Can Living In A Wealthy Family Free Child From The Stunting Risk? Studies On Wealthy Indonesian Families In Urban Areas

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ABSTRACT

Several prior studies have found that poverty was a major cause of stunting. However, we discovered stunting in wealthier homes as well. The study analyzes the stunting risk of wealthy families' children in urban Indonesia. This cross-sectional study enrolled 14,259 children under two in urban Indonesia. Aside from stature, the study looked at seven independent variables (maternal age, marital status, education, employment, children's age, gender, and early breastfeeding beginning). In the final exam, the study utilized a binary logistic regression examination. The result showed that children with wealthy families in urban Indonesia still have a stunting risk of around 11.9%. The study indicates that age was related to the stunting risk of children with affluent families. Children with all maternal age groups were more likely than >44 to experience stunting. Divorced/widowed mothers were 1.089 times more likely than married mothers to have stunting children (AOR 1.089; 95% CI 1.051-1.127). The lower the mother's education, the higher the possibility of stunting children. Unemployed mothers were 1.018 times more likely than employed mothers to have stunting children (AOR 1.018; 95% CI 1.009-1.026). Based on children's age, 12-23 was 2.993 more likely than <12 to experience stunting (AOR 2.993; 95% CI 2.967-3.020). Regarding children's gender, boys were 1.376 times more likely than girls to experience stunting (AOR 1.376; 95% CI 1.365-1.387). Children without early initiation of breastfeeding (EIBF) were 1.008 times more likely than those with EIBF (AOR 1.008; 95% CI 1.001-1.016). The study

concluded that children with wealthy families in urban Indonesia still have a stunting risk.

Keywords: stunting, wealthy families, nutritional status, public health nutrition, public health.

INTRODUCTION

Stunting indicates a failure to accomplish genetic potential for linear growth and a global agreement of the leading indicator for child well-being (de Onis and Branca 2016). Stunting is defined as a length- or height-for-age <-2 SD of a growth standard or reference by the public health communities (Bogin 2022). It indicates infection, poor maternal health and nutrition, lack of care, inappropriate feeding during childhood, poor nutrition, and poor environmental and socioeconomic conditions, which reflect social inequalities (de Onis and Branca 2016; Tanjung, Prawitasari, and Rusli Sjarif 2020; UNICEF, WHO, and World Bank 2018). Stunting may start on the first day of conception and usually continues until two years of age, a golden period called the first 1000 days of life (Vonaesch et al. 2017).

According to UNICEF, WHO, and the World Bank, about 151 million stunted children are found worldwide, or 22.2% of all children. Additionally, compared to upper-middle-income (27%) and high-income (10%) countries, the number of stunted children is concentrated in low-income (16%) and lower-middle-income (47%) countries. There are 5.1 million stunted children in Latin America and the Caribbean, 58.7 million in Africa, and 83.8 million stunted children in Asia, mainly in Southern and Southeast Asia (Mulyaningsih et al. 2021). While the results of the Indonesian Nutritional Status Survey 2022 reported that the stunting rate in Indonesia was 21.6% (The Ministry of Health of The Republic of Indonesia 2023). Many low- and middle-income countries (LMICs) suffer per capita income losses (penalties) that vary from 5 to 7% due to stunting. Meanwhile, decreasing the stunting rate is anticipated to boost global gross domestic product (GDP) by 4–11% in African and Asian areas (Akseer et al. 2022).

Indonesia was ranked 115th out of 151 nations for the prevalence of stunting in 2020. According to the WHO classification, Indonesia still has a high prevalence of stunting and malnutrition. Even though Indonesia's economy is the largest in South East Asia and the 17th largest in the world, results on child health are low. Additionally, in Southeast Asia, the cases of stunting rose from 24.7% in 2019 to 38.5% at the start of the pandemic in 2020 (Mulyaningsih et al. 2021; Sudigyo et al. 2023). Meanwhile, in Indonesia, stunting cases were lower during the Covid-19 pandemic in 2019, 2021, and 2022, which

were 27.7%, 24.4%, and 21.6%, consecutively. However, this figure is still above the target stunting rate of 14% in 2024 (The Ministry of Health of The Republic of Indonesia 2023).

Stunting is caused by multi-dimensional factors, mainly due to the lack of nutrition supply for pregnant mothers and toddlers. Poverty is also an essential factor driving stunting in toddlers. The analysis of Demographic Health Surveys (DHS) in five South Asian countries shows that children from poorer households were at higher odds of being stunted when compared to those from wealthy families (Wali, Agho, and Renzaho 2020). This finding reinforces previous research conducted in India and Indonesia (Beal et al. 2018; Chalasani and Rutstein 2014; Ramli et al. 2009). Low socio-economy status was the critical determinant of childhood stunting issues in Indonesia(Beal et al. 2018). A study in Central Java found that socioeconomic level impacted the length of age Z scores, which were measured by wealth quintiles (Kartasurya et al. 2023). The dominant factors causing stunting include children living in rural areas, with most children having the most difficult access to healthcare facilities (Suratri et al. 2023). A study in Ghana found that household wealth was related to stunting, where the lowest wealth quintiles had the most insufficient length for age Z scores (Darteh, Acquah, and Kumi-Kyereme 2014). Low-income families cannot meet their children's and pregnant women's nutritional intake. As a result, dietary needs are not fulfilled during pregnancy, the child's growth and development are disrupted, and the child becomes stunted.

Stunting is not only a phenomenon for low-income families, children from wealthy families are also at risk of stunting. In Indonesia, it is reported that around 30% of stunting comes from children in affluent families (National Institute of Health Research and Development of The Indonesia Ministry of Health 2019). Studies in several countries (Budhathoki et al. 2020; Talukder, Razu, and Hossain 2018; Tariku et al. 2017) report that stunting also occurs in children from wealthy families, even though the higher risk still occurs in low-income families. A cross-country analysis from 239 nationally representative household surveys from low-and middle-income countries also found stunting among wealthy families (Fink et al. 2017). Stunting in urban areas is usually conducted in slum areas, which also represent the lower economic status (Satapathy et al. 2021). Limited research explored factors related to stunting in wealthy families in urban areas. The study analyzes the stunting risk of wealthy families' children in urban Indonesia based on the background context.

MATERIALS AND METHODS

Data Source

The study looked at secondary data from the Indonesian National Nutritional Status Survey in 2021. The Indonesian Ministry of Health conducted the cross-sectional survey on a national basis. The study's population included all Indonesian under-two-year-olds from wealthy families in urban areas. Children under two (23 months) served as the analysis unit in this study, with mothers serving as respondents. The survey employed a multi-stage cluster random sampling strategy, yielding a weighted sample of 14,259 children.

Setting

We conducted the study on wealthy households in urban Indonesia. The wealth quintile of a household's items was used to determine its wealth status in the 2021 Indonesian National Nutritional Status Survey. The number and diversity of things in the home, such as televisions, bicycles, or cars, and home elements (drinking water sources, restroom facilities, and the principal building materials used for the floor) were considered when giving household grades. The survey computed the score using principal component analysis. National wealth quintiles were developed by assigning a score to each household member and categorizing them into five groups, each representing 20% of the population (Wulandari, Laksono, Prasetyo, et al. 2022). Furthermore, we define wealthy families based on the richer and the richest (quintiles 4 and 5).

Dependent Variable

The study's dependent variable was stunted children. Stunted was a nutritional status indicator based on age-appropriate height or a child's height at a specific age. We calculated a period's height indicator using WHO growth standards and the z-score, or height departure from average height. The study classified stunting into two types: normal and stunting. Based on height index/age, the nutritional status group limit is (Laksono, Wulandari, et al. 2022):

- Stunting : < -2.0 SD
- Normal : ≥ -2.0 SD

Independent Variables

We looked at seven independent factors in the study. Maternal age, maternal marital status, maternal education level, maternal employment position, children's age, gender, and early breastfeeding initiation were the seven factors.

We classified the mothers' ages as follows: 20, 20-24, 25-29, 30-34, 35-39, 40-44, and >44. Married and divorced/widowed moms are included in the maternal marital status. Meanwhile, the study computes maternal education using the most recent certificate held by moms with children under two. The study classified maternal

education into four categories: none, primary, secondary, and higher education. Furthermore, we included unemployed and employed moms in the maternal employment status.

The last month's birthday (in months) determines a child's age. The ages of the children range from 12 to 12-23 months. On the other hand, the study divided children into boys and girls. In addition, early breastfeeding initiation occurs when the baby is placed on the mother's chest immediately after birth, and the baby and mother have skin-to-skin contact after delivery. We classified early breastfeeding initiation into two types: No and Yes.

Data Analysis

In the early rounds of analysis, we performed the Chi-Square test. Then, we ran a co-linearity test to check that there was no strong link between the independent variables. In the final stage, we performed a binary logistic regression test. We used IBM SPSS Statistics 26 software for all statistical analyses.

Ethical Approval

The national ethics commission from the National Institute of Health Research and Development has authorized an ethical license for the 2021 Indonesian National Nutritional Status Survey (LB.02.01/2/KE.248/2021). The study employed written informed consent during data collection, which accounted for the voluntary and confidential features of the data-gathering technique, and respondents supplied signed informed consent.

RESULTS

Based on the study's result, children with wealthy families in urban Indonesia still have a stunting risk of around 11.9%. Moreover, Furthermore, Table 1 provides a statistical breakdown of the characteristics of children under two from wealthy families in urban Indonesia. Based on the maternal age group, the youngest (<20) have the highest prevalence of stunting children.

Regarding maternal marital status, Table 1 indicates that the prevalence of stunting children with divorced/widowed mothers is higher than those with married mothers. According to maternal education, the lower the education, the higher the prevalence of stunting children. Moreover, based on maternal employment status, the ratio of stunting children in unemployed mothers is slightly higher than in employed mothers.

Table 1. Descriptive Statistic of Nutritional Status of Children Under Two Years among Wealthy Indonesian Families in Urban Areas (n=14,259)

Variables	Nutritional Status		p-value
	Normal (n=12,535)	Stunting (n=1,724)	
Maternal age group			*<0.001
- <20	85.7%	14.3%	
- 20-24	86.2%	13.8%	
- 25-29	88.7%	11.3%	
- 30-34	89.2%	10.8%	
- 35-39	86.9%	13.1%	
- 40-44	86.6%	13.4%	
- >44	91.4%	8.6%	
Maternal Marital status			*<0.001
- Married	88.1%	11.9%	
- Divorced/widowed	84.2%	15.8%	
Maternal education level			*<0.001
- No formal education	84.5%	15.5%	
- Primary	85.0%	15.0%	
- Secondary	87.9%	12.1%	
- Higher	90.9%	9.1%	
Maternal employment status			*<0.001
- Unemployed	87.6%	12.4%	
- Employed	88.8%	11.2%	
Age of under two years			*<0.001
- <12 months	93.7%	6.3%	
- 12-23 months	83.5%	16.5%	
Gender of under two years			*<0.001
- Boy	86.4%	13.6%	
- Girl	89.8%	10.2%	
Early initiation of breastfeeding			**0.001
- No	88.2%	11.8%	
- Yes	88.0%	12.0%	

*p<0.001; **p<0.010

Table 1 displays that, based on children's age, the prevalence of stunting children in 12-23 is almost three times that in <12. Regarding children's gender, boys stunting is more prevalent than girls. Furthermore, the ratio of stunting children in early breastfeeding initiation is slightly higher than without early breastfeeding initiation.

The collinearity test came next. The results reveal that the average tolerance value for all variables is more significant than 0.10, and the variance inflation factor for all variables is less than 10.00. The study found no indicators of a strong relationship between two or more independent variables in the regression model by referring to the basis of decision-making in the multicollinearity test.

Table 2 shows the results of the binary regression logistics. The study indicates that age is related to the stunting risk of children with wealthy families. Children with all maternal age groups are more likely than >44 to experience stunting. Based on maternal marital status, divorced/widowed mothers are 1.089 times more likely than married mothers to have stunting children (AOR 1.089; 95% CI 1.051-1.127).

Regarding education level, Table 2 indicates that the lower the mother's education, the higher the possibility of stunting children. According to maternal employment status, unemployed mothers are 1.018 times more likely than employed mothers to have stunting children (AOR 1.018; 95% CI 1.009-1.026).

Table 2 displays that children's age and gender are associated with stunting risk. Based on children's age, 12-23 is 2.993 more likely than <12 to experience stunting (AOR 2.993; 95% CI 2.967-3.020). Regarding children's gender, boys are 1.376 times more likely than girls to experience stunting (AOR 1.376; 95% CI 1.365-1.387). Moreover, according to early breastfeeding initiation (EIBF), children without early breastfeeding initiation are 1.008 times more likely than those with early breastfeeding initiation (AOR 1.008; 95% CI 1.001-1.016).

Table 2. Binary Logistic Regression of Nutritional Status of Children under two years among Wealthy Indonesian Families in Urban Areas (n=14,259)

Predictors	p-value	Stunting		
		AOR	95% confidence interval	
			Lower bound	Upper bound
Maternal age: <20	*<0.001	1.795	1.688	1.909
Maternal age: 20-24	*<0.001	2.043	1.942	2.149
Maternal age: 25-29	*<0.001	1.683	1.601	1.769
Maternal age: 30-34	*<0.001	1.528	1.453	1.607
Maternal age: 35-39	*<0.001	1.835	1.745	1.929
Maternal age: 40-44	*<0.001	1.759	1.670	1.852
Maternal age: >44	-	-	-	-
Marital status: Married	-	-	-	-
Marital status: Divorced/widowed	*<0.001	1.089	1.051	1.127
Education: No formal education	*<0.001	1.848	1.737	1.966
Education: Primary	*<0.001	1.751	1.731	1.772
Education: Secondary	*<0.001	1.370	1.356	1.384
Education: Higher	-	-	-	-
Employment status: Unemployed	*<0.001	1.018	1.009	1.026
Employment status: Employed	-	-	-	-
Age of under two years: < 12 months	-	-	-	-
Age of under two years: 12-23 months	*<0.001	2.993	2.967	3.020

Predictors	p-value	Stunting		
		AOR	95% confidence interval	
			Lower bound	Upper bound
Gender of under two years: Boy	*<0.001	1.376	1.365	1.387
Gender of under two years: Girl	-	-	-	-
Early initiation of breastfeeding: No	**0.037	1.008	1.001	1.016
Early initiation of breastfeeding: Yes	-	-	-	-

AOR: Adjusted Odds Ratio; ∗p<0.001; **p<0.050.

DISCUSSION

The study showed that children with wealthy families in urban Indonesia still have a stunting risk. The findings of this study show that stunting occurs not only in low-income families but also in wealthy families (Quintil 4 and 5). This study revealed children from wealthy families in urban Indonesia still face a stunting risk of around 11.9%. This finding is consistent with an analysis of epidemiological and socioeconomic data from 72 Demographic and Health Surveys (DHS) in low- and middle-income countries, which revealed that stunting in the wealthiest quartile of families ranged from 12.2% (95% CI 10.5% to 13.8%) to 17.5% (95% CI 15.4% to 19.5%) (Bommer et al., 2019). Inadequate dietary intake and disease have a direct impact on childhood malnutrition. Indirectly, stunting could result from food insecurity, insufficient care, and feeding practices, an unhealthy home environment, and insufficient health services (Surono et al. 2021; Wulandari, Laksono, Kusrini, et al. 2022).

Aside from socioeconomic status, chronic or recurring malnutrition, poor maternal health and nutrition, frequent illness, and inappropriate feeding and care during childhood are crucial factors related to stunting (UNICEF, WHO, and World Bank 2018). Parenting styles are critical for preventing stunting, as revealed in previous research. Therefore incorrect parenting style could increase the risk of stunting among children in wealthy families (Nelly SD Situmeang, Etti Sudaryati, and Jumirah 2020). A good maternal parenting style will affect the motherly attitude and practice regarding responsive feeding behavior. Parenting feeding practices are also related to maternal education, an essential factor in stunting in toddlers, including nutrition regulation (De-Jongh González et al. 2021; Laksono, Sukoco, et al. 2022; Suratri et al. 2023).

Maternal factors play essential roles in stunting wealthy urban families. Children with all maternal age groups were more likely than >44 to experience stunting. The maternal age influencing the risk of stunting still varies in several studies. The research found that children of adolescent mothers have an eight times higher risk of developing stunting than mature mothers (Wemakor et al. 2018). A systematic review study states that the maternal pregnancy age is related to

stunting. The younger the mother, the higher the risk of experiencing stunting (Astuti, Azka, and Rokhmayanti 2022). Pregnancy at a young age requires more energy and nutrition, therefore, is more vulnerable to malnutrition (Nguyen et al. 2021). A study has shown different results, stating that the age of parents >35 years increases the risk of having a stunted at birth 2.37 times higher compared to a younger generation (Sari and Sartika 2021). Furthermore, maternal age may not be directly related to the incidence of stunting but through other factors.

Based on maternal marital status, divorced/widowed mothers were likelier than married mothers to have stunted children. Single motherhood can increase the likelihood of stunting in children under two years because it is related to economic problems. Paternal involvement and responsibility during childhood are associated with better emotional well-being in children (Kesebonye and Amone-P'Olak 2020). Research in Ethiopia revealed a similar result. The risk of stunting is 4.27 times higher in children with divorced/widowed compared to children of married mothers in Ethiopia (Dewana et al. 2017). Another study shows that a never-married mother increases the risk of stunting by 5.56 times higher than married and living together status (Wondafrash et al. 2017).

The study informed that the lower the mother's education, the higher the possibility of stunting children. The condition is due to the opportunity that interventions more seldom reach mothers with low education (Kusrini and Laksono 2020; Laksono, Wulandari, et al. 2022). Educated mothers can receive information from various sources, increasing their understanding and knowledge about child-rearing. Our research result is similar to other studies conducted in Bangladesh, which found that parental education was a significant predictor of stunting in children under two. Mothers with lower education are more likely to have stunted children, and mothers who do not complete secondary education have more stunted children than mothers who have completed secondary education (Chowdhury et al. 2020). Therefore, strategies for development in increasing parental education and awareness are essential in improving nutrition and reducing cases of stunting (Laksono et al. 2021; Laksono, Wulandari, et al. 2022).

The result showed that unemployed mothers were likelier than employed mothers to have stunted children. According to this study, children from employed mothers in wealthy urban families have a lower chance of experiencing stunting. Maternal employment is associated with income, a higher standard of living, and the opportunity to bring nutritious food for their children (Amaha and Woldeamanuel 2021; Laksono, Sukoco, et al. 2022). This study's results contradict several studies that showed no significant relation between maternal employment and reduced risk of stunting (Amaha and

Woldeamanuel 2021; Eshete et al. 2017). Employed mothers is related to a higher risk of children stunting. It is due to the limited time and opportunity for caring for breastfeeding infants, reducing the risk of stunting (Ketema, Bosha, and Feleke 2022; Shahraki et al. 2018). The effect of maternal employment could vary between household socioeconomic status. Mothers from wealthy households had more opportunities to compensate for the lesser chances and time to care for their children by providing child care services like a good quality daycare, providing nutritious food, and providing household assistants who are responsible for child care during the maternal working time (Amaha and Woldeamanuel 2021).

Besides maternal factors, several child's characteristics are also related to the risk of stunting. This study indicated that a child's age was associated with the stunting risk of children with wealthy families. According to the findings of this study, children aged 12 to 23 months are nearly three times more likely to suffer from stunting than children of a younger age. Inadequate growth related to higher age could derive from the difficulties associated with transitioning from breastfeeding to complementary feeding. Child growth problems will develop if continuous breastfeeding is not complemented by sufficient complimentary meals at the right age, and inadequate supplemental food in response to the increased nutritional demand might impede their younger linear growth (Goudet et al. 2019). Older children are more likely to be exposed to situations and diseases, such as poor environmental sanitation and food hygiene, which could impair their growth. Inadequate dietary intake and poor ecological conditions increased infection susceptibility in children, resulting in insufficient nutritional uptake. Other research revealed that the body length gap between low birth weight and normal weight infants widened with age, starting at 12 months and continuing until the kid was two years old (Suratri et al. 2023; Titaley et al. 2019).

This study found that boys were more likely to be stunted than girls. This finding is consistent with the results of earlier studies in Indonesia and other developing countries (Nguyen et al. 2020; Titaley et al. 2019). Although boys' susceptibility to stunting is evident in developing countries, the mechanisms underlying this are poorly understood. A possible explanation is the convergence of differences in the maternal feeding behavior of boys due to biological factors, living conditions, and gender-specific cultural perceptions (Beal et al. 2018). Another possible explanation is that boys are more likely than girls to suffer from childhood illnesses such as respiratory infections, diarrhea, and pneumonia. These infections can interfere with the absorption of nutrients from food and thus lead to malnutrition (Takele, Gezie, and Alamneh 2022).

According to EIBF, children without early breastfeeding

initiation were more prone to stunting than those with EIBF. An infant is defined as having EIBF if it has been put to breastfeed within one hour after the birth (World Health Organization and UNICEF 2021). EIBF ensures children obtain colostrum and ingest good microflora forming colonies in the infant skin and intestines; increasing EIBF is also demonstrated to enhance the chance for the success of exclusive breastfeeding, therefore ensuring children obtain the best nutritional intake during the first six months of life and protect the infant from experiencing stunting (Nguyen et al. 2020; Shofiya, Sumarmi, and Ahmed 2020). This result is slightly different from research conducted in urban slum areas of India, which showed EIBF related to the heightened risk of wasting and being underweight but not significant for stunting (Satapathy et al. 2021).

Study Strengths and Limitations

The study's strength is the use of big data in the analysis. The study solely looked at variables provided by the survey in the investigation. The study's findings cannot account for several other factors that previous research has found to influence stunting in young infants. A few examples are antenatal care, mother height, BMI, diarrhea, anemia, and agri-food (Castro-Bedriñana, Chirinos-Peinado, and De La Cruz-Calderón 2021; Castro-Bedriñana, Chirinos-Peinado, and Ríos 2020).

Furthermore, the quantitative technique of the study cannot account for the cultural effects that continue to affect Indonesia, particularly in rural areas. Other studies, such as those on the significance of children, forbidden foods, parenting, and eating habits, influenced the findings (Kusrini, Ipa, and Laksono 2019; Laksono and Wulandari 2019; Maghfiroh and Laksono 2020; Pratita and Laksono 2020).

CONCLUSIONS

Based on the research results, the study concluded that children with wealthy families in urban Indonesia still have a stunting risk. Furthermore, the study also indicated seven variables related to the stunting risk of children with wealthy families: maternal age, maternal marital status, maternal education level, maternal employment status, children's age, children's gender, and early breastfeeding initiation.

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