Journal of Midwifery and Nursing, 6 (1) (2024) pp. 96-101

Published by: IOCSCIENCE

Journal of Midwifery and Nursing

Journal homepage: www.iocscience.org/ejournal/index.php/JMN

The influence of pregnant women's nutrition and parenting patterns on the incidence of stunting among toddlers in Pidie Jaya

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ARTICLE INFO

Article history:

Received Nov 19, 2023
Revised Nov 23,2023
Accepted Dec 1, 2023

Keywords:

BMI;
Nutrition Parenting;
Pregnantcy;
Stunting.

ABSTRACT

Stunting prevention focuses on addressing the causes of nutritional problems, namely factors related to food security, especially access to nutritious food, social environment related to infant and child feeding practices (parenting), access to health services for prevention and treatment, environmental health including the availability of clean water and sanitation facilities. The objective of this study is to examine the influence of maternal BMI during pregnancy and caregiving practices on the occurrence of stunting in toddlers aged 24 to 26 months. This research employs an analytical research design using a cross-sectional approach, and statistical testing is done using the Chi Square test with a significance level of 0.05. The sample consists of 87 toddlers, selected through purposive sampling. Research findings: maternal nutritional status during pregnancy with a p-value of 0.702 ($\alpha > 0.05$), exclusive breastfeeding history with $p=0.001$ ($\alpha < 0.05$). Conclusion: maternal nutritional status during pregnancy does not have a significant effect on stunting incidence. However, parenting practices significantly affect stunting incidence in toddlers aged 24-60 months in the working area of Primary Health Care Jangka Buya.

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1. Introduction

Growth and developmental disorders experienced by children due to malnutrition, recurrent infections, and inadequate psychosocial stimulation can lead to stunting. Children are defined as stunted if their height for age is more than two standard deviations below the median of the Child Growth Standards (WHO, 2020), (Kemenkes RI, 2022). Stunting is measured using the Length-for-Age (LAZ) or Height-for-Age (HAZ) index, which can be categorized as short or very short. A toddler is considered to be experiencing stunting if the Z-score of their height, according to their age, falls below the normal line, i.e., less than -2SD, indicating short stature, or less than -3SD, categorized as very short (TNP2K, 2017).

Stunting is a negative consequence of inadequate nutritional intake during the prenatal and early childhood periods. Globally, in 2020, it was reported that 149.2 million children under the age of 5 experienced stunting (WHO, 2020). This figure has the potential to increase significantly due to limited access to nutritious food and essential nutrition services during the COVID-19 pandemic, contributing to the ongoing impact of stunting in the coming years. Children affected by stunting are likely to fall short of reaching their maximum height potential, and cognitive brain development may not reach its peak (WHO, 2020).

The global impact has been identified as a hindrance to economic growth and a reduction in productivity, potentially causing an 11% decrease in Gross Domestic Product (GDP) and reducing adult incomes by up to 20%. Additionally, stunting contributes to the widening of social disparities, resulting in a roughly 10% decrease in lifelong income and triggering intergenerational poverty (TNP2K, 2017).

Preventive efforts against malnutrition are nearly uniform across all types of malnutrition, including addressing stunting. This involves ensuring adequate nutritional intake for mothers during pregnancy and breastfeeding, promoting optimal breastfeeding during the first two years of a child's life, providing nutritionally rich, diverse, and safe food for young children, and creating a healthy environment, including access to basic healthcare services, clean water, sanitation, and adequate hygiene (Hijrawati et al., 2021).

Good parenting practices begin before pregnancy, with critical aspects including the nutritional status of the mother before and during pregnancy, particularly maternal weight gain. Adequate nutritional intake during pregnancy is a key factor in preventing stunting. Pregnancy is a crucial period within the first 1000 Days of Life (HPK), during which sufficient nutrient consumption is vital to prevent early stunting (Hijrawati et al., 2021). Preventive efforts can commence with an increase in the intake of quality food during pregnancy. Overall, healthy pregnant mothers without nutritional disorders before or during pregnancy tend to have larger and healthier babies compared to those with nutritional issues. Therefore, knowledge about nutritional needs during pregnancy is crucial for pregnant mothers to prevent stunting in their children(Ningrum et al., 2020).

Poor parenting practices also contribute to stunting. Inadequate maternal caregiving is often linked to factors such as young maternal age, closely spaced pregnancies, and insufficient maternal knowledge about child nutrition (Ningrum et al., 2020).

2. Method

This research is analytical in nature, employing a cross-sectional approach. The study population consists of toddlers aged 24 to 60 months in the Jangka Buya Subdistrict of Pidie Jaya Regency, with a total of 645 toddlers in the year 2022. The researcher determined the sample size using the Slovin formula, resulting in a sample size of 87 respondents. Data collection utilized purposive sampling techniques with a data collection period of one month.

The instruments employed in this research include an observation sheet to measure Body Mass Index during pregnancy and caregiving practices, specifically exclusive breastfeeding. Data were extracted from secondary sources such as Maternal and Child Health (MCH) records. Additionally, tools like a stadiometer/microtoa and Z-score tables were used to assess the occurrence of stunting. Data processing involved editing, coding, scoring, tabulating, and data analysis using the Chi-Square test.

3. Results and Analysis

3.1 Characteristics of Respondents Based on Mother's Body Mass Index During Pregnancy, Exclusive Breastfeeding of Children, Stunting Toddlers

Table 1
Distribution of respondents based on Mother's BMI, exclusive breastfeeding, stunting

No	Variable	Frequency (f)	Percentage (%)
1	BMI		
	Normal (18,5-25,0)	34	39,1
	Fat (25,1- >27,0)	53	60,9
2	Breastfeeding		
	Exclusive breastfeeding	33	37,9
	Non Exclusive breastfeeding	54	62,1
3	Stunting		
	stunting	47	54,0
	no stunting	40	46,0

Based on Table 1, it can be concluded that out of 87 respondents of mothers with toddlers, 39.1% had a normal Body Mass Index (BMI), while 60.9% experienced overweight BMI during pregnancy.

In terms of parenting patterns, it can be observed that 37.9% of mothers provided exclusive breastfeeding, while 62.1% did not receive exclusive breastfeeding. Among all respondents, 54.0% experienced stunting, while 46% did not experience stunting

3.2 The Influence of Maternal Nutrition Status During Pregnancy on the Incidence of Stunting in Children Aged 24-60 Months

Table 2
The Influence of Maternal Body Mass Index on the Incidence of Stunting

	BMI	Stunting		Not Stunting		Total		P Value
		f	%	f	%			
1.	Normal	17	50,0%	17	50,0%	34	100,0%	
2.	Fat	30	56,6%	23	43,4%	53	100,0%	0,702

Based on the table above, it is shown that out of 34 mothers with a normal BMI during pregnancy, the average incidence of stunting in their children is 50.0%, while 53 mothers with an overweight BMI during pregnancy have a higher incidence of stunting in their children (56.6%). According to the results of the Chi-Square test, the obtained p-value is ρ=0.702 (α >0.05). It can be concluded that the research hypothesis (Ha) is rejected, meaning there is no influence of maternal nutritional status during pregnancy on the incidence of stunting in children aged 24-60 months.

The research findings indicate that out of 34 mothers with normal Body Mass Index (BMI) during pregnancy, 50.0% of their children experienced stunting. In contrast, among 53 mothers with overweight BMI during pregnancy, a higher percentage of children (56.6%) experienced stunting. The Chi-Square test yielded a p-value of 0.702 (α > 0.05). Based on the statistical test results, the research hypothesis (Ha) is not accepted, suggesting that there is no influence of maternal BMI during pregnancy on the occurrence of stunting in children aged 24 to 60 months.

These results align with a study conducted on children aged 36 to 59 months in coastal areas, where it was found that the nutritional status of mothers before pregnancy statistically did not have a significant relationship with the occurrence of stunting (p > 0.05) (Swanida et al., 2020). The likelihood of stunting is lower in children whose mothers have a smaller number of children, experience obesity, and have a higher level of education, (Zhu et al., 2021).

The 2018 study suggests that the growth and development of infants are significantly influenced by conditions during maternal pregnancy. Pregnancy with Chronic Energy Deficiency (CED) can be a significant factor (25-30%) in the occurrence of Intrauterine Growth Restriction (IUGR) in the fetus. This condition can be passed down from one generation to the next, resulting in suboptimal child growth in the subsequent years (Sukmawati et al., 2018). In contrast, the current study reveals a different scenario where no mothers with Low Body Mass Index (CED) were found; instead, mothers with normal BMI and overweight BMI were identified. Stunting in children was observed in both BMI categories. literature concerning research in Lombok, there are conflicting perspectives regarding the factors influencing stunting. Studies indicate that maternal dietary behavior during pregnancy and family income levels are key factors contributing to the occurrence of stunting, (Yunitasari et al., 2022).

The research is also not consistent with findings from studies in Tanzania, where it is known that children born to mothers with low BMI are 68% more likely to experience stunting compared to children born to mothers with normal BMI or even overweight mothers (Sunguya et al., 2020). Sukmawati suggests that stunting can be influenced or caused by various factors, both direct and indirect, such as birth weight, maternal knowledge, maternal education, and maternal age during pregnancy(Sukmawati et al., 2018). Direct contributing factors include conditions in which a child experiences inadequate nutritional intake or frequent infections. This leads to the consumed food not being optimally utilized for growth and development but rather being used by the body to combat potential diseases (Sunguya et al., 2020).

3.3 The influence of parenting (exclusive breastfeeding) on stunting

Table 3
The Influence of (parenting) Exclusive Breastfeeding on the Incidence of Stunting in Children Aged 24-60 Months

No	Breastfeeding	Stunting				Total		P value
		Stunting		No Stunting				
		f	%	f	%	f	%	
1	Exclusive Breastfeeding	7	21,2%	26	78,8%	33	100,0%	0,001
2	Non Exclusive Breastfeeding	33	61,1	21	38,9%	54	100,%	

Based on the table above, it is evident that out of 33 toddlers exclusively breastfed for 6 months, only 21.2% experienced stunting compared to those who did not experience stunting (78.8%). On the other hand, out of 54 toddlers who were not exclusively breastfed, stunting was more prevalent at 61.1% compared to those who did not experience stunting (38.9%). According to the results of the Chi-Square test, a significance value (ρ) of 0.001 was obtained (α < 0.05). Therefore, it can be concluded that the research hypothesis (Ha) is accepted, indicating that there is an influence of exclusive breastfeeding on the occurrence of stunting in toddlers aged 24-60 months

The results of this study were obtained from 33 toddlers who were exclusively breastfed for 6 months, and only (21.2%) experienced stunting compared to toddlers who were not exclusively breastfed (54 toddlers), where stunting was more dominant (61.1%). Based on the Chi-Square test, the result obtained is ρ=0.001 (α<0.05). It can be concluded that there is an influence of exclusive breastfeeding on the incidence of stunting in toddlers aged 24-60 months.

Effective parenting practices to prevent stunting can be found in nutritional approaches. Appropriate nutrition has a significant impact on the growth, development, and intelligence of children from an early age. Exclusive breastfeeding is considered optimal for the age range of 0-6 months. As the child reaches 6-8 months of age, the nutritional approach involves introducing mashed foods alongside breastfeeding. Between the ages of 9 and 11 months, breastfeeding and soft foods remain important components, while from 12 to 23 months, children are allowed to consume family foods while continuing to receive breast milk (Adriani et al., 2022).

Multivariate analysis with logistic regression test (adjusted OR for exclusive breastfeeding 0.234; P=0.034) revealed a statistically significant correlation between stunting and non-exclusive breastfeeding. According to research in coastal areas, 67.2% or 137 children did not receive exclusive breastfeeding, while 36.5% or 50 children experienced stunting. Statistical analysis showed a p-value of 0.000, indicating a significant correlation between the history of exclusive breastfeeding and the occurrence of stunting (Swanida et al., 2020). Children aged 6 to 24 months are at a risk 1.208 times higher than those exclusively breastfed (Nugraheni et al., 2020).

Breastfeeding is identified as one of the factors influencing nutritional status. Mothers with good nutritional status who provide exclusive breastfeeding to their children have the ability to supply sufficient nutrition, enabling the baby to grow in accordance with normal development.

Research on children aged 36-59 months indicates that the condition of stunting can be influenced by both direct and indirect contributing factors. Some of these factors include Birth Weight, Mother's Knowledge, Mother's Education, Mother's Age during Pregnancy, and Mother's Nutritional Status Before Pregnancy. Statistical analysis shows that these factors, as a whole, do not have a significant relationship with the occurrence of stunting (p>0.05), (Swanida et al., 2020). A study in Northeast Ethiopia states that the non-exclusivity of breastfeeding can increase the risk of children experiencing stunting. This factor is related to the stage of exclusive breastfeeding that includes colostrum. Colostrum is considered the initial immunization for infants and provides immunity to the digestive system, thereby enhancing the absorption of nutrients from consumed food(Mulaw et al., 2020).

Providing exclusive breastfeeding during the first six months of a baby's life has been proven to significantly contribute to improved health. Research findings indicate that the practice of exclusive breastfeeding can reduce maternal and infant mortality rates while enhancing the health of both. Furthermore, the positive benefits of exclusive breastfeeding during the first six months have the potential to have a long-term positive impact on the baby's quality of life,(Latifah et al., 2020).
This research aligns with studies by Haskah (2020) and Zakaria (2020), which suggest that the failure to provide exclusive breastfeeding and early weaning processes can be contributing factors to the occurrence of stunting (Haskas, 2020). Non-exclusive breastfeeding reduces the risk of stunting in children aged 24-59 months, although statistically not significant (Zakaria & Suma, 2020). Children not given exclusive breastfeeding are 2.28 times more likely to experience stunting compared to those exclusively breastfed, (Elni & Julianti, 2020). Similarly, in the study by Noorhasanah et al., there is a correlation between the parenting style provided by mothers and the occurrence of stunting, (Banjarmasin & Asuh, 2021).

4. Conclusion

The nutritional status of a pregnant mother cannot be considered the cause of stunting in toddlers. However, if the mother's caregiving practices have been positive since the child's birth, the likelihood of stunting tends to be lower. Conversely, if the mother's caregiving practices are categorized as poor, the likelihood of stunting is higher. One of the positive caregiving practices is providing exclusive breastfeeding for the first 6 months of life. In this regard, the prevention of stunting requires a holistic approach, involving all factors that can contribute to the condition, including efforts to improve the nutritional status of pregnant mothers and the implementation of optimal parenting practices in the early stages of life, such as providing exclusive breastfeeding for the first six months. As a recommendation to healthcare professionals, especially midwives, it is advised to consistently provide counseling to pregnant women, emphasizing the importance of nutritional care during pregnancy until the child reaches the age of five. Additionally, other educational initiatives that enhance the understanding of families and communities regarding the adverse effects of stunting on the future of children are also crucial. This ensures that parents are more aware of the significance of caring for toddlers

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