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Risk Factors for Stunting in Children Aged 6-23 Months in Pandak 1 Community Health Center

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ABSTRACT

Background and Objective: Indonesia's stunting prevalence remains high, predominantly occurring during the complementary feeding period. With rates above 20% being considered a significant public health concern, the situation underscores the urgency of addressing this issue. The objective of this study is to analyze various risk factors for stunting in children aged 6-23 months in the Pandak 1 Community Health Center Area, Bantul Regency. **Materials and Methods:** This cross-sectional study was conducted from June to August, 2023 in Wijirejo and Gilangharjo, as working areas of Pandak 1 Community Health Center. It focused on toddlers aged 6-23 months. Cluster random sampling was used to get representative sampling across multiple villages. Data collection involved length and weight measurements and structured questionnaires to caregivers. Statistical analysis was performed using SPSS version 16.0, employing Chi-squared and Fisher's exact tests to evaluate associations. **Results:** The findings indicate a significant association between exclusive breastfeeding, complementary feeding, infectious diseases, maternal knowledge and economic factors with the incidence of stunting in children aged 6-23 months. Other factors such as immunization, maternal height and maternal education showed a weaker association with stunting ($p>0.05$). Logistic regression analysis revealed clinical significance in the history of breastfeeding (OR = 4.933), maternal knowledge (OR = 3.560), complementary feeding (OR = 3.241), infectious diseases (OR = 2.211) and economic factors (OR = 1.417), as the primary risk factors for stunting. **Conclusion:** There is a complex interplay of nutritional, health and economic factors contributing to stunting. The community is advised to access information about quality complementary feeding, provide balanced nutrition and improve children's health status.

KEYWORDS

Stunting, early childhood, complementary feeding, children development, breastfeeding, maternal knowledge

INTRODUCTION

Indonesia is ranked third in Southeast Asia for stunting prevalence, exceeded only by Timor Leste and India. Despite a decrease in stunting rates from 37.8% in 2013 to 27.67% in 2019, the country's rates remain alarmingly high[1]. The 2018 Basic Health Research (Riskesdas) in Indonesia revealed an improvement in toddlers' nutritional status, with stunting prevalence dropping from 37.2 to 30.8% between 2013 and 2018[2]. However, despite these improvements, the stunting rates in Indonesia remain

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alarmingly high. Public health experts consider stunting a significant concern when rates surpass 20%, a threshold Indonesia continues to exceed. This persistent high prevalence indicates that, while progress has been made, much work remains to be done to address the nutritional challenges affecting Indonesian children and to bring stunting rates below critical public health thresholds[3].

In Yogyakarta, stunting prevalence among toddlers was 21.41% in 2018, as reported by Basic Health Research which surveyed 711 children. However, this figure rose to 22.4% in 2019, an increase of nearly 1%, with significant contributions from the districts of Sleman, Kulon Progo and Yogyakarta City. The 2020 stunting prevalence in Yogyakarta was not reported, as the COVID-19 pandemic disrupted the nutritional status survey by the health department. Remarkably, Bantul Regency showed a decrease in stunting prevalence to 8.36% in early 2021, down from 9.74% in 2020. In the specific area of Pandak 1 Community Health Center, encompassing Wijirejo and Gilangharjo Villages, the stunting incidence was 5.97% as of April, 2023[4].

Stunting in Indonesia predominantly occurs during the period of complementary feeding and post-breastfeeding, when breast milk alone is inadequate for an infant's nutritional needs. This critical transition period is often marked by inadequate dietary diversity and nutrient density, exacerbating the risk of stunting. Research has identified key risk factors for stunting in children aged 6-23 months, which include breastfeeding practices, complementary feeding, maternal education, family economics and infectious diseases such as acute respiratory infections (ARI), malaria and diarrhea[5]. These factors are interconnected, influencing not only physical growth but also cognitive development, which can severely impact a child's educational outcomes and economic productivity in adulthood. Insufficient nutrition in early life not only impedes physical growth but also cognitive development, ultimately affecting a child's future potential[6].

Addressing these factors through targeted interventions can significantly improve health outcomes. This study aimed to analyze various risk factors for stunting in children aged 6-23 months in the area served by the Pandak 1 Community Health Center, Bantul Regency.

MATERIALS AND METHODS

This study is a quantitative research project employing an analytic observational approach, structured with a cross-sectional design. It was conducted at Integrated Health Posts (Posyandu) in the Pandak 1 Community Health Center's working area, encompassing Wijirejo and Gilangharjo, from June to August, 2023.

The study's population comprised all toddlers aged 6-23 months who visited the Posyandu in Kapanewon Pandak during this period, totaling 120 children.

The sample represented a subset of the research population, chosen to reflect the broader population of toddlers aged 6-23 months. For this study, cluster random sampling was utilized, as the simultaneous scheduling of Posyandu activities across all villages within the Pandak 1 Community Health Center's area rendered it impractical for researchers to attend every Posyandu session.

Anthropometric data were collected through measurements of the toddlers' length and weight, accompanied by interviews with respondents using a structured questionnaire.

Statistical analysis: Data analysis was performed using SPSS (Statistical Package for the Social Sciences) version 16.0. Bivariate analysis was conducted using either the Chi-squared test or Fisher's exact test, with a $p>0.05$ considered statistically significant.

RESULTS

Table 1 indicates that the majority of children aged 6-23 months in the Pandak 1 Community Health Center area received exclusive breastfeeding (61.7%), non-compliant complementary feeding (58.3%) and

Table 1: Distribution of respondent characteristics in the working area of Pandak 1 Community Health Center

Variable	Incident of stunting (%)
History of breastfeeding	
Non-exclusive	46 (38.3)
Exclusive	74 (61.7)
Complementary feeding	
Non-compliant	70 (58.3)
Compliant	50 (41.7)
History of infectious diseases	
With history (diarrhea and ARI in the last 6 months)	48 (40)
Without history	72 (60)
Immunization	
Incomplete	4 (3)
Complete	116 (97)
Maternal height	
Risk (<147 cm)	16 (13.3)
Normal (≥147 cm)	104 (86.7)
Maternal education	
Low (below high school)	3 (2.5)
High (high school or equivalent)	117 (97.5)
Maternal knowledge on toddler nutrition	
Low	70 (58.3)
High	50 (41.7)
Family economic factor	
Low (≤IDR 2,066,438.82)	76 (63.3)
High (>IDR 2,066,438.82)	44 (36.7)

Table 2: Analysis of risk factors for stunting

	Stunting		Non-stunting			
Characteristic	n	%	n	%	p-value	Odds ratio
History of breastfeeding						
Non-exclusive	16	69.5	30	30.8	0.028	4.933
Exclusive	7	30.5	67	69.2		
Complementary feeding						
Non-compliant	18	78.27	52	53.8	0.031	3.241
Compliant	5	21.73	45	46.2		
History of infectious diseases						
With history	18	78.26	30	30.8	0.005	2.211
Without history	5	21.73	67	69.2		
Immunization						
Incomplete	4	17.40	0	0.0	0.546	0.468
Complete	19	82.60	97	100.0		
Maternal height						
Risk (<147 cm)	5	21.74	11	11.5	0.120	1.169
Normal (≥147 cm)	18	78.26	86	88.5		
Maternal education						
Low	3	13.1	0	0.0	0.103	1.764
High	20	86.9	97	100.0		
Maternal knowledge on toddler nutrition						
Low	18	78.2	52	53.8	0.031	3.560
High	5	21.8	45	46.2		
Family economic factor						
Low	20	86.95	56	57.7	0.012	1.417
High	3	13.5	41	42.3		

were without a history of infection (60%). A significant portion (97%) were fully immunized. Regarding maternal factors, 86.7% had a normal height (≥147 cm), 97.5% had a high level of education (at least high school) and 58.3% had low knowledge of toddler nutrition. A majority of the families (63.3%) had an income below IDR 2,066,438.82.

Based on these findings (Table 2), the Chi-Square test shows significant correlations between the sample characteristics and stunting. This includes exclusive breastfeeding history, complementary feeding, history of infectious diseases, toddler immunization status, maternal height, maternal education, maternal knowledge about toddler nutrition and family economic factors.

DISCUSSION

This study's results illuminate significant correlations between exclusive breastfeeding, complementary feeding practices and the prevalence of stunting in toddlers aged 6-23 months in the Pandak 1 Community Health Center area, Bantul Regency. A statistically significant relationship was observed between the history of exclusive breastfeeding and stunting occurrences, with a p-value of 0.028. This finding aligned with the understanding that exclusive breastfeeding, involving the provision of colostrum and exclusively breast milk for the first six months, plays a crucial role in preventing stunting[7,8]. Children who did not receive exclusive breastfeeding were more likely to be given other liquids such as formula, honey and sugar water, suggesting a deviation from ideal nutritional practices[9,10].

The study also revealed a significant association between inappropriate complementary feeding and stunting, indicated by a p-value of 0.031. This was consistent with research that emphasizes the critical role of timely and appropriate complementary feeding in a child's development. The introduction of complementary foods at the wrong age or frequency, or of inadequate quality, significantly increases the risk of stunting[11]. This finding was echoed in studies by Zehner *et al.*[12] and Haszard *et al.*[13], which highlighted the importance of standard compliant complementary feeding in reducing stunting risk.

Moreover, the study identified a noteworthy link between the history of infectious diseases, particularly diarrhea and acute respiratory infections (ARI) and stunting, with a p-0.005. This supported existing literature indicating that recurrent infections, especially in environments with poor sanitation and hygiene practices, substantially contribute to stunting[14]. The chronic impact of these infections on a child's nutritional status, appetite and overall health exacerbated the risk of stunting[15]. This result was aligned with findings from Santosa *et al.*[16] and Arlinda *et al.*[17], highlighting the significant role of infectious diseases in stunting prevalence.

Interestingly, the study found no significant correlation between maternal height and stunting (p-0.120), suggesting that while maternal height can be a factor in a child's growth, it is not a sole determinant. This finding was in line with research by Laksono *et al.*[18] and Green *et al.*[19] indicating the multifactorial nature of stunting. It underscores the importance of considering a range of factors, including nutritional, environmental and health-related aspects, in addressing stunting[20].

The study also noted that maternal education did not show a significant correlation with stunting (p-0.103), challenging the commonly held assumption that higher maternal education directly correlates with better child health outcomes[21]. This result echoes the findings of Bustami *and* Ampera[22], suggesting that while education is important, it is not the only factor influencing a child's nutritional status.

Lastly, the study highlighted the substantial impact of family economic factors on stunting, with a significant correlation noted (p-0.012). This aligned with findings by Wicaksono *et al.*[4] and Mulyaningsih *et al.*[23], emphasizing the role of economic status in determining access to adequate nutrition,

healthcare and overall living conditions. It reflects the broader socio-economic dimensions influencing child health and development, underscoring the need for comprehensive interventions that address these wider determinants of health[24].

This study boasts several strengths, including its comprehensive approach to analyzing a range of risk factors for stunting in a specific demographic, which offers valuable insights into localized health challenges. The use of cluster random sampling techniques ensures a representative sample of the population in the Pandak 1 Community Health Center area, enhancing the reliability of the findings.

However, the study also faces limitations. The cross-sectional nature of the research restricts its ability to establish causality between the identified risk factors and stunting. Longitudinal studies would be more effective in determining causal relationships. The reliance on self-reported data, particularly in the case of breastfeeding and feeding practices, could introduce recall bias[25].

Furthermore, the study's focus on a specific geographic area may limit the generalizability of its findings to other regions with different socio-economic and environmental conditions. Lastly, the study does not account for all potential confounding factors, such as genetic predispositions, which might influence stunting outcomes. Recognizing these limitations is crucial for interpreting the study's findings and for guiding future research directions.

CONCLUSION

The findings highlight the significant role of exclusive breastfeeding and appropriate complementary feeding practices in reducing the risk of stunting. The data demonstrate a clear link between inadequate breastfeeding practices, improper complementary feeding and increased stunting prevalence, emphasizing the need for targeted educational and support programs for mothers. Furthermore, the study underscores the influence of infectious diseases, particularly diarrhea and acute respiratory infections, on stunting. This connection calls for improved healthcare interventions and better hygiene and sanitation practices in the community.

SIGNIFICANCE STATEMENT

This study investigates the primary risk factors for stunting among children aged 6-23 months in the Pandak 1 Community Health Center area of Bantul Regency, addressing a critical public health issue in Indonesia where stunting rates remain alarmingly high. By employing a cross-sectional design and analyzing data from both affected and unaffected groups, the research identifies key variables such as breastfeeding history, co-mplementary feeding practices, maternal knowledge of nutrition, infectious disease history and socioeconomic status. These findings underscore the complex interplay of nutritional, health and economic factors contributing to stunting. The study's results are pivotal for shaping targeted interventions and policies aimed at reducing stunting prevalence. Looking forward, this research can guide future initiatives to enhance community health education, improve access to quality nutrition and address underlying economic challenges, thereby contributing to the overall reduction of child stunting rates in Indonesia.

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