

Household Expenditure on Tobacco and the Risk of Stunting in West Sumatra

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ABSTRACT

Stunting remains a major public health issue in Indonesia, requiring urgent attention, particularly regarding its underlying risk factors, one of which is cigarette consumption. Smoking has well-documented negative effects on health, contributing to illness, nutritional deficiencies, and even mortality. Furthermore, it is closely associated with household spending behaviour. Income that could support child is often diverted to cigarettes. This study aims to describe the risk of stunting and household expenditure patterns in West Sumatra and discuss their potential relationship based on findings from previous studies. A descriptive observational approach was applied, using secondary data from Statistics Indonesia (BPS), the Indonesian Health Survey (SKI), and the National Population and Family Planning Board (BKKBN). The analysis compared household expenditure on cigarettes with stunting prevalence in Agam District and West Sumatra Province. Stunting in West Sumatra prevalence increasing from 23.6% in 2023 to 24.9% in 2024. The results showed that most families in Agam District were categorised as high risk of stunting (55.2%), while household expenditures were largely directed toward prepared foods (Rp 238.840), and cigarettes (Rp 112.394) rather than nutrient-rich foods, indicating that spending priorities may contribute to the persistence of stunting in the region. Stunting in West Sumatra is primarily driven by high family-level risk and household spending that favors cigarettes and prepared foods over nutrient-rich options, highlighting the need for integrated strategies addressing tobacco use, dietary practices, and social support to improve child growth outcomes.

Keywords: household expenditure, household, cigarettes, stunting

1 INTRODUCTION

Stunting remains a major public health concern in Indonesia, particularly in West Sumatera, where the prevalence of growth faltering among children under five continues to pose significant challenges to long-term human development [1]. Stunting, characterized by low height-for-age, is not only a reflection of chronic undernutrition but also an indicator of broader socio-environmental determinants, including household health behaviours [2,3]. One of the less frequently addressed yet critical factors influencing stunting is tobacco exposure, especially in the form of second-hand smoke within the household environment [1,4].

Evidence has shown that exposure to cigarette smoke can adversely affect maternal and child health through various pathways, including reduced birth weight, impaired nutrient absorption, increased risk of respiratory infections, and poor appetite in children all of which are associated with a higher risk of stunting[5]. In West Sumatera, cultural acceptance of smoking, particularly among adult males, and the lack of awareness about its indirect impacts on children's growth have

perpetuated a cycle of health risks that undermine national stunting reduction targets.

Efforts to quit smoking, especially among parents and caregivers, must be recognized not only as a means of reducing non-communicable disease risk but also as an essential strategy for stunting prevention[6]. Community-based health promotion, local policy enforcement, and targeted interventions aimed at smoking cessation can play a pivotal role in breaking this cycle [7]. Therefore, understanding the health consequences of tobacco use and strengthening smoking cessation efforts are essential components in the integrated approach to stunting prevention in West Sumatera.

Stunting remains a pressing public health issue in Indonesia, with West Sumatera among the provinces struggling to meet national reduction targets. Defined as a condition in which a child is too short for their age due to chronic malnutrition, stunting has long-term impacts on physical growth, cognitive development, and economic productivity [8]. While the determinants of stunting are multifactorial including inadequate nutrition, poor sanitation, and limited access to health services emerging evidence highlights the significant role of environmental and behavioural factors, such as household tobacco exposure [4,9]. Recent studies indicate that household spending on tobacco substantially limits the allocation of funds for essential needs, including healthcare, education, housing, and clothing. Recent studies indicate that household spending on tobacco substantially limits

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the allocation of funds for essential needs, including healthcare, education, housing, and clothing. Money that could be used to purchase nutritious foods such as fruits, vegetables, or protein sources is instead spent on cigarettes. This behaviour reduces the quality of family diets and may increase the risk of malnutrition or stunting among children, particularly in low-income households where resources are already limited [10]. The health consequences of tobacco use, particularly in the context of stunting prevention in West Sumatera, are profound and multifaceted. Exposure to cigarette smoke has been shown to adversely affect child growth by disrupting nutrient absorption mechanisms, thereby increasing the risk of stunting [11]. Smoking cessation and the promotion of healthy lifestyle behaviours are critical interventions to mitigate these adverse outcomes. This study aims to analyze the relationship between household tobacco expenditure and stunting prevalence in West Sumatera through a descriptive qualitative approach using secondary data.

2 METHOD

This study employed a descriptive observational research design using secondary data obtained from publicly accessible sources provided by Statistics Indonesia (BPS), the Indonesian Health Survey (SKI), the Indonesian Nutritional Status Survey (SSGI), and the National Population and Family Planning Board (BKKBN). The analysis focused on household expenditure patterns, particularly spending on cigarettes, and their relation to stunting prevalence in Agam District and West Sumatera Province. The analysis was conducted to categorize families based on two groups of risk variables, namely specific risks and sensitive risks. The specific risk variables included maternal and reproductive factors such as the 4T (too old, too young, too close, and too frequent), while the sensitive risk variables covered environmental and household conditions such as the source of drinking water and sanitation facilities. Based on the combination of these variables, families were classified into three risk categories: families having both specific and sensitive risks were classified as high risk; families having either specific or sensitive risk were classified as moderate risk; and families having neither specific nor sensitive risk were classified as low risk. The resulting risk categories were then compared descriptively with secondary data on average monthly household expenditure to identify potential patterns or associations between expenditure behavior and family risk levels. No ethical approval was required as the analysis was based on secondary, de-identified data.

3 RESULTS

Figure 1 illustrates the prevalence of stunting in West Sumatera Province from 2023 to 2024. The

prevalence showed a fluctuating pattern but increased from 23.6% in 2023 to 24.9% in 2024, indicating that stunting remains a significant public health challenge in the province [12, 13].

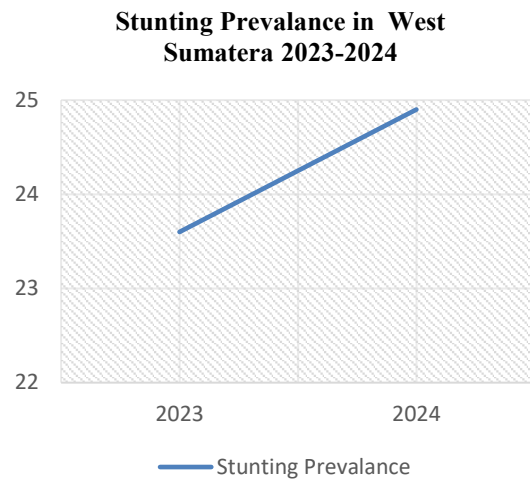


Figure 1: Stunting prevalence in West Sumatera Province 2023 – 2024. Source: Secondary Data of Indonesian Nutritional Status Survey and Indonesian Health Survey.

Table 1 presents the frequency distribution of families at risk of giving birth to stunted children in Agam District. The majority of families were categorized as high risk (55.2%), while 44.3% were classified as moderate risk, and only a small proportion of families were considered low risk (5%). This finding highlights that most families in Agam District face a considerable risk of having children affected by stunting.

Table 1: Frequency distribution of families at risk of giving birth to stunted children in Agam District, 2024

Category of Stunting	Frequency	Percentage
Low risk	114	0.5
Moderate risk	9,546	44.3
High risk	11,909	55.2
Total	21,569	100

Source: Secondary data from the National Population and Family Planning Board (BKKBN, 2024).

Table 2 shows the average monthly per capita expenditure by food commodity group in West Sumatera Province in 2024. The largest expenditure was for prepared food and beverages (Rp 238.840), followed by cigarettes (Rp 112.394). In contrast, spending on nutrient-rich foods such as fruits (Rp 37.119), legumes (Rp 10.043), and eggs and milk (Rp 33.763) was relatively low.

Table 2: Average Monthly Expenditure per Capita by Food Commodity Group in West Sumatra Province, 2024

Commodity Group	Average Monthly Expenditure per Capita (Rp)
Food	
Cereals	105.298
Tubers	9.295
Fish/shrimp/com mon squid/shells	70.645
Meat	28.625
Eggs and milk	33.763
Vegetables	85.076
Legumes	10.043
Fruits	37.119
Oil and coconut	27.451
Beverage stuffs	17.681
Spices	11.761
Miscellaneous food items	9.737
Prepared food and beverages	238.840
Cigarettes	112.394
Non Food	
Housing and household facilities	330.299
Goods and services	167.921
Clothing, footwear, and headgear	49.497
Durable goods	57.127
Taxes and insurance	55.409
Parties and ceremonies	22.873
Total	1.480.853

Source: Secondary data obtained from Statistics Indonesia (BPS, 2024).

4 DISCUSSION

This study shows that stunting in West Sumatra remains a serious challenge, with prevalence increasing from 23.6% in 2023 to 24.9% in 2024. This trend suggests that current efforts have not been sufficient to protect children's growth. Similar findings have been reported in other provinces, where progress in stunting reduction has been slower than expected [12, 13].

Looking more closely at family-level risk, the majority of families in Agam District were categorized as high risk of stunting (55.2%), followed by moderate risk of stunting (44.3%), with only a very small group considered low risk of stunting. The data of Average Monthly Expenditure per Capita by Food Commodity shows that most

families live in conditions that increase the likelihood of stunting among children. Although cigarette spending accounted for 16.5% of total non-food expenditure (Rp 112,394 out of Rp 683,125), it still represents a substantial portion of household budgets that could otherwise be allocated to nutrient-rich foods. This spending pattern suggests that cigarette consumption may indirectly reduce the purchasing power for nutritious foods such as eggs, milk, fruits, and legumes, potentially affecting the overall diet quality of households in West Sumatra. Smoking exacerbates the effects of poverty, as expenditures for tobacco may divert household income from food, clothing, housing, health, and education. This situation is particularly problematic in low-income settings, where limited resources are already stretched. In Indonesia Djutaharta. et al. (2022) reported, a statistically significant correlation has been found between household cigarette consumption and per capita protein intake, indicating that cigarette expenditure reduces dietary quality and quantity [14].

Beyond economic constraints, exposure to cigarette smoke also has direct biological effects on children's health. In early childhood, exposure to smoke increases the risk of respiratory infections such as pneumonia and other chronic respiratory conditions, which impair growth and development. Fine particulate matter (PM 2,5) and other toxic pollutants from cigarette smoke cause respiratory irritation, inflammation, and recurrent infections, which may further contribute to stunting [15].

Previous studies strengthen these findings. Muchlis et al. (2023) reported that paternal smoking was strongly associated with child stunting, partly due to household dietary quality being reduced when fathers smoked [16]. Consistent with this, households with smokers showed lower expenditures on eggs, fish, fruits, and vegetables, further limiting children's access to essential nutrients [14, 17]. Similar observations have been made by Ginting et al.(2020), who noted that smoking not only poses health risks to smokers themselves but also adversely affects family members. Expenditures on cigarettes by household heads reduce the share of household income allocated for food, thereby limiting the fulfillment of nutritional needs [18].

Another possible pathway is through the physiological effects of tobacco smoke on nutrient absorption. Inhalation of cigarette smoke not only reduces dietary diversity but also interferes with children's nutrient metabolism and utilization, directly impairing growth and development [6].

This study is not without limitations. The reliance on secondary data restricts the scope of variables that could be examined, as important determinants of stunting such as child feeding practices, sanitation, and parental education were not fully captured. In addition, the use of pre-

existing survey data introduces the possibility of reporting bias, particularly regarding sensitive expenditures like tobacco. The nature of the data also prevents a deeper exploration of household decision-making processes in allocating income between tobacco and food, which might provide richer insights into the mechanisms linking cigarette consumption and child nutrition. Furthermore, because household behaviors and socio-economic contexts differ across regions, the findings should be interpreted with caution and may not be directly generalizable to all populations.

5 CONCLUSION

This study aims to analyse the impact of smoking habits on household expenditure and explore their relationship with the incidence of stunting in West Sumatra. This study finding demonstrates that stunting remains a critical public health challenge in West Sumatra, with prevalence showing an upward trend despite ongoing interventions. The majority of families in Agam District were identified as being at high risk, largely due to household spending patterns that prioritize prepared foods and cigarettes over nutrient-rich foods. Cigarette consumption, in particular, exerts a dual adverse effect by reducing household expenditure on nutritious foods and directly exposing children to harmful smoke, thereby increasing the risk of stunting. These findings emphasize that stunting is not solely the result of food scarcity but is also strongly shaped by household financial priorities and lifestyle behaviors. To address this, stunting prevention strategies should integrate efforts to reduce tobacco consumption, promote smoke-free homes, and encourage better dietary practices, while social protection programs and targeted subsidies for nutrient-rich foods could help offset the diversion of household resources to tobacco. A multisectoral approach that combines health promotion, economic support, and stronger policy enforcement is crucial to breaking the cycle and enabling children in West Sumatra to achieve optimal growth. Further research is warranted to evaluate how combined tobacco control measures and nutrition education strategies can improve household food allocation and contribute to stunting reduction efforts.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this paper.

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