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Maternal Knowledge of Balanced Nutrition and Maternal Feeding Practices Associated with Stunting in Children Aged 24-60 Months in the Puskesmas Siempat Rube Working Area

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ABSTRACT

Introduction: The prevalence of stunting among children aged 24-60 months is a critical public health concern including in the Puskesmas Siempat Rube working area. Inadequate maternal knowledge about balanced nutrition and inappropriate feeding practices can contribute to the incidence of stunting.

Objective: To analyze the relationship between maternal knowledge of balanced nutrition and maternal feeding practice on the incidence of stunting in children aged 24-60 months in the Puskesmas Siempat Rube working area.

Method: This cross-sectional study was conducted in December 2023. The research sample consisted of 43 participants selected using purposive sampling. Balanced nutrition knowledge scores were categorized into poor, sufficient, and good; meanwhile, the higher the score for feeding practice, the better the mother's feeding practice was assumed. Height was assessed based on the TB/U indicator and categorized into stunting and not stunting. Hypotheses were analyzed using logistic regression tests, with statistical significance set at $p < 0.05$.

Result: The prevalence of stunting in this study was 69.8%. Most mothers had insufficient knowledge of balanced nutrition (90.7%), and the average feeding practice score was 58.4. Maternal knowledge of balanced nutrition and maternal feeding practice are significantly related to the incidence of stunting in children aged 24-60 months in the Puskesmas Siempat Rube working area ($p < 0.05$). Maternal knowledge of balanced nutrition and maternal feeding practice act as protective factors against the incidence of stunting. The odds of children aged 24-60 months experiencing stunting were 0.056 times lower if their mothers had sufficient knowledge of balanced nutrition compared to mothers with poor knowledge. Similarly, each 1-point increase in a mother's feeding practice score could reduce the incidence of stunting by 0.910 times compared to mothers with a feeding practice score one point lower.

Conclusion: Maternal knowledge of balanced nutrition and maternal feeding practice are significantly associated with the incidence of stunting in children aged 24-60 months in the Puskesmas Siempat Rube working area.

Keywords: Feeding Practice; Knowledge of Balanced Nutrition; Stunting

INTRODUCTION

The prevalence of stunting among children aged 24-60 months represents a significant public nutrition issue, including within the working area of Puskesmas Siembat Rube. Pakpak Bharat Regency ranks fourth in the highest stunting cases in North Sumatra, with a rate of 30.8% (1). Siempat Rube is one of the sub-districts in Pakpak Bharat Regency. Stunting, characterized by impaired growth and development, is influenced by various factors, such as maternal nutritional knowledge and feeding practices, which play crucial roles (2,3). Consistent research findings indicate that inadequate maternal knowledge about nutrition, improper feeding practices, and delayed introduction of complementary foods can contribute to stunting in children (4,5). Additionally, factors such as family income, maternal education, and responsive feeding practices have been identified as determinants of stunting in toddlers (6-8).

Balanced nutritional knowledge encompasses awareness and understanding of the needs, selection, preparation of food, and proper eating behaviors. Caregivers with limited nutritional knowledge may struggle to provide sufficiently diverse and nutrient-rich foods to their children, leads to deficiencies in essential macro and micronutrients critical for growth and development. Conversely, caregivers with good nutritional knowledge are better positioned to make informed decisions regarding food choices, portion sizes, and feeding frequency, optimizing the child's nutrient intake and reducing the risk of stunting (9,10). Feeding practices encompass a spectrum of behaviors related to breastfeeding, complementary feeding, feeding frequency, mealtime environment, and hygiene practices. Exclusive breastfeeding for the first six months of life, followed by the introduction of nutrient-rich complementary foods and continued breastfeeding until two years or beyond, is recommended by global health authorities for optimal growth and development. However, suboptimal feeding practices, such as early cessation of breastfeeding, delayed introduction of complementary foods, or inappropriate feeding methods, can compromise a child's nutritional status and lead to stunting (11,12).

The relationship between balanced nutritional knowledge and maternal feeding practices with stunting in children aged 24-60 months is highly complex and influenced by various factors, including sociocultural beliefs, economic constraints, food availability, maternal education, and healthcare services access. Understanding the mechanisms underlying this relationship is crucial for designing targeted interventions and policies to address the prevalence of stunting and improve children's health and well-being. Explaining the link between balanced nutritional knowledge, feeding practices, and stunting aims to contribute to the evidence base that informs effective strategies to combat childhood malnutrition and promote optimal growth and development worldwide. This study aims to analyze the relationship between balanced nutritional knowledge and maternal feeding practices on the incidence of stunting in children aged 24-60 months in the working area of Puskesmas Siempat Rube.

METHODS

This study employs a cross-sectional design conducted in December 2023. The population of this study includes all mothers with children aged 24-60 months within the working area of Puskesmas Siempat Rube, totaling 505 individuals. The sample consists of 43 participants selected through purposive sampling who have signed informed consent forms. Data was collected through interviews using a questionnaire on balanced nutritional knowledge and feeding practices and measuring the children's height. The reliability of the questionnaire instruments for balanced nutritional knowledge and feeding practices was tested with a Cronbach's Alpha > 0.60. Scores for balanced nutritional knowledge were categorized as poor, sufficient, and good (13), while feeding practice scores were presented numerically on a scale of 0-100. Higher feeding practice scores indicate better maternal feeding practices. Height data were processed based on the Height-for-Age (HAZ) indicator (14) and categorized as stunting (z-score < -2) and not stunting (z-score ≥ -2). Descriptive data are presented as frequencies and proportions for categorical data and as means and standard deviations for numerical data. Bivariate analysis was performed using the chi-square test and Mann-Whitney test. The relationship between balanced nutritional knowledge and maternal feeding practices with the incidence of stunting was analyzed using logistic regression. Statistical significance was set at $p < 0.05$.

RESULTS

The mothers of children aged 24-60 months who participated in this study numbered 43, with an average age of 32.7 years. Most of the mothers had completed high school (48.8%), were farmers (90.7%), had low family incomes (76.6%), and came from families of moderate size (46.8%). Data in Table 1 show that the socioeconomic characteristics of mothers with stunted and non-stunted children are not significantly different ($P > 0.05$).

Table 1. Socioeconomic characteristics of respondents based on the incidence of stunting in children aged 24-60 months

Characteristics	Stunting		Total n (%)	p-value[1]
	Stunting n (%)	Not stunting n (%)		
Age (year)[2]	32,8±2,9	32,5±4,9	32,7±3,6	0,863
Education				0,129
Did not complete elementary school	1 (2,3%)	0 (0,0%)	1 (2,3%)	
Elementary school or equivalent	5 (16,7%)	0 (0,0%)	5 (11,6%)	
Junior high school or equivalent	10 (23,3%)	3 (7,0%)	13 (30,2%)	
High school or equivalent	11 (25,6%)	10 (23,3%)	21 (48,8%)	
Diploma/Bachelor's/Master's/PhD	3 (7,0%)	0 (0,0%)	3 (7,0%)	
Occupation				0,270
Housewife	0 (0,0%)	1 (2,3%)	1 (2,3%)	
Civil servant	1 (2,3%)	0 (0,0%)	1 (2,3%)	
Entrepreneur	2 (4,7%)	0 (0,0%)	2 (4,7%)	
Farmer	27 (62,8%)	12 (27,9%)	39 (90,7%)	
Family Income				0,517
< Rp 1.500.000	22 (51,2%)	11 (25,6%)	33 (76,7%)	
Rp 1.500.000 - Rp 2.500.000	8 (18,6%)	1 (2,3%)	9 (20,9%)	
> Rp 2.500.0000	0 (0,0%)	1 (2,3%)	1 (2,3%)	
Family Size				0,906
Small (≤ 4 people)	14 (32,6%)	5 (11,6%)	19 (44,2%)	
Medium (5-6 people)	13 (30,2%)	8 (18,6%)	21 (48,8%)	
Large (≥ 7 people)	3 (7,0%)	0 (0,0%)	3 (7,0%)	

Note: [1] Mann-Whitney test; [2] Age is presented as mean ± standard deviation in years

The prevalence of stunting in this study was 69.8%. Data in Table 2 show that most mothers of young children had poor knowledge of balanced nutrition (90.7%). The proportion of balanced nutrition knowledge categories between mothers with stunted and non-stunted children differs significantly (P < 0.05). Similarly, the average score of feeding practices of mothers with stunted children is significantly different from that of mothers with non-stunted children (P < 0.05). The average feeding practice score of mothers with stunted children is significantly lower than that of mothers with non-stunted children. Bivariate analysis results in Table 2 indicate that the variables of balanced nutrition knowledge and feeding practices qualify for inclusion in multivariate analysis (P < 0.25).

Table 2. Distribution of balanced nutrition knowledge and feeding practices based on the incidence of stunting in children aged 24-60 months

Characteristics	Stunting Incidence		Total n (%)	*p-value*
	Stunting n (%)	Not stunting n (%)		
Balanced Nutrition Knowledge				0,041[1]
Poor	29 (67,4%)	10 (23,3%)	39 (90,7%)	
Adequate	1 (2,3%)	3 (7,0%)	4 (9,3%)	
Good	0 (0,0%)	0 (0,0%)	0 (0,0%)	
Feeding Practices[3]	56,5±9,1	62,6±8,9	58,4±9,4	0,047[2]

Note: [1] Chi-square test; [2] Mann-Whitney test; [3] Presented as mean ± standard deviation

Based on the multivariate analysis results presented in Table 3, it can be concluded that balanced nutrition knowledge and feeding practices are significantly associated with the incidence of stunting in children aged 24-60 months in the service area of Siempat Rube Health Center (P < 0.05). Both balanced nutrition knowledge and feeding practices serve as protective factors against the incidence of stunting. The likelihood of stunting in children aged 24-60 months whose mothers have adequate knowledge of balanced nutrition is 0.056 times compared to those whose mothers have poor knowledge of balanced nutrition. Similarly, each one-point increase in the maternal feeding practices score can protect against stunting by 0.910 times compared to mothers with a feeding practices score one point lower.

Table 3. The relationship between balanced nutrition knowledge and feeding practices with the incidence of stunting in children aged 24-60 months

Characteristics	p-value	OR
Balanced Nutrition Knowledge		
Poor	-	-
Adequate	0,041	0,056 (0,004 – 0,884)
Feeding Practices	0,028	0,910 (0,837 – 0,990)

DISCUSSION

Most mothers of children aged 24-60 months in the service area of Siempat Rube Health Center have insufficient knowledge about balanced nutrition (90.7%). This is likely due to a lack of access to sources of information related to balanced nutrition. Previous research has concluded that information is one of the significant factors related to mothers' knowledge about stunting (15). Based on the respondents' interviews in this study, eight mothers of young children admitted that they did not know about stunting, including its causes, how to encourage good feeding practices in young children, and how to provide balanced nutrition to young children. Insufficient maternal knowledge about balanced nutrition is one of the factors contributing to stunting in young children. Similarly, improper maternal feeding practices are also a factor. In this study, the average score for maternal feeding practices was 58.4. Feeding practices reflect a mother's ability to allocate time, attention, support, provide food, and choose the types of food to meet the nutritional needs of young children (16) According to Rahman et al. (17), good feeding practices involve mothers who know the quantity and types of food their children need to meet their nutritional requirements.

Based on logistic regression analysis, maternal knowledge about balanced nutrition and feeding practices are significantly associated with the incidence of stunting in the service area of Siempat Rube Health Center ($p < 0.05$). Lailiyah et al.'s (18) study also shows a significant relationship between maternal knowledge about balanced nutrition and feeding practices and the incidence of stunting in children aged 2 to 5 years. The incidence of stunting in children aged 12 to 59 months in the service area of Parapat Health Center, Girsang Sipangan Bolon District, Simalungun Regency, is significantly correlated with maternal knowledge about balanced nutrition and feeding practices (19). The quality of nutrition in the food provided to young children depends on the mother's knowledge about balanced nutrition. Research conducted in Planjan Village, Saptosari Health Center service area, Gunung Kidul District, also shows that maternal knowledge about balanced nutrition is associated with the incidence of stunting in children aged 24-60 months (20).

Knowledge of balanced nutrition acts as a protective factor against stunting in the service area of Siempat Rube Health Center. Mothers with adequate knowledge of balanced nutrition protect their children from stunting 0.056 times more effectively than mothers with insufficient nutrition knowledge. Based on this, the higher the mother's knowledge of balanced nutrition, the better she can protect against stunting. This aligns with Tsaralatifah's (21) research, which found that the stunting cases in Ampel Village, Surabaya City, are indirectly caused by low maternal knowledge about balanced nutrition. Similarly, Palupi et al. (22) state that maternal knowledge about balanced nutrition is associated with the incidence of stunting in children aged 24 to 36 months in the service area of Cipadung Health Center, Bandung City. Mothers with low nutritional knowledge have 2.7 times higher chances of having stunted children compared to mothers with high nutritional knowledge.

Maternal feeding practices also act as a protective factor against stunting in the service area of Siempat Rube Health Center. Each one-point increase in feeding practice score can protect against stunting 0.910 times more effectively than subjects with a one-point lower score. The better the feeding practices, the more they can protect against stunting. This is consistent with Noftalina et al.'s. (23) research found that poor feeding practices increase the likelihood of stunting 4.929 times. Mothers' views and behaviors in providing inadequate food, both in quality and quantity, influenced by their lack of knowledge about good feeding practices, cause delays in child growth and development (24). Similar results are shown in Wibowo et al.'s (25) study, where poor feeding practices increase the likelihood of having stunted children by 2.9 times and poor eating habits by 3.3 times. Mothers who understand the importance of good feeding practices are 2.7 times more likely to protect their children from the risk of stunting (26). Stunting in young children increases fivefold if feeding practices do not comply with balanced nutrition guidelines (27).

CONCLUSION

Maternal knowledge of balanced nutrition and feeding practices are significantly associated with the incidence of stunting in children aged 24-60 months in the working area of Puskesmas Siempat Rube ($P < 0.05$). Both balanced nutrition knowledge and feeding practices serve as protective factors against the incidence of stunting. The likelihood

of stunting in children aged 24-60 months whose mothers have adequate knowledge of balanced nutrition is 0.056 times compared to those whose mothers have poor knowledge of balanced nutrition. Similarly, each one-point increase in the maternal feeding practices score can protect against stunting by 0.910 times compared to mothers with a feeding practice score one point lower.

SUGGESTION

This study recommends that addressing stunting in children aged 24-60 months, particularly in the working area of Puskesmas Siembat Rube, requires a multifaceted approach that includes improving maternal nutritional knowledge, promoting proper feeding practices, and enhancing family support systems. Interventions aimed at educating caregivers, especially mothers, encouraging responsive feeding practices, and ensuring the timely introduction of complementary foods are crucial in reducing the prevalence of stunting and promoting healthy growth and development in children.

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