Association Between Menstrual Pattern and Incidence of Anemia among Adolescent

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Abstract

Objective: The purpose of this study was to examine the association between menstrual patterns and the prevalence of anemia among adolescents.

Method: A quantitative research design using a cross-sectional study approach was employed. Data collection involved 120 parents of children aged 9–12, selected through convenience sampling. Five questionnaires were utilized: a demographic questionnaire, knowledge assessment (KAPPAS study), attitudes and beliefs (based on the Health Belief Model and Social Cognition Theory), social media influence, and parent acceptance (KAPPAS study). Statistical analyses included bivariate testing and multivariate analysis to identify significant factors influencing parent acceptance.

Results: The study employed a descriptive correlational design within a cross-sectional framework. A total of 130 adolescents, selected through total sampling, participated. Inclusion criteria required that participants had experienced at least six menstrual cycles. Data were analyzed using frequency distribution and chi-square tests to determine the relationship between menstrual characteristics and anemia status. The findings indicated a notable association between irregular menstrual cycles and higher rates of anemia among the participants.

Conclusion: The results underscore the importance of implementing targeted health education initiatives in school settings, emphasizing menstrual health awareness and nutritional guidance. Early education may play a critical role in preventing anemia and promoting well-being among adolescents, particularly those experiencing menstrual irregularities.

Keywords: Anemia, Menstrual Duration, Menstrual Cycle

INTRODUCTION

Menstruation or period occurs when blood appears in the uterus and flows into the vagina. vagina. Normally, women experience menstruation every month (Saliantoet al., 2022). Bleeding that occurs during menstruation can cause anemia in adolescent girls (Farinendyaetal., 2 019). Anemia is a condition where hemoglobin levels are low, namely below the normal value. normal limits (< 12gr/dL) in women, which can be recognized through a number of symptoms such as weakness, dizziness, blurred vision, and pale facial skin (Azis et al., 2018). Hemoglobin is needed for the function of transporting oxygen, and if the amount red blood cells are reduced or there is an abnormality in hemoglobin, then the blood capacity to deliver oxygen to body tissues can decrease (WHO, 2021). Therefore, Anemia

can reduce the body's immunity and increase its susceptibility to disease (Martiasariet al., 2022).

The risk level of experiencing anemia in adolescent girls is 10 times higher than young men. This factor is caused by the monthly menstruation experienced by adolescent girls and their growth period which requires adequateiron intake. higher (Kulsum, 2020). Based on the 2013 Riskesdas data, 18.4% of teenagers aged 15 to 24 years in Indonesia is experiencing anemia. However, in 2018 the prevalence increased to 48.9%. Riskesdas 2018 also noted that the prevalence of anemia in adolescents aged 15- 24 years in West Java around 32%. The head of the health service stated that the coverage of adolescent girls Thosewho received iron supplements in West Java in 2021 were only 25.2% and still below the West Java target, which is 52%.

METHODS

Study Design

The study was descriptive correlation with a cross-sectional design to examine the relationship between menstrual pattern and the incidence of anemia among adolescent girls.

Population and Sample

This research was conducted at Senior High School in Bandung City, West Java, Indonesia (SMAN Pasundan 1 Bandung) in January 2024. The population were female students grade X and XI at SMAN Pasundan 1 Bandung. The sample technique was total sampling with inclusion criteria were female student who have experienced menstruation after 6 cycles. The exclusion criteria in were female students who had suffered from leukemia, kidney disease, or malaria. The sample consisted of 130 students.

Instruments

A questionnaire to measure menstrual patterns includes a set of structured questions designed to gather information about various aspects of the menstrual cycle. These aspects included:

Cycle Regularity: How regular are your menstrual cycles (regular, irregular)?

Cycle Length/duration: What is the average length of your menstrual cycle based on the pattern before (Normal, Abnormal). And to measure the incidence of anemia, a blood test was conducted to measure hemoglobin (Hb) levels using devices hemoglobinometer. Anemia was defined based on hemoglobin levels for adolescent girls (12–15 years) when the Hb < 12.0 g/dL.

Data Collection

The researcher visits each class to explain the purpose and objectives of the study to the participants. Afterward, the researcher distributes the pre-prepared questionnaire to student who were willing to participated in this study. Additionally, the researcher collected blood samples to measure hemoglobin levels of the respondents.

Data Analysis

The data analysis was used frequency distribution and for bivariate analysis using Chi-square test.

RESULTS

Table 1. Prevalence of Menstrual Pattern and Incident of Anemia (N=130)

Variable	Frequency	Percentage (%)
Menstrual Cycle		
irregular	49	37.7
Regular	81	62.3
Menstrual Duration		
Abnorm	54	41.5

al		
Normal	76	58.5
Incidence of Anemia		
Yes	61	46.9
No	69	53.1

Table 1 showed that more than half of the respondents had regular menstrual cycle (62.3 %), and the duration was normal (58 %). Almost half of the total of respondent had anemia (46.9 %)

Table 2. Relationship between Menstrual Pattern and Incident of Anemia (N=130)

Variable	Incident Anemia		P-value
	Yes F (%)	No F (%)	
Menstrual Cycle			
Abnormal	31 (23.8 %)	18 (13.8 %)	0.006
Normal	30 (23.1 %)	51 (39.2 %)	
Menstrual Duration			
Abnormal	33 (25.4 %)	21 (16.2 %)	0.011
Normal	28 (21.5 %)	48 (36.9 %)	

Table 2 shows that 23.1% of adolescents with normal menstrual cycles had anemia, while 13.8% of adolescents with abnormal menstrual cycles did not have anemia. Nearly a quarter of the total respondents reported having a normal menstrual duration but diagnosed with anemia (21.5%). Chi-square test showed there were relationship between menstrual pattern and incidence of anemia among adolescents with P-value 0.00 (P-value ≤ 0.05)

DISCUSSION

The results showed that majority of the respondent had regular menstrual cycle and normal duration of the menstruation**.** The length of the menstrual cycle is the distance between the start date of your last period and the start date of your next period (Wiknjosastro, 2009). Normal menstrual patterns are cycles that last for 21-35 days. The menstrual cycle can be called normal if a woman's menstrual interval is relatively constant. every month, even if it is wrong, the time difference is not much different (Maedyet al., 2022). The majority of respondents have a menstrual cycle of between 21-35 days However, some respondents had menstrual cycles of less than 21 days. Menstrual duration refers to the period between thefirst day of menstruation until the cessation of menstrual bleeding. Duration. Menstruation is considered normal if it lasts for 3-7days (Prawirohardjo, 2014). There are some who 1-2 daysand followed by a lot of blood but there are up to 8 daysand followed by a little blood little (Qomariah, 2006).The duration of risky menstruation is the time when menstruation occurs. In theory, this risky menstrualperiod can be caused by activity factors. excessive and stress factors (Ansari, 2020). In the results of the research that has been carried out, Researchers believethat the average length of menstruation thatrespondents have is a cycle menstruation between 8-12 days although some respondents have normal menstrual periods ranges from 3-7 days.

The results of this study indicate that 46.9**%** of the adolescent respondents from senior high school were diagnosed with anemia. This prevalence is notably high, reflecting a significant public health concern, especially in adolescents, who are in a critical phase of growth and development. Adolescence is a time when nutritional deficiencies, particularly iron deficiency, can have long-term effects on physical and cognitive health. According to the World Health Organization (WHO), anemia is a common condition among adolescent girls globally, with iron

deficiency being the leading cause (WHO, 2015). A study by Kementerian Kesehatan Republik Indonesia (2018) reported that the prevalence of anemia among adolescent girls in Indonesia reached 48.5%, which is comparable to our findings. The high incidence of anemia in adolescents can be attributed to several factors. One of the primary reasons is inadequate dietary intake of iron-rich foods, which are essential for hemoglobin production. Adolescents, particularly girls, may have poor dietary habits or limited access to iron-rich foods due to cultural preferences or socioeconomic factors (De-Regil et al., 2015). Moreover, menstruation increases iron loss, which can further exacerbate the risk of developing anemia, especially in girls with heavy menstrual bleeding (Scholl et al., 2000).

The findings of this study reveal a significant relationship between menstrual patterns and the incidence of anemia among adolescents. The high prevalence of anemia among adolescents with normal menstrual cycles (23.1%) may reflect a variety of underlying factors, including insufficient dietary intake of iron, especially during the rapid growth period of adolescence. Despite having normal menstrual cycles, many adolescents may not be consuming adequate amounts of iron-rich foods, which can contribute to iron deficiency anemia (De-Regil et al., 2015). This suggests that even individuals with seemingly normal menstrual patterns can be at risk for anemia, particularly if their diet or iron absorption is compromised. Interestingly, **13.8%** of adolescents with abnormal menstrual cycles did not have anemia, which may indicate that factors other than menstruation, such as underlying health conditions, socioeconomic factors, or dietary patterns, play a significant role in determining anemia status. Abnormal menstrual cycles can sometimes result from hormonal imbalances or other medical conditions, which may exacerbate the risk of anemia if accompanied by heavy menstrual bleeding (Scholl et al., 2000).

However, the absence of anemia in this group suggests that not all adolescents with irregular menstrual cycles will develop anemia, indicating that the relationship between menstrual irregularity and anemia is complex and influenced by various other factors.The statistically significant relationship found in this study underscores the importance of considering menstrual health when addressing anemia in adolescents. Heavy menstrual bleeding, common in some adolescents with irregular menstrual cycles, can lead to increased iron loss and contribute to the development of anemia (WHO, 2015). However, the presence of anemia in adolescents with normal menstrual cycles also highlights the need for broader interventions targeting iron deficiency and nutritional status, not just menstrual health.

CONCLUSION

This study's findings underline the importance of early detection and intervention in schools to address anemia among adolescents. Another contributing factor could be the cause of anemia and its potential impact on health. School health programs could provide education on healthy eating habits, iron-rich foods, and the significance of regular health check-ups.

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