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Factors Related To Anemia Among Female Students City

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ABSTRACT

Adolescent girls have a higher risk of developing anemia than adolescent boys, Based on the 2018 National Basic Health Research, 48.9% of adolescent girls in Indonesia are anemic. Adolescents who suffer from anemia when they become pregnant are at risk of giving birth to low birth weight (LBW) and stunting. Iron nutritional anemia is one of the main causes of anemia, including due to insufficient intake of iron-source foods. namely BMI, Mid Upper Arm Circumference (MUAC), and tea and coffee consumption. This research aims to determine the factors associated with hemoglobin levels in adolescent girls at SMK 3 Bengkulu City. Data analysis used regression testing. The sample for this research was 73 respondents who were selected used the purposive sampling technique. sampling is carried out in accordance with the inclusion criteria. validity and reliability tests of questionnaires are taken from the results of previous studies. Data analysis used the Pearson product moment correlation test. The results of the research, namely the relationship between BMI and hemoglobin levels, obtained univariate results hemoglobin in the interval 8.0-11.9 gr/dl was (35.61%) low hemoglobin and the interval >12 gr/dl was (64.38%) normal hemoglobin category, BMI (4.10%) underweight, (17.80%) underweight, (69.86%) normal, and (8.21%) overweight. MUAC: (43,83%) Calorie energy deficiency, (56,16%) non Calorie energy deficiency, Tea/Coffee Consumption (58,90%) lower, (41,10%) currently, and bivariate result (p = 0.001–0.05), so there was an influence on BMI and hemoglobin levels. The results of the analysis regarding the relationship between MUAC and hemoglobin levels obtained results (p = 0.001– 0.05), so there was an influence on MUAC and hemoglobin levels. The results of the analysis regarding the relationship between tea/coffee consumption and hemoglobin levels obtained results (p = 0.011 0.05), so there was an influence on tea/coffee consumption and hemoglobin levels in young women at SMK 3 Bengkulu City. The conclusion of this research is that there is an influence on BMI, MUAC, and tea/coffee consumption on hemoglobin levels.

Keywords: Hemoglobin; Adolescent Girls.

Introduction

Anemia is estimated to affect half a billion women aged 15-49 years and 269 million children aged 6-9 months worldwide. Cases of anemia in 2019 affected 30% (539 million) non-pregnant women and 37% (32 million) pregnant women aged 15-49 years. WHO in Africa and Southeast Asia are the most affected regions, with an estimated 106 million women and 103 million children affected by

anemia in Africa and 244 million women and 83 million children affected by anemia in Southeast Asia [2].

Anemia in Southeast Asia is quite high in Malaysia; the prevalence of anemia in non-pregnant women aged 15-49 years is 32 %, Indonesia 30%, Thailand 23.8 %, Singapore 12.9 %, and the Philippines 11.6%. Indonesia ranks second highest for anemia in Southeast Asia in 2019.

Based on the 2018 National Basic Health Research, 48.9% of adolescent girls in Indonesia are anemic. Adolescents who suffer from anemia when they become pregnant are at risk of giving birth to low birth weight (LBW) and stunting. Iron nutritional anemia is one of the main causes of anemia, including due to insufficient intake of iron-source foods [4].

Adolescent girls have a higher risk of developing anemia than adolescent boys. A woman who experiences heavy menstruation for more than five days is worried about losing iron, so she needs more replacement iron than a woman who only menstruates for three days and a little. The second reason is because teenage girls often maintain their appearance and have the desire to stay slim or thin, so they diet and reduce food intake. An unbalanced diet will cause the body to lack important nutrients such as iron. Anemia can also be caused by other factors such as iron and protein intake that do not match needs and the presence of inhibitory factors for the absorption of iron minerals, namely tannins and oxalates [5].

Adolescence is a period of growth where the body requires sufficient nutritional intake. A person's nutritional status is one method that can be used to determine the adequacy or balance of their nutrition. Nutrition in a person's body can be seen from nutritional status; it is said to be lacking if the body lacks intake. One indicator for assessing a person's nutritional status is the Body Mass Index (BMI). BMI is an assessment of a person's nutritional status obtained from calculating body weight in kilograms divided by height in meters squared. Respondents who have a BMI of 18.5 will be categorized in the thin group, 18.5–25 will be categorized in the normal group, and >25.0 will be categorized in the overweight/obese group [6].

Health and nutrition issues in Indonesia in the period of 1000 Days. First 1000 Days of life is the focus of attention because it not only impact on morbidity and mortality rates in mothers and children, but also has individual quality of life consequences that are permanent until adulthood. The onset of nutritional problems in children under two years of age is closely related to the health and nutritional preparation of women for motherhood, including rematrices. and nutrition preparation of a woman for motherhood, including adolescent girls. [7]. One of the habits that can affect iron absorption is coffee consumption. Coffee contains caffeine compounds; caffeine can damage and thwart the process of rapid iron absorption. By binding iron in the blood so that iron cannot be absorbed by the body and is excreted through feces, the amount of iron in the body decreases, and the formation of red blood cells and hemoglobin also decreases [8].

Tannin compounds in tea, in addition to providing good effects on the body, also have bad effects on the body. Tannin compounds, if consumed in excessive amounts, will inhibit iron absorption by binding it. It is better not to consume tea at mealtimes because it can interfere with the iron absorption process. Iron absorption in individuals who eat with water and individuals who eat with black tea. The results showed that iron absorption in individuals who eat with water is 22.1%, while in individuals who eat with black tea it is 6.9%. So it can be concluded that black tea reduces iron absorption by 70% [9].

According to data from the Bengkulu Provincial Education Office in 2023, SMK 3 Bengkulu City has the largest number of female students, totaling 1,049 people and the largest number of female students at SMK 3 Bengkulu City is in the beauty department, totaling 195 students. The purpose of this study was to determine the factors associated with hemoglobin levels in adolescent girls at SMKN 3 Bengkulu City, and the target was adolescent girls aged > 15 years

Methods

This research method is purposive sampling. The sample used was 73 respondents. The target of this study was female beauty students of SMK 3 Bengkulu City in grades X and XI who were >15 years old (grade XII had graduated at the time of the study).

Sampling for respondents used Excel on random devices (grades 10 and 11) by conducting a lottery. Then prospective respondents who met the criteria is Students of SMK 3 majoring in beauty in Bengkulu City aged >15 years old, were given information about the purpose of the study regarding factors related to hemoglobin levels in adolescent girls and the research procedures carried out until the respondents could understand them. After agreeing to the terms of the study, the researcher asked the subjects to participate as

respondents by signing the informed consent form.

operational definitions of variables and their measurements, BMI is Measurement in monitoring nutritional status is simple with the formula weight in kilograms divided by the square of height in meters Underweight measurement: <18.5, Normal: 18.5-24.9, Overweight: ≥25,0, MUAC is Nutritional status data includes measures obtained through measurement using a MUAC tape the measuring result Not Chronic Energy Deficiency: >23.5 cm, Chronic energy deficiency : <23.5 cm.

The measurement of tea/coffee consumption by giving 11 questions to respondents with multiple choice answers, namely a, b, and c. If the respondent answers choice a will be given a score of 1, choice b has a score of 2, and choice c is given a score of 3. Tea/coffee consumption is classified into 3 categories, namely: low:11-18, medium: 19-26, and high : 27-33. The data KEPK.BKL/376/05/2024.

Results and Discussion

The measurement scale for the variables of hemoglobin level, BMI, MUAC, and tea/coffee consumption is a ratio, so the analysis used is the Pearson product-moment test using the SPSS for Windows program. Here are the results:

analysis design used in this study is univariate and bivariate analysis which is used to analyze the relationship between research variables.

Conduct an assessment of the subjects using primary data, namely giving questionnaires, weighing, measuring height, measuring MUAC, and checking Hb levels in the research subjects, and secondary data obtained from data at the research site. The calculation of sample size according to Slovin is as follows. In this study, the accuracy level of 85% and the tolerance limit of 10% have been determined. The number of samples of the beauty department at SMK 3 Kota Bengkulu: 73 respondens, sample determination based on class: class X amounted to: 38 sample and class XI amounted to: 35 sample. This study was approved by the Ethics Committee of the Bengkulu Ministry of Health Polytechnic with approval number

Table 1. Frequency Distribution of Hemoglobin Levels in Adolescent Girls at State SMK 3 Bengkulu City

Interval	Frequency	Category	%
8,0-11,9 gr/dl	26	Low	35,61
>12 gt/dl	47	normal	64,38
Total	73		100

The frequency distribution of hemoglobin levels in the interval of 8.0-11.9 gr/dl is 26 respondents (35.61%) in the low hemoglobin category, and the interval >12 gr/dl is 47 respondents (64.38%) in the normal hemoglobin category. According to the Ministry of Health of the Republic of Indonesia in 2018, the division of anemia in adolescent girls is not anemic hb 12 gr / dl, anemia with mild anemia categories 11.0-11.9, gr / dl, moderate 8.0-10.9 gr / dl, severe < 8 gr / dl [10].

There are several contributing factors why adolescents are at risk of anemia, namely lack of knowledge about anemia so that affecting the choice of nutritious food nutritious food, not used to breakfast, have a habit of consuming tea and coffee at the same when eating which causes inhibition of the iron absorption process in the body, as well as absorption of iron in the body, as well as the intake of intake of nutrients such as energy, protein, vitamin C, and iron are lacking [11].

Anemia is a condition where the hemoglobin (Hb) level in the blood is lower than the normal value for groups of people according to age and sex, in adolescent women the normal hemoglobin is 12-15 g/dl and adolescent men 13-17 g/dl. Below-normal hematocrit, hemoglobin, and erythrocyte count are basically the only indicators of anemia. The most common cause of anemia is nutrient deficiency. The underlying causes of nitric anemia include inadequate intake, inadequate absorption, increased nutrient losses, and excessive demand. Iron deficiency is the most common nutritional deficiency in both developed and developing countries [12].

Table 2. Frequency Distribution of BMI in Adolescent Girls at State SMK 3 Bengkulu City

Interval	Frequency	Category	%
<17,0	3	Thin	4.10
<18,5	13	Underweight	17,80
18,5-24,9	51	Normal	69,86
≥25,0	6	Overweight	8,21
Total	73		100

The frequency distribution of BMI in the interval <17.0 is 3 respondents (4.10%) in the thin category, the interval <18.5 is 13 respondents (17.80%) in the underweight category, the interval 18.5-24.9 is 51 respondents (69.86%) in the normal category, and the interval 25.0 is 6 respondents (8.21%) in the overweight category. The results of the analysis still have respondents with a BMI below normal, namely 15.83, and a BMI above normal, namely 29.29. BMI below normal in the 2018 Ministry of Health nutritional standards states that BMI below normal (18.5-24.9) is called underweight and this is a threat to health status, as well as normal BMI (> 25) is called overweight; this condition also threatens health status. Nutritional status is one of the factors that affect hemoglobin levels, because if the intake of nutrients is not fulfilled in the body, it can cause a person to experience anemia or lack of hemoglobin levels, especially the need for nutrients such as iron [13].

The results of the study are in line with those stating that body mass index has a positive correlation with hemoglobin concentration, meaning that someone who has less i will be at risk of suffering from anemia. There is a significant relationship between body mass index and anemia, where adolescent girls with body mass index below 18.5 classified as thin have a risk of 1.4 times suffering from anemia compared to 48 adolescent girls with normal body mass index. There is a relationship between body mass index and hemoglobin levels in adolescents [14].

Table 3 Frequency Distribution of MUAC in Adolescent Girls at State SMK 3 Bengkulu City

Interval	Frequency	Category	%
<23,5 cm	32	Calorie energy deficiency	43,83
≥23,5 cm	41	Non Calorie energy deficiency	56,16
Total	73		100

The frequency distribution of upper arm circumference is in the interval <23.5 in 32 respondents (43.83%) in the calorie energy deficiency category and the interval 23.5 in 41 respondents (56.16%) in the non chronic energy deficiency. The results of the analysis still have many respondents with MUAC below normal (<23.5 cm), which is 17 cm. This is an indication of chronic energy deficiency, which threatens health status. 43.83% of respondents in the chronic energy deficiency category have excessive diet habits and irregular eating. In contrast to respondents in the non- chronic energy deficiency category who have regular eating habits, they maintain a healthy diet such as breakfast in the morning, consuming a balanced nutritional menu such as fruits, vegetables, carbohydrates, and sufficient protein.

Based on research it is known that most respondents have a length of arm circumference >23.5 cm as many as 74 with a percentage (78.7%), which means that most respondents in the South Purwokerto Health Center area do not experience the risk of calorie energy deficiency, so pregnant women must maintain nutrition so that their pregnancy is normal and not at risk of calorie energy deficiency. The data is obtained from the results of observations by looking at the pregnant women's book [15].

Table 4 Frequency Distribution of Tea/Coffee Consumption in Female Adolescents at State SMK 3 Bengkulu City

Interval	Frequency	Category	%
11-18	43	Lower	58,90
19-26	30	Currentyly	41,10
27-33	0	High	0
Total	73		100

The frequency distribution of tea/coffee consumption in the 11-18 interval is 43 respondents (58.90%) in the low category, the 19-26 interval is 30 respondents (41.10%) in the medium category, and the 27-33 interval is 0 respondents (0%) in the high category. The data shows that there are still respondents with the habit of consuming tea or coffee from their daily lives, and this can threaten the health status of the respondents. Adolescent girls who are included in mild and moderate anemia have a habit of consuming tea or coffee with a low to moderate score category. Consuming tea or coffee at the same time as eating can cause anemia. The data shows that there are still respondents with the habit of consuming tea or coffee from their daily lives, and this can threaten the health status of the respondents.

Tea consumption is one of the factors that can cause anemia due to tannin compounds in tea. The oxidation/steeping process carried out in tea processing can determine the amount of tannin content in tea. Therefore, tea that undergoes the longest oxidation process contains the most tannin content. The thicker the color of the tea brewing water, the more astringent the taste of the tea and the stronger the aroma of the tea, the more

tannins it contains. Tannins will inhibit iron

Hemoglobin levels are related to BMI, upper arm circumference, and tea/coffee consumption. Teenage girls are very concerned about their body shape, and many of them go on excessive diets so that BMI and upper arm circumference are below or above normal. Iron greatly affects

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absorption by binding to iron. Iron is needed by he body to produce hemoglobin. If the supply of hemoglobin is reduced, it will cause the preparation of red blood cells in the body to be disrupted which will cause the flow of oxygen to the body to decrease, this will cause anemia The data shows that there are still respondents with the habit of consuming tea or coffee from their daily lives, and this can threaten the health status of the respondents. Adolescent girls who are included in mild and moderate anemia have a habit of consuming tea or coffee with a low to moderate score category. Consuming tea or coffee at the same time as eating can cause anemia. The data shows that there are still respondents with the habit of consuming tea or coffee from their daily lives, and this can threaten the health status of the respondents [16].

The incidence of anemia in tea-drinking women may be due to tea inhibiting iron absorption. A 50-70% reduction in iron absorption occurs when adding 78 or 156 mg of polyphenolics found in tea if drinking tea together with a rice meal. Strong interaction between iron and polyphenolics in tea in the intestinal lumen regardless of iron status [17].

Conclusion

the absorption of iron in the body. Teenage girls need iron because they menstruate every month. Teenage girls also like to consume tea or coffee; not a few consume tea or coffee at mealtimes, which can inhibit iron absorption.

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