

A Review Article : The Relationship between Nutritional Status and Menstrual Patterns with the Incidence of Anemia in Adolescent Girls

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Abstract: Anemia is a health condition in which the number of red blood cells or hemoglobin is less than normal hemoglobin levels are generally found in men and women. In men, it is defined as a hemoglobin level of 14-16 grams/100 ml while in women it is defined as hemoglobin of 12-15 grams/100 ml. This study aims to study Literature Review to determine the relationship between knowledge of the nutritional status and menstrual patterns on nutritional anemia among adolescent girls in Indonesia. In this study, a literature review design was used. A literature review study is a method used to collect data or sources related to a particular topic that can be obtained from various sources such as research articles.

1 INTRODUCTION

Nutritional problems are still an important problem that must be overcome because nutrition is one of the determining factors to achieve excellent and optimal health. One of the nutritional problems that often occurs is anemia in adolescents. Nutritional disorders in adolescence that often occur include a lack of energy and protein, nutritional anemia, and deficiencies in various vitamins. In particular, iron deficiency is also found in adolescents.

Adolescence is the stage that begins when children begin to show signs of puberty and lasts until those who have not experienced sexual change become sexual. The speed of puberty is affected by several variables, including diet, genetics, health problems, social, behavioral, and environmental influences. The most important factor influencing puberty is nutrition. Boys usually reach puberty between the ages of 9 and 14 years while girls usually reach between 9 and 12 years of age. Due to rapid growth and menstrual cycles, teenage girls have a greater need for iron. In addition, many young women eat less because they are often preoccupied with body image. As a result, young women are more prone to health problems, such as anemia. (Anita Martiasari, 2022)

The prevalence of anemia in adolescent girls is still quite high, according to the World Health Organization (WHO) in 2010 the incidence rate ranges from 40-88%. In developing countries, about 53.7% of all young women, anemia often attacks young women due to stress, menstruation, or late food (Briawan, 2013). In Indonesia, in 2016 the incidence of anemia at the age of 12-18 years was 10.3% (Kemenkes RI, 2017). According to data from the Indonesian Ministry of Health (2017), the number of anemia sufferers in adolescent girls aged 12-18 years in Riau province in 2016 was 6.41%.

According to the World Health Organization in 2020, more than 30% of people worldwide suffer from anemia. Iron deficiency anemia affects 4.3-20% of people in developed countries and 30-48% in developing countries. (WHO, 2020) Anemia in adolescent girls is still quite high, according to (WHO, 2015), the prevalence of anemia in the world ranges from 50-80%. The prevalence of anemia in adolescent girls (aged 15-19 years) is 26.5%, and in fertile women is 26.9% (Kemenkes RI, 2015).

Anemia is still a widespread health problem, especially affecting developing and poor countries. Lack of energy and protein, nutritional anemia, and vitamin deficiency are common nutritional

problems in adolescence. If the red blood cells do not have enough hemoglobin, it can lead to anemia. Red blood cells include hemoglobin (Hb), a metalloprotein (a protein containing iron) that functions as a conduit for oxygen from the lungs to the rest of the body. Men usually have normal hemoglobin levels of 14-16 g/dl, while women usually have levels of 12-15 g/dl. (Briawan D, 2014)

Adolescent anemia negatively impacts the immune system, ability to focus, learning rate, fitness level, and productivity. The female menstrual cycle and anemia are related. A woman who suffers from anemia or who is experiencing it may experience irregular menstrual cycles (Kristanti et al. 2014)

2 METHODS

The research method we use is a Literature Review which reviews several articles that discuss the Relationship between Nutritional Status and Menstrual Patterns with the Incidence of Anemia in In the article, we adjusted the inclusion and exclusion criteria of our study so that the results of our screening paper were ten articles which we will discuss further in this article.

3 RESULTS

Based on the results of our writing on related references, it will be described in the following table:

Table 1: Matriks Artikel Literature Review

Referen-ces	Writer	Year	Name, journal volume, number	Article title	Method	Research result	Data Based
(1)	Desi Kumalasari, Kameliawati Ferry, Hamid Mukhlis, Dian Ayu Kristanti	2019	Wellness and healthy magazine, Volume 1, Number 2	Menstrual Pattern with Anemia Incidence in Adolescents	Cross Sectional	The relationship between menstrual patterns (p = value + 0.001) and the incidence of anemia in female junior high school students in East Lampung in 2018. The length of menstruation can affect anemia in adolescent girls, where there is bleeding from the body during menstruation. This results in iron expenditure and balance impaired iron in the body.	Google Scholar
(2)	Dwi astuti, Ummi Kulsum	2020	/ Journal of Nursing and Midwifery Vol.11 No.2	Menstrual Pattern with Anemia in Young Women	Correlation Analytical Research	Most of the respondents had a normal menstrual pattern as many as 25 people (69.4%) and an abnormal menstrual pattern as many as 11 people (30.6%).	Google Scholar
(3)	Dzul Istiqomah Hasyim	2018	Journal of Nursing and	Knowledge, Socio-Economic,	total sampling method.	Abnormal menstrual pattern increased the incidence of anemia	Google Scholar

Referen-ces	Writer	Year	Name, journal volume, number	Article title	Method	Research result	Data Based
			Midwifery Aisyiyah Vol 14, No. 1	Menstrual Pattern, Nutritional Status and Physical Activity with the Incidence of Anemia in Young Women		by 4.7 times compared to normal menstrual pattern OR=4.707 with 95% CI (1.710-12.956) and p-value=0.003 ($p \leq 0.05$). There is no significant relationship between nutritional status and the incidence of anemia p-value = 0.111	
(4)	Mia Rita Sari	2020	Vol 3 no 1	Relationship between menstrual pattern and nutritional status with the incidence of anemia in young women at SMAN 2 Tembilahan	Quantitative Analytical with Cross Sectional Study Approach	majority of respondents have pattern menstruation normal as much as 63.6%, abnormal nutritional status as much 50.5%, no experience incident anemia as much 57.6%, there is menstrual pattern relationship with the incidence of anemia with a value of p value 0.000 fund there is a relationship between nutritional status with incident anemia with a value of p value 0.000.	Google Scholar
(5)	Novy Ramini Harahap	2018	Nursing Arts, Vol. XII, Number 2	Factors Associated with the Occurrence of	Analytical Survey with Cross Sectional	Based on the results of statistical tests, shows that there is a relationship between	Google Scholar

Referen-ces	Writer	Year	Name, journal volume, number	Article title	Method	Research result	Data Based
				Anemia in Young Women	Approach	menstruation and the incidence of anemia in adolescent girls at SMP Negeri 8 Percut Sei Tuan (p = 0.000) and OR = 15,857, which means that the incidence of anemia with hypermenorrhea has a risk of 15.8 times compared to those without hypermenorrhea.	
(6)	Vanitha Krishnan, Rafdzah Ahmad Zaki, Azmi Mohamed Nahar, Muhamamad Yazid Jalaludin, Hazreen Abdul Majid	2021	The Lancet Regional Health - Western Pacific 15 (2021) 100228	Knowledge, Socio-Economic, Menstrual Pattern, Nutritional Status and Physical Activity with the Incidence of Anemia in Young Women	Literature Review	The trend of anemia prevalence increased significantly across the age group at 13, 15, and 17 years, respectively, especially among females. A longitudinal analysis using GEE revealed that adolescents who did not meet the Recommended Nutrient Intake (RNI) for total iron intake per day were significantly associated with anemia (RR=1.517;95% CI: 1.012-2.275; p=0.044) and IDA (RR=1.776;95% CI: 1.225-2.57; p= 0.002).	Science Direct
(7)	Utary Dwi Listiarini, Indah Dewi Sari, Andi Deswita Chaniago, Efnesia Nadeak	2021		The Relationship of Menstrual Patterns with The Incidence of Anemia in Adolescent Girls at SMA PAB 5 Klumpang, Deli Serdang in 2021		Menstrual patterns greatly affect the incidence of anemia in adolescent girls at SMA PAB Klumpang Deli Serdang which is caused by the nutritional intake of young women who are still lacking and even a deficit of iron needed during menstruation. Girls who experience normal menstrual	Google Scholar

Referen-ces	Writer	Year	Name, journal volume, number	Article title	Method	Research result	Data Based
						patterns are less likely to experience anemia and have mild anemia	
(8)	Salma Nabilah, Hartati Eko Wardani, Rara Warih Gayatri	2019	Advances in Health Sciences Research, volume 29	Correlation of Menstrual Patterns, Nutritional Status and Level of Knowledge with the Incidence of Anemia on Teenage Girls	Cross Sectional Approach	The result showed that there was a correlation between nutritional status and the incidence of anemia (p value<0,05), and there was no correlation between menstrual patterns(menstrual cycle,duration of menstruation) and the level of knowledge with the incidence of anemia in teenage girls(p value>0,05)	Google Scholar
(9)	Tupriliany Danefi, SST.,M.Kes, Fenty Agustini, SST.,M.Kes	2018	Jurnal Kesehatan	Hubungan Status Gizi dan Pola Menstruasengan Kejadian Anemia pada Remaja di SMAN 2 Singaparna	Cross Sectional	Based on the results of the study, 25.7% of students with good nutritional status had anemia, while 71.4% of students with poor nutritional status had anemia. Based on the results of the study, 28.6% of female students with normal menstrual patterns experienced anemia, while 37.5% of female students with abnormal menstrual patterns experienced anemia. There is a relationship between nutritional status and the incidence of anemia in adolescent girls where p value $0.012 < \alpha (0.05)$ c. There is no relationship between menstrual patterns and the incidence of anemia	
(10)	Anisa Muhayari	2019	Indonesian Journal of Nursing	The Relationship Between	Literature Review	as many as 62 respondents (33%) had a nutritional status	Google Scholar

Referen-ces	Writer	Year	Name, journal volume, number	Article title	Method	Research result	Data Based
			Science Vol. 9 No.1	Nutritional Status and Diet with the Incidence of Adolescent Women		with underweight BMI, 106 respondents (56.4%) had normal BMI, and the excess BMI category, as many as 20 respondents (10.6%). Nutritional status is the respondent's body condition seen from the food consumed and the use of nutrients.	

4 DISCUSSIONS

Relationship between Nutritional Status and Occurrence of Anemia

Nutritional status is a condition of adolescent BMI seen from the content of nutrients consumed. BMI value is one of the measuring tools that can be used to monitor nutritional status. The relationship between nutritional status and anemia status showed that based on body mass index, 22.42% of adolescents had very thin nutritional status and 20.69% of adolescents were thin. Teenagers who are said to be very thin and thin are those who have a low weight that does not match their height. Although many factors affect a person's nutritional status, adequate nutritional intake is the most dominant factor to have a normal nutritional status (Nurlina akbar. 2018).

Several factors trigger nutritional problems in adolescence such as wrong eating habits, wrong understanding of nutrition where a slim body becomes the dream of teenagers so that nutritional needs are not met, and excessive preference for certain foods, for example, fast food. Teenage girls often do unhealthy diets and without the supervision of a doctor or nutritionist which can interfere with the growth of nutrients that the body needs. Young women also mostly drink tea or coffee less than an hour after eating which can interfere with iron absorption, affecting hemoglobin levels. (Salma Nabilah, 2019)

In this study, there was no significant relationship between nutritional status and the incidence of anemia, this was because students who had normal nutritional status were found to be 32.76% had anemia even though they had normal nutritional status.

In the case of thin and very thin adolescents, 32.75% also had anemia. These results indicate that there is no difference in the percentage between normal nutritional status and adolescents who have underweight nutritional status who experience anemia. Basically, anemia is influenced by

directly by the daily consumption of foods that lack iron, in addition to infectious factors as the trigger. The level of nutritional consumption affects the anemia status of female students. The possibility of anemia can be caused by the lack of consumption of nutrients that facilitate iron absorption, thus affecting the nutritional status of adolescent girls.

Based on the results of research at SMAN 2 Singaparna, Singaparna District, Tasikmalaya Regency in 2018, 25.7% of students with good nutritional status were anemic, while 71.4% of students with poor nutritional status were anemic. Statistical test results obtained p value $0.012 < \alpha (0.05)$ which means there is a significant difference in the proportion of anemia in good and poor nutrition so that it can be concluded that there is a relationship between nutritional status and the incidence of anemia in female students with an OR value of 7.22 which means female students with poor nutrition 7 times more likely to experience anemia compared to students with good nutritional status. (Tupriyani Danefi, 2018)

Based on research conducted by Wibowo Tri Daris, et al entitled *The Relationship Between Nutritional Status and Anemia in Young Girls at Muhammadiyah 3 Junior High School Semarang*. Based on the results of the study, it was found that respondents who had good nutritional status with anemia were 4 students (12.9%), respondents who had good nutritional status but not anemia were 27 students (87.1%), respondents who had poor nutritional status with anemia as many as 13 students (100.0%), and respondents who have poor nutritional status but are not anemic as many as 0 students (0.0%). Based on the results of the Chi-Square Test, a significance value of 0.000 or less than 0.05 is obtained which indicates that the relationship between nutritional status and anemia is related to.

Relationship between Menstrual Cycle and Anemia Status

Adolescent girls will normally experience blood loss through menstruation every month. Along with menstruation will be issued a number of iron needed for the formation of hemoglobin. This is one of the causes of the high prevalence of anemia in adolescent girls. The length of menstruation can be measured based on the first day to the last day of bleeding. Above average iron loss can occur in adolescent girls with more menstrual patterns and longer periods (Atikah, 2011).

Women bleed 30-40 ml each menstrual cycle between 21-35 days with a menstrual period of 3-7 days. The amount of blood that comes out (hypermenorrhea) and the menstrual cycle are used as measurements of the incidence of anemia. Because women do not have sufficient iron supplies and eventually causes low absorption of iron into the body so it can not replace the iron lost during menstruation. The amount of iron lost during menstruation depends on the amount of blood that comes out each menstrual period

Based on the results of the study, it was found that the frequency of respondents without hypermenorrhea, the majority did not suffer from anemia, amounted to 37 respondents (56.9%), the minority suffered from anemia, amounted to 14 respondents (21.5%). The majority of respondents with hypermenorrhea suffered from anemia as many as 12 respondents (18.5%), the minority who did not suffer from anemia amounted to 2 respondents (3.1%).

The results of the relationship between the menstrual cycle and anemia status showed that as many as 65.51% of adolescents had regular menstrual cycles, but also obtained some female students who had short menstrual cycles (<21 days) as many as 12.1% and long (>35 days) as much as 22.4%. Menstrual cycles in adolescents are very easily influenced by the atmosphere of life, for example fatigue due to activities at school age/school age and the influence of high stress. This will disrupt the menstrual cycle and will easily affect the amount and duration of bleeding.

This study also found female students with irregular menstrual cycles, namely 34.39%. Irregular menstrual cycles can be caused by diet. There are several factors that can interfere with a woman's menstrual cycle. One of them is eating disorders (eating patterns). The condition of the body that refuses food because it wants to get used to always feeling hungry (anorexia), the habit of eating a lot of food and then expelling it by vomiting (bulimia) and the obsession with having the right diet and eating healthy (orthorexicnervosa) can disrupt a woman's monthly cycle.

5 CONCLUSIONS

There is a relationship between nutritional status and anemia, but there is no relationship with menstrual patterns.

6 REFERENCES

- Astuti, D., & Kulsum, U. 2020. Menstrual Pattern with Anemia in Young Women. *Journal of Nursing and Midwifery* , 11 (2), 314. <https://doi.org/10.26751/jikk.v1i2.832>
- Danefi, T., & Agustini, F .2019. The Relationship between Nutritional Status and Menstrual Patterns with the Incidence of Anemia in Adolescents at Sman 2 Singaparna, Singaparna District, Tasikmalaya Regency in 2018. *Journal of Health Bidkesmas Respati* , 1 (10), 15–24. <https://doi.org/10.48186/bidkes.v1i10.100>
- Harahap, NR .2018. Factors Associated with the Incidence of Anemia in Young Women. *Nursing Arts* , 12 (2), 78–90. <https://doi.org/10.36741/jna.v12i2.78>
- Hasyim, DI .2018. Knowledge, socioeconomic, diet, menstrual pattern, nutritional status and physical activity with the incidence of anemia in adolescent girls. *Journal of Midwifery and Nursing Aisyiyah* , 14 (1), 06–14. <https://doi.org/10.31101/jkk.544>

- Krishnan, V., Zaki, RA, Nahar, AM, Jalaludin, MY, & Majid, HA .2021. The longitudinal relationship between nutritional status and anemia among Malaysian adolescents. *The Lancet Regional Health - Western Pacific*, 15 , 100228. <https://doi.org/10.1016/j.lanwpc.2021.100228>
- Kumalasari, D., Kameliawati, F., Mukhlis, H., & Krisatanti, DA .2019. Menstrual Pattern with Anemia in Adolescents. *Wellness And Healthy Magazine*, 1 (2), 187–192. <https://wellness.journalpress.id/wellness/article/view/v1i218wh>
- Listiarini, UD, Sari, ID, Chaniago, AD, & Nadeak, E. 2021. The Relationship of Menstrual Pattern With The Incidence of Anemia in Adolescent Girls at SMA PAB 5 Klumpang, Deli Serdang in 2021. *International Archives of Medical Sciences and Public Health*, 2 (2), 118–126.
- Muhayari, A., & Ratnawati, D. 2015. The Relationship Between Nutritional Status With The Incidence Of Anemia. *Scientific Journal of Pharmacy*, 4 (4), 563–570.
- Nabilah, S., Wardani, HE, & Gayatri, RW .2020. Correlation of Menstrual Pattern, Nutritional Status, and Level of Knowledge With the Incidence of Anemia on Teenage Girls. 29 (Icssh 2019), 121–125. <https://doi.org/10.2991/ahsr.k.201107.030>
- SARI, MR. 2020. The Relationship between Menstrual Patterns and Nutritional Status with the Incidence of Anemia in Adolescent Girls at Sma Negeri 2 Tembilahan. *Lighthouse Health Journal*, 3 (1), 28–36. <https://doi.org/10.36984/jkm.v3i1.81>