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Analysis of Hemoglobin Levels and Hematocrite Value in Stunting Children in Bukit Sileh, Solok Regency

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ABSTRACT
Stunting is a linear growth syndrome that fails,according to the Ministry of Health, the stunting category is children under five with a z-score of less than -2SD called stunted. The Basic Health Research (Riskesdas) in 2018 stated that the incidence of stunting decreased from 37.2% to 30.8%. Hemoglobin is a protein complex consisting of heme containing iron and globin in which Hb is an important part which is the main oxygen-carryingpigment and is present in erythrocytes. Hematocrit is a measurement result that states the ratio of red blood cells to blood volume. The prevalence of stunting in West Sumatra is also high at 36.1% with 11.2% very short and 24.9% short. For the Solok Regency area, including the stunting rate No. 3 in West Sumatra. Methods This research is quantitative research with descriptive design with cross sectional approach. Theresearch was conducted at Bukit Sileh Health Center. Children under five who are categorized as stunting are short 30 people and very short 30 people. Statistical tests were carried out using the Paired Sample t-test with a significance level of Sig.(2-tailed) <0.05. The results of the study the averagehemoglobin level in short children was 10.74±0.35 while the average for Hb levels in very short children was 10.65±3.8. The results of the study the average hematocritlevel in short children was 32.37±1.07, while the average hematocrit level in very short children was 32.31±1.27. Statistical test results obtained Sig. (2-tailed) 0.00 <0.05. Which means there is a significant difference. From the results of the study, it can be concluded that there is an effect of Hemoglobin Levelsand Hematocrit Values in the categories of short and very short children.

Keywords: *Hemoglobin, Hematocrit, Stunting Children.*

1. INTRODUCTION

Stunting is a linear growth syndrome that fails, according to the Ministry of Health, the stunting category is a child under five with a z-score of less than -2SD called stunted. The Basic Health Research (Riskesdas) in 2018 stated that the incidence of stunting decreased from 37.2% to 30.8%. The prevalence of stunting in West Sumatra is also high, namely 36.1% with 11.2% very short and 24.9% short. For the Solok Regency area, including the stunting rate No. 3 in West Sumatra after Pasaman, West Pasaman and the third is Solok Regency.

Hemoglobin (Hb) is a protein complex consisting of hemecontaining iron and globin in which Hb is an important part which is the main oxygen-carrying pigment and is present in erythrocytes. The series of hematopoiesis starts from the yolk sac, spleen, liver, and finally bone marrow, which is followed by variations in Hb synthesis [5].

Hematocrit is a measurement result that states the ratio of red blood cells to blood volume. The word hematocrit comes from the Greek words hema which means blood, and krite means to judge or measure. (Cernadas et al,2018).

This research was conducted in the area of Bukit Sileh Public Health Center. For data on children under five who are categorized as stunting, namely Very Short there are 39 people and Short there are 60 people, from the total number of toddlers 512 toddlers data as of August 2020, which was obtained at the Bukit Sileh Health Center. This research will be carried out from April 2021 to March 2022. The population in this study is stunted children who are in the working area of the Bukit Sileh Public Health Center, totaling 99 people.

2. METHODS

This research method is a quantitative study with a survey descriptive design, namely research that tries to present quantitative data from a particular population with the aimof generalizing the population based on a predetermined sample with a cross sectional time approach.

Data Collection Method

i. Subjects were selected according to the research criteria. Parents of prospective research subjects were provided with information about this study and were then asked to sign an informed consent form before becoming research subjects. Parents who refused were not included in the study.

ii. Check Hb and Ht levels using a Hb meter. Taken from arterial peripheral blood at the fingertip, 10 L of blood is taken. Immediately after the blood sample is obtained, it is inserted into the test strip area on the Hb meter. Hb and Ht levels can be seen after 15 seconds on the Hb meter

3. RESULT AND DISCUSSION

Table 1. Characteristics of Respondent Based on Sex

	f	**Percentage**
Man	24	40
Women	36	60
Total	60	100

Table 2. Characteristics of Respondent Based on Ages

Characteristic	**Age**	**F**	**Percentages**
Short	2	6	10
Very Short	2	6	10
Short	3	7	11,7
Very Short	3	9	15,0
Short	4	8	11,7
Very Short	4	7	11,7
Short	5	7	11,7
Very Short	5	10	16,7
Total		60	100

The characteristics of the age of toddlers in table 1, shows the female sex of stunting toddlers is 60%. This contradicts the research of Roscha, et al (2013) whichstates that stunting toddlers are more male than female. This is because boys need more protein energy than girls. However, this is in accordance with research in Nigeria that stunting under-fives were more female (50.3%) [11]. The characteristics of children under five in table 2 show that the distribution of stunting under five is evenly distributed in each age group, namely 2-5 years. In addition, the interaction of the external environment can also increase the occurrence of infectious diseases and canincrease the risk of stunting. The results of the study the average hemoglobin level in short children was 9.74 ± 1.95 while the average Hb level in very short children was 8.64 ± 2.11. Statistical test results obtained Sig. (2-tailed) 0.00 <0.05. Which means there is a significant difference.

Table 3 Average Hb levels of stunting children in Bukit Sileh

Hb	Mean	Std Deviation	Sig (2-tailed)
short	9,74	±1,95723	,000
Very short	8,64	±2,11851	,000

The results of the study the average hemoglobin level in short children was 9.74 ± 1.95 while the average Hb level in very short children was 8.64 ± 2.11. Statisticaltest results obtained Sig. (2-tailed) 0.00 <0.05. Which means there is a significant difference.

The results of this study are in line with the research of Ayoya et al which stated that there was a significant relationship between stunting under five and the incidence of anemia. Anemia and stunting can occur together because each individual has a risk for developing complex nutritional problems.

Stunting toddlers have a risk of developing anemia 2 to 3 times greater than toddlers with normal height. Lowlevels of hemoglobin can be caused by several factors, including low intake of nutrients, especially iron, bleeding, repeated infections, and low iron supplies in the body.

Environmental factors that cause stunting include nutritional status of the mother, insufficient protein in the proportion of total calorie intake, feeding patterns to children, environmental hygiene, and the incidence of infection in the early life of a child, in addition to environmental factors can also be caused by genetic and hormonal factors, however, most of the short stature iscaused by malnutrition.

Table 3 mean Ht levels of stunting children in Bukit Sileh

Ht	Mean	Std Deviation	Sig (2-tailed)
Short	31,37	±5,91	,000
Very Short	30,31	±6,95	,000

The results of the study the average hematocrit level in short children was 31.37±65.91, while the averagehematocrit level in very short children was 30.31±6.95. Statistical test results obtained Sig. (2-tailed) 0.00 <0.05. Which means there is a significant difference.

Hematocrit is a measurement result that states the ratio of red blood cells to blood volume. Hemoglobin and hematocrit have long been used as indicators of a person's iron status compared to other tests.

If nutrition is not fulfilled properly, the impact will have short-term and long-term effects. Symptoms of short-term stunting include developmental barriers, decreased immune function, brain development that is not optimal which can affect mental abilities and learning is not optimal, and poor learning achievement. While long- term symptoms include obesity, decreased glucose tolerance, coronary heart disease, hypertension and osteoporosis.

4. CONCLUSIONS & SUGGESTIONS

Cross-sectoral collaboration to identify and detect so that children do not fall into stunting status where therewill be a growth failure condition in children (body and brain growth) due to malnutrition for a long time, so that children are shorter or shorter in stature than normal children of their age and have delays in thinking. Generally caused by food intake that is not in accordance with nutritional needs. communicating behavior to change habits or traditions from generation to generation that can affect children's growth and development, especially in offering food, parenting factors and the family in chargeof the program both at the primary health care and at the health office.

AUTHORS' CONTRIBUTIONS

The author's contributions in this study include preliminary surveys, proposal makers, licensing administrators, conducting research data collection activities, conducting data analysis, making reports, and making research manuscripts for publication.

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