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The influence of maternal behavior in infant and young child feeding with stunting

Pengaruh perilaku ibu dalam pemberian makanan pada anak usia 3-4 tahun dengan kejadian stunting

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Abstract

Stunting in children under the age of five is the result of a prolonged lack of nutritional intake or past malnutrition, such as feeding that does not meet nutritional needs. Maternal behavior during feeding is an important factor to consider. This study aimed to determine the effect of maternal behavior on the incidence of stunting in children aged 3-4 years. The research used a case-control design in the coastal area of the Aceh Jaya Health Center in May 2024. The sample was children aged 3-4 years as many as 69 children, divided into two groups, namely cases of stunted children and controls were normal children. Data were collected through interviews, using questionnaires, and anthropometric measurements of height and age. Data analysis was performed using the chi-squared test. Results: There was an influence between maternal behavior in feeding and the incidence of stunting in children (p = 0,039; OR = 2,9); thus, mothers with poor behavior had an increased risk of stunting in children by 2,9 times. In conclusion, maternal feeding behavior influences the incidence of stunting in children aged 3-4 years in the coastal area of the Aceh Jaya Health Center.

Keywords: Feeding, maternal behavior, risk of stunting

Abstrak

Stunting pada anak-anak di bawah usia lima tahun adalah akibat kurangnya asupan gizi dalam jangka waktu yang lama atau kekurangan gizi di masa lalu seperti pemberian makanan yang tidak memenuhi kebutuhan gizi. Perilaku ibu dalam pemberian makanan merupakan faktor yang penting untuk diperhatikan. Penelitian bertujuan untuk mengetahui pengaruh perilaku ibu dalam pemberian makanan dengan kejadian stunting pada anak usia 3-4 tahun. Metode penelitian menggunakan desain *case-control* di wilayah pesisir pantai puskesmas Aceh Jaya, pada Mei 2024. Sampel adalah anak usia 3-4 tahun sebanyak 69 anak, dibagi kedalam dua kelompok yaitu kasus anak stunting dan kontrol adalah anak normal. Pengambilan melalui wawancara menggunakan kuesioner dan pengukuran data antropometri tinggi badan dan umur. Analisis data menggunakan uji Chi-square. Hasil, terdapat pengaruh antara perilaku ibu dalam pemberian makanan dengan kejadian stunting pada anak (p= 0,039; OR= 2,9), dengan demikian ibu dengan perilaku kurang baik memiliki risiko meningkatnya kejadian stunting pada anak sebesar 2,9 kali. Kesimpulan, terdapat pengaruh perilaku ibu dalam pemberian makanan dengan kejadian stunting pada anak usia 3-4 tahun di wilayah pesisir pantai puskesmas Aceh Jaya.

Kata Kunci: Pemberian makanan, perilaku ibu, risiko stunting

Introduction

Stunting is a condition of chronic malnutrition that has an impact on children's lives, both in the short and long term, in the form of an increased risk of morbidity and mortality caused by infection. In addition, stunting can cause cognitive and behavioral disorders (Muliyati et al., 2021; Novitasari & Wanda, 2020). Those in the first two years of life tend to enter school later than children their age and get lower

grades (Wardani et al., 2023). Another impact of stunting is the increased risk of metabolic syndrome, such as hypertension, cardiovascular disease, and type 2 diabetes mellitus, in adulthood. Moreover, children with stunting tend to have a lower socio-economic status in later life due to reduced productivity (Laksono et al., 2022).

The World Health Organization (WHO) considers stunting a public health problem if its prevalence is 20% or more. According to ADB data quoted by Databoks (2021), Indonesia is the second country in ASEAN, with the highest prevalence of stunting in 2021 (24,4 %). This figure shows that Indonesia has not yet reached the WHO target of 20%. Therefore, the President of the Republic of Indonesia, Joko Widodo, signed Presidential Regulation (PERPRES) Number 72 of 2021 concerning the Acceleration of Reducing Stunting. This regulation aims to accelerate the achievement of the target of reducing stunting prevalence to 14% by 2024, which is stipulated in the 2020–2024 Medium Term Development Plan (RPJMN in Indonesia) (Ilmani & Fikawati, 2023).

Based on the Indonesian Nutrition Status Survey (INSS) results in 2022, the prevalence of stunting in toddlers has decreased from 24,4% in 2021 to 21,6% in 2022. This figure was still in the high category. Several factors play a role in fulfilling children's nutritional needs, including socioeconomic conditions, mother's education, parents' employment, number of children, parenting style, mother's knowledge, and living environment. There was a significant relationship between nutritional status and the area in which the child lived. Children who live in coastal areas tend to be thinner than children who live in mountainous areas (Wanimbo & Wartiningsih, 2020).

According to the results of the 2023 Indonesian Health Survey (IHS) has decreased from 21,6% (SSGI 2022) to 21,5%. This decline in the prevalence of stunting has occurred successively over the last 10 years (2013-2023). However, this figure still does not meet the 2020-2024 RPJMN target of 14% in 2024, and the WHO standard is below 20%. A total of 38 provinces in Indonesia and 15 provinces had a stunting prevalence below the national figure. The three provinces with the highest prevalence of stunting were Central Papua (39,4%), East Nusa Tenggara (37,9%) and Mountain Papua (37,3%). Meanwhile, the three provinces that have achieved the 2024 RPJMN target are Bali (7,2%), Jambi (13,5%) and Riau (13,6%).

Data from Indonesian Health Survey for 2023 state that the factors causing stunting are the health of the mother, the baby, and household factors. Maternal health is categorized into prenatal period and birth to postnatal period, especially in pregnant women who are at risk of Chronic Energy Deficiency (CED) and pregnancy checks (K4). Compared with the RISKESDAS 2018 results, based on the 2023 SKI, the proportion of pregnant women at risk of CED increased from 17,3% to 16,9%, while pregnancy checks decreased from 74,1% to 68,1%. These two factors are determinants of nutritional status before a baby is born, and require attention. Exclusive breastfeeding also plays a role in the incidence of stunting (Kemenkes RI., 2023).

Another factor is that feeding practices for babies and children that are not optimal, such as not giving exclusive breast milk or nutritious complementary breast milk, can cause stunting. Complementary breast milk is an additional food and fluid given to children aged 6-23 months because breast milk is not sufficient to meet the child's nutritional needs. It is important to provide complementary breast milk food at the age of 6-23 months because the incidence of growth failure, micronutrient deficiencies, and infections is the highest at that age. (Sundari, 2022).

When providing complementary breast milk food, one needs to pay attention to several things, namely when to start giving it, frequency of giving it, quantity and quality of food, as well as responsive feeding methods. In fact, currently Complementary breast milk food is sometimes given at inappropriate times, either too fast or too slow, and the quantity and quality of food given is sometimes not appropriate so that children's nutritional needs are not met (Nirmala & Octavia, 2022). The research results of Manan & Lubis (2022) showed that there is a relationship between maternal behavior in providing diets to toddlers and cases of stunting. The worse the mother's behavior in providing feeding patterns to toddlers, the greater the incidence of stunting (Manan & Lubis, 2022a).

The urgency of this study is that stunting is often caused by prolonged malnutrition. Inadequate feeding practices, in terms of both

quality and quantity, can exacerbate this problem. Mothers' behavior in providing food to babies and children plays a very important role in ensuring the adequate nutrition needed for optimal growth. Research on stunting in coastal areas still needs to be carried out to gain a deeper understanding of the risk factors for stunting in coastal areas, develop more effective interventions to overcome stunting and increase public awareness about stunting and its prevention (Prasetyo, 2023). Coastal areas have several risk factors that contribute to stunting, including coastal communities with limited access to nutritious food, such as animal protein, vegetables, and fruit. This is caused by economic limitations, infrastructure, and nutritional knowledge. Poor sanitation and clean water conditions in coastal areas can increase the risk of infection in children, which can disrupt the growth and development of toddlers.

The Aceh Jaya Regency is a coastal region on the west coast of Sumatra, with a coastline of approximately 160 km, with the capital being Calang, and has nine sub-districts and 172 gampongs. The Aceh Jaya District Health Office noted that the prevalence of stunting in the local area will decrease from 33,6 percent in 2021 to 19,9 percent in 2022. Data as of December 2022, the number of stunted children in Aceh Jaya was 766 children (BPKK Aceh Jaya, 2021). Therefore, this research aimed to determine the behavior of mothers in providing food and the incidence of stunting in children aged 3-4 years in nine sub-districts in the work area of the Aceh Jaya Regency Health Center.

Methods

The research uses an observational analytical research design with a case control approach, also known as retrospective research, where taking subjects starts from identifying groups with and without effects, then traces back whether within a certain period of time the subjects had risk factors or not (Muhammadong et al., 2023). Case control studies are used to determine risk factors or health problems that are thought to have a close relationship with diseases that occur in society (Piniliw et al., 2021). This research was conducted in nine sub-districts in the work area of the Aceh Jaya Regency Health Center in May 2024. The data used were the criteria for maternal behavior in the practice of giving food to children aged 3-4 years.

The sample in this study consisted of two groups: a case group and a control group. The case group included children aged 2-3 years who were declared stunted, whereas the control group included children aged 2-3 years who were declared not stunted. The sample size in this study was determined using the following formula from Sastroasmoro (2014):

$$n = \frac{\left\{Z_{\alpha}\sqrt{2P(1-P)}+Z_{\beta}\sqrt{P_1(1-P_1) + P_2\,(1-P_2))}\right\}^2}{(P_1-P_2)^2}$$

Information:

n : Minimum sample size from both sample groups
$Z_{1-\alpha}$: 5% level of significance (1,96 using α=0,05)
$Z_{1-\beta}$: Value in the same standard normal distribution with a power of 20%, namely 0,84
P : Total proportion, namely the result of (P1 + P2)/2
P1 : Proportion of exposure in the case group
P2 : Proportion of exposure in the control group

Based on the sample formula calculation above, the sample size was 22,23, rounded to 23 people. The ratio between the case group and the control group is 1:2, which means that every person in the case group will be paired with two people in the control group (Muliyati et al., 2021). Each individual in the case group (23 people) was paired with two individuals in the control group, resulting in a total of 46 individuals in the control group. The total sample size was 69 people. The sampling technique used in this research is stratified random sampling, which is a sampling process by dividing the population into strata to be able to represent samples from 9 sub-districts in the work area of the Aceh Jaya Regency health center throughout Aceh Jaya Regency (Widodo et al., 2023). Subjects were excluded if they had a congenital syndrome, chronic disease, or mental disorder, or if the mother was unable to conduct an interview.

Primary data collection was conducted through an interview survey using a questionnaire prepared based on guidelines from the Indonesian Ministry of Health in 2020 concerning Guidelines for Infant and Child

Feeding (IYCF). Meanwhile, secondary data are in the form of stunting and non-stunting data obtained directly from community health centers. The results of measuring height (cm) and age, then the stunting data is processed using the PSG Balita application (Al Rahmad et al., 2024). The questionnaire consisted of respondents' characteristics and questions regarding maternal behavior in the practice of feeding children.

The statement in the maternal behavior questionnaire regarding the practice of feeding children contains 16 questions, each consisting of four questions, namely, when the child is 6-8 months, 9-11 months, 12-24 months and 2-3 years. The statements were as follows: 1) the form/consistency/texture of children's food, 2) frequency/feeding of staple foods in a day, 3) portions at each meal providing nourishment, and 4) variations in providing staple foods and snacks. The assessment of the questionnaire is that appropriate answers are given a value of 1 and inappropriate answers are given a value of 0, so that the appropriate/good category if the score is >13,36 and the inappropriate/ inadequate category if the score is ≤13,36. The value 13,36 was obtained from the mean of the total score of answers to questions about maternal behavior in the practice of feeding children.

The statistical analysis used in this research was descriptive statistical analysis and bivariate analysis using the chi-squared test at a CI of 95%. This research received ethical exemption from the Aceh Ministry of Health Polytechnic Health Research Ethics Commission (DP.04.03/12.7/053/2024) and obtained permission from the Aceh Jaya Community Health Center.

Result and Discussion

Based on the results of research data collection on 23 mothers of stunting toddlers and 46 mothers of non-stunting toddlers aged 2-3 years in nine sub-districts in the work area of the Aceh Jaya District Health Center, in 2024.

Based on the research results (Table 1) and the characteristic data provided, there is a dominant pattern in the groups of stunted and non-stunted children. In the stunting group, the most dominant characteristics were observed in mothers aged 31–39 years (15,9%), children aged 30–36 months (18,8%), three children 3 people (11,6%), one toddlers 1 people (24,6%), mothers with a primary education (18,8%), mothers who did not work (24,6%), and male toddlers (20,3%).

Table 1. Characteristics of groups of stunted and non-stunting toddlers

Characteristics	Group	
	Stunting (%)	Not Stunting (%)
Mother's Age		
<25 years	3 (4,3)	3 (4,3)
25-30 years	5 (7,2)	12 (17,4)
31-39 years	11 (15,9)	27 (39,1)
40-49 years	4 (5,8)	4 (5,8)
Child Age		
24-29 month	10 (14,6)	22 (31,8)
30-36 month	13 (18,8)	24 (34,8)
Number of children		
1 person	4 (5,8)	8 (11,6)
2 person	7 (10,1)	15 (21,7)
3 person	8 (11,6)	16 (23,2)
4 person	3 (4,3)	4 (5,8)
5 person	1 (1,4)	3 (4,3)
Number of Toddlers	17 (24,6)	38 (55,1)
1 person	6 (8,7)	8 (11,6)
2 person		
Mother's Education		
Base	6 (8,7)	10 (14,5)
Intermediate	13 (18,8)	25 (36,2)
Tall	4 (5,8)	11 (15,9)
Mother's Job		
Doesn't	17 (24,6)	39 (56,5)
work	6 (8,7)	7 (10,1)
Work		
Toddler Gender		
Man	14 (20,3)	29 (42)
Woman	9 (13)	17 (25)

In contrast, in the non-stunted group, the most dominant characteristics were mothers aged 31–39 years (39,1%), children aged 30–36 months (34,8%), three children 3 people (23,2%), one toddler (55.1%), mothers with primary education (36,2%), mothers who did not work (56,5%), and male toddlers (42%). In general, the factors of mothers aged 31–39 years

and children aged 30–36 months showed a dominant percentage in both the stunted and non-stunted groups, but the number of children under five in the household and the mother's education seemed to have a significant influence on the differences in children's nutritional status.

The mother's or parent's age will influence the mother's or parent's ability and experience in providing nutrition to children who come from breast milk and complementary breast milk food. The more experienced the parents, the better their ability to care for, raise, and maintain the child's growth and development. This experience can also be gained because parents have had children before, or have had experience caring for babies before having their own children. A mature mother will have seriousness in caring for, nurturing and raising her child which will affect her child's survival (Pusmaika et al., 2022).

The results of the study showed that there was a relationship between maternal age and the incidence of stunting in toddlers; mothers aged < 20 years had a higher risk of having stunted offspring than mothers aged 20-34 years. A family's economic readiness to care for children influences their growth and nutritional status. A family's economic readiness depends on how large or small its income and expenses are. The availability of nutritious food for families is influenced by family income (Nita et al., 2023).

Child care is influenced by knowledge gained from formal and informal education. Low maternal education can influence parenting and childcare patterns in addition to influencing the selection and method of serving food that will be consumed by the child (Anggraini et al., 2022). Providing appropriate food ingredients and menus for toddlers in an effort to improve their nutritional status will be possible if mothers havea good level of nutritional knowledge. This is in line with research results which reveal that the level of maternal education and maternal knowledge about nutrition influence the occurrence of stunting (Pramithasari & Sefrina, 2022).

Education level greatly influences a person's knowledge. Education is also a process of changing knowledge, attitudes, and behaviors. Mother's knowledge about nutrition is what the mother knows about healthy food, how the mother chooses, processes and prepares food correctly, the housewife's knowledge about food ingredients will influence food behavior and ignorance can cause errors in food selection and processing (Rizcewaty et al., 2022; Al Rahmad et al., 2023).

Family size, or the number of family members, is closely related to the distribution of the variety of foods consumed by family members. The larger the number of family members, the smaller the amount of nutritional intake or food consumed by each family member to provide adequate and nutritious food to the family. Families with many children will need more food reserves than families with fewer children (Wahyudi et al., 2022).

Table 2. The influence of maternal behavior in providing food to children aged 3-4 years on the incidence of stunting

Mother's Behavior	Incidence of Stunting		Odds Ratio	p-value
	Stunting (%)	No Stunting (%)		
Not enough	14 (60,9)	16 (34,8)	2,917	0,039
Good	9 (39,1)	30 (65,2)		

Based on the case-control test results displayed in the table, analysis was performed based on columns to compare the distribution of stunting and non-stunting groups regarding maternal behavior. In the stunting group, most children (60,9%) came from mothers with poor feeding behavior compared to 39,1% of mothers with good behavior. In contrast, in the non-stunted group, the majority of children (65,2%) came from mothers with good behavior, while only 34,8% came from mothers with poor behavior. The statistical test showed a p-value of 0,039 ($p<0,05$), indicating a significant relationship between maternal behavior in providing food and the incidence of stunting. An odds ratio (OR) value of 2,917 shows that children of mothers with poor feeding behavior have a 2,9 times higher risk of experiencing stunting than children of mothers with good behavior. This underlines the importance of increasing positive

maternal behavior in providing food to reduce the risk of stunting in children aged 3–4 years.

The results of the research above are in line with the results of previous research, namely that the worse the mother's behavior in providing feeding patterns to toddlers, the greater the incidence of stunting (Manan & Lubis, 2022b). Appropriate feeding practices accompanied by strict supervision are indicators that need to be considered to overcome problems related to child growth and development disorders, one of which is stunting. The practice of feeding children contributes to the incidence of stunting; for example, the suboptimal provision of exclusive breastfeeding (especially non-exclusive breastfeeding) and the provision of complementary foods that are limited in terms of quantity, quality, and variety of types. Babies who do not receive minimum dietary diversity and minimum feeding frequency are significantly more likely to experience stunting than children who receive appropriate diets (Manan & Lubis, 2022b).

Parenting patterns are the attitudes and behaviors of parents in terms of their closeness to children, one of which is the way of giving food and eating schedules to children. However, many parents do not pay attention to how children schedule food, so children are lazy to eat. Parental parenting style is an indirect cause of a child's nutritional status. A good parenting style will have a normal child's nutritional status, whereas a poor parenting style will affect the child's nutritional status. The results of the research show that the worse the mother's behavior in providing feeding patterns to toddlers, the greater the incidence of stunting (Lensoni et al., 2022; Miko & Al-Rahmad, 2017). Other studies have reported that overall feeding practices are associated with the incidence of stunting. Adequate feeding and responsive feeding have a relationship with stunting, but timely and safe feeding does not affect the incidence of stunting (Tantriati & Setiawan, 2023).

The limitations of this research include the fact that the study was a case-control study, and further research would be better carried out with an experimental or cohort study so that the cause-and-effect picture is better and there is an intervention process. This study did not consider other risk factors for stunting, such as history of repeated infections and parental height.

Conclusion

There was a significant relationship between maternal behavior in providing food to children aged 3-4 years and the incidence of stunting in the work area of the Aceh Jaya District Health Center. Mothers with poor feeding behavior had a 2,917 times greater risk of having stunted children than mothers with good feeding behavior. Factors such as mother's age, number of children, and mother's education also influence behavior in providing food. The worse the feeding behavior, the higher the risk of stunting in children.

To reduce the incidence of stunting, interventions are needed in the form of ongoing education for toddler mothers, especially regarding the importance of providing food that is appropriate in quantity, quality, and variety. Programs to increase nutritional knowledge and improve parenting patterns must be optimized in community health centers and communities, as well as strict supervision of exclusive breastfeeding and adequate complementary foods.

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