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Letter to the Editor

Risk Factors of Mild and Severe Stunting Children in Rural and Urban Areas in Indonesia

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Dear Editor-in-Chief

Geographically, Indonesia is very wide, and therefore the disparity of stunting is different in rural, urban, or isles (1-3). Subsequently, socio-economic factors are the main cause of malnutrition (4), while distal factors such as the environment, water access, hygiene, sanitation, and housing are contributing factors (5). The proximate factors are biological aspects such as mother and children characteristics (6).

These results showed that the prevalence of stunting and severe stunting children in rural areas was higher than in urban areas, while the HAZ-score for urban children was 1.4 higher than rural children. Also, after controlling for confounding factors, low birth weight, parental stature, and economic income were the risk factors for mild and severe stunting in both urban and rural areas. Furthermore, in rural areas Water and Sanitation Hygiene (WASH) and children's age were determinant factors of stunting children, while the number of household members was a risk factor for severe stunting children. In urban areas, severe stunting was determined by the number of children. In particular, low birth weight, short parents, and economic income were the most vital risk factors for stunting and severe stunting of children in urban and rural areas.

This research was a cross-sectional study using the pooled data from Indonesian Basic Health Research in 2007, 2010, and 2013, covering all provinces. The samples were all children 0-59 months with complete data and -5.99 to 5.99 HAZ-scores, including 38,246 children. The risk factors were characteristics of the children such as age, gender, birth weight, vitamin A supplementation. Parent's characteristics include height, education, and economic level; and household characteristics; economic level, number of household members, number of children, water, sanitation, and dwelling in rural, urban, and isles. The univariate, bivariate, and multivariate analysis used STATA-13. The highest Odds Ratio by multinomial analysis was considered the most vital risk factor.

The best multivariable analysis model found that the strongest determinant factors for stunting and severe stunting in rural and urban areas were the same, including low birth weight, short parent, and low and middle economic level (Table 1).

Table 1: Multivariate analysis of children and household characteristics related to stunting and severe stunting of children in urban and rural areas

Children characteristics	***Rural***		***Urban***	
	Severe stunting AOR (95%CI)	Stunting AOR (95%CI)	Severe stunting AOR (95%CI)	Stunting AOR (95%CI)
Age (months)				
-0-23	1	1	-	1
-24-59	1.22(1.13-1.32)	1.73(1.59-1.87)		1.31(1.21-1.42)
Sex				
-Girls	1	-	-	-
-Boys	1.14(1.06-1.23)			
Birth weight				
-Normal	1	1	1	1
-LBW	1.31(1.11-1.55)	1.46(1.24-1.72)	1.5(1.27-1.76)	1.42(1.21-1.68)
Mother's height				
-Normal	1	1	1	1
-Short	1.44(1.33-1.55)	1.64(1.51-1.77)	1.23(1.13-1.33)	1.66(1.53-1.79)
Father's height				
-Normal	1	1	1	1
-Short	1.33(1.23-1.44)	1.35(1.24-1.46)	1.36(1.24-1.48)	1.38(1.26-1.50)
Socio-demographic variables				
Number of households				
-> 9	1.66(1.07-2.56)	1.13(0.68-1.89)	-	-
-5-9	1.11(1.02-1.19)	1.13(1.05-1.23)		
-< 5	1	1		
Number of children				
->3			1.64(1.27-2.13)	-
-2-3			0.95(0.87-1.05)	
-1			1	
Father's education				
-Low	1.01(1.01-1.22)		1.09(0.98-1.22)	-
-Middle	1.06(0.95-1.18)		1.16(1.04-1.29)	
-High	1		1	
Economic level				
-Low	1.13(1.01-1.26)	1.33(1.21-1.46)	1.44(1.29-1.60)	1.42(1.28-1.57)
-Middle	1.35(1.23-1.48)	1.25(1.11-1.39)	1.17(1.07-1.29)	1.30(1.18-1.44)
-High	1	1	1	1
Mother's occupation				
-No	1.13(0.96-1.35)			1.13(0.99-1.29)
-Yes, non-formal	1.26(1.11-1.58)			1.18(1.01-1.37)
-Yes, formal	1			1
Father's occupation				
-No	-		1.13(0.86-1.48)	0.86(0.64-1.16)
-Yes, non-formal			1.17(1.07-1.29)	1.15(1.04-1.27)
-Yes, formal			1	1
WASH				
-Bad		1.45(1.12-1.87)		1.17(1.03-1.33)
-Good	-	1		1
Isles				
-Java-Bali	1	-	1	1
-Sumatra	1.26(1.14-1.38)		1.19(1.08-1.31)	1.11(1.01-1.22)
-East Indonesia	1.11(1.01-1.23)		1.11(1.01-1.23)	1.23(1.12-1.36)

In conclusion, there were no significant differences in risk factors between stunting and severe stunting among children in urban and rural areas in Indonesia. In general, low birth weight, social-economic level, and parent's height were the risk factors for stunting and severe stunting of children in urban and rural areas. However, the number of household members was the dominant risk factor for severe stunting in rural areas, while the number of under five children was the dominant risk factor for severe stunting in urban areas. In this research, it was reported that most stunting and severe stunting children were living in unhealthy conditions with bad water access, poor hygiene and sanitation.
Thus, efforts to improve the health of malnourished children focused on increasing low birth weight, economic level, WASH, family structure and family planning. Specific interventions focused on maternal and children's health to prevent baby low birth weight, while sensitive interventions focused on WASH treatment and improving economic status.

Conflict of interest

The authors declare that there is no conflict of interest.

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