Parental Height is Associated With Stunting in Children Aged 6-24 Month

Itza Mulyani[1], Marniati[2] , Teuku Muliadi[3], Cukri Rahma[4], Afwa Hayuningtyas[5] , Suci eka Putri[6]
[123456]Universitas Teuku Umar
Coresponding Author : itzamulyani@utu.ac.id
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Abstract:. Stunting is a public health problem because it is associated with an increased risk of morbidity and mortality. Stunting illustrates the long-term nutrients deficiency and needs time for the child to develop and recover. Riskesdas 2018 explained that stunting in Aceh Province was 37,3%. This figure makes Aceh Province occupy the third national position for stunting toddlers after Nusa Tenggara Timur (NTT) and Sulawesi Barat (Sulbar). Aceh Barat Regency based on the report card of kesga and gizi in 2017 stunting by 33%. According to WHO this figure is high because the prevalence of stunting must be less than 20%. There are many factors related to the case of stunting, for example parental height. Knowing relationship parental height with stunting in the children aged 6-24 months.This study is an analytic observational study with the quantitative method. The design of this study is cross sectional which learn the correlation between independent variables and the dependent variables, where the measurement of both variables was conducted at the same time. From 212 children, there are 55,66% children suffer from stunting. The result of bivariate analysis suggests that the factors related to stunting are height of the father ($p < 0.05$). Height of the mother are not related to stunting cases ($p > 0.05$). There is a relationship between father's height and stunting.

Keywords: Stunting, parental height.

Introduction

Stunting is a linear growth retardation with a deficit in body length of <-2 z-score or greater by reference standard of growth[1]. Stunting illustrates the long-term nutrients deficiency and needs time for the child to develop and recover[2]. Stunting is a public health problem because it is associated with an increased risk of morbidity and mortality, late motor development, and retardation of mental development[3]. Stunting may also be considered as nutritional indicator in determining the success of human resource quality improvement. This because stunting is one of the nutritional problems that adversely affect the quality of life of children in achieving optimal growth according to their genetic potential[4].

During the last 10 years the proportion of stunting in Indonesia has not decreased in 2007 (36.8%) in 2013 (37.2%) and in 2018 (30.8)[5]. According to WHO (2018) the prevalence of stunting in Indonesia is among the third countries with the highest prevalence in the South-East Asian Region after Timor Leste (50.5%) and India (38.4%) which is 36.4%[5]. The prevalence of stunting in Indonesia is still above 20%, meaning it has not reached the WHO target of below 20%[6]. Aceh province ranked the third highest prevalence of stunting in children under five in Indonesia, which is 37.3% compared to the National average of 30.8%. Kabupaten Aceh Barat is one of the districts in Aceh Province. The district is still facing serious nutritional problems, one of which is stunting with a prevalence of 33%[7]. This figure indicates that the problem of stunting is also a nutritional problem in Kabupaten Aceh Barat.

The basic causes of stunting such as the economic and political environment underlying socioeconomic status; and its direct causes are inadequate food intake and infectious diseases[8]. The socio-economic of the family ie education, occupation, and income is a risk factor for stunting[9-10]. Parents whose height is relatively short tends to have stunting children and vice versa, in parents who have a relatively high height then their children grow normally[11]. Genetic factors of parental height have an impact on the rate of growth of early school-age children[12].

The effects of stunting include increased morbidity and mortality in children under five years old, low cognitive and psychological functioning in school, may also be detrimental to long-term health and in adulthood may affect work productivity, labor complications and increased risk of obesity that can lead to metabolic syndrome such as coronary heart disease, stroke, hypertension and type 2 diabetes mellitus[13].

Methods

This is a quantitative research with cross sectional research design and conducted from April to May 2017. This research was conducted at four health centers in Kabupaten Aceh Barat, Johan Pahlawan Community Health Center and Suak Ribee Public Health Center (Johan Pahlawan Sub-district), Meureubo Community Health Center (Meureubo Sub-district), and Meutulang Health Center (Panton Reuh Sub-District). Site selection was done by simple random sampling method.

The population of this study was all children under five in West Aceh District. The sample of this study was children aged 6-24 months selected based on inclusion and exclusion criteria. The required number of samples is 212 children. The variables used in this study are stunting (as dependent variable), mother's age, mother's education, family income, exclusive breastfeeding, mother's height, father's height, and LBW (as independent variables).

The instrument of research are microtoise, lengthboard, and structured questionnaire. The data obtained were then tested statistically by chi-square test for bivariate analysis then followed by multivariate analysis using logistic regression. This research was conducted with permission from Kesbangpol Kabupaten Aceh Barat and ethical clearance number: KE/FK/0427/EC/2017 from Ethics Committee of Faculty of Medicine Universitas Gadjah Mada.

Results

Characteristics of research subjects were obtained from univariate analysis. The number of subjects in this study were 212 children aged 6-24 months spread from four public health center located in three sub-districts. The univariate analysis found that the proportion of child sex is almost the same, which is 50.94% for girls and 49.06% for boys. . Based on result of univariate analysis, children categorized as stunting were 118 (55.66%) and a normal child's height by age as much as 94 (44.34%). The proportion of paternal height and maternal height is more normal (65.09% and 88.68% respectively). The characteristics of the full research subjects can be seen in Table 1 below

Table 1. Characteristics of research subjects

Variabel	N	%
Height/Age		
Stunting	118	55,66
Normal	94	44,34
Sex		
Women	108	50,94
Man	104	49,06
Breasefeeding		
< 6 Month	153	72,17
> 6 Month	59	27,83
Born Weight		
<200 gram	29	13,68
>200 gram	183	86,32
Mother Height		
Short	24	11,32
Normal	188	88,68
Fahther Height		
Short	74	34,91
Normal	138	65,09

Bivariate analysis showed Mother's height is not statistically related to the incidence of stunting (p=0.249), but father's height has relationship with stunting incidence (p=0,011) and the VALUE OR = 2.14 (95% CI = 1.14 – 4.06). This means that children whose fathers have a short-term height are 2.14 times more likely to stunt than fathers with normal height.

Table 2. Cross-tabulation of factors related to stunting events

Variabel	*Stunting* (n=118)	Normal (n=94)	Total (n=212)	p	OR	95% Conf. Interval
Mother	16	8	24	0,249	1,69	0,64 –
Height	(13,56)	(8,51)	(11,32)			4,77
Short	102	86	188			
Normal	(86,44)	(91,49)	(88,68)	0,011	2,14	
Fahther						1,14 –
Height	50	24	74			4,06
Short	(42,37)	(25,53)	(34,91)			
Normal	68	70	138			
	(57,63)	(74,47)	(65,09)			

Discussion

Mother's height did not have a statistical relationship with stunting incidence (p=0.249). This is probably because the proportion of mothers who have normal height (≥ 150 cm) dominate

the sample that is 88.68%. The absence of a mother's height relationship to the stunting incidence is presumably due to shorter moms resulting from malnutrition not due to gene abnormalities in chromosomes. This study was not searched risk factors that affect the mother's height, so it can not be distinguished whether the height of the mother's body caused by genetic factors, pathological process, or malnutrition. The short nature of the parent caused by nutritional or pathological problems will not be inherited on to the child, on the contrary if the short nature of the parent caused by the gene in the chromosome is likely to be inherited on to the child[14]. In contrast to the el Kishawi study et.al (2017) states that children born to mothers with a height of 1.55–1.60 m or <1.55 m are more likely to experience stunting (p = 0.008), or (p <0.001), than children born to mothers with a height of > 1.60 m. O. Yaw Addo et.al (2013) also states that mothers who are short (<150.1 cm) are more likely to have stunted children at age 2 (prevalence ratio = 3.20 (95% CI: 2,80-3,60).

Chi Square analysis results found that the father's height has an association with the incidence of stunting (p = 0.011) can be interpreted that the child whose father has a height with a short category is at risk for stunting 2.14 times greater than the father with his normal height. Amigo et al. (2001) mentioned that genetic factors such as parental height have an impact on the growth rate of new school children, in addition to a history of malnutrition, birth length and unclean home conditions are the main risk factors. The interaction of genetic factors with the environment has a relationship with the incidence of stunting[17].

The same with Rahayu's research (2011) paternal height is a risk factor for changes in stunting status in boys (OR=1,6). Father height < - 2 elementary school is a risk factor for changing stunting status in boys (OR = 1,6). In contrast to the results of Novelinda's research, et al (2018) said that there is no meaningful relationship between paternal height and stunting incidence (p =0.378).

Conclusions

There is a relationship between height father’s and stunting.

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