

LETTER TO EDITOR

The Effect of Red Bean Soup (*Phaseolus Vulgaris L*) on Hemoglobin Levels of Female Students at Nusantara Kupang Health Vocation High School

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Dear Editor

Hemoglobin is needed to carry oxygen and its level for each individual is different, influencing factors include gender and age. Anemia is defined as a decrease in circulating hemoglobin concentration (1). The causes of anemia are generally very diverse. It is caused by insufficient production of red blood cells, excessive blood loss, the quick destruction of red blood cells, and certain diseases (2). This causes symptoms such as fatigue, weakness, dizziness, and shortness of breath. Nutritional, folate, vitamins B12 and A deficiencies, can be causes of hemoglobinopathies (3). Red beans are a type of *Phaseolus vulgaris L* which can live in tropical areas, and contain protein, fat, carbohydrates, fiber, calcium, phosphorus, iron and folic acid (4). This study aimed to determine the effect of red bean soup on hemoglobin level of female students at Nusantara Kupang Health Vocational School.

A quasi-experiment research with a pre-test and post-test group design was conducted in Nusantara Kupang Health Vocational High School

for grade 1 class 10 female students in January 2021 experimental and control groups. Exclusion criteria were students who had a history of chronic illness, students who experienced illness and treatment at the hospital, and students who were not ready to become respondents. Red bean soup was provided in a cup container with a volume of 100 grams, which was given 6 times a week. Hemoglobin level was determined using the SAHLI method. Kolmogorov-Smirnov and bivariate analysis and Wilcoxon test were conducted using SPSS software considering a P-value level <0.05 for significance.

Eighty female students were enrolled. The hemoglobin level before in both groups was presented in Table 1 showing that 40 subjects with low hemoglobin level experienced an increase in hemoglobin level after treatment. In control group, an increase in hemoglobin level happened from 32.5% to 57.5%.

Giving red bean soup was shown to have an impact on changes in hemoglobin level because red beans contain 10.3 mg of iron from 100 grams of edible

Table 1: Characteristics of hemoglobin level in the two study groups.

Hemoglobin levels classification	Experimen group				
	Pre-test		Post-test		
	n	%	n	%	
Normal (>12 g/dL)	0	0	40	100	
Low (<12 g/dL)	40	100	0	0	
Count	40	100	40	100	
	Control group				
	Pre-test		Post-test		
Normal (>12 g/dL)	27	67.5	17	42.5	
Low (<12 g/dL)	13	32.5	23	57.5	
Count	40	100	40	100	
Percentage of increase in hemoglobin level in experimental group					
	Hemoglobin level (g/dL)		Increase difference (g/dL)	Percentage increase (%)	
	Pre-test	Post-test			
Average	10.0	12.8	2.05	1.19	
Min	9.7	12	0.4	1.03	
Max	11.8	13.4	3.3	1.34	
Percentage of increase in hemoglobin level in control group					
	Hemoglobin level (g/dL)		Increase difference (g/dL)	Percentage increase (%)	
	Pre-test	Post-test			
Average	12.18	11.6	-0.6	0.96	
Min	11	10.4	-2.8	0.79	
Max	13.2	12.7	1.2	1.11	
Analysis with the Wilcoxon test					
Sample group (n=40 for each group)	Amount of hemoglobin increase	Amount of hemoglobin decrease	No changes	Mean Rank	p
Experimental	40	0	0	20.50	0.000
Control	6	22	12	11.00	0.001

n: number; g/dL: grams per deciliter

weight (4). Apart from food intake and physical activity, hemoglobin level is also influenced by stress factors and nutritional status. In an experimental study with one group pre- and post-test by the Institute of Health Science STRADA Indonesia on 18 female students with mild anemia, it was found that all samples experienced a change to become non-anemic after being given boiled red beans (5). The content of iron in boiled red beans has health benefits in preventing iron deficiency anemia in adolescents. The results of the two groups showed that hemoglobin level <12 g/dL significantly increased with an average of 1.25 g/dL (6). Giving red beans in pregnant women in Surakarta City in the work area of the Ngoresan Public Health Center illustrated an increasing hemoglobin level in pregnant women (7). One study conducted in German female students and staff aged 18-30 years with body weight <65 kg revealed a fractional increase in absorption of iron (8). In the analysis of 269 students in demonstrated that feeding for 104 days with an average intake of 504 mg *Phaseolus vulgaris* showed increased total body iron concentrations in the intervention and control groups (9).

Our findings have also shown that red bean soup (*Phaseolus vulgaris L*) had a positive effect on significant increasing hemoglobin level among Kupang Archipelago Health Vocational School students with an average of 2.05 g/dL. So the content of iron in red beans can be used as a food ingredient of choice in meeting the needs for iron, especially for school-age girls.

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Conflict of Interest

None declared.

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