



Factors Related to Stunting Events in Baby 25 – 59 Months at Tanjung Wangi Village, Pataruman Health Center West Bandung Indonesia

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ABSTRACT

This study talks about stunting, that is, a chronic malnutrition problem that occurs as the fetus is still in the womb and only appears after the child has been two years old. West Bandung Regency is one of the priority districts has determined 10 villages in focusing (locus) to handle stunting cases, like at Tanjung Wangi Village. The research design used a case control. The sample was toddlers aged 25 - 59 months who were selected by purposive technique. Respondents were taken from 30 case samples and 30 control samples from the results of questionnaire, interviews, the SQFFQ form and height measurements using microtoise. Data analysis included univariate and bivariate analysis using the chi square test. The results of this study showed that there was no relationship among protein intake and stunting, calcium intake ($p = 0.670$), health insurance ownership status ($p = 0.335$), history of ANC ($p = 0.515$) and maternal occupation ($p = 0.859$).) with the stunting event. However, there was a relationship between vitamin D intake ($p = 0.022$) and body length at birth ($p = 0.021$) with the incidence of stunting.

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INTRODUCTION

Stunting is a chronic malnutrition problem caused by insufficient nutritional intake for a long time due to feeding less nutritional needs. It occurs as the fetus is still in the womb and only appears when the child has been two years old. Malnutrition at an early age increases infant and child mortality, causes sufferers to get sick easily and have an unoptimal body posture as she/he becomes an adult. The cognitive abilities of sufferers are also reduced, resulting in long-term economic losses for Indonesia. (Millenium Challenge Account (MCA) Indonesia, 2017)

Decision of the Minister of Health regarding very short definitions of nutritional status based on the index of body length (PB/U) and height of proper age (TB/U) which is the same with the term stunted if the z-score is between -3 SD to <-2 SD and severely stunted if the z-score is <-3 SD. (Ministry of Health RI, 2020)

WHO states that stunting becomes a public health problem if the prevalence is 20% or more. The results of Basic Health Research noted that the percentage of stunting in 2010 was 35.6%, increasing to be 37.2% in 2013. Although the prevalence of stunting nutritional status in 2018 has decreased to be 30.8% consisting of 19.3% short nutritional status and very short nutritional status 11.5%, this number is still above the value determined by WHO so that stunting is still a health problem in Indonesia (Riskesdas, 2018).

Stunting is caused by direct, indirect and basic causes. Direct causes are due to lack of nutritional intake and infectious diseases. Then, indirect causes are resulted from family food security, parenting and family diet as well as environmental health and health services. The last is basic causes are seen from education, employment, poverty, government policies, politics and socio-culture (Trihono, 2015).

Protein is needed as a building substance, namely for the growth and formation of protein in serum, hemoglobin,

enzymes, hormones and antibodies, replacing body cells which is damaged, maintains the balance of acid-base body fluids and energy sources (Adriani, 2012). The research conducted by Teguh Akbar in Citeurep Village, Cimahi City, showed that stunted toddlers had a low protein intake of 37.5% and 15% moderate deficit categories. Low protein intake causes the bodylack of enough nitrogen so that it cannot synthesize amino acids for growth. This also results disturbances in the absorption and transportation of other nutrients. If it occursfor a long time it will cause stunting.

During growth, the process of bone mineralization is very high. Low calcium intake can cause low mineralization of the new bone deposit matrix and affect the work of osteoblasts (Chairunnisa, 2018). Lack of calcium in toddlers can affect the linear growth of a toddler which if it lasts for a long time will be a factor causing stunting.

Vitamin D helps harden bones by helping the process of metabolizing calcium and phosphorus in the blood to be deposited in the bone hardening process. One of the active forms of vitamin D is calcitriol which functions to increase calcium and phosphorus levels in plasma, thereby maintaining normal conditions so that bone mineralization is maintained, especially during growth. Vitamin D helps the absorption of calcium, because if calcium absorption is disturbed, growth will also be disrupted (Almatsier, 2010).

Apart from nutrient intake and infectious diseases, stunting is a chronic nutritional problem caused by multiple factors. Other factors contribute to growth and development disorders that lead to stunting are birth length, history of antenatal care (ANC), maternal occupation and health insurance ownership status for children under five (Trihono 2015).

Birth length describes the linear growth of the baby during pregnancy (Supariasa, 2016). Birth length is influenced by the mother's nutrition during pregnancy. Nutritional needed during the first 1000 pregnancies from conception until the baby has been 2 years old that plays an important role in the process of growth and development of infants. The occurrence of stunted toddlers can occur since the baby is in the womb if the nutritional needs are not met and affect the weight and length of the fetus. Therefore, the need for both macro and micro nutrients during pregnancy is very important.

Mother's jobinfluences childcare patterns and family economic status. Those who work outside tend to have more limited time to carry out household tasks than thosewho do not work. Automatically, childcare patterns will affect the growth and development of children as well and will be disturbed.

Regulation of the Minister of Health of the Republic of Indonesia Number 43 of 2016 concerning Minimum Service Standards in the Health Sector states that antenatal services according to standards are services provided to pregnant women at least 4 times during pregnancy. This is very important to prevent complications during pregnancy and childbirth and to maintain the health of the fetus.

Tanjung Wangi Village is one of the villages in the West Bandung Regency area becomes the focus of stunting countermeasures. This study aims to analyze the factors related with the incidence of stunting in toddlers aged 25-59 months at Tanjung Wangi Village, Pataruman health center working area, West Bandung Regency.

METHOD

This study used Case Control research design. The sample of the cases in this study taken from stunted children aged 25 - 59 months based on the Height-for-age Z-Score (HAZ) index using microtoice. The control sample consisted of children who were not stunted using theHeight-for-age Z-Score (HAZ) and obtained from the results of measuringthe heigher of under five children. The control sample applied matched age and sex. The number of the case samples contained 30 cases and 30 controls, so that the total sample was 60 toddlers using purposive sampling (children aged 25 - 59 months, stunting, willing to be a respondent, not in the treatment of disease). The studywas conducted in Tanjung Wangi Village, the working area of Puskesmas Pataruman, West Bandung Regency in July 2019. Measurement of variable nutrient intake employed protein, calcium and vitamin D using the SQFFQ form and analyzed using Nutri Survey software, health insurance ownership status, ANC history,Birth Length and maternal occupation. Data obtained from the questionnaire and interview. They were analyzed to observe the frequency distribution and bivariate analysis to see the relationship between variables using the chi square.

RESULTS

The results showed that those who were under five tend to be stunted about 35%, severely stunted by 15% and the rest were normal nutritional status by 50%. It can be seen from the figure below.

Distribution Nutritional Status Of Children Aged 25-59 Months Based on the Height-for-age Z-Score (HAZ)

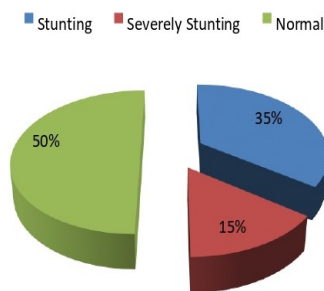


Figure 1. Frequency Distribution of Toddler Nutritional Status The figure shows that families who are with incomes below the UMK (city district minimum wage) amounted to Rp.

2.89.8744.63) was about 35% in West Bandung Regency like in the figure 2.

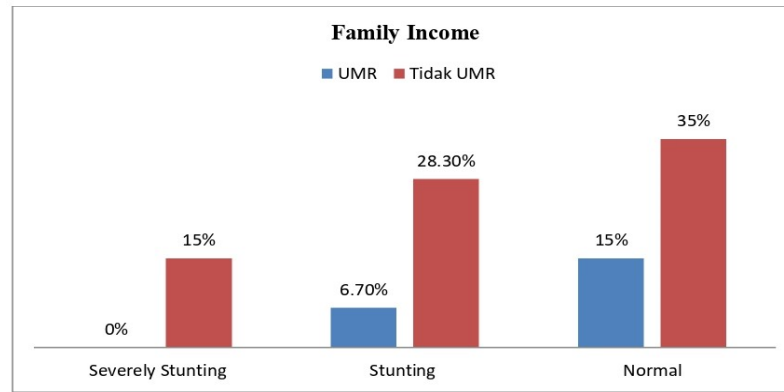


Figure 2. Family Income

Table 1
 Risk factors for stunting in toddlers aged 25 - 59 months

Variabel	Severely Short		Short		Normal		Amount		p-value	OR
	n	%	n	%	n	%	n	%		
Protein Intake										
1 = Less	0	0	0	0	0	0	0	0	-	
2 = Good	9	15	21	35	30	50	60	100		
Calcium Intake										
1 = Less	4	6,7	8	13,3	2	3,3	14	23,3	0,670	
2 = Good	5	8,3	13	21,7	28	46,7	46	76,7		
Vitamin D Intake										
1 = Less	9	15	19	31,7	30	50	58	96,7	0,022	0,493
2 = Good	0	0	2	3,3	0	0	2	3,3		(0,370 – 0,630)
Birth Length										
1 = Short	8	13,3	17	28,3	13	21,7	38	63,3	0,021	4,375
2 = Normal	1	1,7	4	6,7	17	28,3	22	36,7		(1,320 – 14,504)
Status of Health Insurance ownership										
1 = not own	8	13,3	13	30	21	35	42	70	0,335	-
2 = own	1	1,7	8	5	9	15	18	30		
ANC History										
1 = Non-standard	0	0	0	0	3	5	3	5	0,515	-
2 = Standard	9	15	21	35	27	45	57	95		
Mother's Job										
1 = Jobless	8	13,3	18	30	23	38,3	49	81,7	0,859	-
2 = Work	1	1,7	3	5	7	11,7	11	18,3		
Total	9	15	21	35	30	50	60	100		

The results of the study showed that there was no relationship between protein, calcium intake, health insurance ownership and maternal occupation with the incidence of stunting $p \Rightarrow 0.05$. In addition, it has not become a risk factor with $p\text{-value} \Rightarrow 0.05$.

Otherwise, the intake of vitamin D influenced to the toddler group who experienced deficiency of vitamin D became severely stunting (15%) and stunting (31.7%). That's why vitamin D deficiency became a risk factor for them with $p\text{-value} = 0.022$. Based on the OR value, the amount of risk seen for about 0.49 (95% Confidence Interval = (0.370-0.630)). It means that toddlers who lack of vitamin D have a risk of severely stunting and stunting 0.49 times compared to those who have sufficient vitamin D intake.

Likewise with the length of the birth body, the group of toddlers who were severely stunted (13.3%) and stunting 28.3% had short birth length with $p\text{-value} = 0.021$. Based on the OR value, the amount of risk seen 4.37 (95% Confidence Interval = (1,320-14,504)). It means that toddlers with short

birth lengths have the risk of severely stunting and stunting by 4.37 times compared to those who have normal birth length.

DISCUSSION

Stunting is a condition of failure to thrive in children under five years old (toddlers) due to chronic malnutrition and recurrent infections, especially during the first 1000 days of life (HPK). It can cause developmental disorders, experience obstacles in cognitive and motor development for them, and has a greater risk of suffering from infectious diseases as adults (Bertalina and Amelia, 2018).

Nutritional intake with good quality and quantity is needed, especially at the age of five because toddlers are in a period of rapid physical and cognitive growth and development. The intake of nutrients as the body needs is

obtained from macro nutrients such as energy, carbohydrates, proteins and fats. In addition to macro nutrients, micronutrients also play an important role in growth and development. Even though it is needed a little in the body, its function cannot be replaced by other nutrients so that their needs must be fulfilled in daily food (Almatsier, 2010)

The direct cause of stunting is the inadequate intake of nutrients at 1000HPK and exacerbated by the provision of bad nutrients during toddlerhood and recurrent infectious diseases (Atikah Rahayu, et al., 2018). The results of this study indicate that severely stunted toddlers had 15% less intake of vitamin D. Then, the category of less than 15% of stunted infants experience insufficient vitamin D intake as much as 31.7%. In the body, the main function of vitamin D is to build and maintain bones along with vitamin A and vitamin C, parathyroid hormones and calcitonin, collagen protein, as well as the minerals calcium, phosphorus, magnesium and fluorine. The special function of vitamin D in this case is to harden bones by regulating calcium and phosphorus available in the blood to be deposited in the bone hardening process. (Almatsier, 2010)

In the gastrointestinal tract, calcitriol increases the absorption of vitamin D by stimulating the synthesis of calcium-binding protein and phosphorus-binding protein in the small intestine mucosa. Meanwhile in the bones, calcitriol together with parathyroid hormone stimulates the release of calcium from the bone surface into the blood. Then in the kidneys, calcitriol stimulates the reabsorption of calcium and phosphorus. (Almatsier, 2010) In short, vitamin D intake for toddlers in Tanjung Wangi Village is still relatively low. This happens because the variation in sources of vitamin D intake from food is not fulfilled properly. Therefore, this study is not in line with the research result of Nur Amaliah et al, which states that there is no relationship between calcium and vitamins D with stunting ($p > 0.005$)

The length of the baby's body at birth describes the linear growth of the baby during the womb. Low linear size usually indicates a state of undernutrition due to lack of energy and protein suffered in the past, which begins with a slowdown or retardation of fetal growth. Inadequate maternal nutritional intake before pregnancy causes growth disorders in the fetus so that it can cause babies to be born with short birth length. (Supariasa, et al., 2016) The results of this study indicate that cases of severely stunted toddlers have short birth length categories as much as 13.3%, under five. And stunting category is those who had a short birth length was 28.3% (p -value = 0.021 < 0.05). The OR value is 4.375 (1,320 - 14,504) means that toddlers who have a short birth-length category will have a 4.375 times risk of experiencing stunting compared to those who with normal body length at birth. The results of this study are in line with previous research conducted by Ni'mah (2015), which shows that there is a significant relationship between body length at birth and the incidence of stunting in toddlers ($p = 0.045$).

The child is stunted because during in the womb he/she has experienced growth retardation or stunted growth (Intra Uterine Growth Retardation / IUGR). This occurs due to frequent infections during pregnancy or poor nutritional status in pre-conception and pregnancy period (Atikah Rahayu, et al, 2018). Nutritional deficiencies that occur in the womb and early in life cause the fetus undergoing adjustment reactions. In parallel, these adjustments include slowing growth with a reduction of quantity and development of body cells including brain cells and other organs. The results of adjustment reactions due to malnutrition. Then, it appears in adulthood in the form of a

short body, low cognitive abilities or intelligence as a result of not optimal brain growth and development (Bappenas, 2013).

Good socio-economy will create good family food security as well. Food security will ensure the supply of nutritional intake in accordance with the needs of family members. In this study, because of below family income under the UMK, 15% of children under five were severely stunted. Meanwhile, there are 28.30% of children under five were stunted.

CONCLUSION AND RECOMMENDATION

In this study, the intake of vitamin D and the body length at birth of the baby were risk factors for stunting. In contrast, the intake of protein, calcium, ownership of health insurance, maternal occupation and ANC history were not risk factors for post-accounting $p \Rightarrow 0.05$.

The occurrence of stunting is an accumulation of multi factors. Therefore, it needs comprehensive handling starting from pre-conception nutrition, nutrition for pregnant women, infants and toddlers.

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