Household Food Security Status And Food Feeding Culture With Stunting Incidence: A Cross-Sectional Study Among Children 24- 59 Months In Indonesia

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ABSTRACT

Introduction: Low levels of food consumption for a long time due to food insecurity and inappropriate food feeding culture can lead to chronic nutritional deficiencies, which can manifest as stunting. This study aims to determine the relationship between household food security status, food feeding culture, and the incidence of stunting in toddlers aged 12–59 months. **Methods:** The research involved the design of a cross-sectional analysis. The sample in this study was 103 toddlers registered at the Integrated Healthcare Centre in the working area of Pujer Public Health Centre, Bondowoso Regency, East Java, Indonesia. Sampling technique: proportional random sampling. The instruments used are the microtoice, the US-HFSSM questionnaire and the Child Feeding Questionnaire (CFQ). Data analysis using the Chi-square test. **Result:** The results showed that most toddlers are female (54.4%) and have normal nutritional status (64.1%). Toddlers have a household status of food security (58.3%) and an appropriate Food Feeding Culture (64.1%). While the results of the chi-square test show that there is a significant relationship between household food security status (p-value=0.000) (OR= 0.219), there is also a significant relationship between food feeding culture (p-value=0.004) (OR=0.295). **Conclusion:** The household food security status and food feeding culture is related to the incidence of stunting in toddlers. For this reason, efforts to strengthen food self-sufficiency at the household level are expected. Such as

intensification of yards through the Sustainable Food Home Area programme and local food diversification.

Keywords: Stunting, Household Food Security, Food feeding culture, Nutrition, Toddlers.

INTRODUCTION

Stunting is a global nutritional problem that is closely related to an increased risk of morbidity and mortality, so it has a serious impact on the quality of life between generations (1). Stunting is a condition of failure to grow, which is a form of long-term reflection of nutrient deficiency due to poor quality and quantity of food consumed as well as the presence of chronic recurrent infectious diseases (2). According to WHO standards, a child is included in the stunting criteria if the z-score of PB/U or TB/U is <-2 Standard Deviation (3). Stunting can affect physical growth, increase susceptibility to infectious diseases, and inhibit cognitive development, which causes the occurrence of a decrease in intellectual capacity, so that it can affect the level of intelligence and productivity of children in the future and eventually impact the economy of a country (4). The results of the Indonesian Nutritional Status Study (SSGI) in 2021 showed that the prevalence of stunting in Indonesia is 24.4% and in East Java Province is 23.5%. Meanwhile, the stunting prevalence rate in Bondowoso Regency reached 37%, and in Pujer District, it was 15% (5).

Stunting is a multifactorial nutritional problem caused by inadequate nutritional intake, a history of recurrent infections, and a lack of psychosocial stimulation that has occurred since the first 1000 days of life and is getting worse with the inability to catch up (6). Household food security is closely related to food availability in supporting the level of food consumption, so it becomes an indirect factor that can affect children's nutritional status. Household food security is reflected in the ability of households to fulfil access to food in the form of the availability of sufficient food in terms of quantity, quality, food safety, food distribution, and level of food consumption. Household food insecurity can affect the quantity and quality of food consumption levels so that it can exacerbate the value of nutritional status through its impact on stress and poor parenting patterns, especially in terms of child feeding culture (7).

The culture of feeding in toddlers is carried out gradually according to the needs of the child's age. Some things that need to be considered in food feeding culture for children are the age of the child, the frequency of feeding in a day, the number of feedings, food texture, variety of food, food hygiene, and cleanliness of food handlers (8). At

the age of 12–36 months, children are still passive consumers, and every food consumed by children still depends on what is provided by the mother. From the age of 36–59 months, usually children have started to form active consumer traits, where they can choose the food they like (9). Parents will find it easier to direct their children's eating culture if parents succeed in forming children's eating habits in accordance with the principles of balanced nutrition from the age of toddlers. This is because children have known good eating culture at an earlier age (10). The application of a good diet is also developed so that it can support the formation of synergistic interactions and avoid forms of antogenic interactions with every nutrient and non-nutritional substance that enters the body.

MATERIALS AND METHODS

Study Design

This type of research is an analytic observational study with a quantitative approach using a cross-sectional research design. The independent and dependent variables are examined simultaneously over a certain time period.

Population, Samples, and Sampling

The population in this study was children aged 12–59 months who were registered at the Integrated Healthcare Centre in the working area of the Pujer Health Centre, for a total of 2157 populations. The research was conducted from January to March 2022.

Sampling was carried out using non-probability sampling with the proportional random sampling technique. The sample in this study is part of a population with the following inclusion criteria: Toddlers aged 12–59 months who are registered at the Integrated Healthcare Centre in the study area; toddlers who live with both parents in the study area; toddlers who have a KIA; and toddlers who have mothers who are willing to be interviewed. Exclution criteria: Toddlers have a history of chronic infectious diseases such as pulmonary TB. They also have a physical disability that means their height cannot be measured precisely. The child was sick when the research was conducted. The sample size in this study was 103 respondents.

Instruments

The instruments used in this study are based on each variable: A microtoise with an accuracy of 0.1 cm was used to measure the child's height. Height data will be converted into a Z-score value. Each indicator for TB/U in children under five is: 1) severely stunted: < -3 SD; 2) Stunting: -3 SD to <-2 SD; 3) Normal: -2 SD to 2 SD.

The US-HFSSM questionnaire is used to measure household food security status. Affirmative responses to each item given are given a

score of 1, and negative responses are given a score of 0. Households that obtain a score of 0–2 from the US-HFSSM questionnaire are classified as food-secure households, while households that obtain a score of 3–18 from the US-HFSSM questionnaire are classified as food-insecure households (11).

The Child Feeding Questionnaire (CFQ) is used to measure feeding culture. The questionnaire given totaled 15 questions; each item was given a score of 1-4, which means (score 4: always), (score 3: often), (score 2: rarely), and (score 1: never). The measurement results are then interpreted with the appropriate category if the answer score is ≥60%, and the category is inappropriate if the answer score is <60% (12).

Data Analysis

For the Univariate test using descriptive statistics, for the Bivariate test using the Chi-Square test which was then analyzed using SPSS with a significance value ($\alpha = 0.05$). The results of the research test significance $p \leq 0.05$, meaning that there is a relationship between the variables studied.

Ethical Clearance

This study received approval from the Health Research Ethics Committee, Faculty of Public Health, University of Jember No. 309/KEPK/FKM-UNEJ/II/2022.

RESULT

Characteristics of Toddlers

Data on the characteristics of toddlers shows that most of the respondents are female (54.4%). Out of 103 toddlers, 64.1% had normal nutritional status, 8.7% were severely stunted, and 27.2% were stunted (table I).

Table I: Frequency Distribution of Toddlers Characteristic Data

Category	Frequency (f)	Percentage (%)
Gender		
Male	47	45,6
Female	56	54,4
Nutritional Status		
Severely Stunted	9	8,7
Stunting	28	27,2
Normal	66	64,1
Total	**103**	**100**

The toddlers participating in the study had an age range of 12–59 months and had a body length or height range of 66.2 cm to 103.7 cm (table II).

Table II: Distribution of Age and Height of Toddlers

Variable	Lowest – Highest
Child age	12 months – 59 months
Child's length or height	66,2 cm – 103,7 cm

Characteristics of the Mother

Based on the characteristics of mothers (table III), it is known that most of the respondents have an age range of 20–35 years (84.5%)

Table III: Frequency Distribution of Mothers Characteristic Data

Category	Frequency (f)	Percentage (%)
Mother's age		
< 20 Years	2	1,9
20-35 Years	87	84,5
> 35 Years	14	13,6
Mother's Education		
basic education (SD/SMP)	69	67
Secondary education (SMA/SMK/MA)	31	30,1
higher education (D3/S1/S2)	3	2,9
Mother's job		
Doesn't work	88	85,4
Work	15	14,6
Number of children		
1-2	93	90,3
> 2	10	9,7
Number of Family Members		
Small Family (≤ 4 people)	93	90,3
Medium family (5-6 people)	10	9,7
Big Family (≥ 7 people)	0	0
Family Income		

Category	Frequency (f)	Percentage (%)
Below the UMK: < Rp. 1,958,640	53	51,5
UMK: ≥ Rp.1,958,640	50	48,5
Total	**103**	**100**

have basic education (elementary or junior high school) (67%), do not work (85.4%), have 1–2 children (90.3%), have the characteristics of a small family (90.3%), and 51.5% are low-income families, which is less than 1,958,640 rupiah per month.

Status of Household Food Security

Table IV: Frequency Distribution of Household Food Security Status

Status of Household Food Security	n	%
Food Security	60	58,3
Food Insecurity	43	41,7
Total	**103**	**100**

Based on the results of the frequency distribution of household food security status, it shows that the majority of households (58.3%) have the status of food secure households (table IV).

Food Feeding Culture

Table V: Frequency Distribution of Food Feeding Culture

Food Feeding Culture	n	%
Appropriate	66	64,1
Inappropriate	37	35,9
Total	**103**	**100**

Based on the results of the frequency distribution of food feeding culture in toddlers, it shows that most toddlers (64.1%) have the appropriate Food Feeding Culture (table V).

Relationship between Household Food Security Status and Stunting Incidence in Toddlers Aged 12–59 Months

Table VI: Relationship between Household Food Security Status and Stunting Incidence in Toddlers Aged 12–59 Months

Nutritional Status	OR

Household Food Security Status	Stunting		Normal		Total		p value	(CI 95%)
	n	%	n	%	n	%		
Food Security	13	12,6	47	45,6	60	58,3	0,000	0,219 (0,093 – 0,517)
Food Insecurity	24	23,3	19	18,4	43	41,7		
Total	**37**	**35,9**	**66**	**64,1**	**103**	**100**		

The results of the analysis of the relationship between household food security status and the incidence of stunting in children aged 12-59 months showed that out of 103 respondents, 58.3% of toddlers had household food security status, with the majority of toddlers (45.6%) having normal nutritional status.

The results of the Chi Square test using the SPSS programme with the categorical Pearson Chi-Square obtained a significant value, p = 0.000 < a = 0.05. This means that there is a relationship between household food security status and the incidence of stunting in toddlers aged 12–59 months. The results of the Chi-square test also showed an Odds Ratio (OR) = 0.219 (95% CI: 0.093–0.517) (OR <1), indicating that household food security status is a protective factor for stunting (table VI).

Relationship between Food Feeding Culture and Stunting Incidence in Toddlers Aged 12–59 Months

Table VII: Relationship between Food Feeding Culture and Stunting Incidence in Toddlers Aged 12–59 Months

Food Feeding Culture	Nutritional Status						p value	OR (CI 95%)
	Stunting		Normal		Total			
	n	%	n	%	n	%		
Appropriate	17	16,5	49	47,6	66	64,1	0,004	0,295 (0,126 – 0,690)
Inappropriate	20	19,4	17	16,5	37	35,9		
Total	**37**	**35,9**	**66**	**64,1**	**103**	**100**		

The results of the analysis of the relationship between food feeding culture and stunting incidence in toddlers aged 12–59 months showed that out of 103 respondents, 64,1% of toddlers have the appropriate Food Feeding Culture, with the majority of toddlers (47.6%) having normal nutritional status.

The results of the Chi Square test using the SPSS programme with the categorical Pearson Chi-Square obtained a significant p value = 0.004 < a = 0.05. This means that there is a relationship between food

feeding culture and stunting incidence in toddlers aged 12–59 months. The results of the Chi-square test also showed an Odds Ratio (OR) = 0.295 (CI 95%: 0.126-0.690) (OR <1), indicating that food feeding culture is a protective factor for stunting (table VII).

DISCUSSION

Stunting is a chronic nutritional problem in toddlers because it has a serious impact on increasing the risk of mortality and morbidity by inhibiting the growth and development of physical capacity, motor function, and suboptimal brain function (13). The amount of nutrients needed to fulfil metabolic and physiological functions of the body can be affected by gender. However, both female and male toddlers have similar possibilities related to the risk of stunting (14). Stunting is the result of a multifactorial relationship related to nutrition, environmental and demographic conditions, economic status, household food security status, health status, and child feeding practises (15).

Mothers have the closest relationship and have the closest bond in the process of child development, especially in terms of caring for children from the womb to growing into adults (16). A study states that children born to mothers in the safe reproductive age group (20–35 years) have a lower risk of experiencing stunting (17). Mother's educational level is also a determining factor related to ease of access to information, mother's capacity to understand and absorb nutritional knowledge, as well as increasing mother's ability to make decisions and power related to health, nutrition, and child development (18).

Mothers behaviour in the practise of providing nutrition to toddlers is also influenced by the mother's employment status. Compared to mothers who do not work, mothers who work outside the home tend to have relatively less time to carry out parenting activities, which can affect the quality of care and nutritional status of their children. The number of children > 2 is a risk factor for stunting in children (20). The level of family food consumption in terms of quantity and distribution in the household is strongly influenced by the number of family members and the number of toddlers in the family. A study conducted in South Euthopia revealed that toddlers who live in large families consisting of 5 to 7 family members are at risk of being 2.97 times more likely to experience stunting problems compared to toddlers who live in small families with 2 to 4 family members in them (21).

Family income is a fundamental indicator that can determine the economic and financial level of a household. Household economic capacity is a crucial aspect that can describe a person's purchasing power and ability to meet their needs, especially the need for adequate, healthy, and safe food. Households with low economic

status are at risk of consuming food in smaller quantities and with fewer variations due to limited access to certain types of food. Limitations that occur can increase the risk of nutritional deficiencies and the failure to thrive, such as stunting (22).

Household food security is highly dependent on how much access to food a household has (23). Food insecurity can negatively affect the level of food consumption due to the low quality and limited amount of food consumed, which can hinder nutritional improvement and exacerbate existing nutritional problems. In addition, the consequences of food insecurity, through its effects on stress, depression, inappropriate parenting culture, and inadequate feeding, can have an impact on children's nutritional status (7).

Inadequate food intake is a direct causal factor in stunting and nutritional problems in children. The culture of feeding greatly determines the level of nutrient intake from the food consumed, even though the food is available in sufficient and adequate quantities. If the application of the culture of feeding is not carried out correctly, the level of nutritional intake received will not be achieved ideally (24).

Relationship between Household Food Security Status and Stunting Incidence in Toddlers Aged 12–59 Months

Failure to achieve nutritional security as a result of not fulfilling household food security status can cause various nutritional problems. Based on the results of cross-tabulation and statistical data testing using the Chi Square test, a significance of p-value (0.000) < α (0.05) was obtained with an Odds Ratio value = 0.219 (95% CI: 0.093–0.517), meaning that there is a relationship between household food security status and stunting incidance in toddlers aged 12-59 months in the working area of the Pujer Health Centre. The Odds Ratio value (OR<1) is protective, meaning that toddlers with food insecure household status have a 0.219 times greater tendency to experience stunting compared to toddlers who have food secure household status.

The results in this study are in accordance with previous research conducted by Fentiana et al. (25), which found that household food security had a significant relationship with the incidence of stunting in toddlers 0–59 months. The results of this study are also in accordance with research conducted by Wardani et al. (26), which stated that there is a relationship between food security, which includes aspects of food insecurity in the household sector, and the incidence of stunting in toddlers aged 12–59 months.

Respondents with food insecurity mostly admitted that they were worried about running out of food supplies, worried about not being able to replenish food availability, worried about not being able to buy

food, could not provide balanced meals for children and their families, and only depended on several food groups with low costs of feeding the child. Household food insecurity can result in a low intake of nutrients and cause food consumption habits to become unbalanced, resulting in a long-term impact because it is closely related to the absorption of food, which is a form of the process of using food that is absorbed by the body to meet energy and nutrient needs, which are closely related to the quality of growth, physical development, and level of intelligence, especially in toddlerhood (27).

The state of household food security has a reciprocal relationship with stunting in children under five (28), but in this study, the researchers also found that out of 60 households with food security status, there were 13 children under five (12.6%) with stunting nutritional status, while out of 43 households with food insecurity status, there were 19 under five (18.4%) with normal nutritional status. The occurrence of stunting in toddlers with food-secure household status can be caused by inappropriate use of family food due to a lack of maternal knowledge regarding nutrition, resulting in low optimisation of the absorption of nutrients contained in food. The phenomena found in the field show the tendency of mothers who have stunted toddlers to only give food according to what their children want without considering the nutritional balance. This was exacerbated by the mother's level of education, most of which only reached the basic level of education (SD-SMP). Research conducted by Pratiwi et al. (29) states that malnutrition in toddlers is caused by the attitude or behaviour of the mother in choosing food, using food, and serving food that is not correct. Mothers ignorance can lead to food selection errors, especially for toddlers. Meanwhile, households with a food insecure status but toddlers with normal nutritional status can be caused by mothers having good knowledge about food and nutrition, so they are able to manage family income to allocate household food supplies, are able to process food and serve food appropriately, and are able to utilise available local food potential. So, even though the foodstuffs consumed are obtained at cheap and simple prices, they have a high nutrient content and can meet the nutritional needs of their toddlers. Utilisation of local food can be an alternative to stunting prevention. Local food sources are full of community traditions and habits, spread all over the environment, easy to get, affordable, and have good nutritional content (30).

Along with the problems, opportunities, and paradigms related to household food security, a joint strategy and synergy between all parties are needed. The role and involvement of all elements, including the community, government institutions, agricultural institutions, village apparatus, and stakeholders, are the main pillars in realising a joint resolution as an effort to develop food security (31).

Efforts that can be made are to foster self-sufficiency and increase the active role of the community in an effort to realise the availability, distribution, and consumption of food that is accommodated from time to time; revitalising institutions and community food security systems; increasing the quality and effectiveness of implementing government policies; encouraging community participation to seek to strengthen food security (32).

Relationship between Food feeding culture and Stunting Incidence in Toddlers Aged 12–59 Months

An appropriate Food Feeding Culture is one that is able to adjust the type of food, amount of food, and meal schedule according to the needs of children according to their age (33). Based on the results of cross-tabulation and statistical data testing using the Chi Square test, a significance of p-value (0.004) < α (0.05) was obtained with an Odds Ratio value = 0,295 (CI 95%: 0,126-0,690), meaning that there is a relationship between food feeding culture and stunting incidence in toddlers aged 12-59 months in the working area of the Pujer Health Centre. The Odds Ratio value (OR<1) is protective, meaning that toddlers with inappropriate food feeding culture have a 0.295 times greater tendency to experience stunting compared to toddlers who have appropriate food feeding culture.

The results in this study are in accordance with previous research conducted by Purwani et al. (10), which showed a relationship between food feeding culture and nutritional status in children aged 1 to 5 years in Kabunan Village, Taman District, Pemalang Regency. Research conducted by Putra (34), also showed a significant relationship between food feeding culture and the incidence of stunting in toddlers aged 12–59 months in Juking Pajang Village in 2020. Danita's research (35), explained that food feeding culture were significantly related and had an estimated risk of 5.1 times the incidence of stunting in toddlers.

Based on the results of the study, it was shown that 35.9% of the 103 respondents who participated in this study had feeding culture that were classified as inappropriate. More than half of the respondents who had an inappropriate Food Feeding Culture experienced stunting (54.1%), while the others (45.9%) had normal nutritional status. The researcher found that most of the respondents with inappropriate food feeding culture admitted that they rarely gave children food with a balanced menu every day, rarely made meal schedules for children, rarely gave snacks, and only gave stall snacks as children's snacks. Most of the respondents also said that children rarely finished the food served at meals. From the interview results, the researchers also found that mothers with inappropriate feeding practises only gave food menus such as rice and vegetable gravy or rice with one type of

protein such as tofu, tempeh, or eggs, with the repetition of the same menu every day. Most mothers also admitted that it was very rare to give their children fruit to eat every day. The inaccuracy of the feeding culture applied to toddlers can be caused because the mothers of toddlers do not understand how to properly apply feeding practises, how to eat, the amount of food, and the right type of food according to the needs of children according to their age, resulting in inappropriate feeding culture (36).

The researcher also found that of the 66 toddlers who had proper feeding culture, there were 17 (16.5%) who had stunted nutritional status, while of the 37 toddlers who had improper feeding culture, there were 17 (16.5%) who had normal nutritional status. Researchers assume that the occurrence of stunting in toddlers with appropriate feeding culture is related to poor environmental sanitation conditions in the study area. From the observations of researchers, there are still many people who carry out hygiene and sanitation activities such as bathing and washing food in the river. Toddlers who consume food as a result of poor hygiene practises can increase their risk of getting infectious diseases, which are usually characterised by appetite disorders, vomiting, diarrhoea, and worms, so that even though the feeding has been carried out properly, the level of absorption of nutrients is not optimal. can be achieved optimally, conditions like this will later have bad implications for children's growth (37). There is a back-and-forth interaction between nutritional status and infectious diseases. Malnutrition can increase the risk of infection, while infection can cause malnutrition. Malnourished children have low resistance to disease, causing them to get sick easily and hindering the process of catching up and improving nutrition, thereby exacerbating the malnutrition experienced (38). Whereas toddlers with inappropriate food feeding culture who do not experience stunting can be caused because food feeding culture are not the only factor that most influences a child's height growth. Prenatal environmental factors such as genetic expression passed on by parents through the genetic instructions contained in the fertilised egg can affect a child's growth in height. A good environment can enable optimum innate potential to be achieved, while an unfavourable environment tends to inhibit its growth process (39).

Referring to the results of this study, it is necessary to make efforts to increase the importance of food feeding culture in toddlers, which include how to arrange menus, choose food ingredients, process food ingredients, and serve food, as well as the frequency and method of feeding, so that the nutrients needed in physiological processes and child development can be fulfilled optimally according to their age (40). In addition, the mother's most important character in providing nutrition for children is to provide attention, emotional support, have

good behaviour, and be open to any information and knowledge, especially in terms of fulfilling children's nutrition (41).

CONCLUSION

The household food security status and food feeding culture is related to the incidence of stunting in toddlers aged 12-59 months. For this reason, efforts to strengthen food self-sufficiency at the household level are expected. Such as intensification of yards through the Sustainable Food Home Area programme and local food diversification.

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