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The Analysis of Factors Related to Anemia Levels in Adolescent Girls

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Abstract

The impact on teenagers, if they experience anemia, is that it disrupts their ability to learn, reduces their physical exercise ability and body fitness, reduces individual work capacity, reduces the body's immune function, and reduces the ability to regulate body temperature. This research aimed to analyze factors related to anemia in adolescent girls. The research method used quantitative with a cross-sectional approach. The population in the study were all 50 Adolescents who were checked for Hb in March and had moderate anemia. The sample was 44 respondents taken by purposive sampling technique. The instrument used a questionnaire to determine the length of the menstrual period, nutritional status, knowledge, and iron intake. The research used an ordinal distribution used an ordinal regression test. The research results showed that the variable length of menstruation was 0.879 with p=0.348 (> 0.05), the nutritional status variable was 0.231 with p=0.631 (>0.05), the knowledge level variable was 4.407 with p=0.021 (>0.05) and the nutritional intake variable was 11.575 with p=0.001 (<0.05). This meant that the level of knowledge and nutritional intake was related to the level of anemia. Meanwhile, the length of menstruation and nutritional status were not related to the level of anemia. For future researchers, it is expected to provide interventions related to knowledge including individual or group counseling as well as providing a healthy lunch menu program to increase iron intake in adolescents.

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INTRODUCTION

Anemia is a condition of the body where the level of hemoglobin (Hb) in the blood is lower than normal values. Anemia is called anemia, precisely because it is a deficiency in the number of red blood cells (erythrocytes). The normal Hb level in adolescent girls aged 12-15 years is 12 g/dl (Taufiqa, 2020). The impact that occurs if anemia occurs in adolescents is stunted growth, the body during the growing period is easily infected, resulting in reduced fitness and freshness, enthusiasm for learning, or decreased achievement (Apriyanti, 2019). Adolescent girls are one of the groups that are prone to suffering from anemia along with menstruation which will release iron which is needed aged 5-14 years, adolescent girls aged 10-18 years are 57.1%, and aged 19-45 years are 39.5% Women have the highest risk of anemia, especially adolescent girls (Husna & Saputri, 2022).

The results of the 2018 Riskesdas data show that the prevalence of anemia in Indonesia aged 5 - 14 years is 26.8% and 15 - 24 years is 32%. Based on data from the East Java Provincial Health Service, there are 50-60% of adolescents in East Java who suffer from anemia (Asrina et al., 2021). Based on data from the Blitar City Health Service in 2023, the incidence of anemia among adolescent girls in Blitar City is around 46.01% with a classification of mild 30.72%, moderate 14.98% and severe 0.30%. Based on preliminary studies at MTSN 1 Blitar City, results of interviews with teachers

The person in charge of the School Health Unit at MTSN 1 Blitar City, from the Blitar City Health Service through the UPT Puskesmas Sukorejo, has a program to consume blood supplement tablets once a week. These blood supplement tablets are usually consumed every Tuesday by grade 7 students, Wednesdays in grade 8, and Thursdays by grade 9. Apart from that, providing knowledge to students about anemia and blood supplement tablets has been carried out and includes a healthy lunch menu. However, the results of a preliminary study examining Hb levels carried out by the Sukorejo Community Health Center on March 21 2023 from 119 children showed that 69 children were in the mild anemia category and 50 children were in the moderate anemia category.

Factors related to the incidence of anemia in adolescent girls are the level of knowledge of adolescent girls regarding anemia, iron intake, nutritional status, length of menstruation, BMI (Body Mass Index), category of residence (rural/urban), dietary habits and the presence of infections such as malaria (Suandana et al., 2023). The factors that influence iron deficiency anemia in adolescents are body mass index, knowledge, iron supplement intake, and menstrual conditions with an incidence rate of (60.8%). Another research shows that the incidence of anemia in adolescent girls is 40% out of 115 people. Factors that increase the incidence of anemia in adolescent girls are nutritional status, knowledge of anemia, and maternal education (Listiana, 2016; Martini, 2015).

Typical and non-specific signs and symptoms of anemia include: (1) Typical signs and symptoms of anemia are angular stomatitis, dysphagia glossitis, hypochlorhydria, koilonica, and pagophagia. (2) Signs and symptoms are not typical of anemia, fatigue, anorexia, increased sensitivity to disease infections, certain behavioral abnormalities, reduced intellectual performance, and workability (Suandana et al., 2023). Based on several studies that have been conducted, anemia has several factors, including body mass index, knowledge, iron supplement intake, and menstrual conditions. Meanwhile, there have been several efforts made by teenagers and schools to prevent anemia in teenagers. However, in reality, the results of the examination still show that some experience mild or moderate anemia.

METHODS

This research was quantitative research with correlational descriptive research and cross-sectional approach that describes factors related to the level of anemia in adolescent girls at MTsN 1 Blitar City. The population in this study was all 50 adolescents who were examined for Hb in March and experienced moderate anemia at MTsN 1 Blitar City. The total sample was 44 adolescents. The samples were taken by purposive sampling. The inclusion criteria for the sample are as follows: 1) Menstruating adolescents. 2) Adolescents who experience anemia. Exclusion criteria are as follows: 1) Adolescent girls diagnosed with blood disorders. The independent variables were the length of menstrual period, nutritional status, iron (Fe) intake and level of knowledge, the dependent variable is anemia in adolescents. The instruments in this study were a questionnaire to determine the length of the menstrual period. This was assessed as abnormal if the length of menstruation was > 8 days and normal if the length of menstruation was ≥3 days ≤8 days. Weight scales, and meters for assessing nutritional status using BMI guidelines

from the Ministry of Health. The knowledge questionnaire is assessed by giving a score of 1 for the correct answer and 0 for the wrong answer. Score assessment is carried out by adding up the results obtained by respondents with a minimum score of 0 and a maximum score of 10. The results obtained by respondents are then given a percentage by dividing the correct number of respondents by the maximum score multiplied by 100%. The results of the percentage of knowledge are categorized with the criteria of good knowledge of 70-100%, sufficient knowledge of 50-70%, and insufficient knowledge if <50%. The iron intake questionnaire is rated 0 = insufficient if <100% of the RDA and 1 = sufficient if ≥100 % RDA. This iron assessment uses the Nutri Survey 2007 application. This questionnaire is assessed using a score of 3 = mild anemia: 11.0 mg/dl – 11.9 mg/dl, 2 = moderate anemia: 8.0 mg/dl – 10.9 mg/dl, 1 severe anemia: < 8.0.

This research has been ethically tested by the Patria Husada Blitar Health Research Ethics Committee with number: 06/PHB/KEPK/175/10.23 on October 17, 2023.

RESULTS

Table 1. Respondents Characteristics

Age	Frequency (f)	Percentage (%)
12	18	40.9
13	21	47.7
14	4	9.1
15	1	2.3
Total	44	100.0

Based on Table 1, it is known that the highest age distribution was 13 years old with 21 respondents (47.7%) and the lowest was at the age of 15 years with 1 respondent (2.3%).

Table 2. Analysis of the Correlation between the Length of The Menstrual Period, Nutritional Status, Level of Knowledge and Iron Intake and The Level of Anemia in Adolescent Girls

Length of Menstruation Period:	Level of Anemia						Total	
	Severe		Moderate		Mild			
	F	%	F	%	f	%	f	%
Abnormal	4	9	13	30	9	20	26	59
Normal	0	0	6	14	12	27	18	41
Nutritional Status:								
Very Thin	3	7	0	0	1	2	4	9
Thin	1	2	4	9	2	5	7	16
Normal	0	0	14	32	17	39	31	71
Fat	0	0	0	0	1	2	1	2
Obesity	0	0	1	2	0	0	1	2
Level of Knowledge:								
Not enough	1	2	2	5	2	5	5	12
Enough	3	7	8	18	5	11	16	36
Good	0	0	9	20	14	32	23	52
Iron Intake:					6	14	27	61
Not enough	4	9	17	39				
Enough	0	0	2	5	15	34	17	39

Based on Table 2, the highest results for the length of the menstrual period were 13 respondents (30%) with moderate anemia and the lowest level of severe anemia was 4 respondents (9%). The results of statistical analysis using the ordinal regression test are considered from the Wald (t) value and significance value. The menstrual length variable is 0.879 with a sig value. 0.348 (> 0.05). This shows that there is no Correlation between the length of the menstrual period and anemia in adolescent girls.

The highest nutritional status results were normal nutritional status with mild anemia levels for 17 respondents (39%). Meanwhile, the lowest nutritional status was thin with a severe level of anemia, very thin with a mild level of anemia, fat with a mild level of anemia, and obesity with a moderate level of anemia 1 respondent (2%). The results of statistical analysis using the ordinal regression test are considered from the Wald (t) value and significance value. The nutritional status variable is 0.231 with a sig value. 0.631 (> 0.05). This shows that there is no correlation between nutritional status and anemia in adolescent girls.

The research results showed that the level of knowledge with the highest level of anemia was at a good level of knowledge with a mild level of anemia, 14 respondents (14%). Meanwhile, the lowest score was at the level of poor knowledge with a level of severe anemia of 1 respondent (1%). The results of statistical analysis using the ordinal regression test are considered from the Wald (t) value and significance value. That the knowledge level variable is 4.407 with a sig value. 0.021 (< 0.05). This shows that there is a Correlation between the level of knowledge and anemia in adolescents.

The highest value of insufficient iron intake with a moderate level of anemia was 17 respondents (39%). Meanwhile, the lowest value of iron intake was sufficient with a moderate level of anemia in the number of 2 respondents (5%). The results of statistical analysis using the ordinal regression test are considered from the Wald (t) value and significance value. That the iron intake variable is 11.575 with a sig value. 0.001 (< 0.05). This shows that there is a Correlation between iron intake and anemia in adolescent girls.

DISCUSSION

Identification analysis of factors related to the length of the menstrual period with the occurrence of anemia levels in adolescent girls

The results of research analyzing factors related to the occurrence of anemia levels in adolescent girls at MTsN 1 Blitar City show that the average length of the menstrual period is abnormal for 26 students (59.1%) with the occurrence of anemia with Wald value analysis (t) of 0.879 with p=0.348 (>0.05) so it can be concluded that Ho is accepted and H1 is rejected, which means that the length of the menstrual period has no Correlation to the level of anemia in adolescents at MTsN 1 Blitar City.

Research conducted by (Memorisa et al., 2020) showed that there was no Correlation between the length of menstruation and the incidence of anemia in adolescents at SMK PGRI 3 Kediri. Excessive menstruation usually lasts more than 8 days with heavier bleeding, which can result in the body experiencing iron deficiency. If iron and red blood cells in the body decrease during menstruation, our organs and tissues cannot receive enough oxygen, and this is indicated by dizziness, fatigue, pale face, and cloudy eyes, this can result in decreased concentration in learning and activities. teenagers every day (Memorisa et al., 2020).

The menstrual cycle in women normally ranges from 21-35 days and only 10-15% have a menstrual cycle of 28 days with a menstrual period of 3-5 days, some reach 7-8 days (Suandana et al., 2023).

Researchers believe that the length of the menstrual period has no Correlation with the level of anemia in adolescent girls because it is possible that the efforts that have been made by adolescent girls. Apart from that, the length of your menstrual period does not necessarily mean that you will produce a lot of menstrual blood. It can be concluded that the length of the menstrual period has no Correlation, but depends on the total amount of menstrual blood loss during the menstrual period.

Identification analysis of nutritional status factors that are associated with the occurrence of anemia levels in adolescent girls

The results of research analyzing factors related to the occurrence of anemia levels in adolescent girls at MTsN 1 Blitar City showed that there was a nutritional status factor in the occurrence of anemia with a Wald (t) value analysis of 0.231 with sig. 0.631 (>0.05) so it could be concluded that Ho was accepted and H1 was rejected, which meant that nutritional status did not correlate with the level of anemia in adolescents at MTsN 1 Blitar City.

Research conducted by (Nurazizah et al., 2022), found that there was no significant

Correlation between nutritional status and the incidence of anemia in adolescent girls. This is because the majority of subjects were classified as having normal nutritional status. This research is in line with (Adiyani et al., 2020), there is no significant correlation between nutritional status and the incidence of anemia in adolescent girls at SMK PGRI 4 Banjarmasin in 2017.

During adolescence, an assessment of nutritional status needs to be carried out. One method used to assess nutritional status in adolescents is by measuring BMI (Body Mass Index). Nutritional status is a balance of consumption, absorption of nutrients, and use of these nutrients (Adiyani et al., 2020). Malnutrition or underweight status is caused by improper diet, bad eating habits, and excessive dislike of certain foods. A slim body is often a dream for teenagers, especially adolescents, this is often a factor causing nutritional deficiencies; because to maintain a slim body they apply food restrictions incorrectly so that their nutritional needs are not met (Memorisa et al., 2020).

Researchers believe that nutritional status is not related to the level of anemia in adolescents because nutritional status is calculated using the body mass index, where the body mass index describes macronutrients. Meanwhile, anemia describes micronutrient status. In this study, the average nutritional status of adolescents was normal, so there was no Correlation with the level of anemia in adolescent girls.

Identification analysis of knowledge level factors that are related to the occurrence of anemia levels in adolescent girls

The results of research analyzing factors related to the occurrence of anemia levels in adolescent girls at MTsN 1 Blitar City show that there is a factor in the level of knowledge on the occurrence of anemia levels with a Wald (t) value analysis of 4.407 with sig. 0.021 (< 0.05) so it can be concluded that Ho is rejected and H1 is accepted, which means that the level of knowledge has a Correlation with the occurrence of anemia levels in adolescents at MTsN 1 Blitar City.

Research conducted states that there is a significant Correlation between knowledge of anemia and the occurrence of anemia. Adolescent girls who have an insufficient level of knowledge about anemia are twice as likely to experience anemia (Permanasari et al., 2020). This research is in line with (Permanasari et al., 2020). This research uses a cross-sectional approach with the results of research on knowledge of adolescent girls which has a Correlation with hemoglobin levels in adolescent girls at SMAN 05 Pekanbaru.

Knowledge among adolescents regarding anemia will have an impact on teenagers' attitudes and behavior in preventing anemia (Permanasari et al., 2020). A person's knowledge can influence the occurrence of anemia, because knowledge can influence their behavior, including lifestyle and eating habits. Lack of knowledge about anemia, its signs, impacts and prevention results in teenagers consuming foods that contain little iron so that the iron intake needed by teenagers is not met (Memorisa et al., 2020).

The researcher's opinion, based on theory and the results of research that has been carried out, the higher the knowledge of teenagers, the lower the level of anemia so that anemia does not occur in adolescents at MTsN 1 Blitar City. Knowledge by adolescents will influence the level of anemia because knowledge influences lifestyle and eating habits.

Identification analysis of iron intake factors that are associated with the occurrence of anemia levels in adolescent girls

The results of research analyzing factors related to the occurrence of anemia levels in adolescent girls at MTsN 1 Blitar City show that there is a factor of iron intake on the occurrence of anemia levels with a Wald (t) value analysis of 11.575 with sig. 0.001 (< 0.05) so it can be concluded that Ho is rejected and H1 is accepted, which means that iron intake is related to the occurrence of anemia levels in adolescents at MTsN 1 Blitar City. Another research about the analysis of the Correlation between consumption patterns of iron sources and anemia status showed a significant correlation between consumption patterns of iron sources and the incidence of anemia among female students at the Al-Mizan Islamic Boarding School. (Nabilla et al., 2022).

Adolescence is an important period of growth. If the food consumed does not contain sufficient amounts of iron, then the body's need for iron is not met, this is due to the low quality and quantity of iron in the food we consume. Lack of consumption of vegetables and fruit as well as side dishes will increase the risk of iron anemia.

Factors causing adolescent nutritional problems include poor eating habits stemming from poor family eating habits since childhood, wrong

understanding of nutrition in adolescents such as limiting food to maintain body slimness, and preferences for certain foods such as only eating junk food. Nutritional problems in adolescents will have a negative impact on the level of public health, such as decreased concentration in learning, decreased physical fitness, and the risk of giving birth to LBW babies (Setianingsih, 2023).

The researcher's opinion, based on research conducted and according to theory, the high incidence of anemia could be due to a lack of consuming foods that contain sources of iron which results in low hemoglobin in the body. Adolescents at MTsN 1 Blitar City often consume junk food and do not like vegetables that contain high levels of iron.

CONCLUSION

Based on the research results, factors that are related to the level of anemia in adolescent girls are the level of knowledge and iron intake, while factors that are not related to the level of anemia are the length of the menstrual period and nutritional status.

SUGGESTION

This research provides an understanding regarding anemia to increase the level of knowledge. Adolescent girls and families are expected to pay attention to food intake to increase iron. For further researchers, it can be developed by providing interventions by conducting individual or group counseling and providing programs related to increasing iron intake. iron and knowledge.

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CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this paper.

AUTHOR CONTRIBUTIONS

Yeni Kartika Sari served as proposal and writing supervisor, Wimar Anugrah Romadhon responsible in producing the article and Adelia Dwi Novitasari served as data collector and statistical report.

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