Effectiveness of Green Beans and Soybeans in Increasing Hemoglobin and Oxygen Saturation Levels in Adolescents

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Abstract—Objectives: The purpose of this study was To know effectiveness of green beans and soybeans in Increasing levels of Hemoglobin and Oxygen Saturation method: This research is a kind of non-randomized quasi-experimental pre-test post-test. Samples were taken by using purposive sampling method that meet the inclusion and exclusion criteria. Instruments in this study using the Hemoglobin Testing System Quick Check Oxymetri data sets and research results will be processed by using paired t test, Sample in this study consisted of 64 students.

Result and discussion: The results of this study on a group of green beans or a group of soybeans have different hemoglobin levels before and after treatment, whereas in the group of green beans have a value thitungsebesar 2.266 with a significance level ρvalue amounted to 0,030, and in the group of beans and the difference in oxygen saturation before and after treatment, this is evidenced by the results of the statistical test t where the group of green beans have a value of 3,325 t ρvalue significance level of 0.002, and in the group of soybeans have tcount of 2.912 with a significance level of 0.006. Conclusion: There are differences in levels of hemoglobin and oxygen saturation in the group of green beans with soy bean group before and after treatment.

Keywords: teens, hemoglobin, green beans

I. INTRODUCTION

In the era of globalization occur very intense competition in various aspects, therefore we need qualified human resources. Health and nutrition are the most powerful factor in resource manusia.18 In Indonesian society. According to the WHO in 2013 the prevalence of anemia ranges from 40-88% of the world population of adolescents 26.2%. In Indonesia, 57.1% suffered by pregnant women and adolescents [5].

Basic Health Research (RISKESDES) 2013 national report tshun 15-14 anemia 26.4% and 18.4% of people aged 15-24. Women tend risk terkenaanemia especially teens, high incidence of early marriage 48% menggakibatkan kejadiananemia is the effect of teenage pregnancy sebanyak48 per 1,000 live births. Beresikokematian pregnant with maternal anemia caused bleeding of childbirth [4].

Adolescence is a transition period from the time change to adult children who experience a lot of changes from various aspek.13 Thus requiring more nutrients, requires optimal nutrition for its future

growth and development. 15 Nutritional problems in adolescents one of which is anemia anemia can cause immune deficiencies, lowered aktivitasdan school performance because of lack of concentration [10].

Anemia is caused by several factors among her nutritional intake is less, in addition to the menstrual patterns, knowledge of anemia, on the nutritional status also affected. The amount of iron that is released by the body sekitar1,0mg / day for women plus 0.5mg concealment during menstruation. Iron is absorbed only 10% of consumption in required by women 15 mg. 2 The iron requirement can be obtained by consuming tablets fe, but the iron in the supplements if taken in large quantities can give some side effects such as damage to the intestinal lining, shock and heart failure [6]

Another way to meet the body's need for iron dlalam is to consume foods that contain lots of iron, for example green beans and soybeans. Green beans and soybeans can be processed into food and drinks fresh. And there are also many in the market making it more easily available (Winarsi, 2010).

Results of a preliminary study carried out in the town of Tasikmalaya that many of anemia in adolescents. Results crawl hemoglobin levels in adolescents tigkat SMA / MA or equivalent undertaken by the City Health Office Tasikmalaya prevalence of anemia among adolescent in Tasikmalaya in 2012 amounted to 12.8% in Tasikmalaya district was within 4 years of the incidence of anemia has increased notably in 2015 [8].

II. MATERIAL AND METHODS

This research is a kind of non-randomized quasi-experimental pre-test post-test. In this study, researchers conducted a study the levels of hemoglobin and oxygen saturation before and after intervention. The intervention provided in the form of consuming processed soybeans and peanuts hijau.alat used in this study are digital and oximetri HB. Data were processed using t test and paired t test.

III. RESULTS

TABLE 1: DIFFERENCES IN HB AND OXYGEN SATURATION IN THE GROUP OF GREEN PEAS AND SOYBEANS BEFORE AND AFTER TREATMENT ON VOCATIONAL STUDENTS "B"

Group	Treatment	mean	Difference	t	ρvalue
Green beans	HB Before After HB	12.7676 12.9941	.2265	2,266	0,030
Soybeans	HB Before After HB	11.6765 11.7765	0.1000	2,171	0,037
Green beans	saturation before saturation after	97.6167 98.0882	.4706	3,325	0,002
Soybeans	saturation before saturation after	96.7059 97.5588	.8529	2.912	0,006

Based on Table 1 Based on the results of the second test shows that the treatment group is better than the green beans soybeans treatment group in improving hemoglobin concentration and oxygen saturation.

TABLE 2

HB levels	Treatment	mean	Difference	t	ρvalue
Before	Green beans Soybeans	12.7676 11.7765	.9911	2,884	0,005
After	Green beans Soybeans	12.9941 11.6765	1.3176	3,580	0,001
oxygen saturation	Treatment	mean	Difference	t	ρvalue
Before	Green beans Soybeans	97.6167 96.7059	.9117	2,054	0,044
After	Green beans Soybeans	98.0882 97.5588	.5294	2,165	0,034

Statistical test results obtained value of 2,884 t with a significance level (ρvalue) of 0.005, this shows that there are differences in Hb group of green beans with soy bean group before treatment. And the statistical test result obtained tcount of 2,165 with significance level (ρvalue) of 0.034, this shows that there is a difference in oxygen saturation in the group of green beans and soy beans group after treatment.

IV. DISCUSSION

Based on the research that has been conducted regarding the differences in levels of hemoglobin in the group of green beans with a group of soybeans before and after treatment showed that both before and after treatment in the group of green beans with groups of soybeans have different levels of hemoglobin, the result is evidenced by the statistical test t wherein the difference before treatment in the group of green beans and soybeans have tcount amounted to 2,884 with ρvalue significance level of 0.005, and the difference after treatment in the group of green beans to soybeans have tcount of 3.580 with a significance level of 0.001. Thus both these variables have a significant difference in Hb levels both before and after the treatment because it has a smaller ρvalue value of α (0.05).

This is in accordance with the opinion Astawan (2009) that the green beans in addition contains iron, vitamin C, and zinc that play a role in the treatment of iron deficiency anemia. Green beans also contain vitamin A by 7 mcg in a half cup. Vitamin A deficiency may worsen iron deficiency anemia. Vitamin A supplementation has beneficial effects on iron deficiency anemia. Vitamin A has many roles in the body, among other things for the growth and differentiation of cells progenitoreritrosit, the body's immunity against infection and mobilization of iron stores throughout the network. The interaction of vitamin A to iron is synergistic. Based on the numbers, the protein is a second major preparation after carbohydrate. Green beans contain 20-25% protein. Proteins in raw green beans has a digestibility of approximately 77%. Digestibility is not too high is caused by the presence of substances antigizi, such as anti-trypsin and tannins (polyphenols). To improve the digestibility of the protein, green beans must be processed first through the cooking process, such as boiling, steaming, and roasting (Astawan M, 2009).

From the above it can be assumed that the drink green beans can increase hemoglobin levels in the blood were significantly because it contains iron, vitamin C, and zinc and vitamin A has many roles in the body, among other things for the growth and differentiation of cells progenitoreritrosit, immunity the body against infection and mobilization of iron stores throughout the network, it is recommended for teenagers or college student to take the green beans during menstruation or after menstruation as to prevent iron deficiency anemia.

The difference in oxygen saturation in the group of green beans with a group of soybeans before and after treatment showed that both before and after treatment in the group of green beans with groups of soybeans has the distinction of oxygen saturation, this result proved by the statistical test t where the difference before treatment in group of green beans and soybeans have tcount of 2.054 with a significance level ρvalue amounted to 0,044, and the difference after treatment in the group of green beans with soy beans have a value of 2,165 t with a significance level of 0.034. Thus both these variables have a significant difference in oxygen saturation before and after the treatment because it has a smaller ρvalue value of α (0.05).

V. CONCLUSIONS

There are differences in levels of hemoglobin and oxygen saturation in the blood after administration of

green beans and soybeans. The most influential is the green beans.

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