



PENGARUH TINGGI BADAN IBU YANG PENDEK PADA BALITA STUNTING

THE INFLUENCE OF SHORT MATERNAL HEIGHT ON STUNTING CHILDREN

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Abstrak

Latar Belakang: *Stunting* adalah kondisi kekurangan gizi kronis yang disebabkan oleh asupan gizi yang kurang dalam jangka waktu cukup lama. Kondisi ini ditandai dengan tinggi badan anak berdasarkan umur kurang dari minus 2 standar deviasi ($<-2SD$) dari WHO *Child Growth Standart*. *Stunting* menimbulkan efek jangka panjang pada kesehatan dan kecerdasan anak. Penelitian ini bertujuan untuk menganalisis pengaruh tinggi badan ibu yang pendek terhadap kejadian *stunting* pada balitanya di wilayah kerja Puskesmas Raci. **Metode:** Studi analitik observasional dengan pendekatan *case control* dilaksanakan pada bulan Maret-Mei 2021. Sampel penelitian terdiri dari 130 ibu dan balita sesuai kriteria inklusi dan eksklusi dan menggunakan teknik *purposive sampling*. Variabel independen pada penelitian ini ialah tinggi badan ibu dan variabel dependennya ialah *stunting*. Uji statistik *chi square* digunakan untuk menentukan tingkat signifikan pada data. **Hasil:** Uji bivariat menunjukkan bahwa tinggi badan ibu mempengaruhi kejadian *stunting* dengan $\rho=0,003$ dan $OR=3,222$. **Kesimpulan:** Tinggi badan ibu merupakan faktor risiko terjadinya *stunting* pada balita di wilayah kerja Puskesmas Raci Kabupaten Pasuruan.

Kata Kunci : tinggi badan ibu, balita, *stunting*

Abstract

Background: *Stunting* is a condition of chronic malnutrition caused by inadequate nutritional intake over a long period. This condition is represented by a child's height based on age less than minus 2 standard deviations ($<-2SD$) from the WHO *Child Growth Standard*. *Stunting* has long-term effects on children's health and intelligence. This study aims to analyze the effect of short maternal height on the incidence of *stunting* in the working area of the Raci Health Center. **Methods:** An observational analytic study with a case control approach was conducted in March-May 2021. The research sample consist of 130 mothers and children according to the inclusion and exclusion criteria and using purposive sampling technique. The independent variable in this study was maternal height and the dependent variable was *stunting*. The Chi square statistical test was used to determine the level of significance in the data. **Results:** Bivariate test showed that maternal height affected the incidence of *stunting* with $p =0.003$ and $OR=3.222$. **Conclusion:** Mother's height is a risk factor for *stunting* in children in the working area of Raci Health Center in Pasuruan..

Keyword : maternal height, children, *stunting*



INTRODUCTION

Stunting is a linear growth disorder and the accumulative impact of inadequate feeding, poor health conditions and inadequate parenting (Aridiyah et al., 2015). This situation is indicated by the z-score of the child's height based on age less than minus 2 standard deviations (<-2SD) from the WHO Child Growth Standard (Indonesian Ministry of Health, 2018). Stunting is considered as a health problem if the prevalence is above 20% (Indonesian Ministry of Health, 2018). In 2017, the worldwide prevalence of stunting was 22% (Indonesian Ministry of Health, 2018). The result of the 2018 Basic Health Research by National Institute of Health Research and Development showed that the prevalence of stunting in Indonesia was 30.8% and East Java was 32.8%. This prevalence of stunting in Indonesia remains high and it exceeded the cutoff point by WHO (Indonesian Ministry of Health, 2018). The result of the 2019 National Socio-Economic Survey of the Ministry of Health found that the prevalence of stunting in Indonesia was 27.7% and East Java was 26.9% (Izwardy, 2020), while the recent survey by the Ministry of Health in 2021 shows that the prevalence of stunting in Indonesia decreased to 24.4% (Indonesian Ministry of Health, 2021). This results showed that there was a decrease in the incidence of stunting, but it still exceeded the cutoff point (20%).

Stunting can affect physical growth, cognitive, motoric, and verbal development in children. This condition will have long term consequences for the futures of education, income and productivity (The National Team for the Acceleration of Poverty Reduction, 2017). Short children are referred to predictors of poor quality of human resources which will have an impact on the productive ability of the future of a nation (Indonesian Ministry of National Development Planning & UNICEF, 2017). Stunting is a multifactorial phenomenon that has many contributing factors including mother's height. Mothers who were less than 150 cm had 2.5 times higher odds of stunting when compared with taller (above 160 cm) women. The Demographic and Health Surveys (DHS) conducted in 14 Low and Middle Income countries from 2006 to 2016 showed that children from the shortest mothers had an 89% higher risk of stunting compared with those of the tallest women (Wu et al., 2021). According to a previous study by Rachmi et al in 2016, short maternal height was associated with stunting in children under five in Indonesia (Rachmi et al., 2016). It happens due to the limited uterine blood flow and the growth of the uterus, placenta and fetus in short pregnant women so the babies have low body weight (LBW) (UNSCN, 2010). It will take place the next generation who commonly refers to intergenerational nutritional cycle and this problem cannot be avoided unless there is an improvement in nutrition and adequate health services (Naik & Smith, 2015). A mother is the primary care provider for her children. The health and well-being of an infant is dependent



on the mother's health and well-being. In Ethiopia, increasing 1 cm of maternal height reduced the odds of stunting by 1% (Amaha & Woldeamanuel, 2021).

The prevalence of stunting in Pasuruan was 29.27%. Pasuruan is included in the 260 priority cities in a stunting reduction program. The Raci Health Center is one of the health center in Pasuruan Regency which has 22.09% prevalence of stunting. This area has become one of the priorities for reducing stunting rates due to its high prevalence. Specifically, in Raci village, the prevalence of the incident reaches 33.54% which is the highest incidence among 8 work areas. The purpose of this study is to analyze the relationship between maternal height and the incidence of stunting in children aged 24-59 months in the working area of the Raci Health Center.

METHOD

Observational analytic study with case control approach was conducted in March-May 2021. The population was all mother and children aged 24-59 months in the working area of Raci Pasuruan Health Center. The sample size was calculated using the formula of hypothesis test : difference between proportions (Lemeshow et al., 1990) and obtained a sample of 65 mothers with her children in each group. The total number of samples in this study was 130 mothers with her children from active posyandu according to the inclusion and exclusion criteria using purposive sampling technique. All data collected is used secondary data. Data of baby's length were taken from the last weighing month in April 2021 and maternal height data were taken from Maternal and Child handbook. The data that has been collected was analyzed univariately and bivariately using the computerized program Statistical Package for the Social Sciences (SPSS) version 25. The analysis in this study used the chi square statistical test with a 95% confidence degree and was done by comparing the significant value obtained with $\alpha = 0.05$. The result are said to be significant if $p < \alpha$. This study obtained an ethic certificate from the Research Ethics Committee of the Faculty of Medicine, Universitas Airlangga number 95-KEPK on May 5, 2021.

RESULT AND DISCUSSION

Results

Subject Characteristics

There were 130 respondents participating in this study. Most mothers were aged 20-35 years (80.8%) and unemployed (64,6%). More than half of mothers were high school graduates

(53.9%). The Majority of children were girls (56.2%) and in the age range of 36-47 months (44.6%). Summary of subject's characteristics was presented in Table 1.

Table 1. Characteristics of Research Subjects

Characteristics	Total (n)	Percentage (%)
Mother's Age		
< 20	2	1.5
20-35	105	80.8
> 35	23	17.7
Education level		
Elementary school graduate	19	14.6
Middle school graduate	25	19.2
High school graduate	70	53.9
University graduate	16	12.3
Profession		
Employed	46	35.4
Unemployed	84	64.6
Child's Gender		
Boy	57	43.8
Girl	73	56.2
Child's Age (months)		
24-35	48	36.9
36-47	58	44.6
48-59	24	18.5
Total	130	100

Univariate Analysis

The number of stunting and non-stunting events was 65 children and their mothers in each group. More than half of mothers had a normal height (67.7%). The result of univariate analysis was presented in Table 2.

Table 2. Univariate Analysis Results

Variable	Total (n)	Percentage (%)
Incident		
<i>Stunting</i>	65	50.0
Non Stunting	65	50.0
Maternal height		
Normal	88	67.7
Short	42	32.3
Total	130	100

Bivariate Analysis

The result of a statistical test through the SPSS program indicates that there was a relationship between maternal height ($=0.003$) with stunting in children aged 24-59 months in the working area of the Raci Health Center. The result bivariate analysis was presented in Table 3.

Table 3. Results of Bivariate Analysis

Maternal height	Stunting incident				Total		p value	OR	95% CI	
	Stunting		Not stunting						Lower	Upper
	n	%	n	%	n	%				
Normal (≥150 cm)	36	40.9	52	59.1	88	67.7	0.003	3,222	1,477	7,030
Short (<150 cm)	29	69.0	13	31.0	42	32.3				
Total	65	50.0	65	50.0	130	100				

Discussion

The result of this study indicates that there is a relationship between maternal height and incidence of stunting. The fetal growth is determined by a specific gene on the chromosome that is inherited by their parents (Sadler & Pendit, 2010). There are 35,000 genes on 46 chromosomes in human. Genetics inherit the state of stunting. Maternal height related to the physical growth of their child. Mothers who are short due to pathological conditions (such as growth hormone deficiency) have genes in their chromosomes that carry short traits so that their children will have a higher risk to become stunted (Amigo et al., 1997). The study by Khatun in Bangladesh showed that maternal short stature is an indicator of cumulative nutritional deficiency during infancy (Khatun et al., 2011). Girls who had stunting during their golden period are more prone to various kinds of disorders in the future such as reproductive disorders, complications during pregnancy, difficulties in giving birth, and perinatal death. Stunted mothers have a higher risk of giving birth to stunted children (Hanum, 2019).

The result of interviews with mothers who had short height and stunting children showed that most of the parents of these mothers, or grandmothers, also had below average height. This specifies that stunting is a condition that will continue in the next generation if there is no improvement in nutrition and supported by an adequate health service. It is also known as an intergenerational nutritional cycle (Naik & Smith, 2015). In addition, some of the mothers admitted that their growth during adolescence was hampered due to an unbalanced nutritional intake, where most of them came from underprivileged families and had low education. In this study, mothers with normal height who had stunted children are found in high number. This condition is resulted from lack of breastfeeding since 24 of 130 children were not given exclusive breastfeeding. Many factors might influence this condition because stunting is an accumulation of nutritional inadequacy during the thousand day window of opportunity (Fikawati et al., 2017). In addition, there are some short height mothers who have children with

normal height. It indicates that stunting is not always caused by genetic disorder but can also be triggered by nutritional problems and disease (Hanum, 2019). Therefore, children who have short height genes from their parents can still grow to a normal height as long as they are not exposed to other risk factors.

According to Soetjiningsih (2014), in general, there are two factors that take a role in growth and development of children, which are genetics and the environment. These two factors support each other, if a person is born with good genes but raised in an unsupportive environment then the child's growth and development will be disrupted. *Vice versa*, good environmental factors can support children who were born with unfortunate genetic conditions so that they can achieve maximum catch-up growth (Soetjiningsih, 2014). The result of this study is equal to Fitriahadi's research in Wonosari I Health Center, Gunung Kidul Regency, which showed that there was a relationship between maternal height and the incidence of stunting based on bivariate analysis results of ρ value <0.001 (<0.05) (Fitriahadi, 2018). So it can be concluded that maternal height is one of the factors in the incidence of stunting. Women who have short height are more at higher risk of physical disruption in the development of the anatomical system of pregnancy, and metabolic disorder such as low maternal glucose levels and lack of protein and carbohydrates. Some of these disorders contribute to the impaired intrauterine development and delayed linear growth of infants (Sinha et al., 2018).

From the result, we suggest optimizing the preconception care program for prospective brides. So, the risk of having a stunted child can be prevented and reduced. Whereas, preconception care has many advantages, including the identification of illnesses, assessment of psychological, and finances (Kriebs, J & Gegor, C, 2010). Studies on the effect of maternal height on the incidence of stunting have not been widely carried out in Indonesia. This research is expected to be a trigger for other similar research. This study still has limitations where researchers cannot take data directly due to the covid-19 pandemic. Most of the data come from secondary data which is highly dependent on the completeness of the documentation.

CONCLUSION AND ACKNOWLEDGMENT

From this study, we can conclude that the short maternal height can affect stunting in children. This study suggests the importance of improving the nutritional status of children and adults, as adequate nutrition can help achieve optimum height in adulthood. Further studies that allow better data collection methods were required to reconfirm the result of this study. The authors would like to express gratitude to all research participants for their cooperation.



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