

## Association Between Household Food Security And Nutritional Status Among Children Age Under 5 Years In Flood Prone Area, Sukolilo, Surabaya

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### ABSTRAK

Ketidakamanan pangan rumah tangga (KRP) merupakan masalah signifikan yang mempengaruhi negara maju dan berkembang, yang menyebabkan berbagai masalah kesehatan dan gizi. Yang paling memprihatinkan adalah dampak kerawanan pangan pada anak kecil, yang sangat rentan terhadap kekurangan gizi dan stunting. Sukolilo merupakan daerah rawan banjir, dan banjir dapat menyebabkan perubahan ketahanan pangan rumah tangga dan berdampak pada status gizi anak. Penelitian ini bertujuan untuk mengetahui hubungan antara ketahanan pangan rumah tangga dengan status gizi balita di Sukolilo. Penelitian ini menggunakan metode cross-sectional dengan mengumpulkan data karakteristik rumah tangga (umur orang tua, pendidikan, jumlah anak, status pekerjaan orang tua, dan total pendapatan), mengukur ketahanan pangan rumah tangga melalui kuesioner Household Food Insecurity Access Scale (HFIAS), dan mengukur antropometri (BB/U) pada balita untuk menganalisis status gizi. Hasil penelitian menunjukkan bahwa terdapat hubungan yang signifikan antara tingkat pendidikan ibu ( $P = 0,03$ ), jumlah anak ( $P = 0,000$ ), dan status pekerjaan ibu ( $P = 0,000$ ) dengan ketahanan pangan rumah tangga ( $p < 0,05$ ). Selain itu, terdapat hubungan antara ketahanan pangan rumah tangga dengan status gizi anak ( $P < 0,05$ ) (AOR (95% CI) 0,86 (0,77 – 1,73)). Dapat disimpulkan bahwa ketahanan pangan rumah tangga memiliki hubungan yang kuat dengan status gizi balita.

Kata kunci: Balita; Ketahanan Pangan; Malnutrisi; Rumah Tangga

### ABSTRACT

Household food insecurity (HFI) is a significant issue that affects both developed and developing countries, leading to various health and nutritional problems. Particularly concerning is the impact of food insecurity on young children, who are highly vulnerable to malnutrition and stunting. Sukolilo is a flood-prone area, and flooding can cause changes in household food security and impact the nutritional status of children. This study to determine the association between household food security and the nutritional status of toddlers in Sukolilo. This study used a cross-sectional method by collecting data on household characteristics (parents' age, education, number of children, parents' employment status, and total income), measuring household food security through the Household Food Insecurity Access Scale (HFIAS) questionnaire, and measuring anthropometry (W/A) in toddlers to analyze nutritional status. The results showed that there is a significant relationship between mother education level ( $P = 0.03$ ), number of children ( $P = 0.000$ ), and mother employment status ( $P = 0.000$ ) with household food security ( $p < 0.05$ ). As well as there is an association between household food security and children's nutritional status ( $P < 0.05$ ) (AOR (95% CI) 0.86 (0.77 – 1.73)). It can be concluded that household food security has a strong relationship with the nutritional status of toddlers.

Keywords: Food Security; Household; Malnutrition; Toddler

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## Introduction

Food security refers to the condition where everyone has reliable and consistent physical and economic access to enough safe and nutritious food to meet their dietary needs and preferences for an active and healthy life. Household food insecurity (HFI) is linked to various health and nutrition issues, affecting both developed and developing countries.<sup>1</sup> Food insecurity is marked by a decrease in food intake and disruption of eating patterns due to insufficient financial resources or a lack of food availability in the household. This persistent situation can lead to malnutrition over time.<sup>2</sup> The importance of food security is underscored by its impact on the nutritional status of the population. If food security is inadequate, it automatically leads to poor nutritional status, which in turn results in a decline in health.<sup>3</sup> Therefore, food security is closely related to both nutritional and health aspects. Insufficient food security over a prolonged period can lead to malnutrition even in the absence of disease. Conversely, adequate food security, combined with illness, can also result in malnutrition.<sup>4</sup>

Children under five years old, or toddlers, are particularly vulnerable to health issues, notably nutritional problems such as stunting. Stunting is a persistent nutritional deficiency in toddlers, marked by a height that is shorter than that of their peers. This condition can hinder physical and cognitive development, increase the risk of mortality, and contribute to noncommunicable diseases later in life.<sup>5</sup> In 2022, the prevalence of stunting in Indonesia was 21.6%, indicating that this figure remains above the World Health Organization's target of 20%.<sup>6</sup> In Surabaya, particularly in the Sukolilo area, 78.9% of toddlers still have weight below the standard.<sup>7</sup> Stunting can be directly caused by inadequate nutritional intake and poor health status. Therefore, addressing stunting primarily involves tackling factors related to food security and nutrition.

In Indonesia, low energy, protein, iron, and zinc intake is linked to the prevalence of

stunting in toddlers. Insufficient nutrient intake in this age group often results from limited food consumption, poor food quantity, inadequate eating habits, and infrequent feeding, all of which are influenced by the mother's nutritional knowledge and the family's food security.<sup>8</sup> Households with good food security are better able to prevent nutritional problems in toddlers, including stunting. Such households have a lower proportion of stunted children under five compared to those in food-insecure conditions. Additionally, toddlers from food-insecure households are at a higher risk of stunting compared to their peers from food-secure households. Research has consistently shown that toddlers from food-insecure households are 2 to 10 times more likely to experience stunting.<sup>9</sup>

Sukolilo area is prone to flooding, primarily due to changes in land use from undeveloped to developed land. The construction of infrastructure in Sukolilo has contributed to reduced water absorption by the soil. This situation is exacerbated by drainage systems clogged with sediment from eroded soil and accumulated waste. Consequently, during the rainy season, water overflows and floods the surface. Flooding in Sukolilo has been increasing year by year.<sup>10</sup> Persistent flooding significantly impacts household food security. Floods often lead to the loss of crops, livestock, and food storage facilities, which can disrupt food availability and access. This disruption can exacerbate food insecurity in affected households, making it difficult for them to obtain sufficient, safe, and nutritious food. Additionally, floods can damage infrastructure, including markets and transportation networks, further impeding food distribution and accessibility.<sup>11</sup> Therefore, this study was conducted to determine association between household food security and the nutritional status of toddlers in flood-prone areas, Sukolilo, Surabaya.

## Methods

This study was conducted in the Sukolilo area of Surabaya City, East Java Province, using a cross-sectional study design. The study

included 48 toddlers and their parents as subjects. Inclusion criteria for participants were being aged 12 to 59 months at the time of data collection, residing in Sukolilo, being in good health (i.e., not suffering from health issues that could affect appetite), and being willing to participate in the study. Exclusion criteria included suffering from severe malnutrition, having disabilities or congenital abnormalities, and experiencing serious illness.

The dependent variable in this study is the child's nutritional status, while the independent variable is household food security. Household food security was measured using the Household Food Insecurity Access Scale (HFIAS). The questionnaire consisted of nine questions representing general levels of food insecurity severity (access) and nine "frequency of occurrence" questions that followed each event question to determine how often these events occurred. Household food security categories were divided into food secure and food insecure. Child nutritional status was measured using a digital scale and a height measurement tool. Nutritional status was assessed based on the World Health Organization (WHO) 2005 anthropometric standards, using the height-for-age index (HAZ).

All the statistical analyses were carried out using the Statistical Package for Social Sciences version 23 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were, firstly carried out and were utilized to compare the food-secure and food-insecure household according to household characteristics. Chi-square test were used for categorical and continuous variables in comparing differences between the household food secure and household characteristics. While, logistic regression was used to find the association between nutritional status and household's food security. Significance level was set at  $p < 0.05$ .

## Result and Discussion

### Characteristics of Households

The sample size in this study comprised 39 households, with the characteristics of the sample presented in Table 1. According to Table 1, the majority of fathers are aged between 26 and 40 years, totaling 25 individuals (65%), while the majority of mothers are aged between 15 and 25 years, totaling 22 individuals (56%). In terms of education, the highest level of education for fathers is typically a senior high school diploma, with 20 individuals (51%), while the highest level of education for mothers is usually junior high school, with 29 individuals (74%). Additionally, 95% of parents have 1-2 children. All 39 fathers are employed, whereas only 28% or 11 mothers are employed. Furthermore, the total household income for most families remains below the regional minimum wage, affecting 27 households (69%).

Table 1. Characteristics of Households

Characteristics	n	%
Age in years (father)		
15 – 25	14	35
26 – 40	25	65
Age in years (Mother)		
15 – 25	22	56
26 – 40	17	44
Educational Level (Father)		
Low (Max Junior High School)	19	49
High (Min Senior High School)	20	51
Educational Level (Mother)		
Low (Max Junior High School)	29	74
High (Min Senior High School)	10	26
Number of Children		
1 – 2	37	95
3 – 4	2	5
Employment (Father)		
Not Working	0	0
Working	39	100
Employment (Mother)		
Housewife	28	72
Working	11	28
Total Household Income		
Under (Regional Minimum Wage)	27	69
Above (Regional Minimum Wage)	12	31

### Association Between Household Food Security and Characteristics of Household

Association between household food security and household characteristics was examined to test the relationship between household food security and various household characteristics. The results are presented in Table 2. The findings indicate that there is a significant relationship between mother education level ( $P = 0.03$ ), number of children ( $P = 0.000$ ), and mother employment status ( $P = 0.000$ ) with household food security ( $p < 0.05$ ). In contrast, other factors such as parental age, father education level, father employment status, and total household income did not show a significant relationship.

In terms of food security, education influences household consumption. The mother plays a key role in making food consumption decisions. Providing food for all household members is a primary responsibility of the mother. Therefore, the higher the level of education of the mother, the greater her ability to make informed decisions regarding household consumption, particularly in meeting the nutritional needs of all family members.<sup>12</sup>

The number of children in a household is closely associated with household food security. As the number of children increases, the demand for food and resources also rises, which can strain the household's ability to maintain food security.

Larger families may face greater challenges in providing adequate and nutritious food to all members, especially if their income or resources are limited. This increased demand can lead to difficulties in managing food budgets, prioritizing expenditures, and ensuring balanced nutrition for each child.<sup>(13)</sup> Additionally, households with more children might experience a higher risk of food insecurity due to the greater overall consumption needs and potential for increased expenses related to healthcare and education. Conversely, smaller families may have more manageable food costs and resources, which can contribute to better food security.<sup>14</sup>

The mother's employment status also significantly affects household food security. This is because mothers who are not employed typically have more time to dedicate to their children. They can manage their children's eating patterns and personally prepare their meals. Additionally, non-working mothers have the opportunity to regularly visit community health centers, where they can receive education on child health and nutrition. This increased availability of time allows them to be more attentive to their children's dietary needs and to ensure a more consistent and nutritious food intake, which positively impacts overall household food security.<sup>15</sup>

Table 2. Association Between Household Food Security and Characteristics of Household

Characteristics	Food Secure	Food Insecure	<i>P</i>
	n (%)	n (%)	
<b>Age in years (Father)</b>			
15 – 25	5 (42%)	9 (33%)	0.687
26 – 40	7 (58%)	18 (67%)	
<b>Age in years (Mother)</b>			
15 – 25	12 (54%)	10 (58%)	0.379
26 – 40	10 (46%)	7 (42%)	
<b>Educational Level (Father)</b>			
Low (Max Junior High School)	7 (44%)	12 (52%)	0.410
High (Min Senior High School)	9 (56%)	11 (48%)	
<b>Educational Level (Mother)</b>			
Low (Max Junior High School)	14 (78%)	15 (71%)	0.03*
High (Min Senior High School)	4 (22%)	6 (29%)	
<b>Number of Children</b>			
1 – 2	16 (89%)	21 (100%)	0.00*
3 – 4	2 (11%)	0	

Employment (Father)			
Not Working	0	0	0.136
Working	18 (100%)	21 (100%)	
Employment (Mother)			
Housewife	18 (72%)	10 (71%)	0.00*
Working	7 (28%)	4 (29%)	
Total Household Income			
Under (Regional Minimum Wage)	3 (24%)	24 (92%)	0.5
Above (Regional Minimum Wage)	10 (76%)	2 (8%)	

### Association Between Household Food Security and Nutritional Status

The association between household food security and nutritional status was examined to test the relationship and correlation between household food security and nutritional status. The results in Table 3 show that there is a relationship between household food security and children's nutritional status ( $P < 0.05$ ). Additionally, food security can affect nutritional status by up to 0.86 times (AOR (95% CI) 0.86 (0.77 – 1.73)).

Table 3. Association of Household Food Insecurity and Nutritional Status

Nutritional Status	Food Secure	Food Insecure	AOR (95%CI)	P
	n (%)	n (%)		
Not Good	12 (6%)	15 (10%)	0.86 (0.77 – 1.73)	0.02
Good	5 (94%)	7 (90%)		

The association between household food security and toddler nutritional status is a critical area of study in public health and nutrition. Household food security, defined as consistent access to sufficient, safe, and nutritious food, directly influences the nutritional status of toddlers. When households experience food insecurity, the availability and quality of food can be compromised, leading to inadequate nutrient intake for young children. This lack of essential nutrients can result in stunted growth, delayed development, and increased susceptibility to illness among toddlers.<sup>16</sup>

In food-secure households, parents are generally better equipped to provide a balanced diet that meets the nutritional needs of their

children. With stable access to a variety of foods, these households can ensure that toddlers receive the appropriate amounts of vitamins, minerals, proteins, and energy required for healthy growth and development. Additionally, food security allows for more consistent meal patterns and better overall dietary habits, which contribute to optimal nutritional outcomes for toddlers.<sup>17</sup>

Conversely, in households experiencing food insecurity, the nutritional status of toddlers often deteriorates due to irregular meal times, poor-quality diets, and insufficient caloric intake. The stress and financial strain associated with food insecurity can lead to prioritization of quantity over quality in food choices, which further exacerbates the risk of malnutrition. Addressing food security within households is therefore essential for improving toddler nutritional status and ensuring long-term health and development.<sup>18</sup>

### Conclusion

The conclusion of this study is that the household characteristics related to or influencing household food security are the mother's level of education, the number of children, and the mother's employment status. Further analysis shows that children's nutritional status has a relationship and correlation with household food.

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### Conflict of Interest

There was no conflict of interest in this research.

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