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ANALYSIS OF PARENTS' SMOKING BEHAVIOR WITH INCIDENTS STUNTING IN TODDLERS

Odilia Esem[1], Meri Flora Ernestin[2]

[1.2] Diploma III Midwifery Study Program, Citra Bangsa University
Email Correspondence :odiliaesem28@gmail.com

ABSTRAK : ANALISIS PERILAKU MEROKOK ORANG TUA DENGAN KEJADIAN STUNTING PADA ANAK BALITA

Latar Belakang : Stunting merupakan masalah kesehatan serius yang berdampak pada pertumbuhan dan perkembangan anak dalam jangka panjang. Salah satu faktor risiko yang berkontribusi terhadap kejadian stunting adalah paparan asap rokok dari orang tua. Paparan asap rokok dapat meningkatkan risiko infeksi saluran pernapasan dan gangguan penyerapan nutrisi pada anak, yang berkontribusi terhadap stunting.

Tujuan : Penelitian ini bertujuan untuk menganalisis hubungan antara perilaku merokok orang tua dengan kejadian stunting pada anak balita Di Desa Penfui Timur Kabupaten Kupang Nusa Tenggara Timur.

Metode : Penelitian ini merupakan penelitian kuantitatif dengan pendekatan *cross-sectional*. Populasi dalam penelitian ini adalah seluruh balita usia 24–59 bulan yang tinggal bersama orang tua laki-laki (ayah kandung) di Desa Penfui Timur. Penentuan sampel dilakukan dengan menggunakan teknik *purposive sampling*. Data dikumpulkan melalui kuesioner dan pengukuran antropometri, kemudian dianalisis menggunakan uji statistik *Chi-Square*.

Hasil : Terdapat hubungan yang bermakna secara statistik antara perilaku merokok orang tua dengan kejadian stunting pada balita, dengan nilai p = 0,036 (p < 0,05). Dari hasil distribusi, didapatkan bahwa balita yang orang tuanya merokok aktif di dalam rumah memiliki proporsi stunting paling tinggi, yaitu sebanyak 18 anak dari 34 (52,9%). Sebaliknya, pada kelompok orang tua yang tidak merokok, hanya terdapat 2 balita yang mengalami stunting dari total 13 anak (15,4%).

Kesimpulan : Temuan ini mengindikasikan perlunya intervensi kesehatan masyarakat untuk mengurangi paparan asap rokok dalam rumah tangga guna mencegah stunting pada anak.

Kata Kunci : Anak Balita, Perilaku merokok, Orang Tua, Stunting

ABSTRACT

Background : Stunting is a serious health problem that affects children's growth and development in the long term. One of the risk factors that contributes to stunting is exposure to cigarette smoke from parents. Exposure to cigarette smoke can increase the risk of respiratory tract infections and impaired nutrient absorption in children, which contributes to stunting.

Objective : This study aims to analyze the relationship between parental smoking behavior and the incidence of stunting in toddlers in Penfui Timur Village, Kupang Regency, East Nusa Tenggara.

Method : This study is a quantitative study with a cross-sectional approach. The population in this study were all toddlers aged 24–59 months who lived with their male parents (biological fathers) in Penfui Timur Village. The sample was determined using a purposive sampling technique. Data were collected through questionnaires and anthropometric measurements, then analyzed using the Chi-Square statistical test.

Results : There is a statistically significant relationship between parental smoking behavior and the incidence of stunting in toddlers, with a p value = 0.036 (p <0.05). From the distribution results, it was found that toddlers whose parents actively smoked at home had the highest proportion of stunting, which was 18 children out of 34 (52.9%). In contrast, in the group of parents who did not smoke, there were only 2 toddlers who experienced stunting out of a total of 13 children (15.4%).

Conclusion : In conclusion, this finding indicates the need for public health interventions to reduce exposure to cigarette smoke in households to prevent stunting in children.

Keywords: Parents, Stunting, Smoking behavior, Toddlers

INTODUCTION

Stunting is still a serious problem in Indonesia. According to the 2023 Indonesian Health Survey, the prevalence of stunting in toddlers reached 21.5%, which is still above the threshold set by WHO of 20%. This condition shows that efforts to reduce stunting require a more comprehensive approach, including considering risk factors that may have been overlooked. The government is targeting a reduction in stunting rates to below 20% by 2024, but achieving this target faces various challenges (Kemenkes RI, 2022).

One of the provinces with the highest prevalence of stunting in Indonesia is East Nusa Tenggara (NTT) Province. In 2023, stunting in East Nusa Tenggara reached 37.9%. This figure actually increased by 2.6% from 2022, which was 35.3% (Kemenkes RI, 2024). Stunting data in East Nusa Tenggara is spread across various regions including Kupang Regency. Stunting cases in Kupang Regency showed a significant decline. In February 2023, 4,899 toddlers were recorded as experiencing stunting out of 30,271 toddlers measured, equivalent to 16.18%. Then, in February 2024, this number decreased to 3,574 toddlers out of 28,940 toddlers measured, or around 12.35%. Despite the decline, stunting cases are still above the national target (BPS Provinsi NTT Tahun 2024). Based on the latest data, in 2022, Penfui Timur Village in Kupang Tengah District, Kupang Regency, East Nusa Tenggara, there were 122 toddlers experiencing stunting out of a total of 5,141 toddlers recorded in the Tarus Health Center work area. This figure shows that around 2.37% of toddlers in the village experience stunting (Puskesmas Tarus, 2023).

Malnutrition is often assumed to be the result of food insecurity alone, data from many countries states that food is not the only or even the main cause of malnutrition, except under conditions of famine (Nadiyah, 2014). Various factors contribute to the incidence of stunting, including maternal nutritional status, access to health services, and family behavior. One behavior that has received attention is smoking in the household environment. Exposure to cigarette smoke at home can increase the risk of respiratory infections and impaired nutrient absorption in children, which contributes to stunting. Research shows that toddlers who live with smoking parents have a 5.5% higher risk of stunting compared to children from non-smoking families. In addition, children from smoking families tend to weigh 1.5 kg less than children from non-smoking families (Semba., et al, 2023).

Data from the Global Adult Tobacco Survey (GATS) Indonesia 2021 shows that around 64% of households in Indonesia have family members who smoke. This condition increases the risk of exposure to secondhand smoke for children, especially in the home environment. Exposure to secondhand smoke has been linked to stunted child growth and an increased risk of stunting (WHO, 2021).

Exposure to cigarette smoke not only has an impact after the child is born, but also during pregnancy. Nicotine and other harmful substances from cigarette smoke can penetrate the placenta, thus affecting fetal growth. Research shows that babies born to mothers who are active or passive smokers have lower length and weight compared to babies from non-smoking mothers (Chen., et al, 2022).

In addition to the direct impact on children's health, parental smoking behavior also has an impact on household expenditure allocation. Data shows that household spending on cigarettes is the second largest, even three times higher than the cost of children's protein needs. This shows that smoking behavior can reduce the family's ability to provide nutritious food needed for optimal child growth (Adriana., et al, 2023). Based on this description, it is important to analyze the relationship between parental smoking behavior and the incidence of stunting in children. A deeper understanding of this factor can help in formulating effective policies and interventions to reduce the prevalence of stunting in Indonesia.

RESEARCH METHODS

This study is a quantitative study with a cross-sectional approach that aims to analyze the relationship between parental smoking behavior and the incidence of stunting in toddlers. This approach was chosen because it allows researchers to observe the independent variable (smoking behavior) and the dependent variable (incidence of stunting) simultaneously in one measurement time. The study was conducted in Penfui Timur Village, Kupang Tengah District, Kupang Regency, East Nusa Tenggara Province, from July to August 2024.

The population in this study were all toddlers aged 24–59 months who lived with their male parents (biological fathers) in Penfui Timur Village. The sample in this study was 67 people. The sample determination was carried out using a purposive sampling technique, namely selecting research subjects based on the inclusion criteria that had been set. The inclusion criteria in this study included: (1) toddlers aged 24–59 months, (2) living

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with their biological fathers, and (3) parents willing to be respondents. Meanwhile, the exclusion criteria included toddlers with congenital abnormalities or chronic diseases that affect growth. The number of samples obtained was calculated using the Slovin formula with an error rate of 10%, from a total population of 200 toddlers, so that 67 respondents were obtained.

The variables in this study consisted of independent variables, namely parental smoking behavior, and dependent variables, namely the incidence of stunting in toddlers. Smoking behavior was measured based on the frequency of smoking per day, the number of cigarettes, and smoking habits in the house. Data were collected through structured questionnaires that had been tested for validity and reliability. Meanwhile, data on the incidence of stunting were obtained through anthropometric measurements of toddler height using a microtoise tool, and the age of toddlers was determined based on the KIA Card or birth certificate. The results of height and age measurements were analyzed using WHO Anthro software, to determine the Z-score value of height according to age. Toddlers are categorized as stunted if the Z-score value is <-2 SD according to WHO standards.

The data obtained were analyzed in three stages, namely univariate analysis to describe the frequency distribution of each variable, bivariate analysis using the chi-square test (χ^2) to see the relationship between smoking behavior and stunting incidence, and interpretation of the p value, where p <0.05 is considered to indicate a statistically significant relationship.

RESEARCH RESULTS

The study was conducted in Penfui Timur Village, Kupang Tengah District, Kupang Regency, East Nusa Tenggara Province. The study was conducted from July to August 2024 with 67 respondents. Data on parental smoking behavior were collected through a structured questionnaire that had been tested for validity and reliability. Meanwhile, data on stunting incidence were obtained through anthropometric measurements of toddler height using a microtoise, and the age of toddlers was determined based on the KIA Card or birth certificate. The results of height and age measurements were analyzed using WHO Anthro software, to determine the Z-score value of height according to age. The results obtained are presented in the table below:

Univariate Analysis (Respondent Characteristics)

Based on the results of the univariate analysis, it was shown that of the total of 67 toddlers, 26 toddlers (38.8%) experienced stunting, while 41 toddlers (61.2%) did not experience stunting

Table 1
Frequency Distribution of Stunting Incidents in Toddlers

Stunting Incident	Frequency (n)	Percentage (%)
Stunting	26	38.8%
No Stunting	41	61.2%

Table 2
Frequency Distribution of Parents' Smoking Behavior

Parental Smoking Behavior	Frequency (n)	Percentage (%)
Active Smoking Inside the House	34	50.7%
Active Smoking Outside the Home	20	29.9%
Do not smoke	13	19.4%

Parents' smoking behavior shows that 34 parents (50.7%) are active smokers at home, 20 parents (29.9%) smoke outside the home, and 13 parents (19.4%) do not smoke at all.

Bivariate Analysis

Bivariate analysis using the Chi-square test showed that there was a statistically significant relationship between parental smoking behavior and the incidence of stunting in toddlers, with a p value = 0.036 (p < 0.05). From the distribution results, it was found that toddlers whose parents actively smoked at home had the highest proportion of stunting, which was 18 children out of 34 (52.9%). In contrast, in the group of parents who did not smoke, there were only 2 toddlers who experienced stunting out of a total of 13 children (15.4%).

Table 3
Relationship between Parental Smoking Behavior and Stunting Incidence

Parental Smoking Behavior	stunting (n)	No Stunting (n)	Total (n)	*p-value*
Active Smoking Inside the House	18	16	34	
Active Smoking Outside the Home	6	14	20	
Do not smoke	2	11	13	

DISCUSSION

Stunting is a global health problem that must be addressed immediately. Stunting describes a condition of chronic malnutrition, especially in the first thousand days of life. As a result, the growth of children's height is disrupted. One of the causes of stunting in children is the behavior of parents who smoke. The results of this study show a relationship between the behavior of parents who smoke and the incidence of stunting.

Smoking habits are generally classified as behaviors that can harm individual health. In fact, when viewed from the side of passive smokers, a person's smoking activity also affects the health of others around them who do not smoke, so that overall it has a direct impact on public health) (Widayati, 2019).

The presentation of research results conducted by Dadras et al (2020) showed that the duration of exposure to cigarette smoke had a significant relationship with the incidence of stunting in children aged 25–59 months. Exposure to cigarette smoke for more than 3 hours per day increased the incidence of stunting by 10,316 times (Dadras, 2017).

Research by Dyah et al (2020) shows that children who have fathers who do not smoke tend to experience fewer growth disorders compared to children whose fathers smoke. In families where the father does not smoke, the possibility of meeting the child's nutritional needs, especially from high-nutrient food sources such as relatively expensive animal protein, is greater. The study also revealed that the expenditure of smoking fathers to buy cigarettes is equivalent to the cost that can be used to buy nutritious food such as eggs, meat, milk, oil, and vegetables (Astuti., et al, 2020).

Exposure to cigarette smoke can affect blood vessels and the distribution of blood flow to body tissues, which has a direct impact on children's growth. This is caused by disruption of the absorption process of nutrients that are important for children's development and growth. In addition, in children who have parents who smoke, abnormal leukocyte function was found. The nicotine content in cigarette smoke is also known to interact directly with chondrocytes through special nicotine receptors, thereby inhibiting the growth process of children's bones (Hasanah., et al, 2020).

This study is also in line with the findings of Humairoh (2021) who studied the relationship between height and parental smoking behavior with the risk of stunting in toddlers. In her study, Humairoh explained that parental smoking habits have an influence on the incidence of stunting in children. This is caused by disruption of children's nutritional absorption and the tendency for household budget allocations to prioritize buying cigarettes rather than meeting the need for nutritious food that is important for children's growth. In addition, smoking behavior also increases the risk of intrauterine growth restriction (IUGR), which is one of the factors causing stunting (Humairoh, 2021).

Cigarette smoke contains around 2,256 hazardous chemicals that are prooxidant and carcinogenic. Many of these substances are able to pass through the blood-gas barrier and enter the blood circulation and peripheral tissues. One of the effects of these substances is the disruption of the vasodilation process, which then affects the distribution of oxygen throughout the body. In addition, the content of cigarette smoke can also stimulate increased secretion of proinflammatory cytokines (Nogueira, 2018).

Muraro's (2014) study stated that pregnant women who are exposed to cigarette smoke, either actively or passively, can experience short-term impacts on fetal growth and long-term impacts on the child's height in the future. This is caused by the nicotine content in cigarette smoke inhaled during pregnancy, which can interfere with embryonic development and bone growth, and can enter the baby's body through breast milk during breastfeeding. Although the study showed the effect of cigarette smoke exposure on fetal development during pregnancy, it has not specifically examined its relationship to the incidence of stunting in toddlers (Muraro., et al, 2014).

Research conducted by Sembat et al (2023) also revealed that exposure to cigarette smoke at home can increase the risk of respiratory tract infections and impaired nutrient absorption in children, which contributes to stunting. Research

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shows that toddlers who live with smoking parents have a 5.5% higher risk of stunting compared to children from non-smoking families. In addition, children from smoking families tend to weigh 1.5 kg less than children from non-smoking families (Semba., et al, 2023).

A study conducted by Niken (2020) showed that there is a relationship between parental smoking behavior and the incidence of stunting in toddlers aged 2-5 years. The results of the study showed a p value = 0.011 (p <0.05), which means that there is a significant relationship between parental smoking behavior and the incidence of stunting. However, the correlation strength of 0.33 indicates that the relationship is relatively low (Niken, 2020). Exposure to cigarette smoke is one of the important factors contributing to stunting in children, because the chemical content in it can have direct or indirect impacts on children's health. Therefore, education about the dangers of smoking and the negative impacts of inhaled cigarette smoke is very much needed to increase public awareness.

CONCLUSION

Based on the results of the study, it can be concluded from the distribution results, it was found that toddlers whose parents actively smoked at home had the highest proportion of stunting, which was 18 children out of 34 (52.9%). In contrast, in the group of parents who did not smoke, there were only 2 toddlers who experienced stunting out of a total of 13 children (15.4%). Bivariate analysis using the Chi-square test showed that there was a statistically significant relationship between parental smoking behavior and the incidence of stunting in toddlers, with a p value = 0.036 (p <0.05).

Exposure to cigarette smoke, either directly or indirectly, has an impact on disrupting the absorption of nutrients in children and can trigger growth disorders, including the risk of intrauterine growth restriction (IUGR) since pregnancy. In addition, smoking behavior is also related to the low priority of family spending on nutritious food because some of the budget is diverted to buying cigarettes. Therefore, smoking behavior in the household is one of the important risk factors that needs attention in efforts to prevent stunting in children.

SUGGESTION

Based on the results of this study, it is recommended that health workers be more active in providing education to the community, especially to parents and prospective parents, regarding the negative impacts of smoking behavior on child growth and development, including the risk of stunting. This education can be done through routine counseling at health facilities, integrated health posts, or home visits, with an emphasis on the importance of creating a smoke-free home environment. In addition, health workers also need to encourage behavioral change through a counseling approach and family support in stunting prevention programs.

Further research is recommended to explore the relationship between duration and intensity of cigarette smoke exposure with the severity of stunting, as well as considering other factors such as maternal nutritional status, parental education level, and household expenditure. In addition, research with a longitudinal design or qualitative approach is also needed to better understand the dynamics of smoking behavior in families and its impact on child growth from pregnancy to toddlerhood.

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