

## **Mother's Education as A Determinant of Stunting among Children of Age 24 to 59 Months in North Sumatera Province of Indonesia**

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**Abstract:** Indonesia has the fifth-highest level of stunting in the world. Stunting was the most severe problem that was impeding child growth and development. This study aims to determine the relationship between the characteristic of the mother with the incidence of stunting in under-five children (24-59 months) in North Sumatera in 2013. This study, we took data from the 2013 Indonesian National Basic Health Survey (RISKESDAS), with a sample of 573 children. For this study, Data were collected using a questionnaire and processed using Chi-square test ( $\alpha=0.05$ ). Variables that are used include mother's age, height, education, and occupation. The result reveals that prevalence of stunting among children is 40.3%. Prevalence of mother's height in category 150-155 cm is 35.6%. Most of the mother in this research at 24-35 years old (65.4%), higher education (86.4%), and has no fixed monthly income (80.1%). Chi-square test results showed mother's height, education and occupation were connected with stunting. The result of multivariate analysis showed that the variable which had the most dominant influence as the determinant of the incidence of stunting was mothers' education (OR = 1.9; 95% CI 1.188 – 3.133;  $p=0.08$ ). It is suggested that families to the family (parents) to pay attention to education, especially for girls.

**Keyword:** *Stunting, children aged 24 – 59 months, mother's education, mother's height, mother's occupation*

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### **I. INTRODUCTION**

The problem of toddlers stunting is a global issue experienced in some countries around the world. Stunting according to WHO Child Growth Standard is based on an index of body length over age (PB / U) or height over age (TB / U) with Z-score less than -2 SD (WHO, 2010). The TB / U index (English -> HAZ ->Height-for-age) measures chronic growth disorders or growth disturbances that occur over a period (months or years). Recorded number of stunting figures in the world as many as 178 million children under five. In Indonesia, in 2013 Basic Health Research recorded the national prevalence of stunting reached 37.2%, increasing from 2010 (35.6%) and 2007 (36.8%). That is, the growth is not maximally suffered by about 8 million Indonesian children or 1 of three Indonesian children. It can be concluded that more than one-third of children under the age of five in Indonesia are below average.

The impact of under-five stunting is the weak cognitive abilities and IQ scores assumed by little learning ability and achievement in school. Stunting can cause a child to lose an IQ of 5-11 points (World Bank, 2006). A weak cognitive ability will have an adverse impact on achievement in school, resulting in low labor and low productivity at later stages of life (Martorell, 2010). Research in Brazil revealed that higher men could earn more, where a 1 percent increase in height was associated with a 7 percent wage increase (Strauss & Thomas, 1998). Parents of infants with malnourished conditions will give their children more food to pursue growth. However, stunting children early in the first two years of life and experiencing rapid weight gain will be at high risk for chronic diseases, such as obesity, hypertension, and diabetes (Victoria et al., 2008). Hales and Barker (2001) also mentions the hypothesis of phenotype thrifty that suggests an epidemiological association between

poor fetal growth that results in small outcome pregnancy with diabetes mellitus type two and metabolic syndrome as a result of malnutrition early in life.

Stunting problems are influenced by several factors, including stunting can be caused by various factors. WHO (2013) divides the causes of stunting in children into four broad categories: family and household factors, dry complimentary/complementary food, breastfeeding and infections. Family factors, especially mothers, have an important role in child care.

The prevalence of stunting in Indonesia is higher than other countries in Southeast Asia, such as Myanmar (35%), Vietnam (23%), and Thailand (16%). Moreover, according to Riskesdas data the largest proportion of stunting incidents found in infants aged 24-59 months. North Sumatera Province is one of the provinces with a prevalence of high stunting incidence in under-fives in the province that is 42.5% compared to national figure that is 37.2%. This number is categorized as a serious problem, so the author is interested to see the relationship between toddler age, gender, and birth weight and body length with stunting event in North Sumatera Province.

## II. METHODOLOGY

National Basic Health Research (RISKESDAS) or Primary Health Research was held by The National Institute for Health Research and Development, Ministry of Health, Republic of Indonesia. Riskesdas was conducted between May and June 2013 covering 33 provinces and 497 districts in Indonesia Primary data cleaning and analysis by the National Institute of Health Research and Development Ministry of Health of the Republic of Indonesia In this analysis, and we included data from subjects aged 24-59 months. We exclude subjects aged 24-59 months. We exclude subjects aged 24-59 months. There were 573 subjects involved in the analysis. Information about the items was collected by interviewing their mother. In Indonesia, infants and toddlers are regularly weighed once a month as part of a child growth and nutritional status monitoring program. The data are recorded in a nationally standardized control card. Enumerators took anthropometric measurements.

This study uses secondary data derived from Basic Health Research (Riskesdas) data in 2013 through the collection of validated questionnaires. The data is in the form of raw data from the Riskesdas 2013 survey for the province of North Sumatra, including location recognition data, household description, and description of family members. Furthermore, to be analyzed, the raw data obtained is processed by computer program through the stages of editing, coding, cleaning, and processing using computer software.

This study uses the dependent variable in this study is the incidence of stunting in children aged 24-59 months. The independent variables are mother characteristics such as mother's age, mother's height, mother's education and mother's job.

## III. RESULT AND DISCUSSION

Univariate results can be seen in Table 1. Some children under five stunting in North Sumatra Province as many as 231 children (40.3%). Infants aged 24-36 months are infants aged 24-36 months (34.70%), while toddlers aged 37-48 months and 49-59 months respectively as many as 187 children (32.65%).

**Table 1.** Univariate Analysis

Variable	Frequency	Percent (%)
Nutritional status (HAZ)		
Normal	342	59.7
Stunting	231	40.3
Characteristics of children		
Age		
24-36 months	199	34.70
37-48 months	187	32.65
49-59 months	187	32.65
Characteristics of mother		
Mother's age		
24-35 years	375	65.4
<24years & >35years	198	34.6
Mother's height		
<145 cm	47	8.2
145-149.9 cm	121	21.1

150-154.9 cm	204	35.6
155-159.9 cm	167	29.1
>160 cm	34	5.9
Mother's education level		
Never	9	1.6
Un-completed Elementary School	25	4.4
Completed Elementary School	44	7.7
Completed Middle School	129	22.5
Completed High School	245	42.8
Finished college	122	21.1
Mother's occupation		
Civil Government	65	11.3
Private employees	49	8.6
Entrepreneur	147	25.7
Farmers	258	45.0
Fishermen	1	0.2
labour	21	3.7
Others	32	5.6

Table 2 shows the results of bivariate analysis using Chi-square test analysis. It can be seen that the variables that have a relationship with stunting incidence in toddlers are mother's height variable ( $p = 0.010$ ), maternal education level ( $p = 0.013$ ) and mother's job ( $p = 0.044$ ). While the maternal age variable shows that there is no relationship between maternal ages with stunting event. Mother with short height (<155 cm) has PR value (Prevalence Ratio) equal to 1.35 which means a mother with short height 1.35 times have a chance to have child stunting. Mothers with low education levels have a PR score of 1.41 which indicates that mothers with low education 1.41 times have an opportunity to have children who are stunting. While mothers with non-permanent income per month have a PR value of 1.34 which means that parents with non-permanent income have a chance of 1.35 times have a child who is stunting.

**Table 2.** Variables associated with stunting, bivariate analysis

Variable	Nutritional status						PR	p
	Normal		Stunting		Total			
	n	%	n	%	n	%		
Mother's age								
24-35 years	225	60	150	40.0	375	100	-	0.903
<24years & >35years	117	59.1	81	40.9	198	100		
Mother's height								
Tall( $\geq 155$ cm)	135	67.2	66	32.8	201	100	1.35	0.010
Short(< 155 cm)	207	55.6	165	44.4	372	100		
Mother's education level								
High(at least completed middle school)	306	61.8	189	38.2	495	100	1.41	0.013
Low	36	46.2	42	53.8	78	100		
Mother's occupation	78							
Fixed monthly income	264	68.4	36	31.6	114	100	1.34	0.044
No fixed monthly income		57.5	195	42.5	459	100		

Table 3 shows the results of multivariate analysis using logistic regression test analysis. The result is the mother education variable with the largest OR value of 1.9 (CI 1.188 - 3.133). This suggests that mothers with low educational levels are 1.9 times more likely to have stunting children than parents with higher education.

**Table 3.** Variables associated with stunting, multivariate analysis\*

Variable	p-value	OR	95% CI
Mother's height	0.006	1.655	1.153 – 2.375
Mother's education	0.008	1.930	1.188 – 3.133

\* Unconditional logistic regression analysis

### 1. Mother Ages

Mother Age is a significant factor predicting the birth of a stunting child in Ghana. Women 35-44 years of age had a higher risk of having stunting children in a study of 2379 children in Ghana

(Darteh, E. K. M., Acquah, E., & Kumi-Kyereme, A, 2014). The result of this research is there is no significant relationship between toddlers with mother age with stunting event. In contrast to research conducted by Nguyen Ngoc Hien & Sin Kam (2008) in Vietnam revealed that maternal age <24 years and > 35 years has a risk of children born with malnutrition such as underweight, stunting and wasting. Young motherhood (<24 years) is the age of the mother who is not ready to take care of the child. Meanwhile, the increased risk of malnourished children at the age of senior women (> 35 years) is high risk for childbearing with low birth weight. Maternal age is not a risk factor for stunting events in this study because age increases have no correlation with increased knowledge of health.

## **2. Mother's height**

Parental height is related to stunting. Height is one form of genetic expression and is a factor that is passed on to the child and is associated with the incidence of stunting. Children with short parents, either one or both, are at greater risk of growing shorter than children with normal-sized relatives (Supariasa, 2002). Short parents because the gene in the chromosome that carries short traits is likely to decrease the short nature to the child. However, if the short height of the parents is due to nutritional and pathological problems, then the short life will not be passed on to his son (Hanum F, Khomsan A, Heryatno Y., 2014).

Short moms may have a small baby. The results of the study in Egypt showed that children born to mothers of <150 cm tall have a higher risk of growing into stunting (Zottarelli, L. K., Sunil, T. S., & Rajaram, S., 2007). Many factors affect the duration of pregnancy and fetal growth that ultimately affect the outcome of gestation. Sex, birth order, and twins may increase the risk of low birth weight, mainly due to maternal weight gain during conception, short-lived women, and Highland women, and women who give birth at a younger age have more risk High to have a smaller baby. Mothers in the highest age group had children at risk of stunting incidence were mothers with height less than 155 cm (Yang XL et al., 2010).

The results of this study there is a significant relationship between toddlers with the mother's short height with the incidence of stunting. In line with Sri Lankan research showing that maternal height is the largest determinant factor in children with stunting events. (Rannan-Eliya et al., 2013).

## **3. Mother Education**

Many previous studies have concluded that maternal education has significant relevance to stunting children. Judith and Stand (1996) in her research in the Philippines showed that Mother's education affects the incidence of wasting and stunting. In line with that Semba et al. (2008) in his research indicates that maternal education is a determinant of stunting events in Indonesia and Bangladesh. The results of this study suggest that mothers do not finish primary school has 1.89 times greater chance of having stunting children compared with mothers whose education graduated from elementary school and above. Similarly, the results of research conducted in Nairobi in 40 percent of stunting children indicate that maternal education is the strongest factor for predicting the nutritional status of children in low-income rural populations (Abuya, Ciera & Kimani-Murage, 2012). Other earlier researchers such as Ramli et al. (2009) who said that the level of formal education and mother's nutritional knowledge significantly influence the chance of stunting. Maternal education is positively associated with a better nutritional status of children.

The most dominant factor to be the determinant of stunting incidence in this study is maternal education with the value of OR 1.9 which means that mothers with low education level at risk 1.9 times greater have children who were stunting than parents with higher education. Maternal education will influence knowledge of child health and nutrition practices so that children are in good nutritional status. The study by Hadad and Smith (2000) in children with the highest chronic malnutrition occurred in illiterate mothers. The study was conducted in 63 developing countries for over 25 years to identify the determinants of chronic malnutrition. Of the six factors that cause one of them is mother education.

Parents with better education tend to have better knowledge and ability to implement better knowledge than parents with low education. Mothers who have higher education tend to be better in the pattern of child care as well as better in the selection of infant food types. This is because mothers with higher education have greater opportunities in accessing information related to nutrition and

health. Parents as first and principal coaches to the teaching and health of children, and managers or food providers in the family, have a significant role in improving the nutritional status of household members. Knowledge of mother's nutrition can be a determinant of nutritional status of children and mother itself. According to Engel, Menon, and Hadad (1997), low levels of education affect the limited access to good parenting practices and existing health facilities. The low level of mothers' education and low income leads to the mother's confidence in obtaining nutrition and sanitary facilities such as Posyandu and Puskesmas.

EFA Global Monitoring Report team analysis (2013) reported 47 million stunted children in low-income countries can be reduced. If all mothers had primary education, 4% could be saved 1.7 million children from stunting. If all mothers have the secondary school, 26% can be saved 12.2 million children from stunting. Thus, parents' education improves children's nutrition.

#### **4. Mother's job**

The results of this study indicate that the prevalence of working mother who has a fixed income has a toddler stunting of 42.5 percent of healthy children. Statistically obtained  $p < 0.05$  meaning that there is a significant relation between mother job with stunting event. The value of OR obtained by 1.6 means that parents with non-permanent income 1.6 stunting chance compared with toddlers who have a fixed income mother. Working parents will affect family income. Adequate income will support the development of children because parents can meet all the needs of primary and secondary children. In contrast, women who do not work many small children are due to the average economic level at low economic levels, and deep maternal knowledge of nutrition.

The results of this study are in line with Mulyono (2000) study in infants indicating a significant relationship between maternal work with nutritional status in which working mothers have small children ( $< -2$  SD) more in comparison with mothers who are not working. Adequate dietary intake relates to the quantity and quality of food given to the household. Proper nutritional fulfillment is also influenced by the economic status of the family. Low economic status has an impact on the inability to obtain adequate and quality food due to low purchasing power (Ulfani DH, Martianto D, & Baliwati YF, 2011).

### **IV. DISCUSSION**

The number of toddlers who experience stunting in North Sumatra Province in 2013 that is as many as 231 infants (40.3%). Maternal education is the most dominant variable as the determinant of stunting children with OR value of 1.9. This means that mothers with little education at 1.9 times greater risk of having a small child compared to a highly educated mother.

EFA Global Monitoring Report team analysis (2013) shows that maternal education can improve the nutritional status of children. The mechanism of the relationship between mother and child health education is still not widely understood. However, Glewwe (1999) highlights three sections linking teaching and child health. First, parents with formal education will directly provide health knowledge to their kids who later will be a mother as well. Second, the reading and counting skills of girls acquired in school will improve their ability to recognize illness and seek treatment for their children. Besides, they are better able to read curative instructions for the treatment of childhood illness and apply treatment. Third, the increase in the number of years in school in the sense of an increase in formal education makes women more receptive to modern medicine. Therefore, there needs to be an emphasis on the upbringing of children, especially girls who will become mothers to contribute to the rupture of the poverty cycle.

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