DOI: 10.36566/ijhsrd/Vol7.Iss2/346
https://ijhsrd.com/index.php/ijhsrd

Indonesian Journal Of Health Sciences Research and Development
e- ISSN: 2715-4718

Research Article

SOCIOECONOMIC ANALYSIS AND PARENTING PATTERNS ON THE INCIDENCE OF STUNTING IN TODDLERS IN AKABILURU DISTRICT, LIMA PULUH KOTA REGENCY

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ABSTRACT

Background:
Akabiluru Subdistrict was chosen as the research location because of the high prevalence of stunting among toddlers and its correlation with various socioeconomic factors and parenting patterns at the household level. This study aims to analyze the influence of socioeconomic factors and parenting patterns on the incidence of stunting among toddlers.

Methods: This study used a mixed-method design with quantitative and qualitative approaches. The quantitative stage used a case-control study with a sample of 94 cases and 94 controls. The qualitative phase used a sequential explanatory model through FGDs with selected informants to explore mothers' perceptions, cultural factors, family roles, and access to information, which were thematically analyzed to support the quantitative findings.

Results: The results of this study found that maternal education, exclusive breastfeeding, and basic immunization status were significantly associated with stunting, with exclusive breastfeeding being the dominant factor. Qualitative findings showed that exclusive breastfeeding practices were influenced by maternal perceptions, cultural factors, family roles, and access to information.

Conclusion: This study shows that exclusive breastfeeding is a dominant factor associated with stunting in toddlers in Akabiluru District.

Keywords: Parenting, socioeconomics, stunting, toddlers

INTRODUCTION

Stunting remains one of the main health challenges faced by developing countries, including Indonesia (1). According to the World Health Organization (WHO), stunting is a condition of growth failure in children under five years of age due to chronic malnutrition and repeated infections, especially during the first 1,000 days of life(2). Biologically, stunting is characterized by a height that is lower than the standard for age (Z-score TB/U < -2 SD) and is an important indicator of public health status (3).

The short-term effects of stunting include reduced cognitive abilities, metabolic disorders, and increased morbidity and mortality risks(4). In the long term, stunting can lead to low economic productivity, intellectual growth disorders, and an increased economic burden on the country (5). Various strategies have been implemented to prevent stunting, including specific and sensitive nutritional interventions, educating parents about infant and child feeding, and improving access to basic health services (6). Stunting causes suboptimal brain development, resulting in impaired motor and cognitive development, and can even increase the risk of illness and death (7).

Global data for 2023 shows that around 148 million children under five worldwide are stunted, with the highest rates in South Asia and Sub-Saharan Africa(8). Indonesia is among the 10 countries with the highest burden of stunting in the world. In 2024, 22.2% (150.8 million) of children under five worldwide will be stunted, with 55% in Asia and 39% in Africa. Of the 83.6 million stunted children in Asia, the highest proportion is in South Asia (58.7%) and the lowest proportion is in Central Asia (0.9%). This phenomenon is not only a health issue but also a development issue because it directly impacts the quality of future human resources (9).

Based on the results of the 2023 Indonesian Health Survey, the prevalence of stunting in Indonesia only decreased by 0.1%, from 21.6% in 2022 to 21.5% in 2023. This figure is still above the prevalence threshold set by the WHO (<20%). The World Health Assembly has set a target of a 40% reduction in the number of stunted children under five(10). The Indonesian government has made accelerating the reduction of stunting a national priority through various cross-sectoral policies, one of which is the National Program for the Acceleration of Stunting Reduction.

The prevalence of stunting in West Sumatra Province based on 2023 SKI data reached 23.6%, still higher than the national average. Lima Puluh Kota District is one of the areas that still faces serious challenges in efforts to reduce stunting. Based on 2023 SKI data, the prevalence of stunting in Lima Puluh Kota District was recorded at 22.2%, placing it 12th out of 19 districts/cities in West Sumatra Province. This figure shows that although it is below the provincial average, the problem of stunting in this area remains significant. Most cases occur in rural areas with limited access to health and education services. Based on the 2024 District Health Profile, it was recorded that around 27.5% of toddlers experienced stunting, with the highest cases occurring in Nagari Galagua at 20%, followed by Nagari Maek at 19.37%. Socioeconomic inequality between households, low levels of maternal education, and inappropriate parenting patterns are the dominant factors causing high stunting rates in this region.

Lima Puluh Kota District was chosen as the research location because this region represents the complexity of

multidimensional challenges in tackling stunting in rural areas. Despite demonstrating commitment through various convergence programs to accelerate stunting reduction, the prevalence of stunting in this region remains high. Geographical characteristics, such as hilly terrain and remote rural areas, have limited access to health services, education, and nutritional information, contributing to the uneven distribution of interventions. Akabiluru Subdistrict, which is predominantly rural with limited infrastructure and health services, faces obstacles in delivering nutrition and health interventions. while the suboptimal implementation of available programs and the absence of previous studies that specifically examine the relationship between socioeconomic determinants and parenting patterns with stunting in Lima Puluh Kota District reinforce the urgency and relevance of this study, so that the results are expected to provide more targeted and context-based recommendations.

MATERIAL AND METHODS

This study is mixed methods research with a quantitative case control study design and a sequential explanatory qualitative study design using primary data with a questionnaire instrument and to obtain in-depth information from informants regarding contextual factors (mothers' perceptions, cultural factors, family member roles, access to information). Meanwhile, the variables in quantitative research include socioeconomic factors (mothers' education, mothers' employment, household income, food availability, toilet ownership, drinking water sources) and parenting patterns (exclusive breastfeeding, complementary feeding, complete basic immunization status, toddlers' physical activity, access to health services) in the incidence of stunting in toddlers

RESULTS

Univariate analysis was used to examine the frequency distribution of socioeconomic risk factors and maternal parenting patterns in relation to stunting among toddlers in Akabiluru Subdistrict, Lima Puluh Kota Regency. The frequency distribution of these variables can be seen in the following table

Table 1. Frequency Distribution Of Socioeconomic Risk Factors And Maternal Care Patterns On Stunting Incidence In Toddlers In Akabiluru Subdistrict, Lima Puluh Kota Regency

Variables	Case		Control	
	f (94)	%	f (94)	%
Mother's Education				
High	26	27,7	41	43,6
Low	68	72,3	53	56,4
Mother's occupation				
Not working	60	63,8	58	61,7
Working	34	36,2	36	38,3
Household Income				
Low	53	56,4	56	59,6
High	41	43,6	38	40,4
Food Security				
Low	67	71,3	60	63,8
High	27	28,7	34	36,2

Variables	Case		Control	
	f (94)	%	f (94)	%
Toilet Ownership				
Unsuitable	52	55,3	49	52,1
Suitable	42	44,7	45	47,9
Drinking Water Sources				
Unsuitable	52	55,3	48	51,1
Suitable	42	44,7	46	48,9
Exclusive breastfeeding				
No	60	63,8	41	43,6
Yes	34	36,2	53	56,4
Complementary feeding				
No	67	71,3	71	75,5
Yes	27	28,7	23	24,5
Immunization Status				
Incomplete	57	60,6	71	75,5
Complete	37	39,4	23	24,5
Physical Activity				
No	50	53,2	47	50,0
Yes	44	46,8	47	50,0
Access to Health Services				
Difficult	61	64,9	64	68,1
Easy	33	35,1	30	31,9

Based on Table 1, based on the distribution of socioeconomic risk factors and parenting patterns, in the group of stunted toddlers (cases), the majority of mothers had low education (72.3%), were unemployed (63.8%), came from low-income households (56.4%), with low food security (71.3%), and inadequate environmental facilities such as unsanitary toilets (55.3%) and unsafe drinking water sources (55.3%). In terms of parenting, most toddlers did not receive exclusive breastfeeding (63.8%), received inappropriate complementary foods (71.3%), and had incomplete basic immunization status (60.6%). Toddlers did not engage in activities (53.2%) and had difficult access to health services (64.9%). Meanwhile, in the non-stunted toddler group (control), most mothers had low education (56.4%), unemployed (61.7%), with low household income (59.6%), low food security (63.8%), and similar environmental conditions such as inadequate toilets (52.1%) and inadequate drinking water sources (51.1%). Parenting patterns in the control group were also more optimal, with a higher proportion receiving exclusive breastfeeding (56.4%), although most were still given inappropriate complementary foods (75.5%), and the majority had incomplete basic immunization status (75.5%), toddlers who engaged in physical activity (50%), and difficult access to health services (68.1%).

Table 2. The Relationship Between Socioeconomic Risk Factors And Maternal Care Patterns With Stunting In Toddlers In Akabiluru District, Lima Puluh Kota Regency

Variables	Stunting in Toddlers				Total		OR (95% CI)	p value
	Case		Control					
	f	%	f	%	f	%		
Mother's Education								
High	26	27,7	41	43,6	67	35,6	2,023 (1,101-3,718)	0,033
Low	68	72,3	53	56,4	121	64,4		
Mother's occupation								
Not working	60	63,8	58	61,7	118	62,8	1,095 (0,606-1,979)	0,880
Working	34	36,2	36	38,3	70	37,2		
Household Income								
Low	53	56,4	56	59,6	109	58,0	0,877 (0,491-1,566)	0,768
High	41	43,6	38	40,4	79	42,0		
Food Security								
Low	67	71,3	60	63,8	127	67,6	1,406 (0,761-2,598)	0,350
High	27	28,7	34	36,2	61	32,4		
Toilet Ownership								
Unsuitable	52	55,3	49	52,1	101	53,7	1,137 (0,641-2,018)	0,770
Suitable	42	44,7	45	47,9	87	46,3		
Drinking Water Sources								
Unsuitable	52	55,3	48	51,1	100	53,2	1,187 (0,669-2,105)	0,661
Suitable	42	44,7	46	48,9	88	46,8		
Exclusive breastfeeding								
No	60	63,8	41	43,6	101	53,7	2,281 (1,270-4,098)	0,008
Yes	34	36,2	53	56,4	87	46,3		
Complementary feeding								
No	67	71,3	71	75,5	138	73,4	0,804 (0,420-1,538)	0,620
Yes	27	28,7	23	24,5	50	26,6		
Immunization Status								
Incomplete	57	60,6	71	75,5	128	68,1	0,499 (0,267-0,934)	0,042
Complete	37	39,4	23	24,5	60	31,9		
Physical Activity								
No	50	53,2	47	50,0	97	51,6	1,136 (0,641-2,014)	0,770
Yes	44	46,8	47	50,0	91	48,4		
Access to Health Services	61	64,9	64	68,1	125	66,5	0,866 (0,473-1,589)	0,757
Difficult								
Easy	33	35,1	30	31,9	63	33,5		

Based on the analysis results, maternal education is significantly associated with stunting, where mothers with low education have twice the risk compared to mothers with high education (p=0.033; OR=2.023; 95% CI: 1.101–3.718). Exclusive breastfeeding was also found to be associated with stunting, with mothers who did not exclusively breastfeed having a 2.281 times greater risk of their children experiencing stunting (p=0.008; OR=2.281; 95% CI: 1.270–4.098). In addition, basic immunization status was significantly associated with stunting, with toddlers who had completed basic immunization being better protected from stunting (p=0.042; OR=0.499; 95% CI: 0.267–0.934). Meanwhile, the variables of maternal employment, household income, food security, toilet ownership, drinking water

sources, complementary feeding, physical activity, and access to health services did not show a significant relationship with stunting, although the proportion of stunting tended to be higher in the unfavorable categories.

Table 3. Full Multivariate Analysis Model Of Variables Most Related To Stunting Incidence In Toddlers In Akabiluru Subdistrict, Lima Puluh Kota Regency

Variables	OR	95% CI		p value
		Lower	Upper	
Mother's education	0,467	0,249	0,877	0,018
Exclusive breastfeeding	2,150	1,166	3,963	0,014
Immunization Status	0,580	0,300	1,119	0,104

The analysis results show that the independent variables with p<0.05 values are maternal education and exclusive breastfeeding. At this stage, independent variables with p>0.05 values will be removed from the logistic regression test gradually, starting from the largest value for the first stage of analysis.

Table 4. Final model of multivariate analysis of variables most influential on stunting incidence in toddlers in Akabiluru Subdistrict, Lima Puluh Kota Regency

Variables	OR	95% CI		p value
		Lower	Upper	
Mother's education	2,135	1,142	3,988	0,017
Exclusive breastfeeding	2,382	1,310	4,330	0,004

Description: Omnibus Test (0.001), Nagelkerke R Square (0.093), Hosmer & Lemeshow (0.909)

The final multivariate logistic regression analysis model shows that there are two variables that significantly affect stunting in toddlers in Akabiluru District, Lima Puluh Kota Regency, namely maternal education and exclusive breastfeeding. Maternal education has an odds ratio (OR) of 0.468 (95% CI: 0.251–0.875; p = 0.017). Meanwhile, toddlers who were not exclusively breastfed had a 2.33 times higher risk of stunting compared to toddlers who were exclusively breastfed (OR = 2.332; 95% CI: 1.310–4.330; p = 0.004). This regression model was statistically significant (Omnibus Test = 0.001), had sufficient explanatory power (Nagelkerke R Square = 0.093), and was consistent with the data (Hosmer and Lemeshow = 0.909), indicating that the model had good feasibility and suitability. Thus, infants who are not exclusively breastfed are twice as likely to experience stunting compared to those who are exclusively breastfed.

Based on in-depth interviews, most mothers in Akabiluru Subdistrict understand the importance of exclusive breastfeeding for the first six months to support growth and prevent stunting. However, understanding of the definition of exclusive breastfeeding still varies, as some mothers consider giving water or complementary foods early on to be normal. The mothers' level of education also influences this understanding, with more educated mothers tending to have better knowledge and be able to distinguish breastfeeding practices in accordance with health recommendations.

Family support for the decision to exclusively breastfeed is generally quite positive, especially from husbands who play a role in providing moral support and helping with childcare. However, husbands' knowledge about exclusive breastfeeding is still limited. Some mothers also mentioned the influence of parents who still adhere to old habits, such as giving water from an early age, but after receiving explanations from health workers, the family became more accepting and supportive of the decision to exclusively breastfeed.

Cultural factors remain a challenge in the practice of exclusive breastfeeding. Some communities, especially those with low levels of education, still believe in the tradition of giving water, bananas, or additional food from an early age. The influence of parents or in-laws is quite strong in childcare decisions, even though mothers have received information from health workers. However, with education and personal experience, some mothers are beginning to be able to resist these cultural pressures.

Access to information about exclusive breastfeeding is mostly obtained from health workers through integrated health service posts, maternal and child health books, and classes for pregnant women. Some mothers with upper secondary education also begin to seek information through social media and the internet. For mothers with low education, information still needs to be repeated and conveyed in simple terms so that it is easier to understand. The role of health workers is very important in ensuring that the understanding and practice of exclusive breastfeeding is carried out as recommended.

DISCUSSION

Quantitative analysis shows that there is a significant relationship between maternal education, exclusive breastfeeding, and basic immunization status with stunting in toddlers. These findings indicate that educational factors and parenting practices play an important role in children's nutritional status. Meanwhile, other variables such as family income, maternal employment, and access to health services were not statistically significant.

A qualitative approach deepens these results by describing how these factors work at the household level. Through in-depth interviews, it was revealed that exclusive breastfeeding practices are greatly influenced by mothers' perceptions, family support, and cultural norms. Although some mothers understand the importance of exclusive breastfeeding, many are hindered by cultural pressures and limited information.

The relationship between maternal education and stunting observed in the quantitative analysis can be further explained through qualitative findings. Low levels of education limit mothers' understanding of child nutrition and health, including the importance of exclusive breastfeeding and basic immunizations. This shows that education not only has a direct effect but also influences parenting practices through knowledge and attitudes.

The status of basic immunization, which is significantly associated with stunting in quantitative analysis, is also reinforced by interview results. Some mothers reported difficulties in accessing immunization services due to distance, time constraints, and low family support. This explains why basic immunization coverage is uneven and contributes to the high risk of stunting in some toddlers.

The dominant factor that emerged from the quantitative analysis was exclusive breastfeeding, where toddlers who were not exclusively breastfed were at greater risk of stunting. Qualitative findings clarify the mechanism of this relationship, namely the role of spousal and family support, cultural pressures, and mothers' limited knowledge that influence breastfeeding practices. Thus, exclusive breastfeeding is a key variable in this study because it is statistically significant and reinforced by qualitative evidence that emphasizes the underlying social and cultural context.

CONCLUSION

Based on the results of the study, the incidence of stunting among toddlers in Akabiluru District, Lima Puluh Kota Regency in 2025 is still quite high, indicating serious challenges in meeting the nutritional needs and caring for young children. The frequency distribution shows that most mothers are highly educated, unemployed, and come from low-income households, with most households having low food security, inadequate toilets, and using unsafe drinking water sources. In addition, there is a proportion of mothers who do not provide exclusive breastfeeding, do not provide complementary feeding as recommended, and have not completed basic immunizations for their toddlers, while toddlers' physical activity is mostly insufficient and access to health services is still difficult in some areas. Bivariate analysis shows a significant relationship between maternal education, exclusive breastfeeding, and basic immunization status with stunting, while maternal employment, household income, food security, toilet ownership, drinking water sources, complementary feeding, physical activity, and access to health services are not significantly related. The most dominant factor was exclusive breastfeeding, whereby toddlers who were not exclusively breastfed had a 2.28 times greater risk of stunting than toddlers who were exclusively breastfed (OR=2.281; 95% CI=1.270–4.098; p=0.008). In-depth interviews reinforced the quantitative findings by showing that exclusive breastfeeding practices are influenced by mothers' perceptions, family support, cultural factors, and access to information. Although some mothers understand the importance of exclusive breastfeeding, obstacles such as cultural pressure, parental influence, and limited education remain barriers.

ACKNOWLEDGMENT

We would like to express our gratitude to the Lima Puluh Kota District Health Office and the Akabiluru Community Health Center for providing information and assisting in this research.

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