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The Relationship between Sociodemographic Factors and Short Stature in Toddlers

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Abstract

Stature is the human physical form or somatotypes. Stature is often associated with sociodemographic factors. However, now, further evidence is needed about this phenomenon, especially in the toddler population. This study aimed to analyze the relationship between sociodemographic factors and short stature in toddlers. Cross-sectional study design. The population was 303 children aged 12-60 months in Lojejer Wuluhan Village, Jember, East Java. Determination of areas was carried out using cluster sampling and 172 samples using simple random sampling. Sociodemographic variables measured included: the father's age, mother's age, father's and mother's education, family income, gender, and birth weight. Stature dependent variable. Data collection techniques use observation and questionnaires. The instrument uses a checklist of observations of height and age, as well as a questionnaire for sociodemographic data. Data analysis using binary logistic regression. The results showed that gender and birth weight have a relationship with short stature in toddlers. Male sex (p 0.004, AOR 3.94, 95% CI 1.54 to 10.07) and birth weight (p <0.001, AOR 39.005, 95% CI 7.69 to 197.63). This study concluded that male toddlers and those born with low birth weight had a higher risk of experiencing short stature compared to female toddlers and those born with normal birth weight and above. It is necessary to research further the influence of gender on short stature.

INTRODUCTION

Short stature is an important global health problem. Short stature is a height that is not suitable for age so that the height is less than 2-3 standard deviations below the average (Huang et al., 2022). Most of the short stature is caused by physiology and growth failure (Patel & Bajpai, 2021). The impacts that can occur are psychosocial problems, cognitive problems, malnutrition, the presence of chronic diseases, skeletal disorders and dysmorphic disorders (Purnamasari, 2023).

The prevalence of short stature in the national scope is 30.8%, consisting of a prevalence of short stature of 19.3% and very short prevalence of 11.5%. There are several provinces that contribute the most to short stature in toddlers, namely the first rank for the province of East Nusa Tenggara (NTT) with an incidence of 42.6%, then West Sulawesi ranks 2nd with 40% as a contributor to cases of short stature and for the 3rd rank with 37.8% of cases are Aceh province (Riskesdas, 2018).

East Java is the province ranked 11th after Papua with cases of 32.8% with a very short proportion of 12.9% and a short proportion of 19.9%. The biggest contributor to the incidence of short stature in the province of East Java is Sampang Regency with an incidence of 47.92%, ranking second is Pemekasan Regency with 41.87% cases. Jember Regency is also one of the contributors

which is quite a lot, namely 38.31% with the proportion of very short 15.67% and short as much as 22.64% (Riskesdas Jatim, 2018).

Previous studies have explained a lot about the causes of stunting, but there are still very few studies that carry out research based on stunting areas. This study aims to explore factors associated with short stature using stunting clusters directly. Some of the things that cause short stature in toddlers are the sociodemographics of parents and children. Previous research stated that sociodemographic variables were associated with the incidence of stunting which included the mother's education, the mother's employment status, the mother's emotional mental disorder, the mother's age at delivery, the mother's desire to become pregnant, the sex of the child, economic status, the existence of a large family, the type of water source used in the household, social security, expected receipt of direct cash assistance/family programs, and ownership of a latrine in the household (Kusumajaya, 2023). In addition, the driving factors for short stature are the education level of mothers and fathers, household socio-economic status, sanitation conditions, access to maternal health services, and family planning (Vaivada et al., 2020),(Pratama, 2021). Mother's height is also reported to be associated with the incidence of stunting in infants. Mothers with short stature have a higher number of malnourished children compared to taller mothers (Javid & Pu, 2020). Demographic variables of children are also reported to be the cause of short stature, including: toddler's age, gender, history of birth weight, and history of disease (Amelia, 2020). Based on this description, it is necessary to examine the relationship between sociodemographic factors and short stature in toddlers. The implication of this study for the development of science is the importance of paying attention to sociodemographic factors to optimize children's growth and development.

RESEARCH METHODS

Cross-sectional study design. The population in this study were toddlers aged 12-60 months in the working area of the Lojejer Health Center with a total of 303. The number of samples was determined by the Slovin formula. A number 172 samples were obtained. The sampling technique is by means of cluster sampling. The location chosen at random was Lojejer village. Sampling was carried out proportionally at six Posyandu in Lojejer village.

Sociodemographic variables that were measured included: father's age, mother's age, father's education, mother's education, family income, under-five gender, and birth weight. The age of the father/mother is measured by calculating the date of birth until the time of data collection, and is measured in years. Age is measured in the form of categorical data which is divided into three, namely age <20 years; ages between 21-35 years, and ages > 35 years. The education of the father/mother is the educational history that has been passed by the father/mother until graduation. Education is measured in the form of categorical data which is divided into 3, namely elementary, junior high and high school. Family income is calculated by adding up the monthly income of the father and mother. Income is measured in the form of categorical data which is divided into 3, namely: > Rp.3,000,000,-; between Rp.1,000,000.- Rp.3,000,000,-; and < Rp. 1,000,000.-. The sex of the child is measured on a nominal scale, namely boys and girls. Birth weight is measured through data on the child's weight at birth in grams. Birth weight was measured in categorical data with the following provisions: low birth weight (LBW) if < 2,500 grams; normal birth weight if 2500-4000 grams; and more weight if > 4000 gram.

The dependent variable is short stature. The stature measurement follows the provisions of the Republic of Indonesia Minister of Health regulation number 2 of 2020 concerning child anthropometric standards. Stature is measured from the results of measurements of Body Length or Height compared to age. Normal stature if the Z score standard deviation is at -2 SD – 2 SD. Short stature if the Z score standard deviation is at -3 SD - < -2 SD. Values < -3 SD (very short) in this study were merged into the short category. The standard deviation value of the Z score > 2 SD is included in the category of tall stature, but in this study there were no respondents who were in the category of tall stature.

Data collection techniques for stature variables used observation, and sociodemographic variables used questionnaires and document studies from the MCH handbook. The instrument for short stature uses an observation checklist for height and age. Sociodemographic instruments use questionnaires and MCH books. Instrument validity and reliability tests were not carried out because

the variables measured in this study were in the form of demographic and anthropometric data whose validity was confirmed through direct observation of height measurements and study of documents from the MCH handbook. Data analysis to answer the study objectives used binary logistic regression.

The application of ethical principles in this research includes: respecting human dignity (respect for persons), doing good (beneficence) and not harming (non-maleficence), and justice (justice) namely treating everyone (as an autonomous person) the same as morals right and worthy of their rights.

RESULT

Table 1
Descriptive Statistics of Sociodemographic Variables for Children aged 12-60 months in Lojejer Wuluhan Jember Village, East Java 2022 (n=172)

Variable	Short Stature		p-value
	Yes (n = 91)	No (n = 81)	
Father's age			
<20 years	91 (52.9%)	2 (1.2%)	
20-35 years	0 (0%)	63 (36.6%)	0.996
>35 years	0(0%)	16 (9.3%0	
Mother's age			
<20 years	91 (52.9%)	4 (2.3%)	
20-35 years	0 (0%)	61 (35.5%)	0.996
>35 years	0(0%)	16 (9.3%)	
Father's education			
Elementary School	39 (22.7%)	27 (15.7%)	
Junior High School	26 (15.1%)	18 (10.5%)	0.055
Senior High School	26 (15.1%)	36 (20.9%)	
Mother's education			
Elementary School	35 (20,3%)	34 (19.8%)	
Junior High School	36 (20,9%)	33 (19,2%)	0.472
Senior High School	20 (11,6%)	14 (8,1%)	
Family income			
>IDR 3,000,000	16 (9.3%)	34 (19.8%)	0.001
Rp. 1,000,000-Rp. 3,000,000	57 (33.1%)	39 (22.7%)	
< Rp. 1,000,000	18 (10.5%)	8 (4.7%)	
Gender Toddler			
Man	57 (33.1%)	27 (15.7%)	< 0,001
Woman	34 (19.8%)	54 (31.4%)	
Birth weight			
Low	74 (43.0%)	7 (4.1%)	
Normal	14 (8.1%)	64 (37.2%)	< 0,001
More	3 (1.7%)	10 (5.8%)	

Table 1 describes that short stature all have fathers and mothers who are less than 20 years old. Based on education, the incidence of short stature is evenly distributed among fathers and mothers with primary and secondary education. Likewise for parents' income, short stature can still occur in families who have income >Rp. 3,000,000.-/month. Table 1 also describes that male toddlers have a greater proportion of short stature than female toddlers. Furthermore, more short stature has a history of low birth weight.

Table 2
Results of Analysis of The Relationship Between Logistic Regression of Sociodemographic Factors and Short Stature in Children aged 12-60 Months in Lojejer Wuluhan Village, Jember, East Java 2022 (n=172)

Predictors	p-value	Perawakan pendek		
		OR	95% CI	
			Lower Bound	Upper Bound
Family income				
>IDR 3,000,000	.346	.461	.092	2.309
Rp. 1,000,000-Rp. 3,000,000	.757	.791	.179	3.490
< Rp. 1,000,000	referens			
Gender				
Man	.004	3.94	1.540	10.079
Woman	referens			
Birth weight				
Low birth weight	.000	39.00	7.698	197.639
Normal birth weight	.874	.882	.186	4.182
Over birth weight	referens			

CI: confidence interval of 95%; p-value < 0.05

Table 2. Explains that male toddlers are associated with short stature. Boys are 3.94 times more likely to have short stature than girls. In addition, low birth weight is also associated with short stature. Babies born weighing < 2500 grams are 39 times more likely to be short stature than babies born weighing > 4000 grams. Babies born with normal weight are not proven to be associated with short stature.

DISCUSSION

The results of this study prove that male toddlers have a higher risk of short stature compared to female toddlers. Toddler boys tend to be obese compared to toddler girls. Toddler girls have a faster satiety level than toddler boys. Men and women have different heights, weights, and ages which have different body compositions (Aprilia, 2022). Toddler boys need more energy and protein. Short stature in toddler boys illustrates a disturbance in growth in height that lasts for quite a long time (Rahayu 2020). The results of this study are consistent with previous studies which reported that the stature of male toddlers with short or very short conditions was taller than female toddlers (Yuningsih, 2022). Similar to previous studies, based on the analysis of risk factors between the sexes and the incidence of stunting, it shows that the highest percentage is male toddlers (Musadalifah et al., 2022). Gender (male) is a factor related to stunting in children aged 12–23 months in Indonesia (Aryastami et al., 2017). Gender has been shown to have a very important factor in the incidence of stunting. Physiologically, men need more nutrition and protein. Activities Toddler boys tend to have high mobility and require more energy than girls.

The results of this study also prove that babies born with low weight are more likely to have short stature than babies born with more weight. Low birth weight babies are often related to the condition of the mother during pregnancy who has poor nutrition. This has an impact on intra-uterine growth retardation which inhibits the growth and development of the baby. Inadequate nutritional intake will cause slow growth in infants. Slow growth makes toddlers susceptible to infectious diseases (Kamilia, 2019). Slowing growth after birth will be the cause of obstacles in increasing height. Stunted height will cause short stature. Obstacles in the child's growth process cause short stature (Nuryani, 2017). Babies born with low body weight can experience obstacles in the digestive process. As a result, it affects the level of absorption of nutrients, so that the nutrition that is owned

is not optimal, has an impact on the child's growth process that is not optimal, and leads to short stature.

The results of this study are also consistent with a meta-analysis that analyzed 11 primary studies in Brazil, Ethiopia, and Indonesia, which proves that Low Birth Weight (LBW) can increase the incidence of stunting (Putri, 2022). Studies in India are also similar to the results of this study, children with low birth weight experience a much higher probability of stunting compared to children with normal birth weight (Halli et al., 2022). Previous studies have also proven that LBW is a factor associated with stunting in children aged 12–23 months in Indonesia, and LBW is the main determinant of stunting (Aryastami et al., 2017). Likewise the results of studies in Phra Nakhon Si Ayutthaya province, Thailand, and sub-Saharan Africa, supports the results of this study which states that low birth weight has a significant detrimental effect on child health outcome variables (stunting, wasting, and both). Children with low birth weight were significantly more likely to be moderately wasted and very wasted and both (stunted and wasted), compared to children with normal birth weight. Boys, when born at low birth weight, are significantly more likely to be wasted and stunted than girls. The results of this study also support findings that prove that LBW newborns are at higher risk of wasting and stunting in Pakistan, (Chaveepojnkamjorn et al., 2022),(Gyan et al., 2022),(Abbas et al., 2021).

This study also provides evidence that babies born with normal weight are not significantly associated with short stature. Babies born with normal weight nutritional needs during pregnancy have been met. Babies born with normal weight are also related to the age of the mature mother and the reproductive system is ready to be fertilized. The incidence of short stature in babies born with normal weight is less likely because the reproductive system is mature and nutrition in children is sufficient (Liznindya, 2023). The results of this study are in line with studies that state that babies born with normal weight have 0.226 times the risk of becoming stunted compared to children with low birth weight, in other words, normal birth weight is a protective factor. So it was concluded that there was no relationship between birth weight and the occurrence of stunting in toddlers (Winowatan et al., 2017). The study results show that it is important for mothers to give birth to babies with a birth weight between 2500-4000 grams to prevent short stature.

CONCLUSION

This study concluded that male toddlers have a higher risk of experiencing short stature compared to female toddlers. Babies born with low birth weight are at risk of experiencing short stature compared to those with normal birth weight and more. Nutritional status at birth is the initial capital for children's growth in the Toddler period.

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