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Original Article

Relationship between Nutritional Status and Haemoglobin Level in Students of Senior High School 3 Bone

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Abstrak

Latar Belakang: Status gizi adalah suatu ukuran mengenai kondisi tubuh seseorang yang dapat dilihat dari makanan yang dikonsumsi dan penggunaan zat-zat gizi dalam tubuh. Ketidakseimbangan antara status gizi dengan kebutuhan tubuh menimbulkan kelainan patologis bagi tubuh. Seperti malnutrisi akibat kurangnya asupan zat gizi sehingga kebutuhan gizi dalam tubuh tidak terpenuhi terutama kebutuhan gizi seperti zat besi. Dimana zat besi adalah salah satu komponen penting dalam pembentukan hemoglobin. Mengacu pada latar belakang tersebut penulis tertarik untuk melakukan penelitian mengenai hubungan status gizi terhadap kadar hemoglobin pada siswa/siswi SMAN 3 Bone.
Metode: Metode penelitian ini adalah Observasional analitik. Dengan menentukan status gizi melalui pemeriksaan antropometri IMT dan kadar hemoglobin dengan *Easy Touch GCHB.*
Hasil: Hasil penelitian menunjukkan dari 80 siswa/siswi memiliki status gizi underweight 31,3%, normal 46,3%, overweight 13,8%, obesitas I 7,5%, obesitas II 1,3% sedangkan pada kadar hemoglobin sebanyak 27,5% mengalami anemia dan 72,5% normal. Terdapat hubungan yang bermakna antara status gizi terhadap kadar hemoglobin sebesar 0,003 (p<0,005).
Kesimpulan: Terdapat hubungan yang signifikan antara status gizi terhadap kadar hemoglobin pada siswa/siswi SMAN 3 Bone.

Abstract

Background: Nutritional status is a measure of the condition of a person's body that can be seen from the food consumed and the use of nutrients in the body. The imbalance between nutritional status and body needs causes pathological disorders for the body. Such as malnutrition due to lack of nutrient intake so that nutritional needs in the body are not met, especially nutritional needs such as iron. Where iron is one of the important components in the formation of hemoglobin. Referring to this background, the author is interested in conducting research on the relationship between nutritional status and hemoglobin levels in students of SMAN 3 Bone.
Methods: This research method is Observational analytic. By determining nutritional status through anthropometric examination of BMI and hemoglobin levels with Easy Touch GCHB.
Results: The results showed that out of 80 students had a nutritional status of underweight 31.3%, normal 46.3%, overweight 13.8%, obesity I 7.5%, obesity II 1.3% while at hemoglobin levels as much as 27.5% were anemic and 72.5% were normal. There is a significant relationship between nutritional status and hemoglobin levels of 0.003 (p<0.005).
Conclusion: There is a significant relationship between nutritional status and hemoglobin levels in students of Senior High School 3 Bone.

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INTRODUCTION

Nutritional status is a measure of the condition of a person's body that can be seen from the food consumed and the use of nutrients in the body.(Dwimawati 2020) An individual's nutritional status indicates how much of the individual's physiological needs have been met. The balance between nutrients taken in and nutrients required for optimal health is important. When a person's nutritional needs are sufficient to support the body's daily needs and any increased metabolic needs, the individual will achieve optimal nutritional status. Data from the 2018 Riskesdas showed that 8.7% of adolescents aged 13-15 years and 8.1% of adolescents aged 16-18 years were underweight and very underweight.(Nathaniella and Rambulangi, n.d.; Zurrahmi ZR 2020)

Hemoglobin is a protein in red blood cells that carries oxygen from the lungs to the rest of the body. One of the important components of hemoglobin is iron. Anemia is a common blood disorder that occurs when the level of red blood cells (erythrocytes) in the body is too low. This eventually leads to health problems because the lack of hemoglobin in the blood will cause a disruption in the supply of oxygen to the body.(Rahayu et al. 2019; Widowati, Kundaryanti, and Lestari 2019)

Nutritional status is one of the factors that can affect hemoglobin levels in the blood. Because reduced nutrient intake causes nutritional needs in the body to not be met, especially nutritional needs such as iron. Iron is one of the important components in the formation of hemoglobin. If the intake of iron in the body decreases, the material for forming red blood cells will also decrease so that red blood cells cannot carry out their function in channeling oxygen to all body tissues. So the author is interested in making observations about nutritional status and hemoglobin levels in students of Senior High School 3 Bone.(Handayani and Sugiarsih 2022; Sanjaya and Sari 2020)

METHOD

This study is an analytic observational study, where nutritional status is the independent variable and hemoglobin levels are the dependent variable. In determining nutritional status, the author conducted anthropometric examinations, namely body weight and height to determine body mass index, while to determine hemoglobin levels using the GCHB easytouvh tool. After the data was collected, univariate analysis was carried out to determine the frequency based on gender, age, nutritional status, hemoglobin levels. Then bivariate analysis was conducted to see the relationship of nutritional status with hemoglobin levels in students of Senior High School 3 Bone.

RESULTS

Table 1. Sample distribution based on sample characteristics

Respondent Characteristics	N	Percentage (%)
Gender		
Male	24	30,0
Female	56	70,0
Total	**80**	**100**
Age		
16	16	20,0
17	60	75,0
18	4	5,0
Total	**80**	**100**
Nutritional Status (BMI)		
Underweight	25	31,3
Normal	37	46,3
Overweight	11	13,8
Obesity I	6	7,5
Obesity II	1	1,3
Total	**80**	**100**

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Hemoglobin Level		
Normal	58	72,5
Anemia	22	27,5
Total	**80**	**100**

Source: Primary Data Analysis, 2023

Based on the table above, the majority of the samples were female, totaling 56 respondents (70.0%) and 24 respondents (30.0%) were male. As well as the most samples aged 17 years as many as 60 respondents (75.0%) and the least aged 18 years 4 respondents (5.0%). While the nutritional status obtained the majority of students have normal nutritional status totaling 37 respondents (46.3%), underweight 25 respondents (31.3%), overweight 11 respondents (13.8%), Obesity I 6 respondents (7.5%) and Obesity II 1 respondent (1.3%). And the majority of normal hemoglobin levels amounted to 58 respondents (72.5%), and classified as anemia 22 respondents (27.5%).

Table 2. The relationship between nutritional status and hemoglobin levels

Nutritional Status (BMI)	**Hemoglobin Level**				**Total**		***P-value***
	Normal		Anemia				
	n	%	n	%	**n**	**%**	
Underweight	12	15,0	13	16,3	**25**	**31,3**	0,003
Normal	33	41,3	4	5,0	**37**	**46,3**	
Overweight	9	11,3	2	2,5	**11**	**13,8**	
Obesitas I	4	5,0	2	2,5	**6**	**7,5**	
Obesitas II	0	0,0	1	1,3	**1**	**1,3**	
Total	**58**	**72,5**	**22**	**27,5**	**80**	**100,0**	

Source: Primary Data Analysis, 2023

From the analysis of the table above, the result is 0.006 which shows that there is a significant relationship between nutritional status and hemoglobin levels (p value <0.05).

DISCUSSION

In this study, the characteristics based on gender were mostly women compared to men. This study is in line with research conducted by Aulia, et al. (2022) entitled "Analysis of Anemia in Adolescent Girls" which states that the prevalence of anemia in adolescent girls is more than in adolescent boys, this is due to several factors, namely, diet, sleep patterns and menstruation. Generally, anemia often occurs in adolescent girls compared to male adolescents because adolescent girls lose iron during menstruation so they need more iron intake this is because women need to go through menstruation regularly every month. When menstruating the amount of blood that comes out is quite a lot so of course it affects hemoglobin levels in the body. The more and longer a person menstruates, the more likely it is that someone will experience anemia or hemoglobin deficiency. This study states that most respondents have a less regular eating frequency and rarely consume healthy foods such as vegetables and fruits. In addition, the diet of these adolescents is still quite bad because they more often consume snacks or fast food than healthy food. Diet has 3 important components including type, frequency and amount. One of the causes of anemia is the lack of intake of nutritious foods such as animal protein, green vegetables and other foods that are sources of iron.(Sri Atik, Susilowati, and Kristinawati 2022; Janneta Sukarno, Marunduh, and C Pangemanan 2016)

From the results of research related to the relationship of nutritional status to Hemoglobin levels there is a significant relationship. This study is in line with research conducted by Karina et, al. (2016) entitled "Relationship between Body Mass Index and Hemoglobin Levels in Adolescents in West Bolangitang District, North Bolaang Mongondow Regency" states that there is a relationship between body mass index and hemoglobin levels. Conditions in adolescents with good nutritional status with anemia are caused by the content of nutrients in food, especially iron consumed is not fulfilled, especially when these students prefer to eat fast food or junkfood, not nutritious food so that it affects the lack of absorption of iron and disrupts the formation of hemoglobin and causes insufficient oxygen supply in the blood and ends in anemia. So sufficient food consumption does not guarantee adequate iron in it. In addition, this study also found poor nutritional status with abnormal hemoglobin levels as

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many as 9 respondents. Adolescents with poor nutritional status with anemia are caused by poor nutritional intake so that the body's needs are not met, especially iron needs. Iron is one of the important components in the formation of hemoglobin. The need for iron in the body can reduce the amount of red blood cell building blocks, so that red blood cells cannot perform their function in supplying oxygen, causing anemia. This is in line with research conducted by Mayulu N (2013) which states that iron intake has a significant relationship with the incidence of anemia, namely 45 out of 110 respondents experienced anemia due to lack of nutrient intake. In this study, it was also found that there was 1 respondent who had an obese nutritional status with abnormal hemoglobin levels. Adolescents with more nutritional status or even obesity are caused by the accumulation of fat cells in adipose tissue which can reduce iron absorption.(Janneta Sukarno, Marunduh, and C Pangemanan 2016; Arifin, Mayulu, and Rottie 2013; Eftekhari, Mozaffari-Khosravi, and Shidfar 2009)

CONCLUSION

Based on the results of research on students of SMAN 3 Bone, it can be concluded that the majority of samples have normal nutritional status and hemoglobin levels. And there is a significant relationship between nutritional status and hemoglobin levels. Suggestions for respondents are that students are expected to maintain hemoglobin levels to stay within the normal range so as to reduce the rate of anemia. And for future researchers, it is necessary to conduct further research that can affect hemoglobin levels such as nutrient intake, diet, menstrual patterns and other physical activities.

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