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# Relationship Between the Frequency of Eating *Snack Food* and Incidence of Stunting

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**Abstract**

Failure to thrive among toddlers results in stunting. One of the contributing factors is not fulfilling nutritional needs. Toddlers prefer to eat snack food with low nutritional content and the sugar content makes children feel full, reducing the portion of food in the main meal schedule that contains balanced nutritional value. The purpose of this study was to determine the relationship between the frequency of consuming snack food and the incidence of stunting. The method in this study used observations with a cross-sectional design. The Population was 232 people, with a sample of 70 mothers of stunted toddlers selected through the Simple Random Sampling technique. The instrument in this study used a questionnaire and was analyzed with the Spearman Rank test with the results ($\rho = 0{,}000 < 0.05$) between the frequency of consuming snack food and the incidence of stunting. This study showed a relationship between the frequency of consuming snack food and the incidence of stunting toddlers who consume snack food too often will cause stunting in toddlers. Based on the results, it is recommended that snack foods be given two hours before main meals to help address this issue.



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## INTRODUCTION

Growth failure due to malnutrition leads to stunting. One of the nutritional issues that children face worldwide is stunting where children experience impaired growth processes so that their height is not in accordance with their age. Toddlers are said to be stunted if based on indicators of height for age below - 2 standard deviations (Kemenkes RI, 2020). WHO in 2022 stated that around 148.1 millionchildren in the world were stunted. The results of the 2022 Indonesian Nutritional Status Survey, the country's prevalence of stunting has dropped from 24.4% in 2021 to 21.6% in 2022. While it has declined, it is still far from the 14% reduction in the stunting rate that the National Medium-Term Development Plan (NMTDP) calls for by 2024 (Kemenkes RI, 2023).

In East Java, the prevalence of stunting in 2022 was 19.2% (Kemenkes RI, 2023). The prevalence of stunting in Kediri District in 2022 has increased by 21.6% when compared to 2021of 18% (Kemenkes RI, 2023). The highest prevalence of stunting among toddlers in 2023 in Kediri Regency is in the Bendo Community Health Center working area with a prevalence of 16.46% with a total of 289 toddlers. The prevalence of stunting in the Bendo Health Center work area over the last three years has continued to increase, namely in 2020 it was 16.9%, in 2021 it was 18.3% and in 2022 it was 18.7%.

Stunting is a condition of chronic malnutrition at the most dangerous stage of growth and development in children at the beginning of their lives, and therefore children who are stunted do not develop fully and are too short for their age (Taslim et al., 2023). Fulfillment of nutritional needs in children is one of the factors that cause stunting. Food that is not good in quality and quantity will cause children to experience malnutrition and have an impact on the growth process (Indahsari et al., 2023; Putri et al., 2022). When viewed from the side of complementary feeding, what really needs to be considered is the quantity, quality and safety of the food provided (Kemenkes RI, 2018; Risnah et al., 2024).

The Indonesian government has instituted a supplementary feeding program (PMT) for malnourished toddlers, using locally sourced food to improve the nutritional status of young children (Kemenkes RI, 2022). However, the reality is that toddlers who are included in the PMT program do not experience an increase in weight or height, because the nutritional needs of toddlers can only be met when the PMT program is running. Outside the PMT schedule, toddlersconsume food that does not contain balanced nutritional values so that toddlers remain in poor nutritional status (Aryani & Wahyono, 2020).

Snack food is the cause of lower nutritional fulfillment in children. Snack food is a type of food consumed between main meals, namely breakfast, lunch and dinner (Hess et al., 2016). The majority of snack food on the market contains sodium, saturated fat, sugar, and dietary fiber which causes lower nutritional needs (Mireault et al., 2023). In toddlers aged 1 - 2 years who consume unhealthy snacks will be at higher risk of micronutrient deficiencies (Elisanti et al., 2023; Pries et al., 2019). The content contained in snack food such as high sugar content will give children a sense of satiety, reducing children's appetite for consuming the main food menu (Nurkomala et al., 2018). 96.4% of children aged 2 - 5 years have consumed one or more snack foods per day. This happens because the increasing age will increase children's preferences and habits to consume snack food (Vatanparast et al., 2019). The conducive factor of stunting is the deficiency in nutrient intake due to the lack of quantity and quality of food consumed by the children (Nadimin et al., 2021). children who consume snack food by consuming a lot of snack food will have a lower TB/U Z-Score value when compared to toddlers who do not consume snack food (Purwestri et al., 2018).

The study only shows the relationship between the Z-Score TB / U value and consuming snack food has not seen a relationship with the incidence of stunting specifically. From the data above, a study will be conducted on "The Relationship between the Frequency of Eating Snack Food with the Incidence of Stunting in

Toddlers Aged 24 - 59 Months at the Bendo Health Center, Kediri Regency". The purpose of this study was to determine the relationship between the frequency of consuming snack food and the incidence of stunting in toddlers so that it can determine the cause of stunting problems in toddlers.

## METHODS

The design of the study used a correlation analytic research design with Cross Sectional research design. This study was conducted on January 2 - 15, 2024 which was conducted in the working area of the Bendo Health Center, Kediri Regency. The population in this study were all mothers who had stunted toddlers aged 24 - 59 months with a total of 232 respondents. The type of sampling technique used is Simple Random Sampling with a total sample of 70 respondents with inclusion criteria, namely mothers who have stunted toddlers aged 24- 59 months who are willing to become respondents, mothers of toddlers who can read and write, and toddlers who live in Puskesmas Bendo Kediri Regency. Then, according to the exclusion criteria, toddlers who are not in place at the time of data collection and toddlers who do not live with parents. The frequency of snack food consumption is the independent variable, and the incidence of stunting is the dependent variable. The instruments in this study used a questionnaire that had been tested for validity and reliability and height measurements using the One Med brand microtoice and then classified using anthropometric standards that refer to the z- score value based on Height for Age (TB/U). Data collection was done door to door by measuring height directly on toddlers and distributing questionnaires filled out by respondents. Statistical analysis used the Spearman Rank test. This study has met the ethical eligibility of the Poltekkes Kemenkes Malang on December 5, 2023 with number DP.04.03/F.XX1.31/0068/2024.

## RESULTS

**Table 1**. Frequency Distribution of Snack Food Consumption

| Frequency of Consuming Snack Food | Frequency | Persent (%) |
|---|---|---|
| Rare | 11 | 15,7 |
| Often | 37 | 52,9 |
| Very often | 22 | 31,4 |
| **Total** | **70** | **100** |

Source: Primary Data January 2024

Based on the table, it can be seen that most of the frequency of consuming snack food in the frequent category is 37 toddlers (52,9%)

**Table 2**. Distribution of Stunting Incidence

| Incidence of Stunting | Frequency | Persent (%) |
|---|---|---|
| Short | 43 | 61,4 |
| Very Short | 27 | 38,6 |
| **Total** | **70** | **100** |

Source: Primary Data January 2024

Based on the table, it can be seen that most are included in the short category of stuntingwith a total of 43 toddlers (61.4%).

**Table 3**. Relationship between Frequency of Eating Snack Food and Incidence of Stunting

| Frequency of Consuming Snack Food | Incidence of Stunting | | | | Total | | *p-value* | Coefficient Correlation |
|---|---|---|---|---|---|---|---|---|
| | Short | | Very Short | | | | | |
| | F | % | F | % | F | % | | |
| Rare | 10 | 14,3 | 1 | 1,5 | 11 | 15,8 | | |
| Often | 28 | 40 | 9 | 12,8 | 37 | 52,8 | **0,000** | **0,529** |
| Very often | 5 | 7,1 | 17 | 24,3 | 22 | 31,4 | | |
| **Total** | **43** | **61,4** | **27** | **38,6** | **70** | **100** | | |

Source: Primary Data January 2024

After conducting statistical tests using Spearman Rank with the results of p-value = 0.000. The p-value is smaller than the α value (0.000 <0.05) so it can be stated that there is a relationship between the frequency of consuming snack food and the incidence of stunting in toddlers aged 24 - 59 months at the Bendo Health Center, Kediri Regency. The correlation coefficient value is 0.529, so the correlation of the frequency of consuming snack food variables with the variable incidence of stunting is included in the strong category. With a positive correlation coefficient value, the direction of the relationship between the variable frequency of consuming snack food and the incidence of stunting has a unidirectional relationship, meaning that the more often the frequency of consuming snack food, the higher the incidence of stunting.

## DISCUSSION

### Frequency of Snack Food Consumption

The group of snacks that are often consumed by toddlers aged 2 – 4 years are snack foods (Vatanparast et al., 2020). Children's food acceptance and preferences are largely learned through experiences around eating, which emphasizes that how children are fed may be as important as what they are fed. Snack food is often consumed by toddlers because the flavors found in snack food have a distinctive taste so that toddlers like to consume these foods. The frequency of snack food consumption in toddlers should not exceed 2 times a day (Kemenkes, 2014). In this study, it was found that most toddlers often consume snack food only when the main meal schedule is as many as 38 toddlers (54.3%). Frequency of food consumption in toddlers has bad habits that do not consume food with a predetermined frequency of standards (3 times per day main meals, 2 times per day snacks) and the frequency of eating toddlers is often replaced with foods that contain low nutrients such as snack food (Aini, 2019). There was a higher mean difference in energy intake relative to energy expenditure in those that had a mid-morning snack and moderate-intensity exercise compared to when participants only had exercise and no snack (Andres et al., 2025).

The results also show that the type of snack food with a sweet taste is the most frequently consumed snack food compared to salty snack food and traditional snack food. Snack food with a sweet taste inpackaging or drinks with sweeteners is a type of snack food that is often consumed by children (Green et al., 2019). Sweet-flavored snack food has high sugar content but low protein and micronutrient content. The high sugar content in snack food causes children to experience a decrease in appetite due to the satiety produced by these substances. This is in accordance with the results of the study which stated that almost half of the respondents often experienced a decrease in appetite after consuming snack food, namely 29 toddlers (41.4%).

In this study, the results showed that of the three main food schedules (breakfast, lunch and dinner) showed that almost half of the toddlers had a very frequent habit of consuming snackfood before lunch as many as 23 toddlers (32.9%). This happens because many activities in childhood are done during the day, causing children to have a very frequent habit of consuming snack food before lunch to replace the energy that has been used. The duration for the digestive system to process food in

the body depends on the nature and type of food consumed. Generally, the stomach is empty for between 3 - 4 hours after food enters the body (Amalika et al., 2023). Using participant-identified surveys, found that more than half of Australian children aged 9–13 years consumed at least four snacks a day, with most children in the US and Mexico consuming 2–3 snacks a day (Gage et al., 2021). Thus, toddlers who consume Snack food with excessive sweetness cause children to experience a decrease in appetite because they feel full. If snack food is consumed before 3 - 4 hours of the main meal schedule, toddlers feel full so they do not consume other foods and with low nutritional content in snack food can cause children to experience malnutrition.

**Incidence of Stunting**

The incidence of stunting at Puskesmas Bendo shows that most families have stunted toddlers in the short category. In this study, children who were stunted were caused by not fulfilling nutritional needs so that the z score value was below the normal value. In addition, ifthe parents' education level is low, it will affect parents in obtaining information. In this study,the results showed that toddlers with a very short stunting category with the last education of parents in the low education level category were more when compared to toddlers with a short stunting category, namely 6 respondents (8.6%). The education level of parents, especially mothers, has a significant relationship with the incidence of stunting in toddlers (Willyanto & Ramadhani, 2023). The level of education is related to the knowledge and nutritional needs of the family, especially children. Mothers with low levels of education and knowledge will have difficulty absorbing nutritional information so that they do not know the nutritional needs needed by children (Tebi et al., 2021). So indirectly the level of education of mothers who care for toddlers also affects the incidence of stunting. Because parents, especially mothers with low levels of education, will have difficulty absorbing information about children's nutritional needs so they do not know the nutritional needs that must be given to their children.

In addition, the level of family income in one month is an indirect cause of stunting. in this study, it was found that almost half of the family income in one month was in the low categoryas many as 39 respondents (55.7%). Toddlers who come from families with low family income are at risk of stunting (Anugrahaeni et al., 2022). The lower the income level in the family, the lower it will be to provide the needs for nutritional fulfillment so that nutritional needs are not met and will cause toddlers to experience stunting (Tebi et al., 2021). Thus, the low level of family income is a cause of stunting inchildren because it will affect the family's ability to choose a food menu to fulfill the necessary nutrients, if not fulfilled, it will cause children to experience nutritional problems, one of whichis stunting (Kumalasari & Wulandari, 2024).

**Relationship between Frequency of Eating Snack Food and Incidence of Stunting**

Stunting is a child's failure to grow and develop. There are several main causes of stunting. One of them is optimizing child feeding practices (Damanik et al., 2020; Kurniawan et al., 2021; Matondang & Yuliaty, 2024). The results of this study are in line with research conducted by (Basuki et al., 2021; Manalu et al., 2024). The frequency of snack food consumption is related to the incidence of stunting. The frequency of consumption and portion size of snacks have an impact on nutritional status in children (Cooke, 2024). The study states that toddlers with a high frequency of snack food consumption have a risk of 1.61 times to experience stunting compared to those with a low frequency of snack food consumption category.

Based on the categories of frequency of snack consumption carried out in Kathmandu, Nepal, toddlers aged 12 - 23 years were grouped into high and low categories. The results showed that children who consumed snacks with high frequency had reduced intake of calcium, zinc, vitamin A, thiamin, riboflavin, vitamin B6, vitamin B12, and folate (Pries et al., 2019). Stunting occurs in 50.6% of children. Compared to children in the category of more frequent snack consumption, those in the

highest category are less likely to experience stunting (Hess, 2022; Nachvak et al., 2020). This study showed an association between high snack food consumption and lower TB/U Z - score for age.

Toddlers are an age group that is in the golden period of life. Toddlers are prone to stunting problems if their nutritional intake is insufficient (Rahmaniah, 2020). Toddlers who are given excessive snack food before the main meal schedule (breakfast, lunch, dinner) will cause children to experience a decrease in appetite. Snack food consumed before the main meal schedule will cause a feeling of satiety in toddlers, causing children not to want to consume food anymore. This is in line with research conducted (Rahmi, 2018). which states that toddlers who consume a lot of snack food will feel full because of the dense calories that enter the body. While nutrients such as protein, vitamins, and minerals are still very lacking.

In this study, researchers assumed that toddlers who consumed too often Snack food 2 hours before the main meal schedule will feel full first so that the nutritional needs in the body are not met and cause children to experience problems with nutritional fulfillment, causing stunting.

## CONCLUSION

Based on the findings of this study, it can be said that the majority of toddlers between the ages of 24 and 59 months frequently consume snack food, the majority of stunting cases fall into the short category, and there was a correlation between the two. The results of this study can be taken into consideration in providing food to children to avoid stunting by giving snack food two hours before the main meal schedule.

## SUGGESTION

This study needs further research by looking at other factors that influence the causes of stunting in toddlers. The results of this study can be a valuable reference for future research investigating snack food consumption with the incidence of stunting.

## FUNDING

This study is self-funded by the researcher, which gives them greater control over the research process. Independent funding can provide flexibility to design and carry out research in accordance with research objectives without external influence.

## CONFLICTS OF INTEREST

No conflict of interest.

## AUTHOR CONTRIBUTIONS

In the research, journal writers contribute in presenting empirical evidence about the relationship between the frequency of consuming snack food and the incidence of stunting. basedon the research that has been done, the authors provide new insights into the relationship between consuming snack food and the incidence of stunting.

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