



Research Paper

## Determinants of Stunting Events in Primary School Children in Elementary School 188 Manunggal East Tomoni District 2019

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**ABSTRACT:** This study aims to analyze the determinants of stunting in primary school children at elementary school 188 Manunggal, East Tomoni District, East Luwu Regency. The form of statistical analysis used is a cross sectional design which is a form of research that assesses independent and dependent variables at the same time. This study aims to assess the influence of the determinant factors of stunting in primary school age children. This research was conducted at elementary school 188 Manunggal, East Tomoni District, East Luwu Regency in 2019. The population in this study were all elementary school children grades 1-6 at elementary school 188 Manunggal, East Tomoni District, East Luwu Regency using the Slovin formula. The sampling technique used in this study is totaling sampling. The method of collecting data uses observation sheets of height inspection. Data analysis techniques in this study used univariate analysis and bivariate analysis using the chi square test which is to find out the independent variables that have a relationship to the incidence of stunting on respondents. If the value of  $P$  value  $> 0.05$  then  $H_0$  is accepted and vice versa if the value of  $P$  value  $< 0.05$  then  $H_a$  is accepted. Based on the results of the bivariate analysis, the  $p$  value  $< 0.05$   $H_0$  was rejected, meaning that there was a significant relationship between maternal height and nutrient intake on stunting in SDN 188 Manunggal, East Tomoni District, East Luwu Regency, while in the environment  $p$  value  $> 0.05$   $H_0$  was accepted. Which means there is no relationship between stunting and the environment in elementary school 188 Manunggal, East Tomoni District, East Luwu Regency in 2019. In multivariate, logistic regression test results obtained the most dominant variable is the nutrition intake variable with a calculated value of  $p = 0.001$  smaller than the value of  $\alpha = 0.05$ .

**Keywords:** determinant; stunting

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### I. PRELIMINARY

Future Indonesian children must be healthy, intelligent, creative and productive. If children are born healthy, grow well and be supported by quality education, they will become the generation that supports the success of nation building. Conversely, if children are born and grow in situations of chronic malnutrition, they will become stunted children. Dwarf (stunting) in children reflects the condition of growth failure in children under five (Under 5 years) due to chronic malnutrition, so the child becomes too short for his age. Chronic malnutrition occurs from the baby in the womb until the age of two years. Thus the first 1000 days of life should receive special attention because it determines a person's level of physical growth, intelligence, and productivity in the future.

Stunting is a term for height that is below the 3rd or -2th SD in the normal growth curve that applies to the population. Height according to age (TB / U) can be used to assess the nutritional status of the past, the length of the body can be made alone, cheap and easy to carry. While the weakness is that height does not rise quickly so it is less sensitive to nutritional problems in the short term (Ministry of Health, 2010). There are several causes of short stature including inherited variants (familial), endocrine disease, chromosomal disease, chronic disease, malnutrition, history of previous breastfeeding, and family socioeconomic status. Broadly speaking, short stature is divided into two, namely familial and pathological conditions (Sherly, M, 2010).

In Indonesia, around 37% (nearly 9 million) of children under five are stunted (Basic Health Research / Riskesdas 2013) and throughout the world, Indonesia is the country with the fifth highest prevalence of stunting. Toddler / Baduta (babies under the age of two years) who experience stunting will have a level of intelligence

that is not optimal, making children more vulnerable to disease and in the future can be at risk of decreasing levels of productivity. In the end, stunting will be able to hinder economic growth, increase poverty and widen inequality.

Government efforts to improve the health of children, adolescents and WUS are still considered ineffective. This is evident from the inclusion of Indonesia in 17 countries that have problems caused by nutrition, namely stunting, wasting and overweight and entered in 47 countries out of 122 countries that have problems with stunting and WUS anemia. Anemia and stunting prevention programs that have been more focused on pregnant women, whereas children and young women are prospective mothers who must be healthy in order to have a healthy baby so that they will grow and develop into strong and quality human resources (Suryani et al., 2016). Children and adolescents are the age group that is in a phase of rapid growth, thus requiring relatively large amounts of nutrients. Children and adolescents not only grow in terms of size (higher or bigger), but also experience functional progress, especially sexual organs (Guidelines for Balanced Nutrition, 2014).

International experience and evidence shows that stunting can hamper economic growth and reduce labor market productivity, resulting in a loss of 11% of GDP (Gross Domestic Products) and reduce the income of adult workers by up to 20%. In addition, stunting can also contribute to widening inequality, thereby reducing 10% of total lifetime income and also causing inter-generational poverty. Based on these descriptions, the researchers are interested in conducting research on the determinants of stunting events in elementary school children.

## **II. LITERATURE REVIEW**

### **1. Stunting Review**

Short stunting or stunting is a terminology for height that is below the 3rd or -2 SD percentile on the normal growth curve that applies to that population. Height according to age (TB / U) can be used to assess the nutritional status of the past, the length of the body can be made alone, cheap and easy to carry. While the weakness is that height does not rise quickly so it is less sensitive to nutritional problems in the short term (Ministry of Health, 2010). Stunting in children is a key indicator in assessing the quality of human capital in the future. Growth disturbance suffered by children early in life, can cause permanent damage (Anisa, 2012). There are several causes of short stature including inherited variants (familial), endocrine disease, chromosomal disease, chronic disease, malnutrition, history of previous breastfeeding, and family socioeconomic status. Broadly speaking, short stature is divided into two, namely familial and pathological conditions (Sherly, M, 2010).

In addition to the above causes according to TNP2K other causes of stunting in Indonesia include poor parenting practices, including lack of maternal knowledge about health and nutrition before and during pregnancy, as well as after delivery. Some facts and information show that 60% of children aged 0-6 months do not get breast milk exclusively, and 2 out of 3 children aged 0-24 months do not receive complementary food breast milk (MP-ASI). MP-ASI was given / started to be introduced when toddlers aged over 6 months. Besides functioning to introduce new types of food to the baby, MPASI can also meet the nutritional needs of the baby's body which can no longer be supported by breast milk, as well as forming the body's immune system and the development of the child's immunological system for food and drink.

The limited health services including ANC-Ante Natal Care services (health services for mothers during pregnancy) Post Natal Care and quality early learning. Information collected from the Ministry of Health and World Bank publications states that the level of child attendance at Posyandu has declined from 79% in 2007 to 64% in 2013 and children have not yet had adequate access to immunization services. Another fact is that 2 out of 3 pregnant women have not consumed adequate iron supplementation and still have limited access to quality early learning services (only 1 in 3 children aged 3-6 years have not been registered in PAUD / Early Childhood Education services).

Lack of household / family access to nutritious food. This is because the price of nutritious food in Indonesia is still relatively expensive. Limited access to nutritious food in Indonesia is also noted to have contributed to 1 in 3 pregnant women who have anemia. Lack of access to clean water and sanitation. Data obtained in the field shows that 1 in 5 households in Indonesia still defecate in open spaces, and 1 in 3 households do not have access to clean drinking water.

Stunting is a chronic malnutrition that occurs in the womb and during the first two years of a child's life can result in low intelligence and decreased physical capacity which ultimately leads to decreased productivity, slowing economic growth, and prolongation of poverty. In addition, stunting can also have an impact on a weak immune system and susceptibility to chronic diseases such as diabetes, heart disease, and cancer and maternal reproductive disorders in adulthood. The stunting process is caused by poor nutrient intake and recurrent infections resulting in late development of cognitive function and permanent cognitive impairment. In women, stunting can have an impact on the development and growth of the fetus during pregnancy, obstruction of

childbirth and increase the risk of underweight and stunting in children born, which in turn can also pose risks to metabolic disorders and chronic diseases as children grow up (Sandra Fikawati et al, 2017).

Preventive action to reduce the incidence of stunting should begin before birth through perinatal care and maternal nutrition, then preventive is continued until the child is 2 years old. The critical period in preventing stunting starts from the fetus to the 2-year-old child, commonly referred to as the first 1,000 days of life. Evidence-based interventions are needed to reduce the number of stunting in Indonesia. Maternal nutrition needs to be considered through monitoring the nutritional status of mothers during pregnancy through ANC as well as monitoring and improving the nutrition of children after birth, as well as special attention to the nutrition of nursing mothers. Pencegahan kurang gizi pada ibu dan anak merupakan investasi jangka panjang yang dapat memberi dampak baik pada generasi sekarang dan generasi selanjutnya (Sandra Fikawati dkk, 2017). In 2012, the Government of Indonesia joined the global movement known as Scaling-Up Nutrition (SUN) through the design of two major frameworks for stunting interventions. In 2012, the Government of Indonesia joined the global movement known as Scaling-Up Nutrition (SUN) through the design of two large frameworks of intervention. The Stunting Intervention Framework conducted by the Government of Indonesia was divided into two, namely Specific Nutrition Interventions and Sensitive Nutrition Interventions (TNP2K, 2017) stunting.

## **2. Overview of Elementary School Children's Nutrition Intake**

Nutrient intake Nutrients are chemical bonds needed by the body to carry out its functions, namely: producing energy, building and maintaining tissues, and regulating life processes. So that the understanding of nutritional status is the state of the body as a result of food consumption and use of nutrients (Almatsier, 2010). Nutrition is a chemical bond that is needed by the body to carry out its functions, namely energy, building and maintaining tissues, and regulating life processes (Soenarjo, 2000). According to Rock CL (2004), nutrition is the process by which the human body uses food to form energy, maintain health, growth and to carry on the normal functioning of each organ both between nutrient intake and nutritional requirements.

Primary school-aged children can be described as children aged 6 to 12 years, with increasing growth characteristics but with few feeding problems. More time is spent at school so that children of this age begin to adjust to a regular schedule. They also try to learn physical skills and spend a lot of time exercising and playing. Children at primary school age grow up with differences in height that have begun to appear. There are some children who look relatively shorter or taller. The body composition of elementary school-aged children has also begun to change. Fat composition increases after the child is 6 years old (Damayanti, Didit Muhilal, 2006). This is needed to prepare for the accelerated growth of puberty. The body composition of boys and girls starts to look different though not meaningful. A girl's body is more fat, while a boy's body has more muscle tissue.

Adequate nutrition, gradually plays an important role during school age to ensure that children get maximum growth, development and health. School age children 7-12 years old have various activities so their nutritional needs must be considered because at this age children are easily affected by habits outside the family. At this age children begin to choose or determine their own food that is consumed or liked. Sometimes there is excessive difficulty with one particular food called Food Faddism (Anggaraini, 2003).

The growth and development of elementary school age children will be maximized if the nutritional needs of children can be met. In addition, the habit of healthy eating patterns in the family must be truly instilled so that children can grow and develop optimally (Damayanti, Didit Muhilal, 2006). Nutrition in children changes with increasing growth of children such as physical, mental, and emotional. Children who do not have enough nutritional needs, especially energy and protein. If these nutrient deficiencies for months to years cause stunting of children to grow short (stunting) and their learning achievement is lower than children who get good nutrition (A. Roth, R, 2011).

Children need adequate nutrition, such as energy and protein. Energy is one of the products of carbohydrate, protein and fat metabolism. Energy functions as an energy agent for metabolism, growth, body temperature regulation and physical activity. Excess energy is stored as reserves in the form of glycogen as short-term energy reserves and in the form of fat as long-term reserves (IOM, 2002 in WNPG VIII, 2004). In general, a good food pattern is when the ratio of energy composition of carbohydrates, proteins, and fats is 50-65%: 10-20%: 20-30%. This composition can certainly vary depending on age, body size, physiological state, and quality of food protein consumed (WNPG, 2004).

Energy requirements basically depend on four interrelated factors, namely physical activity, size, body composition, age, climate, and other ecological factors. For children needed additional energy that functions for growth. According to the recommended average Nutrition Adequacy Ratio (per person / day), the energy needs of children aged 1-3 years are 1,000 kcal and protein needs are 25 gr. The energy needs of children aged 4-6 years by 1,550 kcal and protein needs by 39 gr. For children's water needs aged 1-6 years around 1.1 - 1.4 liters or 5-7 cups per day. Increasing age increases the amount of water needed (WNPG, 2004).

Protein is part of all living cells and places the largest part of the body after water. One-fifth of the body is protein, half is in the muscles, one-fifth in the bones and cartilage, one-tenth in the skin, and the rest is in other

tissues and body fluids. Protein has a special function that cannot be replaced by other substances, namely building and maintaining cells and tissues of the body (Almatsier, 2009). Protein plays an important role in children for the development of the body and brain cells (Rumadi, 2008).

**Table 1**  
Recommended Average Nutrition Rates (Per Person Per Day) For Children aged 7-12 years

Group / Age	Weight	High	Energy	Protein
7-9 years	27 kg	130 cm	1850 kkal	49 grams
10-12 years (male)	34 kg	142 cm	2100 kkal	56 grams
10-12 years (female)	36 kg	145 cm	2000 kkal	60 grams

**Source:** Regulation of the Minister of Health Republic of Indonesia No. 75 of 2013

The Food and Nutrition Board of the United States National Research Council since 1941 has compiled a Recommended Dietary Allowance (RDA). This recommended nutritional adequacy rate is a standard for achieving good nutrition for the population (National Research Council, 1989 in Almatsier, et al 2011). Each country in general has an AKG that is in accordance with the conditions of its population. The AKG in Indonesia was first established in 1968 through the National Food and Nutrition Work Widya organized by the Indonesian Institute of Sciences (LIPI). This AKG was then reviewed in 1978 and has been regularly every five years, most recently in 2004 (Widya Karya VIII National Food and Nutrition, 2004) (Almatsier, et al, 2011). The Nutrition Adequacy Rate (RDA) is different from the dietary requirement. The nutritional requirements figure illustrates the many minimal nutrients needed by a person to maintain good nutritional status. Various factors affect the number of nutritional needs, such as genetics, activity, weight. While the Recommended Nutrition Adequacy Rate (RDA) or Recommended Dietary Allowances (RDA) is the amount of each essential nutrient that must be fulfilled from food includes almost all healthy people to prevent nutrient deficiency. The RDA itself is influenced by age, sex, activity, weight, height, genetics, and physiological conditions, such as pregnancy or breastfeeding (Sudiarti, T. and Utari, D.M, 2009).

Based on the Guidebook for Nutrition Officials at the Ministry of Health of the Republic of Indonesia (1990) in Supariasa, et al (2012), the consumption level is divided into four categories with each cut off point, which is Good (> 100 AKG); Medium (80-99% RDA); Less (70-80% RDA); Deficit (<70% RDA).

### 3. Nutritional Status Assessment

Stunting dapat diketahui bila seorang anak sudah ditimbang berat badannya dan diukur panjang atau tinggi badannya, lalu dibandingkan dengan standar, dan hasilnya berada dibawah normal. So physically the child will be shorter than his age. This calculation uses the standard Z- Score from WHO-NCHS. Normal, short and Very Short are nutritional status based on Body Length index by Age (PB / U) or Height by Age (TB / U) which are equivalent to the terms stunted (short) and severely stunted (very short) (Trihono et al , 2015). Nutritional status assessment is done by calculating BMI.

### 4. Overview of Parents' Height

The nutritional status of parents, especially the nutritional status of the mother is closely related to the incidence of stunting in children. Seen from a short mother even though a normal father, the prevalence of stunting children must be high, but even if a short father is a normal mother, the prevalence of stunting children is still lower than that of a short mother. So the nutritional status of pregnant women determines the nutritional status of babies to be born (Oktarina, 2012). Maternal height is an indicator that serves to predict children affected by malnutrition. The mother's posture also reflects the mother's height and the initial environment that will contribute to her child's height. However, there are still many environmental factors that affect a child's height. The results showed that mothers who have short body postures have a relationship with the incidence of stunting in their children. This is called the cycle of failure to grow between generations, where IUGR, LBW and stunting occur from generation to generation. Body height or height is the maximum distance from the vertex to the sole of the foot (anatomy team FIK Yogyakarta State University, 2011). According to Snell (2006) cited by Dinda Carissa (2015), height is defined as the result of the maximum measurement of the length of body bones that form the body axis (The body axist), which is measured from the highest point of the head called the vertex (top of the head) to the lowest point of the calcaneus bone (calcanei tuberosity) called the heel. Height growth follows a general type of growth pattern. In the first two years, height grows fast, with a growth of 20 cm at the age of one year and 10 cm at the age of two years, so that the height of a two-year-old child reaches about half the adult height. At the beginning of the school period, height increase of about 6 cm per year, this shows slowing growth, even slower until nearing adolescence about the age of twelve years. At puberty, height growth increases again until around the age of about sixteen years, then slows down again and

stops growing at around the age of 18-20 years (Hanom, 2012). This growth stops due to the closure of the epiphyseal plates. Epiphyseal closure occurs at the age of approximately 16-18 years in women and ages 18-21 years in men (Sinclair, 1978). Height (TB) is a fundamental component as an indicator of nutritional status, by linking weight to height. So that an accurate measurement of a person's height is very important to determine the value of the Body Mass Index (BMI), besides that height can be used as a measure of Basal Metabolism Rate (BMR) (N.Yabanci et al., 2009).

Assessment of nutritional status requires measurement methods that are appropriate to changes in body structure, body composition and deterioration of bodily organs. The method that can be done in measuring nutritional status is to use a Mini Nutritional Assessment (MNA). Measurement using this MNA, making anthropometric measurements as one of the points measured (MOH, 2007). Nutrition anthropometry deals with various measurements of body dimensions and body composition of various age levels and nutritional levels. Anthropometry is very commonly used to measure the nutritional status of various imbalances between protein and energy intake. This disorder is usually seen from the pattern of physical growth and the proportion of body tissue, such as fat, muscle and the amount of water in the body (MOH, 2007). Nutritional status assessment using anthropometric measurements is used to determine BMI, this calculation is calculated to be quite easy to do, where BMI measurement is done by weight in kilograms divided by height squared in meters (MOH, 2007). The BMI results according to WHO in 1985 were then categorized into several groups, wherein Less = BMI <18.5, Normal = BMI 18.5 - 25.0, More => 25.0. Anthropometric measurements are non-invasive and inexpensive measurements, and are easy to do. However, errors in measurement can affect the precision, accuracy, and validity of measurement results as well as the interpretation of a person's nutritional status. Errors in anthropometric measurements can result from changes in measurement results, incorrect analysis and assumptions, unskilled personnel, measurement error and measurement difficulties (Supariasa et al., 2002).

## **5. Review of Environmental Health**

Environmental health is part of the foundations of modern public health which covers all aspects of human beings in relation to the environment, with the aim of enhancing and maintaining human health values at the highest level by modifying not only social factors and physical environment, but also to all the characteristics and behaviors of the environment that can bring influence to the peace, health and safety of human organisms (Mulia Ricky M, 2005). According to the World Health Organization (WHO), environmental health is an ecological balance that must exist between humans and the environment in order to guarantee the healthy state of humans.

Stunting starts from pre-conception when a teenager becomes an undernourished and anemic mother. It becomes worse when pregnant with insufficient nutritional intake, especially when the mother lives in an environment with inadequate sanitation. Adolescent girls in Indonesia aged 15-19 years are at risk of chronic energy (KEK) deficiency of 46.6% in 2013. When pregnant, there were 24.2% of Fertile Women (WUS) 15-49 years with the risk of KEK, and anemia of 37.1%. Referring to the UNICEF / Lancet mindset, the problem of stunting is mainly due to the influence of parenting, the scope and quality of health services, the environment, and food security, then the following tries to discuss in terms of parenting and family level food security.

## **III. RESEARCH METHODS**

This type of research is a quantitative study with a cross sectional study design where data relating to the independent variable (independent variable) and the dependent variable (dependent variable) will be collected at the same time. Analytical research is trying to find the relationship between variables. The research design used was a cross sectional study design, in which the research in collecting data was carried out within a certain time period, each subject, the study was only one observation during the study. The location of the study was conducted in Elementary School 188 Manunggal, East Tomoni District in 2019. When the study was conducted in July until August 2019. The data obtained in this study are secondary data. Secondary data obtained through the results of recording data that has existed in Elementary Schools in SDN 188 Manunggal, East Tomoni District in 2019. All children in elementary school at 188 Manunggal in East Tomoni District in 2019. The sample is a portion taken from the whole object studied and is considered to represent the entire population of 140 people. The sampling technique used the Slovin formula so that the sample size in this study was 58 people.

Data were analyzed univariate, bivariate, and multivariate. Univariate analysis (Descriptive Analysis), aims to explain or describe the characteristics of each research variable. The results of this analysis only produce the frequency distribution and percentage of each variable using SPSS. Bivariate analysis is intended to determine the relationship between the independent variable and the dependent variable. Bivariate analysis is performed on variables that have been categorized using the chi square test ( $\chi^2$ ), using the error rate  $\alpha < 0.05$  (95% accuracy level) Confidence interval in the form of frequencies in the form of either nominal or ordinal categories, this test is also used to determine the significance of two or more variables. Multivariate analysis

aims to find out which variable is most influential on stunting events, multivariate analysis is performed. The test used in multivariate analysis is Multivariate Logistic Regression.

#### IV. RESEARCH RESULT

##### 1. Univariate Analysis

At this stage what is done is to analyze each variable from the results of the research. These variables are Environmental Health, Parental Height, and Nutrition Status for Stunting. This analysis serves to summarize the measurement data set so that the data set can be useful information.

###### a. Stunting

The following is the frequency distribution of Stunting at elementary school 188 Manunggal, East Tomoni District in 2019 is shown in table 2

**Table 2**

Distribution Based on Stunting Frequency at Elementary School 188 Manunggal East Tomoni District 2019 (n = 58)

Stunting	Frequency (f)	Percentage (%)
No	32	55,2
Yes	26	44,8
<b>Total</b>	<b>58</b>	<b>100,0</b>

Source: Primary Data 2019

Based on table 2 shows that of the 58 respondents examined, respondents who did not experience Stunting were 32 respondents (55.2%), and students / students who experienced Stunting were 26 (44.8%).

###### b. Environmental Health

The following is the frequency distribution according to environmental health at elementary school 188 Manunggal, East Tomoni District in 2019 is shown in table 3.

**Table 3**

Frequency Distribution based on respondents' Environmental Health at Elementary School 188 Manunggal, East Tomoni District in 2019 (n = 58)

Environment	Frequency (f)	Percentage (%)
Not good	12	20,7
Well	46	79,3
<b>Total</b>	<b>58</b>	<b>100,0</b>

Source: Primary Data, 2019

Based on table 3 shows that of the 58 respondents studied according to Environmental Health respondents who were in poor environmental health were 12 people (20.7%), and the amount of good environmental health was 46 babies (79.3%).

###### c. Mother's Height

The following is the frequency distribution according to Mother's Height to Stunting at elementary school 188 Manunggal East Tomoni District in 2019 is shown in table 4.3

**Table 4**

Distribution based on respondent's height at Elementary School 188 Manunggal East Tomoni District 2019 (n = 58)

Personal Hygiene	Frequency (f)	Percentage (%)
No Short	46	79,3
Short	12	20,7
<b>Total</b>	<b>58</b>	<b>100,0</b>

Source: Primary Data, 2019

Based on table 4 shows that of the 58 respondents studied, according to maternal height. The number of respondents who are not short is 46 respondents (79.3%), and the number of short respondents is 12 respondents (20.7%).

###### d. Nutrition intake

The following is the frequency distribution according to Nutrition Intake of Stunting at elementary school 188 Manunggal East Tomoni District in 2019 is shown in table 4.4

**Table 5**

Distribution based on Gisi intake of respondents at Elementary School 188 Manunggal East Tomoni District 2019 (n = 58)

Personal Hygiene	Frequency (f)	Percentage (%)
Enough	32	55,2
Deficit	26	44,8
<b>Total</b>	<b>58</b>	<b>100,0</b>

**Source:** Primary Data, 2019

Based on table 5 shows that of the 58 respondents studied, according to nutritional intake. The number of respondents whose nutritional intake is sufficient is 32 respondents (55.2%), and the number of respondents whose nutritional intake is as much as 26 respondents (44.8%).

## 2. Bivariate Analysis

### a. Relationship between Environmental Health and Determinants of Stunting Events

The environment in this study is divided into two criteria, namely, Poor and Good are said to be Less Good if the respondent answers <50% of the questions, and said Good if the respondent answers > 50% of the questions. The results of the bivariate analysis to analyze whether the Environmental variable is one of the factors giving Stunting in this study, is illustrated in table 6 below:

**Table 6**

Environmental Relationship with Stunting at Elementary School 188 Manunggal East Tomoni District 2019 (n = 58).

Environment	Stunting				Total		Score p
	No		Yes		N	%	
	N	%	N	%			
Not good	8	25,0	4	15,4	12	20,7	,518
Well	24	75,0	22	84,6	46	79,3	

**Source:** chi-square test 2019

Based on table 6, it is known that respondents who did not experience environmental stunting were 8 respondents, 25.0%, those who experienced environmental stunting were poor, 4 respondents were 15.4.2%. Respondents who did not experience Stunting with a Good Environment 24 respondents (75.0%), who experienced Stunting with a Good Environment 22 respondents (84.6%). Statistical results using chi-square obtained p value = 518, this means that  $p > \alpha = 0.05$  so that  $H_0$  is accepted which means there is no relationship between the environment and Stunting at elementary school 188 Manunggal East Tomoni District in 2019.

### b. Relationship of Mother's Height with Stunting

Mother's height in this study was divided into two criteria, Short and Not Short. The results of the bivariate analysis to analyze whether the Mother's Height variable is one of the causes of Stunting in this study, is illustrated in table 7

**Table 7**

Relationship between Mother's Height and Stunting at Elementary School 188 Manunggal East Tomoni District 2019 (n = 58)

Mother's Height	Stunting				Total		Score p
	No		Yes		N	%	
	N	%	n	%			
No Short	30	92,8	16	61,5	46	79,3	,003
short	2	6,2	10	38,5	12	20,7	

**Source:** chi-square test 2019

Based on table 7 it is known that respondents who did not experience Stunting with Mother's Height were not short as many as 30 respondents 92.8%, who experienced Stunting with mother's height were not short

16 respondents 61.5%. Respondents who did not experience stunting with short maternal height were 2 respondents (6.2%), those who experienced stunting with short maternal body height were 10 respondents (38.5%). Statistical results using chi-square values obtained  $p = .003$  this means that  $p < \alpha = 0.05$  so that  $H_0$  is rejected which means there is a relationship between maternal height with stunting in elementary school 188 Manunggal, East Tomoni District 2019.

**c. Relationship of Nutrition and Stunting**

Nutrition intake in this study was divided into two criteria, Fair and Foreign exchange. The results of the bivariate analysis to analyze whether the Nutrition Intake variable is one of the causes of stunting in this study, is illustrated in Table 8

**Table 8**  
Relationship of Nutrition and Stunting at Elementary School 188 Manunggal East Tomoni District 2019 (n = 58)

Nutrition intake	Stunting		Total		Score		p
	No		Yes				
	N	%	N	%	N	%	
Normal	32	100	0	0	32	55,2	.000
Deficit	0	0	26	100	26	44,8	

**Source:** chi-square test 2019

Based on table 8, it is known that respondents who did not experience Stunting with normal nutrition intake were 32 respondents with 100%, who experienced Stunting with normal nutrition intake 0 respondents 0%. Based on table 8, it is known that respondents who did not experience Stunting with normal nutritional intake were 32 respondents with 100%, who experienced Stunting with normal nutrition intake 0 respondents 26 respondents (100%). 0%. Statistical results using chi-square values obtained  $p = .000$  this means that  $p < \alpha = 0.05$  so that  $H_0$  is rejected which means there is a relationship between Nutrition Intake and Stunting at elementary school 188 Manunggal East Tomoni District in 2019.

**3. Multivariate Analysis**

Multivariate analysis in this study is from the bivariate analysis there are 3 (three) variables which have a p value  $< 0.05$ , namely Environmental Health, Height, and Nutrition

**Table 9**  
Identification of Dominant Variables Determinants of Stunting Events at Elementary School 188 Manunggal East Tomoni District 2019 (n = 58)

Variable	Score B	Score p		95% C.I.forEXP(B)	
		Lower	Upper	Lower	Upper
Environmental Health	.606	.373	.484	6.948	
Height	2.238	0.007	1.828	48.086	
Nutrition intake	813	0.000			

Based on table 9 above, it can be seen that the variables are excluded one by one starting from the variable that has the largest p value until there are no more variables that have a value of  $p > 0.05$ . Based on the Logistic Regression test the most dominant variable was obtained, the Nutrition Intake variable with a calculated value of  $p = 0.001$  smaller than the value of  $\alpha = 0.05$ .

**V. DISCUSSION**

**1. Environmental Relations with Stunting**

Based on Table 6 shows the statistical results using chi-square obtained p value = 0.518 this means that  $p > \alpha = 0.05$  so that  $H_0$  is accepted, which means there is no relationship between the environment and Stunting in elementary school 188 Manunggal, East Tomoni District in 2019.

Environmental health is part of the foundations of modern public health which covers all aspects of human beings in relation to the environment, with the aim of enhancing and maintaining human health values at the highest level by modifying not only social factors and physical environment, but also to all the characteristics and behaviors of the environment that can bring influence to the peace, health and safety of human organisms (Mulia Ricky M, 2005).



According to the World Health Organization (WHO), environmental health is an ecological balance that must exist between humans and the environment in order to guarantee the healthy state of humans. The results of this study are not in line with Rahman 2017 research, the Relationship between Stunting Events and the Environment in elementary students, with  $p =$

0.43. This shows that the environment does not affect the incidence of stunting. Researcher's assumptions based on the results of the study show that there is no relationship between stunting and the environment, this is because most of the respondents' environments are very good and clean.

## **2. Relationship of Mother's Height with Stunting**

Based on Table 7 the statistical results using chi-square values obtained  $p = .003$  this means that  $p < \alpha = 0.05$  so that  $H_0$  is rejected which means there is a relationship between maternal height with stunting in elementary school 188 Manunggal East Tomoni District in 2019. The statistical results use chi-square which shows that the value of  $p = .017$ . This means that  $p < \alpha =$ ,

0.5 because the value of  $p$  is smaller than ( $\alpha = .05$ ) then  $H_0$  is rejected, which means there is a relationship between Mother's Height and Stunting at elementary school 188 Manunggal East Tomoni District in 2019.

The results of this study are in line with the theory of maternal height which is an indicator that serves to predict children affected by malnutrition. The mother's posture also reflects the mother's height and the initial environment that will contribute to her child's height. However, there are still many environmental factors that affect a child's height. The results showed that mothers who have short body postures have a relationship with the incidence of stunting in their children. This is called the cycle of failure to grow between generations, where IUGR, LBW and stunting occur from generation to generation.

Height growth follows a general type of growth pattern. At the age of the first two years, height grows fast, with a growth of 20 cm at the age of one year and 10 cm at the age of two years, so that the height of a two-year-old child reaches approximately half the adult height. At the beginning of the school period, height increase of about 6 cm per year, this shows slowing growth, even slower until nearing adolescence about the age of twelve years. At puberty, height growth increases again until around the age of about sixteen years, then slows down again and stops growing at around the age of 18-20 years (Hanom, 2012). This growth stops due to the closure of the epiphyseal plates. Epiphyseal closure occurs at the age of approximately 16-18 years in women and ages 18-21 years in men (Sinclair, 1978). Height body is a fundamental component as an indicator of nutritional status, by linking weight to height. So that an accurate measurement of a person's height is very important to determine the value of the Body Mass Index (BMI), besides that height can be used as a measure of Basal Metabolism Rate (BMR) (N. Yabanci et al., 2009). This study is in line with researcher Amin (2014) that bivariate test results indicate that the independent variable, namely maternal height ( $p = 0.01$ ) shows a significant relationship to the incidence of stunting. Likewise with Enny Fitriadi's research entitled the relationship between maternal height and stunting,  $p$  value 0.00.

According to Amin's research (2014) that bivariate test results showed that the independent variable, namely maternal height ( $p = 0.01$ ) showed a significant relationship to the incidence of work stunting, education, income and expenditure, number of family members, and maternal height did not indicate meaningful results on the incidence of stunting. The results of this study are in line with research conducted by Zottarelli (2014) in Egypt that mothers who are <150 cm tall are more at risk of having a stunting child than mothers who are > 150 cm tall.

In addition, according to Naik R & R Smith, 2015 that women who have been stunted since childhood will grow with a variety of growth disorders including reproductive disorders, complications during pregnancy, difficulties in childbirth, and even perinatal death. The results of bivariate and multivariate analysis showed that maternal height and paternal height were risk factors for stunting in infants aged 24–36 months. These results are in line with research in Tangerang which shows that children born to short mothers or fathers are at risk of becoming stunted. One or both parents who are short due to pathological conditions (such as growth hormone deficiency) have genes in chromosomes that carry short traits that increase the chances of children inheriting the gene and growing into stunting. However, if the parents are short due to nutrient deficiencies or disease, the possibility of the child can grow to normal height as long as the child is not exposed to other risk factors (Rahayu, 2011).

Assumptions Researchers Mothers who experience stunting will potentially give birth to children who will experience stunting and this is called the cycle of malnutrition between generations. Parents' height is related to the child's physical growth. Short mother is one of the factors associated with stunting. But this does not apply if the short nature of parents is caused by nutritional or pathological problems experienced by parents. So, this will not affect the child's height.

### **3. Relationship of Nutrition Intake with Stunting**

Based on table 8, it is known that respondents who did not experience Stunting with normal nutrition intake were 32 respondents with 100%, who experienced Stunting with normal nutrition intake 0 respondents 0%. Respondents who did not experience Stunting with 0 respondents (0%) devoid nutritional intake, who experienced Stunting with 26 respondents devoid (100%) devoid nutritional intake. Statistical results using chi-square values obtained  $p = .000$  this means that  $p < \alpha = 0.05$  so that  $H_0$  is rejected which means there is a relationship between Nutrition Intake and Stunting at elementary school 188 Manunggal East Tomoni District in 2019. Based on multivariate analysis the most related variable is nutrient intake with a value of  $p = 0,000$

The results of this study are in line with the theory of nutrition. Nutrition is a chemical bond needed by the body to carry out its functions, namely: producing energy, building and maintaining tissues, and regulating the processes of life. So that the understanding of nutritional status is the state of the body as a result of food consumption and use of nutrients (Almatsier, 2010). Nutrition is a chemical bond that is needed by the body to carry out its functions, namely energy, building and maintaining tissues, and regulating life processes (Soenarjo, 2000). Primary school-aged children can be described as children aged 6 to 12 years, with increasing growth characteristics but with few feeding problems. More time is spent at school so that children of this age begin to adjust to a regular schedule.

They also try to learn physical skills and spend a lot of time exercising and playing. Children at primary school age grow up with differences in height that have begun to appear. There are some children who look relatively shorter or taller. The body composition of elementary school- aged children has also begun to change. Fat composition increases after the child is 6 years old (Damayanti, Didit Muhilal, 2006). This is needed to prepare for the accelerated growth of puberty. These results are in line with Nadya's research entitled "The Relationship of Nutrition Intake with the occurrence of Over stunting in Primary School Age Children in 2017, where the value of  $p = 0.003$ . Likewise with the research of Gladys Salliony Jeanette Tangkudung, with a value of  $p = 0,000$ .

Assumptions of long-term nutritional deficiencies occur from the fetus in the womb until the beginning of the child's life (First 1000 Birth Days) The reason is due to low access to nutritious food, low intake of vitamins and minerals, and poor diversity of food and animal protein sources. There are also maternal factors and poor parenting, especially in the behavior and practice of feeding children, also causing child stunting if the mother does not provide adequate and good nutrition.

## **VI. CONCLUSION**

Based on the results of data processing and research that has been carried out with the title "Determinants of Stunting Events in Primary School Children in Elementary School 188 Manunggal East Tomoni District 2019" the conclusions can be drawn as follows:

1. There is a relationship between environmental health and stunting in children elementary school 188 Manunggal, East Tomoni District in 2019.
2. There is a relationship between height and stunting in children elementary school 188 Manunggal, East Tomoni District in 2019.
3. There is a correlation between nutrition intake and the incidence of stunting in children elementary school 188 Manunggal, East Tomoni District in 2019.
4. The variable of nutrient intake which is most closely related to the Determinant of Stunting in children in elementary school 188 Manunggal, East Tomoni District in 2019.

## **REFERENCE**

- [1]. Dinda, Regia Febriary. 2016. Gambaran Pengetahuan, Sikap dan Perilaku Remaja Putri dalam Penanganan Keputihan di Desa Cilayung. Bandung.
- [2]. Erna, Setya haningrum. 2015. Pelayanan Keluarga Berencana Dan Kesehatan Reproduksi. Jakarta.
- [3]. Eva Ellya, Sibagaring, dkk. 2010. Kesehatan Reproduksi Wanita. Jakarta: Transt Info Media. Gusti, Ayu Marhaeni. 2016. Keputihan pada Wanita. Denpasar
- [4]. Susanti, Handayani, Kusyogo Cahyo, Ratih Indraswari. 2017. Faktor-Faktor Yang Berhubungan Dengan Perilaku Personal Hygiene Pencegahan Keputihan Pada Siswi Smk Negeri 11. Semarang.
- [5]. Kusmiran, Eny. 2014. Kesehatan Reproduksi Remaja dan Wanita. Jakarta : Salemba Medika Kursani, Elmia. 2015. Faktor-Faktor Yang Mempengaruhi Terjadinya Flour Albus (Keputihan) Pada Remaja Putri Di SMA PGRI. Pekanbaru.
- [6]. Maharani Riri & Weni Andriyani. 2018. Faktor yang Berhubungan Dengan Perilaku Personal Hygiene Saat Menstruasi pada Santri Wati di MTS Pondok Pesantren Darel Hikmah Kota Pekanbaru. Pekanbaru.
- [8]. Marhaeni Ayu Gusti. 2016. Keputihan Pada Wanita. Denpasar.
- [9]. Notoatmodjo, Soekidjo. 2007. Kesehatan Masyarakat Ilmu dan Seni. Jakarta : RinekaCipta. Notoatmodjo, Soekidjo. 2007. Promosi Kesehatan dan ilmu perilaku. Jakarta : RinekaCipta
- [10]. Pinem, Saroha. 2014. Kesehatan Reproduksi dan Kontrasepsi. Jakarta Timur : CV Trans Info Media
- [11]. Putri, Octavia Amanda. 2012. Gambaran Pengetahuan sikap dan perilaku "feminimehugiene" Terhadap terjadinya keputihan di

- SMA X Kota Subang.Bandung.
- [12]. Rahmi, Egi Yuniadkk. 2014. Faktor Perilaku Yang Mempengaruhi Terjadinya Keputihan Pada Remaja Putri. Riau
  - [13]. Rahmah, Fadhila Nur. 2017. Hubungan Pengetahuan Dan Perilaku Personal Kebersihan Genitalia Terhadap Kejadian Keputihan Pada Santriwati SMAS/MA Di PPM Rhmatul Asri. Makassar.
  - [14]. Ramayanti, Anita. 2017. Hubungan Personal Hygiene Dengan Kejadian Keputihan Pada Remaja Putri Di SMA Muhammadiyah 5. Yogyakarta.
  - [15]. Susiana, Sariyati. 2014. Faktor-Faktor yang Mempengaruhi Sikap Remaja Putritentang Flour Albusdi SMP Negeri 2 Trucuk Kabupaten Klaten. Yogyakarta.
  - [16]. Soetjningsih. 2004. Tumbuh Kembang Remaja dan Permasalahannya. Jakarta : SagungSeto Sujianti. 2012. Buku Ajar Psikologi Kebidanan. Jakarta: Trans Info Media.
  - [17]. Tri, Wiji Lestari, Dkk. 2015. Buku Ajar Kesehatan Reproduksi. Jakarta: EGC Yani, Widiastuti, Dkk. 2011. Kesehatan Reproduksi. Yogyakarta.
  - [18]. Yanti. 2011. Buku Ajar Kesehatan Reproduksi. Yogyakarta: Tim Pustaka Rihama.

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