



**RESEARCH PAPER**

**Effects of Socioeconomic Status and Food Insecurity on Stunting  
among Children aged 06-59 Months**

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**ABSTRACT**

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Thousands of individuals from countries of low economy are suffering from different forms of malnutrition. Asian' countries have one of the world's highest percentages of malnutrition. Food insecurity is one of the variables that contribute to malnutrition in developing nations, but its results in wasting and developmental delay in children. Present study was aimed to access family food insecurity and its relationship with nutritional status of children aged 6 to 59 months in Nankana Sahab, Punjab, Pakistan. A community-based cross sectional study of 450 mothers with 6-59-month-old children was conducted from different urban and rural areas of Nankana Sahab using systematic random sampling technique involving families with eligible children. Data were collected using structural questionnaires having questions on food insecurities, stunting and socioeconomic status. Univariate analysis was done. Bivariate and multivariate analysis was used to see the association between food insecurity and nutritional status of children. Results of Pearson product moment correlation analysis showed statistically relevant value of p less than 0.05 was considered positive association between variables. Multiple regression analysis found socioeconomic status and food insecurity as significant positive predictors for stunting among children.

**Introduction**

Nutrition is a foundational factor that influences and determines the health of everyone, rich or poor. Malnutrition, on the other hand, renders us all more susceptible to disease and mortality (World Health Organization, 2000; Andersen, 2012). It is a catastrophic problem, especially for the poor and disadvantaged, because the shortage is a primary cause of domiciliary food insecurity and, as a result, malnutrition, which continues to be one of the most serious and widespread health issues impacting children and adults (Andersen, 2012; Wogi

et al., 2014). Malnutrition literally means "poor nutrition," and it refers to both overeating and undereating. Undernutrition is traditionally the main cause of worry in underdeveloped countries, while modernization and changes in dietary patterns have increased the prevalence of overnutrition. Except as otherwise stated, malnutrition applies to severe malnutrition in the context of the World Food Program (WFP) (Webb & Bhatia, 2005).

As a result, malnutrition is frequently caused by a combination of poor nutritional intake and illness (UNICEF, 2006). Children are always at higher risk of developing developmental disorders and diseases related to stomach and other food track diseases due to bad exposures towards eatable food items and deficiencies of important food segments. As a result, the survey results of children under the age of five are used to reach conclusions about the state of the overall nation, not just that age group (Webb & Bhatia, 2005).

Stunting, or the morphological index height for age, indicates prenatal and postnatal linear development, with deficits indicating long-term, cumulative impacts of poor nutrition and/or health. Wasting is a recent and severe process that has resulted in significant weight loss, usually due to a severe food restriction and/or disease. The biomechanical index weight for height reflects body weight in relation to height. The anthropometric index weight for age, or underweight, measures body mass in relation to age. It is a mixture of stunting and wasting impacted by a child's height and weight (Sasha, 2020).

## Literature Review

According to a large body of evidence, food security is linked to a variety of development outcomes related to living standards and economic conditions of developed countries (Fao, 2012; Gundersen & Ziliak, 2015). The Goals that sustained development (SDGs) emphasize food security as a human right that must be treated urgently in view of the high incidence of hunger and its repercussions (United Nations, 2015). Contempt this, many people in poor income nations are starving and malnourished. Food instability in the home has been linked to poor nutritional health (Gundersen & Ziliak, 2015; Frank, Berkowitz, Black, Casey, Cutts & Nord, 2014). Poor nutrition has a deleterious impact on growth and development in children, especially during the early years of life (Grantham et al., 2017). While poor nutrition status in children might include overeating, it is more commonly associated with cases of malnutrition (Ahmed et al., 2012). Undernutrition is defined as a lack of protein, energy, micronutrients, vitamins, and minerals necessary for growth.

More than 90% cases of stunting found in long-lasting diseases and indicator of malnutrition in children live in Africa and Asia, with Africa holding the greatest common stunting at 36%, estimated in 2011 (World Health Organization, 2020). Stunting was prevalent in Kenya at 26% in 2014 (Were, Were, Wamai, Hogan & Galarraga, 2017). The frequency of stunting may be much common in poor urban settings experienced by individuals with low income and moderate-income nations, where few families can grow their own food. In Nairobi's informal settlements, for example, 60 percent of children who were of five were experiencing a decrease in their weight and height stunted in 2010, compared to 17 percent in the city overall (Were, Were, Wamai, Hogan & Galarraga, 2017; Fotso et al., 2012).



## Hypothesis

The current research study was purposed to find the fluctuations in stunting among children affected through household food insecurity and poor economic conditions, which accounts for the exposure to developmental delays and other physical illnesses. Because unavailability of proper food items becomes the worse cause of developing malnutrition in children, which further leads to complex developmental disease that affects physical and mental activities. As a result, we hypothesize that (i) family food security is linked to the nutritional condition of children aged 6 to 59 months (ii) influence of household food security on stunting is affected through an individual's economic values and earning source at home.

## Material and Methods

### Participants

The research data was collected from 450 mothers and children (boys=250, girls=200) age ranges from 6-59 from different areas/villages and urban areas of district Nankana Sahib from the province of Punjab, Pakistan. Both types of children, either school-going or living at home, were selected. Children with physical illness and developmental delays were also included, along with healthy children. Participants of the study were collected using a simple random sampling technique in which every participant had an equal chance to be part of the study. The minimum age was established at six months, marking the end of the fifth month and the beginning of complementary feeding. The number of standard deviations a kid has on a given measure in respect to a mean worth is represented by the low mean and standard deviation scores. Stunted people were defined as high scores on stunting questionnaires and standard deviations below the WHO reference median in height for their age. Normal people had a score of more than two standard deviations (not stunted)

### Variables and Measures

Weight, or height for age, was a dependent variable. Stunting is employed in this study because it is an excellent indication of child nutrition because it measures the long-time unavailability of food (continuing underfeeding) and sickness (Zero & McIntyre, 2003). Household food security was the key independent variable. The household nominating the rate of measuring and using food items by the family members was the second independent variable. The overwhelmed character of the data was reduced to a solitary score that was divided into various categories using statistical analysis. The poorest, the poorest of the poor, and the worst of the poor are the three categories of individuals who participated as a sample of the study

*Consent Form, Information Sheet, and Demographic form:* A participant information sheet that consisted of the information related to the research topic, nature, purpose, process, ethical considerations, and confidentiality and an informed consent form was used that showed a willingness to participate in the present study. Demographic Information Sheet consisted of age, gender, education, profession, monthly income, belonging area and socioeconomic status of parents, age, gender, developmental delay, height-weight measurements, and other related characteristics of participants.

*Household Food Insecurity:* 12 item questionnaire was used to collect individual responses of household food insecurities and the type of food items they gave their children. The questionnaire was pre-tested of sample children and then used in the actual study. The questionnaire had excellent reliability .950 and consistent validity.

*Stunting (height for age):* Height for weight was measured using four-item questionnaires apart from calculated height and weight measurement as demographic characteristics. The questionnaire has excellent reliability .940 and consistent validity.

*Socioeconomic status:* Socioeconomic status of participants was calculated using questions about the wealth status, occupation, source of earning, house condition, and other related questions.

### **Data Analysis**

Data were analyzed statistically using Statistical Package for Social Sciences (SPSS-21). First of all, the reliability analysis was carried out on study instruments to obtain Cronbach's alpha that explained the internal consistencies of the scales. Correlation Analysis (Pearson Product Moment Correlation) to assess the correlation between the study variables. Stepwise Regression Analysis was performed to study household food insecurities, stunting and socioeconomic status of the family.

### **Results and Discussion**

#### **Analysis of reliability**

50 participants were piloted for pre-testing of analysis of reliability. These individuals were also selected from. Excellent value of reliability was found through analysis.

**Table 1**  
**Reliability Analysis of Psychometric Properties of Questioners (N=450)**

Variables	k	M	SD	Potential		Actual		A
				Min	Max	Min	Max	
Household Food Insecurity	12	39.76	6.26	1	5	12	60	.950
Stunting (height for age)	4	24.65	11.4	1	42	6	42	.848
Socioeconomic Status	7	21.56	5.59	1	5	7	35	.654

*Note:* k = No. of items in the scale, M = Mean, SD = Standard Deviation, Min = Minimum score, Max = Maximum score,  $\alpha$  = Reliability Co-efficient, N= number of participants.

The table above showed the results of reliability analysis for the questionnaires used to measure household food insecurities with its effects on children's stunting/height and weight, reasons of being underweight, and their socioeconomic status, which might alter household food insecurities. Results of reliability analysis showed moderate to excellent values of choronback.

**Table 2**  
**Descriptive of Recumbent Length of Children (N=450)**

Measurement of Length	f	Percentage	Mean	SD
60 cm	6	1.3%		
61 cm	5	1.1%		
62 cm	110	24.4%		
65 cm	115	25.6%		
68 cm	135	30.0%		
69 cm	11	2.4%	66.5	4.14
70 cm	5	1.1%		
72 cm	22	4.9%		
73 cm	5	1.1%		
74 cm	14	3.1%		
76 cm	14	3.1%		
80 cm	8	1.8%		
<b>Total</b>		<b>450</b>		

Note. f = Frequency N= number of participants, SD= Standard Deviation

Length of the children was measured in two groups as recumbent length, and standing length of children on age ranges less and above than 24 months. The highest frequency of children 135 was 68cm long and contributed 30.0% of the study's total sample. The least number of children were 5 (1.1%) were those had 61cm length. The highest length of the children was 8cm, and the least length was 61cm.

**Table 3**  
**Descriptive of Standing Length of Children (N=450)**

Measurement of Length	f	Percentage	Mean	SD
87cm	57	12.7%		
88 cm	42	9.3%		
89 cm	56	12.4%		
90 cm	66	14.7%		
91 cm	45	10.0%		
92 cm	49	10.9%	91.36	3.452
93 cm	22	4.9%		
94 cm	37	8.2%		
96 cm	40	8.9%		
99 cm	35	7.8%		
102 cm	1	.2%		
<b>Total</b>		<b>450</b>	<b>100%</b>	

Note. f = Frequency N= number of participants, SD= Standard Deviation

The highest length of the children who participated as the sample was 102cm, and only one child out of 450 had that length. The highest proportion of the total population was 66(14.5%) with 90cm height.

**Table 4**  
**Descriptive of Weight of Children (N=450)**

Weight	f	Percentage	Mean	SD
5.00-5.50kg	13	2.8%	9.912	2.682
7.00-7.50 kg	103	22.8%		
8.00-8.50 kg	140	31.1%		
9.00 kg	13	2.8%		
12.00-12.50 kg	66	14.6%		
13.00-13.50 kg	76	16.8%		
14.00-14.50 kg	39	8.6%		
<b>Total</b>	<b>450</b>	<b>100%</b>		

Note. f = Frequency N= number of participants, SD= Standard Deviation

According to the descriptive of the weight of the children highest frequency of participants, 140 (31.0%), had 8-8.5 kg weight measured as length-weight proportion. While mean (9.912) and Standard Deviation was (2.682).

#### **Pearson Product Moment Co-Relation Analysis**

Purposed statement (i) There will be a significant correlation between household food insecurities and stunting of children (ii) There will be a significant relationship between socioeconomic conditions and household food insecurities effect on stunting (iii) water and poor sanitation will have significant relation with weight and length measurement of children were tested through analysis.

Table 5  
Table Showing Relationship between Household Food Insecurity, stunting and Socioeconomic Status of Children aged 6-59 months (N=450)

Variables	2	3	M	SD
1. Household Food Insecurity	-.026	-.250**	39.76	6.268
2. Stunting	-	.061	7.68	1.726
3. SES	-		29.13	5.92

M= Mean, SD= Standard Deviation, \*Correlation is significant at the 0.05 level (2-tailed). \*\*Correlation is significant at the 0.1 level (2-tailed) and \*\*\*Correlation is significant at the 0.01 level (2-tailed), SES= Socioeconomic status

The table showed a significant association between socioeconomic conditions and household food insecurities, which affects children's health tend to decreasing their weight and length ( $p < 0.5$ ).

#### **Linear Regression (Stepwise)**

The predictive impact of socioeconomic status and household food insecurities for children stunting growth rate through their weight and length measurement were concluded using linear regression (stepwise method)

**Table 6**  
Linear Regression between Household Food Insecurity and Stunting of Children, Predicting through Socioeconomic Status (N=450)

Predictor	Stunting
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	<i>B</i>	$\beta$	<i>R</i> <sup>2</sup>	<i>T</i>
Household Food Insecurity	-.013	-.048		9.95***
Socioeconomic Status	.018	.061	.008	1.24

Note. *B*=Unstandardized coefficient,  $\beta$ = Standardized coefficient, *R*<sup>2</sup>= Square of Change in value of *R*, *t*= significance value of prediction, *p*= value of Significance, \*= significant at  $p < 0.05$ , \*\*= Significant at  $p < 0.01$ , \*\*\*significant at  $p < 0.001$

The table above showed the household food insecurities, a significant predictor, for stunting height for the weight of children age ranged 6-59 months  $F = .545$ ,  $M = 1.629$  while socioeconomic status was not found to be a significant predictor for nutritional status of children,  $F = .695$ ,  $M = 2.989$ .

## Discussion

Household food insecurities and nutritional status of children aged 6 to 59 months, including preschool children. Other factors, including residential areas, water and sanitation conditions, socioeconomic status, and family systems of children, were also analyzed to check its effects on the nutritional status of children, which further influenced their physical and mental health. Effects of household food insecurities on stunting, wasting, and underweight of children were also found to be significant in relation. Data of the study were conducted using a purposive sampling technique from different rural and sub-urban areas of Nankana Sahib. Food security programs should be beneficial in addressing undernutrition concerns, but food alone is not the answer. It's necessary to have a mix of nutrition-specific and nutrition-sensitive policies. Interventions in food security should be incorporated into human development policies (Maitra et al., 2019).

Stunting was found to be prevalent in 49 percent of the population. Infants from food-insecure homes had a 12 percent higher risk of stunting. Both lack of availability or less amount of food and low income combine to affect children's health, respectively (Mutisya, 2015). Food insecurity was linked to underweight children (AOR = 4.15; 65 percent CI = 1.39, 4.74), but not stunting or wasting. The sex and age of the child, foremilk feeding, superior lung illness, fever, and maternal literacy all demonstrated separate associations with children who were malnourished. It was concluded that the research environment, food insecurity in the home, and child malnutrition were major issues. Undernourished children had a positive relationship with economic characteristics, lack of proper medication and spread rate of infection, and food insecurity. To address undernutrition and household food insecurity in the community, implementation of multi-sectoral community-based nutrition interventions and the establishment of income-generating livelihoods (Mulu, E., & Mengistie, 2017). In children with non-obesity moms, severe HFI improves the chances of stunting, but not in those with obese mothers. On the one hand, we've uncovered a new link between HFI and maternal obesity, and on the other, the risk of juvenile stunting. This could be due to a common process involving two types of malnutrition (Levy, 2017).

## Conclusion

In the present study total of 450 mothers were selected to ask about the nutritional status of their children. Parents were asked about different food items, vitamins, breastfed, and other eatables they gave their children in different age



groups. Results of the study revealed significant effects of household food insecurities on nutritional status of children appeared as influenced weight and length of the children. Stunting conditions of children were found to be highly influenced through environmental and social factors, including poor sanitation, poor water management, and socioeconomic status. These factors were significantly predicted nutritional deficiencies and nutritious status in children aged 6-59 months. Results of the present study were highly supported through the review of literature and results of previous findings addressing the same phenomenon.

### **Recommendations**

- The results suggest that improving household food security is necessary but insufficient for the improvement of nutritional status of children aged 6-59 months.
- Overall, socioeconomic wellbeing of families, parental education and maternal nutrition is needed to improve with an integrated strategy for the improvement of nutritional status of children aged 6-59 months.
- Sanitation and improved hygiene practices should also be encouraged by local community.
- As a result, the current study will assist both parents and childrens in discussing and solving their problems related to socioeconomic and nutritional status of children.

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