junior High School in Denpasar showed that the majority of students with good knowledge of anemia showed low compliance in taking Fe tablets (Adnyana, Armini and Suarniti, 2021).

A person's compliance in taking medication is influenced by the level of knowledge they have, because this knowledge can affect an individual's attitude towards discipline in taking Fe tablets. Therefore, a better understanding of the relationship between knowledge and adherence to Fe tablet consumption is essential to improve the success of this health program (Ningtyas, Ulfiana and Ngadiyono, 2021). Based on the data above, which is not known for sure related to how young women consume iron tablets, between once during counseling or taking it routinely once a week. So the author is interested in conducting research related to "The Relationship between Knowledge and Compliance with Iron Tablet Consumption in Female Students in the Nursing Study Program, Muhammadiyah University of Surakarta". The purpose of this study is to analyze the relationship between knowledge and compliance with iron tablet consumption during the menstrual cycle in female nursing students at Muhammadiyah University of Surakarta.

METHOD

This The study applied quantitative observational analytic methods and used a cross-sectional approach to nursing students at Universitas Muhammadiyah Surakarta in July 2024. The method of taking samples was total sampling which involved 145 respondents. The independent variable is the knowledge of students related to blood supplement tablets and the dependent variable is compliance with taking blood supplement tablets. The inclusion criteria applied were students of the nursing study program class of 2023 at Universitas Muhammadiyah Surakarta, and were willing to participate in this study, with exclusion criteria being students who had a history of hypersensitivity to blood-added tablets and a history of digestive disorders or absorption of nutrients and were not willing to do research. In this study, researchers used a questionnaire as an instrument. The questionnaire regarding knowledge of Fe tablets consisted of 19 questions with a validity test result of $r > 0.361$ and a reliability result of 0.725 (< 0.60), where respondents answered correctly worth 1 and incorrectly worth 0. The results were categorized as good (76%-100%), sufficient (56%-75%), and deficient (0%-55%). The questionnaire to explore the level of adherence of female college students in taking tablets used the MMAS-8 (Modified Morisky Adherence Scale-8) which included 8 questions, of which offered a choice of “yes” or “no”. The results were categorized into high adherence level “8”, medium “6-7”, and low “0-5”.

Data analysis was performed with statistical tests, where the univariate analysis test describes the characteristics of respondents and bivariate analysis, the data were processed with IBM SPSS 23 software for windows using Spearman's rank to measure the strength and direction of the relationship between knowledge related to compliance during taking blood supplement tablets. This research has been approved by the Research Ethics Commission of Universitas Muhammadiyah Surakarta with ethics permit number 1524/A.3-III/FIK/2024.

RESULT

Table 1.
Distribution of Respondents n=145

Variables	f	%
Age (Mean±SD)(Range)(Years)	(19.04±0.655)(18-22)	
18	23	15.9
19	97	66.9
20	22	15.2
21	2	1.4
22	1	0.7
Source of Information (n/%)		
Brochure	22/	15.2
Internet	64	44.1
Family	4	2.8
Television	4	2.8
Health worker	51	35.2
Knowledge Level		
Good	70	48.3
Fair	73	50.3
Less	2	1.4
Compliance Level		
Low	96	66.2
Medium	47	32.4
High	2	1.4

Based on Table 1. the data obtained shows a mean of 19.04 and a standard deviation of 0.655 with an age range of 18-22. A total of 44.1% of respondents relied on the internet as the main source of information, indicating the ease and accessibility of online which is now the main

choice. However, 35.2% still get information from health workers, brochures (15.2%), family, and television (2.8% each). Of the 145 respondents, the majority had a moderate level of knowledge 73 (50.3%), and had low and moderate adherence 96 (66.2%) and 47 (32.4%) respectively.

Table 2.
Normality Test Results

Variable	Kolmogorov-Sminorov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Knowledge	.343	70	0.000	.701	70	0.000
Compliance	.481	73	0.000	.510	73	0.000

Based on Table 2. The normality test using Kolmogorov-Sminorov on the knowledge and compliance variables shows a p-value of 0.000 (<0.05) for both, meaning that the variables are unevenly distributed, so the data is then processed using Spearman's rank.

Table 3.
Relationship between Knowledge and Compliance in Consuming Iron Supplement Tablets (n=145)

Variable	Compliance			Sig. (2-Tailed)	Correlation Coefficient
	High (n=2)	Medium (n=47)	Low (n=96)		
Knowledge (n/%)					
Good	2/1.4%	31/21.4%	37/25.5%	0.001	0.282
Fair	0/0.0%	16/11.0%	57/39.3%		
Less	0/0.0%	0/0.0%	2/1.4%		

Based on the table shows that respondents who have good knowledge have no effect on compliance, seen from the results of only 2 respondents (1.4%) with high compliance. Respondents with good knowledge had moderate compliance 31 (21.4%), and low compliance 37 (25.5%). While as many as 16 (11.0%) were moderately knowledgeable with a moderate level of compliance, respondents with sufficient knowledge and lack of knowledge were in the low category as many as 57 (39.3%) and 2 (1.4%), respectively. Although the correlation number shows significance (0.001), the correlation coefficient value is only 0.282, indicating that the relationship between the two variables is weak.

DISCUSSION

Research shows that age affects knowledge and awareness about supplement use. With age, a person's understanding and way of thinking develops, increasing health knowledge and awareness. Age also influences preferences and interests in products, and changes behavior in supplement use (Kołodziej et al., 2019). The age group of 19 years was the largest, with 97 female students (66.9%), indicating that the majority of respondents are at an age where they are just starting higher education, this distribution illustrates that most female students can influence the way they acquire and process information. The results showed that 44.1% of respondents relied on the internet as their main source of information, indicating that online convenience and accessibility is now the main choice. The internet has become a frequently accessed platform, practical in obtaining any explanation including educational materials. The existence of this network has had a beneficial impact. It does not take long to search for information on the network, as searching for data from various sources in a short period of time is very convenient for the public in general. (Tobing, 2019).

Based on the data obtained, out of 145 female students, 73 female students (50.3%) had a sufficient level of knowledge, while 70 female students (48.3%) were at a good level. Only 2

female students (1.4%) had poor knowledge. This is in line with research on Cenderawasih University students as many as 119 people, the majority have a sufficient level of knowledge (21.1%), higher than those with poor knowledge (7.4%) (Pamangin, 2023). In addition, the results of research on adolescent girls at the Al-Fatah Natar boarding school in South Lampung in 2023 with a sample size of 196, the majority of respondents' knowledge about blood supplement tablets, 54.6%, was categorized as good and 45.4% had poor knowledge (Mutmainnah, Zuraida and Suharmanto, 2023).

Although the knowledge of respondents was generally adequate, the majority of respondents (66.2%) in the study showed a lack of discipline in adhering to the consumption of blood supplement tablets, moderate adherence was recorded at 32.4%, and only 1.4% of respondents showed high adherence. This data suggests that adherence does not always improve despite good knowledge. The lowest adherence statement was related to forgetting to take blood supplement tablets, with 95.2% of respondents answering "Yes". Simply put, forgetting is the inability to remember information that has already been acquired. The more often a person forgets to take medication, the lower the level of adherence in their therapy (Cahyati, 2021). Factors affecting respondents with good knowledge but not adherent in taking medication are negligence in taking medication and stopping treatment without doctor's permission. This statement is evidenced by the percentage of adherence questionnaire answers that show respondents answered "yes" (non-compliant) to the question whether they ever forgot to take medicine (Longa, Nurwidi Antara and Sumekar, 2023). Lack of adherence will hamper efforts to prevent and treat anemia effectively.

Statistical tests using Spearman's rank show the level of significance of the relationship between the two variables displaying a p-value of 0.001 (<0.05), so there is a significant relationship between respondents' knowledge about blood supplement tablets and their compliance in consuming them. Previous research conducted on SMA Negeri 1 Karangasem students also showed a relationship between knowledge related to anemia and compliance with taking Fe tablets with a result of 0.000 ($p < 0.05$) (Wahyuningsih and Qoyyimah, 2019). On the other hand, research on students of SMPN 01 Brondong Lamongan showed inconsistent results, where bivariate analysis using the chi-square test found no significant relationship between knowledge and adherence to taking Fe tablets. However, there is a significant relationship between family support and adherence to taking Fe tablets in female students of SMPN 01 Brondong Lamongan. (Ningtyas, Ulfiana and Ngadiyono, 2021). The closeness of the relationship between the two variables in this study, measured by the Spearman's rank correlation coefficient, was 0.282. which is in the range of 0.20-0.399, which indicates a weak relationship category. Adherence in taking iron tablets in addition to knowledge, also depends on two other aspects, namely health workers and personal aspects, such as self-awareness in taking iron supplements. Individuals with positive attitudes are more likely to be disciplined compared to those with negative attitudes. Support from the medical care team is also important in improving adherence, especially through effective interactions. This study is in line with the statement that health workers are the first to understand the patient's health problems, so they play an important role in providing information related to the patient's health and the steps that need to be taken in the recovery stage. This way of communicating can be applied by conducting health education or counseling sessions. (Permatasari, Mita and Herman, 2020).

CONCLUSION

The results of this study accept the alternative hypothesis (H_a), that there is a relationship between knowledge of blood supplement tablets and compliance in taking them, although the

correlation is weak. This suggests that while increasing knowledge about the importance of blood supplement tablets is important, it is not sufficient. Educational programs need to be supported by other interventions such as regular reminders, support from health workers, or campaigns that emphasize the direct benefits of taking blood tablets. Further research is expected to explore other factors that influence the relationship between knowledge and adherence to taking blood tablets, and consider different analytical methods to gain deeper insights.

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