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## Determinants Analysis of the Incidence of Stunting in Children 1-2 Years



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### Article Information

### Abstract

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Stunting become a serious problem in Indonesia because it was associated with increased risk of morbidity and mortality, suboptimal brain development that delayed motor development and mental retardation. In fulfillment of family nutrition required a good knowledge about balanced nutrition. This study was an observational study with case control study design, The sampling technique used purposive sampling so that the respondents obtained were 30 toddlers at 4 posyandu. Analysis of the data used for bivariate frequency distribution, while multivariate logistic regression. Result: Obtained a significant relationship with the incidence of stunting, namely the mother's education level ( $p: 0.03$ ;  $OR: 0.621$ ), family economy ( $p: 0.03$ ;  $OR: 0.158$ ), mother's height ( $p: 0.01$ ;  $OR: 12.045$ ), while the sex of children under five did not have a significant relationship with the incidence of stunting, namely  $p: 0.11 > \alpha 0.05$ . The incidence of stunting in children aged 1-2 years is influenced by the mother's education, height of parents especially mother's, and family economic status. Mothers must know about types of food that have high nutritional value at low prices so that the nutritional adequacy of the family is fulfilled.

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## INTRODUCTION

Growth and development in children is influenced by nutritional factors, but if there is malnutrition it will cause several problems, one of which is stunting (Bahjuri, 2020). Stunting in children can be associated with lack of vitamin and mineral needs, as well as an imbalance between micro and macro nutrients (Apriluana and Fikawati, 2018).

Stunting become a serious problem in Indonesia because it is associated with increasing risk of morbidity and mortality, suboptimal brain development that delay motor development and mental retardation (unicef, 2013 at Mustika and Syamsul, 2018)

Stunting can cause long-term impacts such as disruption of physical, mental, intellectual and cognitive development (Murtaza et al., 2018). In 2017, the stunting incidence rate was 29.6% and in 2019 the national stunting incidence rate fell to 27.67%. Although there has been a decrease in stunting cases, it is still considered a serious problem in Indonesia because the number of stunting cases is still above 20% (Teja, 2019). In the district of Kediri, East Java in 2018 the proportion of the nutritional status is very short and short around 32.81% and for the targets by 2019 approximately 28% (Kementrian Kesehatan RI, 2018). This is due to poverty, behavior and parenting / feeding that has no nutritional value (Anindita, 2012 dalam Jihad, Imran and Ainurafiq, 2016).

Families, especially mothers, play an important role to support in overcoming the problem of stunting, starting from food preparation, selection of food ingredients, to how food is served, the family's ability to fulfill it (Apriluana and Fikawati, 2018). In fulfillment of family nutrition required a good knowledge about balanced nutrition, because of the level of nutrition knowledge a person will influence the attitudes and behavior in determining nutritional balance for families (Olsa, Sulastri and Anas, 2018).

According to the World Health Organization (WHO) Child Growth Standard, stunting is based on the index of body length compared to age (PB / U) or height for age (TB / U) with a limit (z-score) of less than -2 SD (Rambu Podu and Nuryanto, 2017). Stunting assessment indicators using a ratio of height for age will cause chronic nutritional problems. One of the risk factors for stunting recorded by WHO is the mother's height. According to research from Rahayu, it was stated that mothers who have a short stature of around <150cm, the child

born will be at risk of stunting, this is due to physical conditions that will carry the inheritance of genes as carriers of short traits (Rahayu, 2012). Then the results of the study revealed that mothers with short stature may also have inadequate anatomical and metabolic systems that can affect fetal health, such as lower glucose levels or decreased energy and protein. This condition can cause intrauterine growth restriction were also cast in the short stature in children (Manggala *et al.*, 2018).

According to research in Gunung Kidul, Central Java, that the higher a person's education level, the greater the family income, so that if family income decreases, food access is disrupted and causes malnutrition, one of which is stunting (Ngaisyah, 2015).

High income will easily choose healthy and nutritious food menus, if low income allows low in choosing daily menus so they look for cheap and less varied food menus (Ibrahim and Faramita, 2015).

## METHODS

This study was an observational study with case control study design. The study was started by measuring the dependent variable, namely the effect, while the independent variable was searched retrospectively.

The population of this research is toddlers aged 1-2 years who are in the village area of the village of Kandat district of Kediri, covering 4 posyandu. The sampling technique used purposive sampling, which is in accordance with the inclusion criteria, namely parents of toddlers are willing, and are in the place during the research, not in independent isolation. So that we get 30 toddlers. The research was conducted every Wednesday and Saturday when a toddler posyandu was held for 3 weeks in November 2020 in Tegalan village, Kediri district..

The independent variable was the toddler stunting one's state of nutritional status based on height z-score (TB) against age (U) which was located at <-2 SD. Then the dependent variable is the gender of the children under five, mother's education, mother's height, and economic status.

Data analysis was performed used a computer with Microsoft Excel and SPSS programs. Univariate analysis was conducted to describe the frequency distribution of each research variable. Multivariate analysis was carried out to see the relationship between research variables and the inci-

**Table 1. Frequency Distribution of Respondent Characteristics in 4 Posyandu, Tegalan Village, Kediri Regency (n=30)**

Karakteristik	Σ	%
Toddler age		
- 1 year	17	57
- 2 year	13	43
Mother's age		
- <20 year	12	40
- 20-25 year	9	30
- >25 year	9	30
Mother's job		
- Does not work	20	66
- Trader	5	17
- Government employees	0	0
- Private employees	5	17
<b>Total</b>	<b>30</b>	<b>100</b>

dence of stunting. The analysis used was logistic regression statistical test.

## RESULT

The table above shows that 57% of children under 1 year old, 40% <20 years of age under five, and 66% of mothers who do not work or become housewives..

The Table above proves that children under five with the incidence of female sex were 83%, education of mothers under five at the high school level / equivalent was 71%, the height of the mother at risk was <145cm as much as 77% and the family economy is at a low level of <1,500,000 / month as many as 21 respondents.

The data Table shows that the variable that has more influence on the incidence of stunting is gender with a value of 22.618, then the mother's

**Tabel 2. Karakteristik Determinan Kejadian Stunting**

Characteristics	Toddlers with stunting		Toddlers do not stunting	
	Σ	%	Σ	%
The gender of the toddler				
- Man	3	17	10	77
- women	15	83	3	23
Mother's Education				
- Primary school	0	0	0	0
- Junior High school	5	24	0	0
- Senior high school	15	71	3	33
- collage	1	5	6	67
Mother's height				
- Height at risk	20	77	0	0
- Height not at risk	6	23	4	100
Economic status				
- Low	21	100	0	0
- High	0	0	9	100

**Table 3. Results of Multivariate Logistic Regression Analysis for four variables which have a meaningful relationship with the incidence of stunting**

Variabel Independen	B	ρ	OR (adjusted)	CI 95%
The gender of the toddler	3.119	0.11	22.618	0.456-121.738
Mother's Education	1.345	0.03	0.261	0.15-4.603
Economic status	1.845	0.03	0.158	0.004-6.574
Mother's height	2.489	0.01	12.045	0.506-286.581

height with a value of 12.045. however, gender of children under five did not have a significant relationship with the incidence of stunting with  $\rho$  (0.11)

## DISCUSSION

The results showed that children under five with the highest incidence of stunting were female, namely 83%, while those who were not stunted were 23%. Male sex who experienced stunting was 17% and those who were not stunted were 77%. It is known that the value of  $\rho$  (0.117) >  $\alpha$  (0.05) so that there was no relationship between the incidence of stunting and gender, but the OR value was 22,618 so that sex had more likely to be at risk of stunting.

This concurs with research from Savita and Amelia, (2020), that there was no significant relationship between the sex of children under five and the incidence of stunting. Added the results of the study which revealed that there was no relationship between sex and stunting ( $p < 0.05$ ). (Rukmana *et al.*, 2016). However, research from Yemen that there was a significant relationship between the gender of the child with stunting value  $P = 0.001$ ), the prevalence of stunting in males was higher than in women (Al-Mansoob and Masood, 2018).

The results showed that the education of mothers who had children with stunting was 71% at the junior high school level, then there was a significant relationship with the incidence of stunting, namely  $\rho$  (0.03) <  $\alpha$  (0.05). This was confirmed by the reserched of Mataram that there was a significant association between maternal education level with the incidence of stunting and low maternal education 3.313 times higher risk of experienced stunting with high maternal education (Nurmalasari, Anggunan and Febriany, 2020)

The level of mother's education had a big influenced on the nutritional status of the family which had an impact on family health, especially for children, because mothers are the main supervisors in food management and have an important role in improved the nutritional status of children. (Noviyanti, Rachmawati and Sutejo, 2020). This reinforced by research by Vollmer *et al.*, (2017) that mothers with low education did not continue their education even then it will be more at risk to have children with stunting.

The incidence of stunting was higher in mothers with low education, which indirectly affects the ability of mothers to choose food menus that have balanced nutritional value and quality at low prices.

Differences in maternal characteristics in the field of education will affect the nutritional status of children (Apriluana and Fikawati, 2018).

The results showed that the family economy can affect the incidence of stunting, that was 100% of respondents with low economies have children with stunting, and there was a significant relationship between the family economy and the incidence of stunting at  $\rho$  (0.03) <  $\alpha$  (0.05).

This was confirmed by research in Yemen that Yemeni children who had low income will suffer stunting and had a significant relationship between low economic with the incidence of stunting that  $\rho$  (0.001) <  $\alpha$  (0,05) (Al-Mansoob and Masood, 2018).

The family economy could cause children with stunting, which was the purchased power that did not hit. This was in accordance with research by Beal *et al.*, (2018), who had reviewed articles in Indonesia that low economic families can not meet the nutritional adequacy of the family due to low purchased power.

The researched from Ibrahim and Faramita, (2015) states that there is no significant relationship between income levels and the incidence of stunting in children. The absence of a relationship between family income and nutritional status of children under five can be caused indirectly because income does not have a positive effect on nutritional status but through other variables such as food distribution, knowledge and skills of parents (parenting patterns), because income is only a medium for spending needs in.

The results showed that the height of the mother at risk, namely <145cm, had a child with stunting and had a significant relationship, namely  $\rho$  (0.01) <  $\alpha$  (0.05) and the height of the mother who was at risk had a tendency of 12,045 times to be stunted.

This is supported by research from Fitriahadi, (2018) that mothers who have a short stature category are 68.4% and mothers with not short categories who had stunted children are 17.5%, and had a significant relationship between short maternal height and the incidence of stunting. Then the research in Minahasa found that groups with short stature, namely <155 cm in mothers, tended to have children with stunting (Ratu *et al.*, 2010).

Added to research in the Philippines, India and South Africa, Brazil that there is a significant relationship between short maternal height (<150cm) and the tendency for children to be stunted at the age of 2 years. (Addo *et al.*, 2013). Accorded to

Naik dan Smith (2015) at Fitriahadi, (2018), that a woman (mother) who has been stunted since childhood, will experience growth problems included disorders of the reproductive organs, complications in pregnancy that will cause difficulty in childbirth and even perinatal death.

One of the factors of short parents will cause the child to become stunted, which was the result of pathological conditions such as growth hormone deficiency, so that it can carry genes in chromosomes that carry short traits, which will increase the chance for the child to be stunted. (Rahayu and Khairiyati, 2014)

## CONCLUSION

Determinants of stunting incidenced among others, Mother education level, economic, family and Mother's height had a significant relationship to the occurrence of stunting, but the sex of infants did not had a significant relationship to the incidence of stunting.

## SUGGESTION

The incidence of stunting in children aged 1-2 years is influenced by the choice of food menu for toddlers, and the correct way of processing food. Mothers must know about types of food that had high nutritional value at low prices so that the nutritional adequacy of the family is fulfilled. Then the Puskesmas as the front line regularly provides counseling to prevent stunting as early as possible in toddlers

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