



THE RELATIONSHIP BETWEEN STUNTING AND STUDENT LEARNING ACHIEVEMENT IN ELEMENTARY SCHOOL/MINISTRY IN THE WORKING AREA OF LIGAN PUSKESMAS, ACEH JAYA DISTRICT

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Abstract

The incidence of stunting (short) under five is a major nutritional problem in all countries. Based on three years of nutritional status monitoring (PSG) data, stunting in Indonesia shows that stunting has the highest prevalence compared to other nutritional problems such as malnutrition, wasting, and obesity. This is due to the pregnancy process of mothers who experience malnutrition during pregnancy, low Early Breastfeeding Initiation (IMD), and inadequate provision of MP-ASI. This study aims to determine the relationship between stunting and student achievement in SD/MIN schools in the work area of the Ligan Health Center, Aceh Jaya Regency. This study uses a type of quantitative research. The population of this study were all SD/MIN students in the working area of the Ligan Health Center, Aceh Jaya Regency in 2022. The respondents used were students aged 7-12 years and had complete report cards. Researchers took samples using the consecutive sampling method. The samples obtained were 49 samples from different schools. This research was conducted in 3 schools in the working area of SD/MIN Puskesmas Ligan, Aceh Jaya Regency. There were 18 children from SD 12, 15 children from SD 2 and 17 children from MIN 8. The statistical test analysis used the Chi-Square Test, while the student measurements used a meter, then plotted onto the CDC-2000 curve to see TB according to age. The research results obtained 49 students as respondents. The average respondent was found at the age of 7 years (30.6%), and the least was found at the age of 12 years (6%). The results of the analysis test showed that there was no significant relationship between stunting and learning achievement ($0.452 > 0.05$). Conclusion: There is no significant relationship between stunting and student achievement.

Keywords: *Stunting, Learning Achievement*

1. INTRODUCTION

The incidence of stunting (short) under five is a major nutritional problem in all countries. According to WHO (2016), in 2015 the country of Kuwait ranked first with the lowest stunting incidence, namely 4.9%. The incidence of stunting in Indonesia based on Nutrition Status Monitoring (PSG) data for three years, stunting has the highest prevalence compared to other nutritional problems such as undernutrition, underweight, and obesity. The prevalence of short toddlers has increased from 2016, namely 27.5% to 29.6% in 2017 (Ministry of Health, 2018). According to stunting data obtained from SSGI research (Indonesian Nutrition Study Survey) in

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2021 Aceh province with a prevalence of 33.2%. Whereas in Aceh Jaya District the prevalence obtained was 33.7%.

stunt occurs as a result of the pregnancy process of mothers who experience malnutrition during pregnancy, low Early Breastfeeding Initiation (IMD), and inadequate provision of complementary food for ASI (MP-ASI) (Ministry of Health, 2018). Stunting has short and long term impacts on children. In the short term, the child's cognitive, motor, and verbal development is not optimal, and the most serious is death, while in the long term, body posture is not optimal as an adult, increasing the risk of obesity, decreasing reproductive health, and not working productivity optimally. (Ministry of Health, 2018).

Child achievement is the same as cognitive where cognitive is a pattern of changes in mental abilities which include learning ability, concentration, thinking, creativity and language (Khadijah, 2016). According to Aryastami (2017), stunting has an impact on decreasing children's intellectual and cognitive abilities. Meanwhile, according to Yadika et al. (2019), with the title "the effect of stunting on cognitive development and learning achievement". The purpose of this study was to review the effect of stunting on cognitive development and learning achievement. The results of the study show that there is an effect of stunting on cognitive development and learning achievement. The similarity of this research with the research conducted is that the independent variable is stunting. The difference is the location of the research,

According to several previous studies, children's growth retardation is influenced by various factors. Wellina et al. (2016) added that one of the risk factors for stunting is lack of nutritional intake in the long term, so that it has an impact on children's growth and affects the nutritional status of infectious diseases. In fact, this can lead to acute weight loss and affect the nutritional status of toddlers if it occurs for a long time. Infectious diseases easily attack toddlers if they have a low nutritional status of the immune system.

Based on the results of interviews with doctors at the Ligan health center, there are many students experiencing stunting at SD/MIN schools in the working area of the Ligan health center, Aceh Jaya sub-district in 2022.

The general objective of this study is to determine the relationship between stunting and student achievement in SD/MIN in the working area of the Ligan Health Center, Aceh Jaya District in 2022.

2. LITERATURE REVIEWS

Stunting definition

stunt or dwarfism is a condition in which a child has a length or height that is less than his age, and when viewed from a growth curve it is less than -2 standard deviation (SD). The normal value in the growth curve for length/height according to age is -2 SD to +2 SD (Ministry of Health, 2018). Stunting is a condition where a child is too short for his age due to growth failure caused by poor nutrition and child health before and after birth. Stunting was defined as height for age below -2 standard deviations according to the growth curve. Stunting is also considered a failure of linear growth in children due to long-term malnutrition.



In 2017, stunting under five in the world consisted of 29% in Africa and 55% in Asia. The incidence of stunting in South Asia has the largest proportion, namely 58.7%, followed by Southeast Asia 14.9%, East Asia 4.8%, West Asia 4.2%, and Central Asia 0.9% with the smallest proportion. Indonesia ranks third among countries in Asia with a stunting rate of 36.4%, after Timor Leste 50.2% and India 38.4%. The condition of stunting in Indonesia has fluctuated from year to year. Based on Basic Health Research data for 2018, stunting in children under five in Indonesia is 30.8%. This figure has decreased compared to 2013 (37.2%) and 2010 (35.6%). Children who experience stunting have an impact on stunted growth and are irreversible.

Factors Associated with Stunting Risk

a. Genetic Relationship with Stunting Risk

Genetics is one of the main factors that causes stunting. According to Latif & Istiqomah (2017), the mechanism for short genes being passed from parents to their children occurs through the mechanism of inheritance of the imprinting genome. According to Larasati (2018) it was explained that the phenomenon of genome imprinting is a genetic phenomenon that becomes inactive because it is possibly caused by one segment of the autosome being inactive. The imprinting mechanism is influenced by the mother's environment, especially during pregnancy, for example the environment does not support adequate maternal nutritional intake. The mother's environment can affect the expression time of developmental genes that come from parents to be passed on to their children.

The gestation period is a period when the fetus experiences growth and development and its nutritional needs are very dependent on the mother, so the nutritional adequacy of the mother during pregnancy is one of the factors that affect the developing body of the fetus. Fetal growth can run well if the mother's nutritional intake is sufficient. Birth length describes the linear growth of the baby while in the mother's womb. The poor nutritional state of the mother causes the growth of the baby's linear size to be low as a result of the insufficient energy and protein that the baby receives. A state of malnutrition that begins with fetal growth retardation is known as intra uterine growth retardation (IUGR). The condition of IUGR is closely related to LBW, and this affects the length of the baby at birth. Infants with a long history of low birth weight (<48 cm) have a risk of 2.

b. Correlation between Infectious Disease Status and Stunting Risk

Infectious diseases are another factor that causes stunting, both infectious diseases suffered by mothers during pregnancy and infections suffered by children after birth. Infectious diseases cause a diversion of the body's energy to repair damaged cells and can reduce the patient's appetite so that it can cause nutritional deficiencies. Examples of infectious diseases are diarrhea and ARI (Lift, 2018).

The incidence of infection is a symptom of a disease in children which greatly affects the decrease in the child's appetite, so that the child's food intake decreases. If there is a decrease in the child's food intake for a long time, as well as experiencing vomiting and diarrhea. So it can experience a lack of nutrients and fluids. This will affect drastic weight loss in children who have good nutrition before experiencing infectious diseases (Prakhasita, 2018).

c. The relationship between feeding patterns and the risk of stunting

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Diet is one of the growth processes in toddlers which plays a very important role because food contains nutrients. Nutrition is the most important part that influences the growth and development of toddlers. Intelligence and health have a very close relationship with nutrition. The risk is that if the toddler's diet is not achieved properly, the growth and development of the toddler will be disrupted, such as growing thin, short and even malnutrition can occur in toddlers (Delfanti et al. al, 2018).

Malnutrition and stunting are two interrelated problems. Stunting in children is the impact of nutrient deficiency during the first thousand days of life. This causes an irreversible disturbance of the child's physical development, thus causing a decrease in the child's achievement ability and a decrease in work performance. Stunted children have an average intelligence Quotient (IQ) score one point lower than the average IQ score for normal children. Disorders of growth and development in children due to malnutrition if they do not get early intervention continue into adulthood. so that stunting in toddlers needs to get special attention because it can cause delays in physical growth, mental development and health status in children (Delfanti et al, 2018).

d. The relationship between body weight and the risk of stunting

Weight is one way to measure a person's body. Body weight is very easy to determine the shape of a person's index in terms of weight for age (BB/U) and weight for height (BB/TB) according to current conditions (Putra, 2016).

The cause of stunting is when food intake is not balanced, low birth weight (LBW) and infectious diseases. This is the main factor for stunting. A study shows that toddlers who have low birth weight have a 2.3 times greater risk of experiencing stunting compared to toddlers who have normal birth weight (Winowatan et al, 2017).

Toddlers who have low birth weight tend to experience obstacles to their growth and development, and can affect the decline of intellectual function in children. It is susceptible to infection and hypothermia. Even in developed countries, toddler's height is the main factor that affects toddler's weight. Toddlers who have low birth weight are most likely to be shorter children than children born with normal weight (Dalimunthe, 2015).

Stunting Impact

stuntis a condition where the child has a height or body length that is not appropriate or less when compared to age. The impact caused by stunting results from various factors such as low birth weight, inappropriate child stimulation and caregivers, inadequate nutritional intake and recurrent infections as well as various other environmental factors. The impact obtained by stunting is the occurrence of long-term malnutrition in children which ultimately causes linear growth retardation, this is one of the effects of stunting (Fika et al. 2017).

Stunting has short-term and long-term impacts that can affect the quality of life of sufferers. The short-term and long-term impacts are reviewed from a health, development, and economic perspective. The short-term impact from a health perspective is an increase in morbidity and mortality. The short-term impact from a developmental point of view is a decrease in the



patient's cognitive, motor, and language development functions. The short-term impact from an economic perspective is an increase in health costs for sufferers' families. Furthermore, the long-term impact in terms of health is short body posture, increased risk of obesity, and related comorbid diseases. Long-term impact in terms of the development of learning potential because brain development is disrupted.

Adverse effects that can be caused by short-term stunting are impaired brain development, intelligence, physical growth disorders, and metabolic disorders in the body. Meanwhile, the long-term adverse effects that can be caused are decreased cognitive abilities and academic achievement, decreased immunity so that you get sick easily, and a high risk of developing diabetes, obesity, heart and blood vessel disease, cancer, stroke and disability in old age. So that for children who are stunted, there is a possibility of a history of growth and development disorders in the past which is a critical period, especially in brain development, stunting is associated with poor performance in terms of learning achievement, including deficits in literacy, numeracy, reasoning, and vocabulary. and others (Oot et al., 2016). It is also associated with lower overall school achievement, and children who are retarded are more likely to be later enrolled in school, repeat grades, be absent from school, drop out, and fail at least one grade. This is reinforced by several studies showing the impact of stunting on children's academic achievement in a number of subjects, such as mathematics which requires the ability to count (Oot et al, 2016).

Stunting Prevention

stuntis a health problem that can be prevented early on, starting in the womb to the golden period of child growth. Some ways to prevent stunting are:

1. Fulfillment of nutrients for pregnant women
2. Exclusive breastfeeding until the age of 6 months and after 6 months is given complementary food (MP-ASI) in sufficient quantity and quality.
3. Increasing access to clean water and sanitation facilities, as well as keeping the environment clean.
4. It is highly recommended that children aged 3 years consume 13 grams of protein containing essential amino acids every day, which are obtained from animal sources, namely beef, chicken, fish, eggs and milk.
5. Diligently measure children's height and weight every time they check their health at posyandu or other health facilities to monitor children's growth and development and detect early developmental delays (MCA Indonesia, 2015).

The perspective article for the last 4 years has underlined the most important thing in efforts to reduce the incidence of stunting, namely the focus of intervention on young women, especially at the age of one year before puberty. Stunting occurs in the nutritional cycle that involves women of childbearing age, and appropriate interventions for young women will have intergenerational effects such as reducing the risk of stunting in their children in the future (MCA Indonesia, 2015).

Learning achievement

Learning achievement is an assessment of the results of learning activities that are expressed in the form of symbols, numbers, letters, or sentences that can reflect the results that have been achieved by each child in a certain period. Learning achievement is something that

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cannot be separated from learning activities, because learning activities are a process, while achievement is the result of the learning process. School children's learning achievement can be known after conducting an evaluation. The results of the evaluation can show the high or low student achievement (Ridwan in Picauly,2013).

Many studies show that the nutritional status of school children who are good will produce a good degree of health and a good level of intelligence as well. Conversely, poor nutritional status results in poor health status, susceptibility to disease, and a low level of intelligence so that children's performance in school is also lacking. (Delfanti, 2018).

The effect of stunting on children's learning achievement

Stunting is a state of chronic nutritional deficiency which can indicate a disturbance in the body's organs, where one of the organs that is vulnerable and quickly damaged is the brain. The brain which is the nerve center in the human body plays an important role in carrying out functions to see, hear, think, and perform various types of movements. According to Delfanti (2018) said that saving children from stunting is very important, because it is related to intelligence and work productivity in the future as the next generation of the nation. Child achievement is the effect obtained from cognitive. Cognitive is a pattern of changes in mental abilities which include learning abilities, concentration, thinking, creativity, and language. The state of chronic nutritional deficiency in children aged 0-24 months causes delays in the process of maturation of brain neurons thereby inhibiting cognitive development and inhibiting the process of maturation of muscle function. This causes the child's curiosity to decrease in the future (Yadika et al. 2019). According to Yadika et al. (2019), the development of toddlers is assessed from three things, namely physically, cognitively, and psychosocially. Nutritional deficiencies from birth to 2 years of age can reduce a child's brain cells by 15-20%. This condition causes children's thinking and learning abilities to be disrupted, thereby reducing the level of attendance and learning achievement of children. Thus it can be concluded that there is an effect of stunting on the development of learning and intelligence (Wellina et al, 2016).

3. IMPLEMENTATION METHOD

Types and Research Design

The type of research conducted in this research is a quantitative type. While the research design is an analytic survey with cross sectional design. Retrieval of independent variable data in cross-sectional design research depends on the subject being studied and carried out at one time (Sugiyono, 2016). This type of research is a quantitative research. The type of data in this study is secondary data obtained from existing documents at SD/MIN in the working area of the Ligan Health Center, Aceh Jaya Regency.



Research sites

This research was conducted at SD/MIN in the working area of the Ligan Health Center, Aceh Jaya Regency.

Research time

This research was conducted from 23 May 2022 to 28 May 2022.

Research Population

This study uses a type of quantitative research. The population of this study were all students at SD/MIN in the working area of the Ligan Health Center, Aceh Jaya Regency in 2022. The respondents used were students aged 7-12 years and had complete report card scores. The researcher took the sample using the consecutive sampling method.

Research Sample

The samples obtained amounted to 49 samples from different schools. This research was conducted in 3 schools in SD/MIN in the working area of the Ligan health center, Aceh Jaya district. There are 18 students from SD 12, 15 students from SD 2 and 17 children from min 8.

Sampling Technique

The subject studied was a report document on the progress of learning achievement of SD/MIN students in the work area of the Ligan Health Center, Aceh Jaya Regency. Researchers took achievement results based on KKM student reports as a limitation for student improvement.

Research Instruments

Student progress reports

This data is secondary data and as a source of data from things to be observed. This secondary data contains data on the development of student achievement in SD/MIN in the work area of the Ligan Health Center, Aceh Jaya Regency based on the increase in the KKM score.

Data analysis method

Management of univariate and bivariate analysis data using Statistical Analysis software. Data analysis used the Chi-square test. Stunting in this study was determined by measuring height (TB) using a tape measure, then plotting it onto the CDC-2000 curve to see TB according to age, then using the Waterlow criteria (<95%) to determine whether or not stunting was stunting by calculating $TB/U \times 100\%$. Learning achievement is determined by looking at the average score of the odd semester exam results.

Objective Criteria

Research submits Ethical Clearance to ethical committees related to the protection of research subjects. Ethics that researchers need to guard against respondents are as follows.

1. Confidentiality of the respondent's identity
2. There is no coercion, the responder has the right to apply his willingness
3. Does not harm the respondent with the treatment given

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4. Respondents get explanation complete about research which is conducted.

4. RESULTS AND DISCUSSION

Research result

This research was conducted on May 23 and 28, 2022. The research was conducted at SD/MIN in the working area of the Ligan Health Center, Aceh Jaya Regency.

Overview of the Ligan Health Center

The Ligan Community Health Center (Puskesmas) is one of the implementing units within the district of Aceh Jaya that carries out operational tasks for health development at the sub-district level. Puskesmas Ligan has a very important role in the welfare of public health, because if the puskesmas functions properly, the services provided will also be good. In contrast, if the puskesmas is not functioning properly, it cannot help the community in terms of health when the community needs it. To be able to achieve this goal, the puskesmas must first be fully facilitated and overcome any problems experienced, so that the community is comfortable in the puskesmas' services.

Subject Characteristics

Data collection was carried out at SD/MIN in the working area of the Ligan Health Center, Aceh Jaya Regency. The research subjects were SD/MIN students in the working area of the Ligan Health Center, Aceh Jaya Regency and the data used were progress report documents and student profile documents. These documents were taken after obtaining permission from the SD/MIN principal in the working area of the Ligan Health Center, Aceh Jaya Regency. The documents used are documents of students aged 7-12 years who meet the inclusion criteria. Data on gender, age, height and weight were known from direct field practice on 23 May 2022-28 May 2022.

Discussion

a. Nutritional Status based on height/age and weight/age

Based on the results of research conducted at SD/MIN in the working area of the Ligan Health Center, Aceh Jaya Regency, an overview of the nutritional status of BB/TB was obtained which can be seen in the appendix that most of the subjects had good nutrition. Four student subjects had undernourished status and two student subjects had more nutritional status based on weight/height. If confirmed with BB/U and TB/U, the subject is included in the category according to the growth of students of their age. This indicates that the subject is experiencing acute nutritional problems because the value of BB/TB is not enough.

The distribution of height/age is 14 students (28.6%) for height 105-109, 110-114 for 13 students (26.5%), 115-119 for 14 students (28.6%), height 120-124 there are 6 students (12.2%), and height 125-129 there are 2 students (4.1%). While BB/U shows the number of students who have done the scales as many as 28 students get a weight of 16.00-20.90 kg (57.1%), 12 students



get a weight of 21.00-25.90 kg (24.5%), 8 students get a weight of 26.00 -30.90 kg (16.3%), and 1 student gains a weight of 31.00-35.90 kg (2.0%).

Nutrition is the most important thing that can affect the growth and development of students. This is related to the intelligence and health of these students. The risk is that if nutrition is unstable, the growth and development of students will be disrupted, such as growing thin, short and even malnutrition can occur in toddlers (Delfanti et al, 2018). Malnutrition and stunting are two related problems. This causes disruption of physical development, thus causing a decrease in student achievement abilities and a decrease in work performance.

According to the assumptions of researchers, food consumption can be one way to determine the level of nutritional adequacy. This means that the higher the frequency of food, the greater the chance of fulfilling nutritional adequacy. Factors that greatly influence the pattern of feeding is very closely related to one's eating habits. In general, the factors that greatly influence the formation of feeding patterns are economic, social and educational.

b. Stunting Prevalence

This research was conducted at SD/MIN in the working area of the Ligan Health Center, Aceh Jaya Regency, aged 7-12 years with a total of 49 students. This research was conducted from 23 May 2022 to 28 May 2022 from 3 SD/MIN schools in the working area of the Ligan Health Center, Aceh Jaya Regency. There are 18 students from SD 12, 15 students from SD 2 and 17 children from MIN 8 Aceh Jaya. The data taken in this study were age, height, gender, odd semester exam scores.

Based on the results of the research, the researchers found 30 male students (61.2%) and 19 female students (38.8%). According to age, there were 15 students (30.6) at 7 years old, 12 students (24.5) at 8 years old, 11 students (22.4%) at 9 years old, 4 students at 10 years old (8.2 %), at the age of 11 there were 4 students (8.2%), and at the age of 12 there were 3 students (6.1%). The most age of the respondents is 7 years (30.6%). The most respondents were in grade 1 SD (30.6%), and the least were in grade 6 SD (6.1%).

The results of this study are in line with research conducted by Agustin et al (2013) regarding the relationship between nutritional status and learning achievement of grades 4 and 5 of elementary school in Maing Village, Tuminting District, Manado City. The results of statistical analysis showed that there was no significant relationship between nutritional status and academic achievement. Likewise with the research conducted by Nirmala et al. (2018) regarding the relationship between stunting status and learning achievement in grades 4, 5 and 6 at SD Negeri 1 Mawasangka, Mawasangka District, Central Buton Regency, with a total sample of 36 stunted children out of 98 children. The results of the statistical test using the Mann Whitney test obtained a value of $P = 0.694$ (95% confidence level) which indicated that there was no significant relationship between stunting status and academic achievement.

According to the researcher's assumptions, respondents should be more focused in the teaching and learning process. Because stunting status does not affect student achievement, what needs to be improved is the attractiveness of learning to students. Motivating students is one way to improve student learning.

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c. The relationship between stunting and student achievement

The data collected in this research is secondary data. Secondary data includes data on student progress reports in the form of report cards in which there are values from the evaluation of student learning development and student profile data in which there is data on the age, gender of the student. Secondary data was obtained by requesting report card data and student profiles after obtaining permission from the SD/MIN school principal in the working area of the Ligan Health Center, Aceh Jaya Regency. The report card obtained by the researcher is the latest odd semester report card. Data collection was carried out by researchers.

Based on the results of the study, it was shown that there was a distribution of respondents according to grades, with a score of 75-79, there were 15 students (30.6%), with a score of 80-84, there were 26 students (53.1%), and with a score of 85-89, there were 8 students (16, 3%). The highest score obtained by the respondents was 80-84 (30.6%).

Student achievement can be influenced by many factors both from within themselves (internal factors) and from outside themselves (external factors). Good learning achievement is not only achieved with optimal nutritional intake but there are other things that can affect learning achievement including: (1) student learning motivation, (2) student learning concentration, (3) parental approach and attention to students who can shape the mentality and character of students, (4) student learning interests, and (5) the environment in which students grow and develop.

The development of student learning is determined based on the basic competencies listed in the Minister of Education and Culture of the Republic of Indonesia Number 146 concerning the 2013 Curriculum. Aspects that are measured in learning development include aspects of learning problem solving, aspects of logical thinking, and aspects of symbolic thinking. Measurement of learning progress is carried out by matching report card scores with reference to Basic Competency in the Minister of Education and Culture of the Republic of Indonesia Number 146 of 2014 concerning the 2013 Curriculum, according to directions from SD/MIN teachers in the working area of the Ligan Health Center, Aceh Jaya Regency.

The relationship between stunting and student achievement was tested by chi-square. The test results stated that there was no relationship between stunting and student achievement ($0.451 > 0.05$). The results of this study are in line with research conducted by Muchlis (2015), concerning the relationship between nutritional status and student achievement at the 063 State Elementary School on the coast of the Siak River, Rumbai Pesisir District, Pekanbaru City, totaling 93 students. The results of statistical tests using the chi-square test showed that there was no relationship between nutritional status and children's learning achievement ($P=0.771$).

But the results of this study are different from the research conducted by Yuniarti et al. (2014). and Arfines and Puspitasari (2017) who reported that there was a relationship between stunting and student achievement. This is caused by chronic malnutrition will cause a decrease in the number of cells in the brain and there is immaturity and imperfection of the biochemical organization in the brain. This situation greatly affects the development of students' intelligence.

The difference in the research results obtained may be due to differences in the population where the researchers conducted the research and the size of the population studied.



5. CONCLUSION

Based on the results of an analysis of the relationship between stunting and the learning development of SD/MIN students in the working area of the Ligan Health Center, Aceh Jaya Regency, it can be concluded that:

1. This research was conducted in 3 SD/MIN schools in the working area of the Ligan Health Center, Aceh Jaya district. There were 18 students from SD 12 (36%), 15 students from SD (30%) and 17 children from MIN 8 (34%).
2. The highest stunting was in grade 1 SD aged 7 years (31%), and the least was in grade 6 SD aged 12 years (6%).
3. There is no significant relationship between stunting and the learning development of SD/MIN students in the working area of the Ligan Health Center, Aceh Jaya Regency (0.451 > 0.05).

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