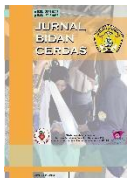
Jurnal Bidan Cerdas
e-ISSN: 2654-9352 dan p-ISSN: 2715-9965
Volume 7 Issue 1, 2025, Halaman 1-7
DOI: 10.33860/jbc.v7i1.3511
Website:https://ojs.polkespalupress.id/index.php/JBC
Penerbit: Poltekkes Kemenkes Palu



Menstrual Cycle and Length of Menstruation in Early Adolescent Girls on the Incidence of Anemia

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ARTICLE INFO

Article History:

Received: 2024-03-25
Accepted: 2024-12-31
Published: 2025-03-27

Keywords:

Anemia;
menstrual cycle;
Adolescent girls.

ABSTRACT

Introduction: Anemia is a prevalent health issue among adolescent girls, particularly in developing countries. This study aimed to investigate the relationship between menstrual cycle and length of menstruation on the incidence of anemia in early adolescent girls. **Methods**: A cross-sectional analytical survey was conducted involving 38 girls aged 12-15 years, selected using purposive sampling. Questionnaires were used to collect data on menstrual cycle and length of menstruation, while hemoglobin levels were measured to determine anemia status. **Results:** The results showed that 73.7% of respondents had normal menstrual cycles (21-35 days), 76.3% had normal menstrual periods (2-7 days), and 68.4% were not anemic. A significant relationship was found between menstrual cycle and anemia incidence, with 6 girls experiencing anemia despite normal cycles and 6 girls with abnormal cycles being anemic. However, no significant association was observed between length of menstruation and anemia. **Conclusion:** Early adolescence is a critical transition period during which health behaviors begin to develop. Adolescent girls are vulnerable to anemia due to increased iron requirements during menstruation. Efforts to prevent anemia in this population include iron and folic acid supplementation programs, minimizing risk factors, and addressing the etiology of anemia. Multisectoral support, including collaboration between health services, schools, and parents, is crucial in preventing anemia among adolescent girls. Further research with a larger, more representative sample is needed to better understand the factors contributing to anemia in this population.

INTRODUCTION

Anemia is still a major problem among young women. During adolescence, growth and development of reproductive health begin to occur rapidly. One of the signs that occurs in teenage girls is menarche, as the first sign that a girl is entering puberty. Research shows that anemia in adolescents is one of the most easily found health problems in society. The importance of various studies related to anemia needs to be done because the causes of anemia are from various complex problems that require comprehensive treatment; starting from prevention, and treatment, and also recovery from anemia (Gedefaw et al., 2015). Menarche is the first menstrual cycle in adolescent girls, usually occurring at the age of 10-16 years with varying duration (Lacroix et al., 2023). The onset of menstruation and pregnancy during adolescence increases the

risk of anemia. Apart from that, this period is a transition period and the most critical period in human development. Health behavior is becoming a concern at this time so there is a need for early understanding regarding reproductive health (Blum et al., 2017). Anemia is more common in women, especially at a young age. This is because teenagers tend to follow strict diets to avoid weight gain which results in malnutrition. Meanwhile, nutrition is needed for growth and menstruation (Deivita et al., 2021).

Globally, as many as 30% of women aged 15-49 years are affected by anemia. Reducing the incidence of anemia is one of the six global nutrition targets of the World Health Assembly and the 2030 Sustainable Development Goals (SDGs) agenda (World Health Organization (WHO), 2023). The incidence of anemia in developing countries is higher than in developed countries and is more susceptible to adolescent girls (Prasanth, 2017). Indonesia is a developing country, the results of the Indonesian Basic Health Research report, the incidence of anemia in adolescent girls in 2018 was 48.9%. This figure has increased compared to 2013, amounting to 37.1%, this situation shows that the problem of anemia in adolescents is still not providing optimal results (Kementrian Kesehatan Republik Indonesia, 2018). Anemia is when the body does not have enough hemoglobin to carry oxygen to organs and tissues which is characterized by symptoms such as fatigue, dizziness, cold hands and feet, headaches, shortness of breath, especially when working (World Health Organization (WHO), 2023).

Anemia is twice as common in adolescents who have reached menarche (Regasa & Haidar, 2019). Causes of anemia in adolescent girls include nutritional factors, chronic infectious/inflammatory diseases, genetic abnormalities in hemoglobin, and excessive and heavy menstrual blood discharge (van Zutphen et al., 2021). Risk factors for anemia in adolescents are food intake practices, menstruation, and parasitic infections (Wiafe et al., 2023). Factors associated with anemia are low food intake, years of education of more than five days, and low economic status (Fentie et al., 2020). Adolescent girls' risk of anemia is also influenced by their food, menstrual patterns, body mass index (BMI), and upper arm circumference (Vaira et al., 2022). Anemia is also linked to inadequate protein consumption (Nasruddin et al., 2021) and poor nutritional status (Sari, Judistiani, et al., 2022). However, there are currently no research that concentrate on the menstrual cycle and Length Of Menstruation, some studies simply address dietary intake. Efforts to prevent anemia in teenagers in Indonesia are through providing blood supplement tablets in educational institutions as a first step (Kementerian Kesehatan Republik Indonesia, 2022). Adolescents can receive iron supplement tablets once a week, which has been demonstrated to raise hemoglobin levels (Usman et al., 2021). Early detection of anemia can be done to prevent anemia, so that treatment and control can be done earlier (Deivita et al., 2021). This study attempts to ascertain the association between menstrual cycle and length of menstruation based on these issues.

METHODS

Analytical survey research with a cross-sectional approach. Including observational research that analyzes the relationship between variables conducted over a certain period of time (Blum et al., 2017) . This study involved 38 teenage girls aged 12-15 years who were selected using purposive sampling. The Ethical Exemption number is No. 023 / KEPK-FIKES UBT / X / 2023. Where this ethal clearance is an ethical approval that provides protection to research respondents, fulfills the rights and principles of research. Before becoming a research subject, respondents will be given an explanation regarding the purpose of the research, and the confidentiality of the research. As proof of agreement as a respondent without any coercion, the research

subject (respondent) will fill out an informed consent form. The inclusion criteria are that adolescents have menstruated, are not taking blood-boosting supplements, and are not menstruating at the time of the study. This research was conducted at SMP Satap Maiwa which was carried out in March-April 2022. The instrument used was a questionnaire sheet. The questionnaire consists of three statements, which are adopted from the research of the menstrual cycle and behavior (Brown et al., 2008). The first statement, namely; how long does the menstrual cycle last? normal (21-35 days) gets a value of 1 and abnormal (< 21 or > 35 days) gets a value of 0;, how many days does menstruation occur? normal (2-7 days) gets a value of 1 and abnormal (< 2 or > 7 days) gets a value of 0. Furthermore, the respondents' hemoglobin levels were checked, normal (Hb ≥ 12 mg / dl) gets a value of 1 and abnormal (Hb < 12 mg / dl) gets a value of 0) (World Health Organization (WHO), 2010) . The limit values for hemoglobin concentration in non-pregnant women are no anemia (≥ 12 g/dL), mild anemia (11.0-11.9 g/dL), moderate anemia (8.0-10.9 g/dL), and severe anemia (< 8 g/dL), this refers to research) (Deivita et al., 2021a)

RESULTS

There were 38 early adolescents involved in this research. Almost the majority were 15 years old (65.8%). There were 34.2% respondents aged 14 years. Most of the menstrual cycles in normal respondents ranged from 21-35 days (73.7%) and 26.3% were abnormal. If you look at the length of time for menstruation, it is 2-7 days, this is included in the normal period (76.3%). However, 23.7% of respondents had long menstrual periods > 7 days. Apart from that, 68.4% of teenagers were not anemic. However, 31.6% of respondents fell into the anemia category. This means that overall the menstrual cycle, length of menstruation, and hemoglobin levels of respondents are quite good because almost half lead to normal conditions (Table 1).

Table 1. Characteristic Respondents

Characteristics	n = 38 n(%)	Mean	Sum	Std. Deviation
Age				
15 year	25 (65.8)	1.68	63	0.481
14 year	13 (34.2)			
Menstrual cycle				
Normal (21-35 days)	28 (73.7)	1.74	66	0.446
Abnormal (< 21 or > 35 days)	10 (26.3)			
Lenght of menstruation				
Normal (2-7 days)	29 (76.3)	1.76	67	0.431
Abnormal (< 2 or > 7 days)	9 (23.7)			
Hemoglobin				
Anemia (<12 mg/dl)	12 (31.6)	1.68	64	0.471
Non anemia (≥ 12 mg/dl)	26 (68.4)			

There is a relationship between the menstrual cycle and the incidence of anemia. There were 6 young women with normal menstrual cycles but anemia and 22 people without anemia. Meanwhile, 6 teenagers with abnormal menstrual cycles experienced anemia and 4 people without anemia (table 2). The results of the research conducted showed that there was no relationship between the length of menstruation and the incidence of anemia. A total of 9 teenagers with a normal menstrual period experienced anemia and 20 people were not anemic, while 3 teenagers with a menstrual period of

>7 days or <2 days experienced anemia and 6 people who were not anemic. This means that even though the menstrual cycle and length of menstruation are normal, anemia can occur in teenagers so that nutritional needs are very necessary and avoiding predictors of possible causes of anemia. Menstruation is a process of reproductive organ maturity, which is interpreted as the process of blood discharge from the endometrium that routinely occurs every month through the vagina to the blood vessels, and unused cell tissue because there is no pregnancy (Deivita et al., 2021b). The normal duration of menstruation is between 3-5 days followed by an average amount of blood discharge, namely; 16 cc, and if more than 80 cc is pathological. Menstrual blood discharge of more than 16 cc can occur when someone has an average menstrual period of more than 7 days. Menstrual blood that comes out for more than 7 days causes the oxygen-binding substance in red blood cells to also come out (Brown et al., 2008). This results in a reduced oxygen supply to body tissues, at that time iron is not sufficient for optimal red blood cell formation, so that red blood cells are smaller and lighter in color. Hemoglobin is a parameter measure used to regulate the occurrence of anemia and in it as a substance that binds oxygen in red blood cells. Hemoglobin measurement can be done with the amount of each hemoglobin/100 ml of blood can be used as an oxygen carrier in the blood with an index of 22 capacity. In adolescents aged 13 to 15 years, the limit for hemoglobin levels is 12 gr/dl (World Health Organization (WHO), 2010)

Table 2. The Relationship Between The Menstrual Cycle And The Incidence of Anemia

Menstrual cycle	Hemoglobin		Total	p-value
	Anemia (<12mg/dl)	Non anemia (≥12 mg/dl)		
Normal (21-35 days) = ya	6	22	28	0.024
Abnormal (< 21 or > 35 days)	6	4	10	

Table 3. The Relationship Between Menstrual Length And The Incidence of Anemia

Lenght of menstruation	Hemoglobin		Total	p-value
	Anemia (<12 mg/dl)	Non anemia (≥12mg/dl)		
Normal (2-7 days) = ya	9	20	29	0.897
Abnormal (< 2 or > 7 days)	3	6	9	

Menstrual patterns with a menstrual period of more than seven days, tend to cause more bleeding. So that iron and red blood cells in the body also experience a reduction. When the menstrual period lasts more than 7 days, our organs and tissues do not get enough oxygen, and this is indicated by dizziness, fatigue, pale face, and blurred vision, so that it can result in decreased concentration in learning and adolescent activities every day (Sari et al., 2022). The trigger for anemia in adolescents is a lack of iron intake in the body, where about two-thirds of the iron in the body is found in red blood cells. The menstrual blood loss that occurs every month in adolescent girls results in women having a higher incidence of anemia than men (Verma et al., 2021). This study found that there is a significant relationship between the variable of menstrual duration and the incidence of anemia in adolescent girls at SMPN 8 Satap Maiwa. Where the results of the study in the statistical test obtained ρ value <α, namely 0.001 <0.05 and it can be concluded that there is a relationship between the duration of menstruation and the incidence of anemia in adolescent girls.

According to the Researcher's Assumption the length of menstruation with the incidence of anemia in adolescent girls has a mutually related relationship (Wiafe et al., 2023). Where the length of menstruation is how much quantity a teenage girl has during her menstrual period, the longer a person's menstruation, the more it will affect the hemoglobin levels in her body. This is what causes a teenage girl who experiences menstrual disorders to experience anemia.

DISCUSSION

Early adolescence is a transition period. At this time, health behavior begins to develop and curiosity about things is high (Blum et al., 2017). The early adolescent age group is the age period 10-15 years (Caissy, 1994). At this time, menstruation first occurs. In early teens, the menstrual period is longer than in late teens, while the menstrual cycle in early teens tends to be shorter (Omidvar et al., 2018). The menstrual cycle lasts 21-35 days (Oyelowo, 2007) and during their first menstrual cycle, most women experience bleeding for 2-7 days (The American College of Obstetricians and Gynecologiests (ACOG), 2020). Anemia is the number of red blood cells or hemoglobin concentration in the blood <12 mg/dl (World Health Organization (WHO), 2023). Anemia is more common in adolescent girls because as adolescent girls experience menstruation, the body's need for iron increases.

The research results showed that the menstrual cycle was related to the incidence of anemia. A total of 6 people experienced anemia with abnormal cycles. Factors associated with anemia are the duration of menstrual blood loss, iron consumption, body weight, height, and Hb levels (Sari, Herawati, et al., 2022). This research does not show a relationship between the length of menstruation and the incidence of anemia. This is the same as research by Sherina Ramadhan, at al., there is no relationship between the length of menstruation and anemia in young women (Sherina Ramadhan et al., 2023). This can be caused by other factors such as hormones and stress.

Early adolescents have a 1.98 times risk of developing anemia (Gebreyesus et al., 2019), so iron and folic acid supplementation programs are very necessary. Intermittent iron supplementation is effective in preventing and controlling anemia (Fernández-Gaxiola & De-Regil, 2019). Apart from giving blood supplement tablets, things that need to be considered in efforts to prevent anemia are minimizing the risk factors and etiology of anemia. n this study, there are still limitations of researchers in presenting respondent subjects so that it is still less representative of the real conditions of adolescents in Enerekang Regency. so supporting data and information from research subjects are needed

CONCLUSION

Girls in early adolescence are between the ages of 10 and 15. Because this is the time when the first menstrual cycle begins, special consideration is needed because the menstrual cycle and duration are not yet regular. Adolescent girls are vulnerable to anemia because they will menstruate every month. Menstrual cycles and the incidence of anemia are interrelated, but the duration of menstruation is not related to the incidence of anemia. To prevent anemia in early puberty, early adolescent girls should continue to take blood supplement tablets and eat healthy foods. Multisectoral support in supporting the health and well-being of children who are free from nutritional problems, especially anemia, especially collaborative synergy between health services, schools, and school committees in preventing anemia in adolescents is

needed. The internalization of adolescent reproductive health education in subjects, as well as schools providing parenting education to parents are one way to implement collaboration in preventing anemia in adolescents.

ACKNOWLEDGEMENT

The researcher thanks the Research and Community Service Institute (LPPM) of University of Borneo Tarakan for supporting Funding and the progress of the research, Institut Ilmu Kesehatan Pelamonia Makassar, and Senior High School 1 Satap Maiwa for being willing as a respondent so that this research can go well.

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