DETERMINANT FACTORS ASSOCIATED WITH ANEMIA PREVENTION BEHAVIORS AMONG ADOLESCENT GIRLS

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Abstract

Anemia, characterized by reduced erythrocyte mass and inadequate oxygen supply, has a significant prevalence among adolescents, particularly girls, due to menstruation and poor dietary iron intake. This study aimed to determine the relationship between knowledge, attitudes, and adherence to consuming iron supplements (Fe) and anemia prevention behaviors among 86 adolescents at SMA Negeri 1 Kramatwatu. Data were collected using questionnaires adapted from previous research and analyzed using the Chi-Square test, with anemia prevention behavior as the dependent variable. Findings indicated that 84.88% of respondents had good knowledge, 37.20% had a positive attitude, and 48.83% adhered to Fe supplementation. The Chi-Square test showed no significant relationship between knowledge and anemia prevention behavior ($p = 0.743$, > 0.05). However, significant relationships were observed between attitude ($p = 0.037$, < 0.05), adherence to Fe supplementation ($p = 0.016$, < 0.05), and anemia prevention behavior. These results suggest that while knowledge alone may not influence prevention behavior, positive attitudes and adherence to Fe supplementation are crucial. This study provides foundational data for future research to explore additional variables and larger samples.

Keywords: Anemia, Adolescents, Behaviour, Prevention.

INTRODUCTION

Anemia is characterized by a reduction in erythrocyte mass, leading to an inadequate supply of oxygen to peripheral tissues. Clinically, anemia is often measured by a decrease in hemoglobin levels, hematocrit, or red blood cell count, with hemoglobin testing being the most prevalent method (1). It manifests as a condition where red blood cells or hemoglobin in the red blood cells are below normal levels, hampering oxygen transport from the lungs to other body parts (1). Normal hemoglobin levels range between 12-16%, and any disruption in the formation of red blood cells, either in quantity or size, can cause anemia (2). Hemoglobin, formed from a combination of protein and iron, is crucial for producing red blood cells essential for human body functions, and inadequate hemoglobin can negatively impact health (3).

The World Health Organization (WHO) stated that global anemia prevalence ranges from 40-88%, with Southeast Asia experiencing 25-45% prevalence of mild to severe anemia among adolescent girls (3). Data from the 2013 Riskesdas survey revealed an anemia prevalence of 21.7% in Indonesia, with notable prevalence rates among children aged 5-12 years (26.4%) and young adults aged 15-24 years (18.4%). The 2012 Household Health Survey (SKRT) highlighted that around 40.5% of toddlers, 50.5% of pregnant women, 45.1% of postpartum mothers, and 57.1% of adolescent girls aged 10-18 suffer from anemia, with adolescent girls being at the highest risk.

The 2018 survey by the Serang City Health Office found that 92% of adolescent girls in Serang experienced anemia, with only 98 out of 1,280 sampled students being free from anemia (Dinkes Kota Serang). In response, the Health Office provides iron tablets to female students regularly, encouraging them to consume 52 tablets yearly or one tablet weekly. Anemia prevention behaviors among adolescent girls are influenced by various factors as highlighted in the literature. Studies emphasize the importance of interventions such as prevention and early treatment of intestinal parasites, nutritional education, screening, and iron supplementation programs to combat anemia (4).Providing additional nutrition through iron supplements or multivitamins, often implemented via school socialization, is also crucial in preventing anemia among adolescent girls (5). Increasing knowledge about anemia through counseling can significantly improve attitudes towards anemia prevention (6). Web-based education has been shown to enhance knowledge and preventive behaviors related to iron deficiency anemia among adolescent girls (7).

Moreover, addressing factors like non-consumption of protein and high-calorie foods, lower socioeconomic status, and the presence of intestinal worms are key in combating anemia among adolescent girls (8). Lifestyle and faulty food habits have been associated with both obesity and anemia in this demographic (9). Additionally, factors such as low socioeconomic class, dietary diversity, parasitic infestations, and menstrual abnormalities contribute to anemia among adolescent girls (10). Furthermore, the prevalence of anemia among adolescent girls can be reduced through health and nutrition education, information dissemination, and appropriate behavioral change communication activities (11). Female adolescents are particularly susceptible to anemia due to menstruation, which results in significant blood loss. This poses risks during future pregnancies, affecting fetal growth and development, and can lead to complications during pregnancy and childbirth, potentially resulting in maternal and infant mortality (3). The high nutritional requirements during adolescence, combined with frequent menstruation and inadequate dietary iron intake, further exacerbate the risk of anemia(12). Other contributing factors include insufficient preventive behaviors, such as poor knowledge about anemia, ineffective dietary habits, and irregular compliance with iron supplementation. The lack of sufficient dietary iron plays a crucial role in hemoglobin production (13).

Anemia affects female adolescents by diminishing immune response, reducing physical fitness, and decreasing productivity in learning(12). Additionally, anemia can lead to decreased academic performance and enthusiasm, with symptoms such as pallor, fatigue, decreased appetite, and growth disturbances(13). Preliminary studies conducted by interviewing 10 students at SMA Negeri 1 Kramatwatu revealed that 6 out of 10 students did not regularly consume iron tablets, often forgetting to do so. Most of them were also unaware of anemia, its causes, effects, and prevention methods. This indicates a significant gap in knowledge and awareness about anemia among adolescents, highlighting the need for effective educational and preventive measures. This study aims to explore the prevalence and impact of anemia among adolescent girls in Indonesia, focusing on identifying the main contributing factors and evaluating the effectiveness of current preventive measures. The chosen age range of 10-18 years is justified by the critical developmental phase and high susceptibility to anemia due to factors such as menstruation and nutritional needs.

RESEARCH METHODS

We conducted a correlational analytic research study with a cross-sectional design. The study population consisted of all adolescent girls at SMA Negeri 1 Kramatwatu, totaling 322 students. For this research, 86 respondents were selected using proportional random sampling to ensure the representativeness of the sample. The study was conducted from March to June 2023. Participants included adolescent girls aged between 12 and 18 years old who were enrolled at SMA Negeri 1 Kramatwatu. Enrollment was verified through school records. Inclusion criteria were regular attendance and consent to participate, while exclusion criteria included any ongoing illness that could affect responses. The context of the study is an urban school setting within Kramatwatu. The measurement tools used were structured questionnaires, which included the following: knowledge about anemia with 10 questions assessing understanding of anemia causes and effects; dietary habits with 12 questions on nutritional intake and meal frequency; adherence to iron supplementation (Fe tablets) with 2 questions on the regularity of consuming iron tablets; and anemia prevention behaviors with 6 questions on actions taken to prevent anemia. These questionnaires were developed based on validated models from previous studies, ensuring both reliability and validity. Data collection was conducted by trained researchers who administered the questionnaires during school hours. The collected data were analyzed using SPSS (Statistical Program for Social Science) software. Analysis procedures included univariate analysis with frequency distribution tables to describe the data. Bivariate analysis was performed using the chi-square test with a significance level set at <0.05 to identify relationships between variables. Students were briefed on the study's purpose and procedures before participation. Consent forms were obtained from students and their guardians. Questionnaires were distributed and completed during a scheduled session within the school premises. The study was conducted following ethical guidelines, with an Approval number of: 348/KEPK.UF/VI/2023, granted by Universitas Faletehan. All participants were assured of their confidentiality and anonymity. Data were coded to ensure privacy, and only aggregated data were reported.

RESULTS AND DISCUSSION

Tables 1 and 2 display the study results using univariate and bivariate analyses.

Table 1: Distribution of Frequency in Anemia Prevention Behavior, Knowledge, Attitude, and Compliance in Taking Iron Supplements (n=86)

Variable	N	%
Anemia Prevention Behavior		
Good	66	76,74
Bad	20	23,26
Knowledge		
Good	73	84,88
Bad	13	15,12
Attitude		
Good	32	37,20
Bad	54	62,80
Fe Consumption Adherence		
Good	42	48,83
Bad	44	51,17
Total	86	100

Table 2: The Relationship Between Knowledge, Attitude, and Compliance in Iron Supplements (Fe) Consumption among Adolescent Girls and Anemia Prevention Behaviors at SMA Negeri 1 Kramatwatu, Serang Regency (n = 86)

Variable	Anemia Prevention				Total		P- value	OR
	Yes		No					
	f	*%*	*f*	*%*	*f*	*%*		
Knowledge								
Good	57	86,36	9	13,64	66	100	*0,734*	1,583
Bad	16	80	4	20	20	100		
Total	73	84,88	13	15,12	86	100		
Attitude								
Good	29	43,93	37	56,07	66	100	*0,037*	4,441
Bad	3	15	17	75	20	100		
Total	32	37,20	54	62,80	86	100		
Fe Consumption								
Good	27	40,90	39	59,10	66	100	*0.016*	0,231
Bad	15	75	5	15	20	100		
	42	48,83	44	51,71	86	100		

According to Table 1, of the 86 respondents, the majority (76.74%) exhibited good anemia prevention behavior. Most respondents (84.88%) had good knowledge about anemia prevention behavior. However, a significant proportion (62.80%) had poor attitudes toward anemia prevention behavior, and more than half (51.17%) displayed poor compliance in taking iron supplements. The Relationship between Attitudes of Adolescent Girls and Anemia Prevention Behaviors at SMA Negeri 1 Kramatwatu, Serang Regency.The study examined the relationship between the attitudes of adolescent girls and their anemia prevention behaviors at SMA Negeri 1 Kramatwatu, Kab. Serang. The Chi-Square test revealed a significant relationship, with a p-value of 0.037 (p < 0.05). The odds ratio (OR) was calculated at 4.441, indicating that girls with negative attitudes towards anemia prevention are 4.44 times more likely not to engage in preventive behaviors compared to those with positive attitudes.

Lestari (2019) noted that adolescent girls with positive attitudes are more proactive in preventing iron deficiency anemia (14). (15) explains that while attitude is not a direct action, it is a predisposition to behave in certain ways. Attitude formation is closely linked to knowledge and begins through a gradual learning process. Changes in attitudes are influenced by stimuli or communication, which generate positive responses (15). The results are consistent with findings by (16), who reported a significant connection between attitude and anemia occurrence, with a p-value of 0.001 (p < 0.05) (16). Similarly,(17) and (18) found that attitudes significantly impact adolescent girls' anemia status. These studies underline that positive attitudes towards health behaviors, such as consuming iron tablets and maintaining a balanced diet, correlate with effective anemia prevention. Hence, promoting positive attitudes could enhance anemia prevention behaviors among adolescent girls, thereby reducing the incidence of anemia. The Relationship Between Compliance in Taking Iron Supplements (Fe) Among Adolescent Girls and Anemia Prevention Behaviors.Results of the Chi-Square test produced a p-value of 0.016 (which is less than 0.05), suggesting a significant relationship between adolescent girls' adherence to taking iron supplements (Fe) and their behaviors in preventing anemia. The analysis also provided an odds ratio (OR) of 0.231, meaning that adolescent girls who are not compliant in taking iron supplements are 0.231 times more likely to not engage in

anemia prevention behaviors compared to those who are compliant. Adolescent girls are required to consume iron supplements, known as Tablet Tambah Darah, due to their monthly menstruation. These supplements help replace the iron lost during menstruation and fulfill the iron needs not met through diet. Iron supplements are also beneficial for increasing concentration levels, maintaining fitness, and preventing anemia in future mothers (19). This finding aligns with research by (13), where the Chi-Square test with α = 0.05 yielded a p-value of 0.01, indicating a significant relationship between compliance in consuming iron supplements and the incidence of anemia among female teenagers in Mumbulsari, Jember Regency in 2021. Compliance refers to a behavioral change from previously non-compliant behavior. The issue of compliance is a matter of daily iron supplementation and compliance monitoring by healthcare practitioners (13). According to (19), iron supplements have a relationship with the incidence of anemia among female teenagers (19). Similarly, research by (20) found that a bivariate analysis between compliance with iron supplementation and incidences of anemia showed a direct relationship between two variables. This means that the more compliant adolescent girls are in consuming iron supplements, the higher their hemoglobin levels will be, which helps prevent anemia (20). There are some limitations of the study, including reliance on self-reported data which may introduce response bias, the cross-sectional design that limits causal inference, and the specificity to one school which limits generalizability. Future research could explore longitudinal designs to establish causality, expand the study to multiple schools or regions to enhance generalizability, and investigate additional factors that may influence anemia prevention behaviors among adolescent girls.

CONCLUSION

Based on the research findings, the majority of respondents (76.74%) exhibit good anemia prevention behaviors, and most respondents (84.88%) possess good knowledge regarding anemia prevention. However, a notable portion of respondents (62.80%) display poor attitudes towards anemia prevention, and a majority (51.17%) demonstrate poor compliance in taking iron supplements for anemia prevention. No significant correlation between knowledge and anemia prevention behaviors among the female students at SMA Negeri 1 Kramatwatu was found in this study. However, significant relationships were observed between attitudes and anemia prevention behaviors and between compliance in taking iron supplements and anemia prevention behaviors. To address these issues, it is recommended that SMA Negeri 1 Kramatwatu routinely conducts educational activities about anemia for female students. These activities can help students play a more active role in anemia prevention, thereby reducing its incidence. Suggested activities include counseling sessions about anemia, coordination with local health centers for the regular provision of iron tablets (Tablet Tambah Darah or TTD), and school support to ensure students comply with taking these iron supplements. These measures are vital as they help replace iron lost during menstruation, fulfill dietary iron requirements, and provide numerous benefits such as improving concentration, maintaining fitness, and preventing anemia, particularly for future mothers. Ensuring compliance through direct monitoring by healthcare practitioners is also crucial to enhance the effectiveness of these preventive measures. This conclusion highlights the importance of educational initiatives and practical support in fostering better health behaviors among adolescent girls to prevent anemia.

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