



THE EFFECT OF FOOD INSECURITY ON HEALTH STATUS

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ABSTRACT

In this article, we'll look at food insecurity from a theoretical perspective, including its definition, causes, consequences, and potential remedies at the global and national levels. The availability of sufficient food on a local, national, and global scale may be characterized as a sign of food security. India and several African nations are dealing with a serious problem of food insecurity. The goal of this research is to find out what influences the food security of Indian households. According to a study of 500 homes, the primary reasons of food insecurity include drought, high food costs, poverty, soil infertility, illness, and insect assaults. Logistic regression's empirical findings demonstrated that the chances ratio of a home having adequate daily rations was significantly influenced by the gender of the household's head, illnesses and pests, labour supply, floods, poverty, market access, distance from the major road, and food assistance. Families led by a woman are more likely to experience food insecurity than families headed by a man, according to the study. This study's results show that the Indian populace is still suffering from food insecurity.

Keywords: Security; household; Health Status; Causes, food Insecurity;

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Introduction

According to life-course theories, exposure to risk factors like hunger might have a significant impact on health outcomes, the beginning of illness, and its progressions in later life. In poor and middle-income nations, food insecurity is a major socioeconomic and public health issue. It's linked to worse health outcomes, self-rated health status, sadness, and anxiety, as well as lower consumption of micronutrients, fruits, and vegetables.

In order for a human person to survive, he or she needs food, clothes, and shelter. The term "basic requirements" is also used to describe it. People have relied on food security since the dawn of time. For countries with a large population and a poor agricultural infrastructure, this is of critical significance. During the early 1970s, worldwide food difficulties sparked the development of the term "food security." As recently as the 1970s, there were over 200 distinct definitions of food security in various texts (Maxwell and Smith, 1992; Barichello and Clay, 2003). The development of food security has taken place during the last several decades, both in terms of area and time. According to a general understanding of the nature of the food issue and the history of global food systems, food security concepts and methods have changed throughout time.

India is the world's second-largest democracy and the world's most populated nation. Many individuals in our nation are still struggling to put food on the table on a daily basis. Chakravarty and Dand (2006) in India say that declining agricultural incomes are the primary cause of food insecurity, which is a consequence of demand deflation. The country's economy has a dualistic structure, with a tiny upper class and a large portion of the population in the lower classes owning a

substantial amount of private assets. Hunger may be stifled by poverty.

The Millennium Development Goal (MDG) to decrease hunger is under jeopardy since almost a billion people are still hungry. There is a worldwide problem of food insecurity, and the severity of the problem varies from country to country, developed or developing. In 2010, 85.5 percent of families in the United States were considered food secure, while 14.5 percent were classified as food insecure at the same point in time. 5.4% of families had "very poor" food security⁷, which is a more severe form of food insecurity. About ten per cent of Canadians were food insecure in 2008⁸. It was later discovered that 7.0 percent of Canadians are food insecure households⁹, a figure that has since been revised. Inner London in the United Kingdom has 20% of its population classed as food insecure. 62.7 percent of families in South Korea reported some degree of food insecurity, compared to the previous instances, which had a lower percentage (8.6 percent for household food insecurity, 28.4 percent for adult food insecurity for adults, and 25.7 percent for child hunger¹¹). The situation is much more dire in undeveloped nations. As an example, 58.0 percent of Pakistan's households were food insecure¹². In rural Malaysia, the frequency of household food insecurity has reached worrisome proportions, making it difficult to re-educate low-income families about the dangers of food poverty.

LITERATURE REVIEW

E.A. Frongillo and J. Bernal (2014), As a result of their shared socioeconomic origins, obesity and food poverty often coexist. The link between food insecurity and obesity is stronger in women than in males. Teenagers seem to be linked, while the findings for youngsters are less clear. By engaging in adult tactics, establishing one's own plans, and taking action



to get more food or money for food; children take responsibility for food insecurity in a unique way. Low nutrition and physical inactivity, as well as behavioural issues, social disruptions, academic decline, poor attendance, poor school performance, and other health problems are all linked to children who are food insecure. Obesity may be a result of some of these effects. From a long-term viewpoint, child food poverty may have long-term consequences, including an increased risk of obesity. Children who are food insecure and at risk of obesity may be identified and treated by paediatricians.

With the help of Campbell and Egede's research team of Walker (RJ), Campbell (JA), and Egede (LE), we are now able to better understand how the brain processes information (2019), Background An investigation of how food insufficiency affects glycemic control and self-care habits was the goal of this research. Methods Data from 615 persons with type 2 diabetes were analyzed using path analysis to examine the relationship between food insecurity and diabetes outcomes. We incorporated psychological elements such as perceived stress, diabetic distress, diabetes fatalism, and depression in the route. Diet, exercise, blood sugar monitoring, foot care, and medication adherence were all part of the self-care routine. HbA1c ($r = 0.08$, $p = 0.001$) and four self-care behaviours were indirectly linked to food insecurity ($r = 0.08$, $p = 0.001$). (General diet, specific diet, exercise, and medication adherence). Conclusions Glycemic control is indirectly affected by food insecurity, which supports the concept that stress is a key mechanism for self-care activities. Food-based initiatives should be paired with programmes to promote access to resources and handle psychological issues for those who are food insecure because of their diabetes.

In this case, we're talking about Akanbiemu F.A. (2018), All people's existence and well-being depends on their ability to get their hands on food, which is widely accepted as a fundamental need of life. Food security encompasses a broad range of factors, including availability to preferred foods at all times and how well they are used. The term "household food insecurity" refers to a home's inability to get the amount and quality of food necessary to meet its members' daily energy and health requirements. Insufficient food support programmes in the neighbourhood, poor farming methods, and economic and social factors all contribute to family food insecurity and hunger. Individuals and family members' capacity to acquire food for consumption is influenced by supply and demand variables that are referred to as supply factors and demand factors, respectively, in this study.

In this case, S.L. (2015), Lack of agreement on the link between hunger and malnutrition and food insecurity hinders attempts to establish effective policies and programmes to address the numerous issues. Delaying action by arguing about semantics is counterproductive. New study in food- and nutrition-deprived situations shows causes, experiences, and effects, as well as how they are interconnected, according to this paper's argument. Coordinating our new understandings is critical for improving beneficiary selection, programme targeting, and intervention effect evaluation. The research introduces a novel paradigm that visualizes food insecurity levels, as well as the associated consequences and actions, as a continuum. An increased attention on less severe but still urgent food poverty symptoms, better intervention targeting and follow-up, and greater donor expenditure accountability are some of the possible advantages of employing the continuum as a diagnostic instrument.



Food Security

Definition: "When all people have access to adequate, safe and nutritious food that fits their dietary requirements and preferences for an active and healthy life," according to the World Food Programme. The International Food Policy Research Institute, 2019. It is vital to human well-being, as well as the state's economic and political stability, to have a secure food supply. The following are the four pillars of food security:

Food security has four dimensions:

Availability: Food availability and production are the key factors. How much food is available in a nation or region, including local production, imports and stockpiling food as well as food assistance (WFP. 2009). The phrase "physical, social, and economic access" is used to describe the notion of food security's accessibility (FAO. 1996). As a result of the Bengal famines, Amartya Sen coined the phrase in the early 1980s (Sen, 1982). Every member of the home should be able to get their hands on adequate food to sustain an active and healthy lifestyle at all times. The right intake of food and nourishment is meant by the term "utilization." Consumption of food is decreased when there is no access to clean water, a bad environment, lack of cleanliness, and a lack of health infrastructure. Environmental hygiene, primary health care, and clean drinking water facilities must be accessible to ensure nutritional security. To avoid nutritional loss, it's important to carefully evaluate one's cooking techniques. Swaminathan The next year, (M.S. 2006). **Temporal dimension:** Stability determines the time span in which food and nutrition security is being examined. Food, money, and economic resources are deemed to be stable if they do not change over the year or for an extended period of time. The importance of minimizing external risks such

as natural catastrophe, climate change and market volatility cannot be overstated.

Food Insecurity

A lack of nutritionally sufficient and safe food, or the inability to get suitable food in a socially acceptable manner, is known as food insecurity. American Dietetic Association Individuals whose food consumption falls below their calorie needs are considered food insecure, as well as those who are physically unfit owing to hunger or an unbalanced diet (FAO. 2000)". According to Thomas (2006), persons are considered to be food insecure if they do not have access to appropriate physical, social, or economic access to the necessary, safe, and nutritious food to satisfy their dietary demands for an active and healthy life. FAO defines food insecurity as "a condition that emerges when individuals lack secure access to appropriate quantities of safe and nutritious food for normal growth and development and active and healthy living".

As the Food and Agricultural Organization (FAO) defines it, there are 3 main categories: I Acute: Extreme hunger, malnutrition, or starvation, which puts the lives of those affected at risk; (ii) Occasional: The existence of food insecurity due to a specific temporary circumstance; and (iii) Chronic: The requirement of food needs is consistently or permanently under threat.

Children and mothers are additionally vulnerable to food insecurity as a result of issues such as overpopulation, gender inequity, lack of education, and poverty, all of which contribute to the problem. Overcrowding in rural regions may contribute to malnutrition in children, particularly in rural areas where food is scarce. After eating meals, the female youngster suffers more than that of a boy because of their inferiority complex. Nutrition



and nursing knowledge among mothers is also an issue. As a general rule, we assume that poverty causes childhood food insecurity, but other factors, such as mother's physical and mental health, residential instability, living without parents, no payment support for a child, mother's past and current substance abuse, and immigrant parents, also influence the children's food insecurity.

METHODOLOGY

During the months of June and July of 2012, a survey was undertaken in the southern Indian district of Kollo. From latitude 12°30' to latitude 13°53', the Kollo region may be found. More than 397,304 people live on a land area of more than 9804 square kilometres. The district's infrastructure is rudimentary. More than 90% of the people in the area work in agriculture, which is the region's primary economic activity. For subsistence farming to thrive in the study region, farmers must produce enough food for their own families. The area's primary crops are millet and sorghum. A three-month rainfall season (July to September), followed by a protracted dry season, is critical to crop productivity. Between 350 and 450 millimetres of rain fall on average each year. Individual landowners or sub-owners tend small plots of land they have inherited using traditional agricultural practices. Many people possess hand tools, which are the most prevalent agricultural implements. Only the excess of food crops is sold in the local market since they are primarily farmed for domestic use. Producing cash crops is a way to supplement a farm's income by buying food that can't be grown on the property. Defining cash crops may be tricky, although cowpeas, groundnuts, okra, and sesame are all examples of what are often known as cash crops. The milk, meat, and hide of cattle are either sold or consumed directly by the families that keep them. Farmers in

cooperatives work together to irrigate rice fields along the India River. Outside of farming, vegetables and fruits are grown mostly in the lower regions, such as in the India River valley and in its tributaries. Tomatoes and onions, for example, are mostly produced by women. The majority of villagers are engaged in agriculture, although many also engage in other occupations, such as minor trading, animal keeping, and so on.

Statistical Analysis

In this research, a home is considered food secure if it has enough food for its members to eat every day for the duration of the study period. It is termed food insecure if the family does not have enough food. For this study, we employed a binary logistic regression model since the dependent variable (having adequate daily ration) is a binary dichotomous variable. If a family has enough daily rations for its members to be food secure (P_i), then the odds ratio is equal to the likelihood that a household does not have enough daily rations for its members ($1 - P_i$). This research uses a dummy variable, which takes the value of one if there is always enough food for everyone in the family (food secure) and zero otherwise (food insecure). Our calculations were based on a number of independent factors, as shown in Table 1.

For the household food security status (FSS) and associated explanatory factors, a logistic model has been defined as follows:

$$\ln [P_i / (1 - P_i)] = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_{17} X_{17i}$$

where subscript i denotes the i -th observation in the sample, P is the probability of the outcome, β_0 is the intercept term and $\beta_1, \beta_2, \dots, \beta_{17}$ are the coefficients associated with each explanatory variable, X_1, X_2, \dots, X_{17} . The estimated coefficients do not directly indicate



the effect of change in the corresponding explanatory variables on the probability (P) of the outcome occurring. Rather, the coefficients reflect the effect of individual explanatory

variables on the odds ratio of the dependent variable (i.e., the household being food secure or food insecure).

Table 1: Description of Variables Used in The Logistic Regression Model

Variables	Definition
Dependent variable	
FSS, food security status (Y)	1 if ration is always enough for household members, 0 otherwise
Independent variables	
HH Age (X_1)	Number of years of age
HH Sex, Gender (X_2)	1 if household head is male, 0 otherwise
HHE, level of education (X_3)	1 if household head is literate, 0 otherwise
FS, family size (X_4)	Number of household members
Variables	Definition
Asset (X_5)	1 if household owns assets, 0 otherwise
Drought (X_6)	1 if food insecurity is caused by drought, 0 otherwise
Diseases and insects (X_7)	1 if food shortage is caused by disease and insect attacks, 0 otherwise
Labor (X_8)	1 if food shortage is caused by lack of enough labor, 0 otherwise
Flooding (X_9)	1 if food shortage is caused by flooding, 0 otherwise
Soil infertility (X_{10})	1 if food shortage is caused by soil infertility, 0 otherwise
Farm inputs (X_{11})	1 if food shortage is caused by lack of farm inputs, 0 otherwise
Land (X_{12})	1 if food shortage is caused by lack enough land to cultivate, 0 otherwise
Money (X_{13})	1 if food shortage is caused by lack of money to buy provisions, 0 otherwise
Food prices (X_{14})	1 if food shortage is caused by high food prices, 0 otherwise
FA, food aid (X_{15})	1 if household used to receive food aid, 0 otherwise
Market (X_{16})	1 if household has access to market, 0 otherwise
Distance from main road (X_{17})	Number of km of the village from the main road

Descriptive Results

Household Characteristics

The demographic and socioeconomic characteristics of the respondents are shown in Table 2 of this report. Farming is the primary source of income for up to 90% of households. Among those who took the survey, just 3.2%

were fishermen, 1.8% were traders, 3.2% were governmental servants, and 3.2% were involved in animal husbandry (0.6 percent). The average age of the household heads is 45.82 years old, which indicates that they have the capacity to farm with their own hands. The average age of the economically productive population is between 15 and 64 years old, according to the FAO. Only two of the



household's assets were taken into account while assessing its value (ownership of land and animal). Almost all of the persons who were surveyed owned land, according to the results. More than three-quarters of all land in India has been passed down through generations via inheritance. Because of the rapid increase in the number of people, land is increasingly being split up between individuals and households, resulting in an overpopulation problem. Conflicts between family members and farmers and pastoralists might arise when land is scarce. Five acres of dry land is the average size of farmland owned by rural farming households. Some households have access to tiny pieces of irrigated land (less than one hectare). Farmers have been forced to increase the amount of land they cultivate due

to poor soil quality, frequently intruding on pastoralists' grazing territory and resulting in conflict [9]. A large average family size (eight people) helps to provide a labour supply, which is critical for agricultural productivity in poorer nations, particularly in emerging countries. Seventy percent of those surveyed reported owning pets. India farmers often raise livestock, which serves as a vital agricultural input and a significant source of income for the family at large. Animals may be thought of as home insurance since they can be sold to pay for food in times of need. In terms of gender and education, the findings suggest a high percentage of men (87.3 percent) and a low level of literacy among those who took the survey (26.6 percent).

Table 2: Summary of The Demographic and Socio-Economic Characteristics of Respondents

Characteristics	Statistics	
	Respondents	Unit
Number of respondents	500	Number
Age of head of household	45.82	Mean
Household size	8.19	Mean
Gender		
Male	87.4	%
Female	12.6	%
Level of Education		
No formal education	73	%
Primary	18	%
Secondary	8.6	%
Others	4	%
Main Occupation of Head of Household		
Farmers	89.4	%
Fishermen	3.2	%
Traders	1.8	%
Herders	0.6	%
Public workers	1.8	%
Others	3.2	%
Assets		
Land + animals	56.8	%
Land + animal + others	13	%
Land only	26	%
Animal only	1	%
Others	3.2	%



Causes of Food Insecurity

Table 3 shows the various reasons of food insecurity in India that we discovered throughout our study. Drought seems to be the most significant factor in India's food insecurity. 94.2 percent of the 500 people polled believed that drought contributed to food insecurity in the home. The timing and unpredictability of rains and other meteorological elements have a significant impact on Indian agriculture. Crop yields are limited by a lack of precipitation. Droughts are often followed by severe flash floods, due to the region's poor and irregular rainfall. Water supplies are scarce, poorly distributed, and difficult to get in this country. Many areas of the land are no longer suited for rain-fed farming, and natural pastures are being depleted. Most homes who rely completely on their own production suffer from price rises in food, making it difficult for them to acquire enough to feed their families. More than seven equipment, fertilizer, herbicide and insecticide is a major contributor to poor grain yield on traditional farms.

in ten families polled agreed that rising food costs had an impact on their ability to feed themselves on a daily basis. Another big problem for Indian agriculture is soil infertility. Sixty-two percent of those polled said that soil infertility is linked to food poverty. Agricultural production is hampered by land degradation, primarily owing to soil fertility loss and soil erosion. In India, there are just a few crops that can be produced because of the country's difficult weather circumstances. India's soils have a low carbon content and a lack of plant nutrients, making them particularly unstable. Human welfare and environmental sustainability may suffer if these soils are badly managed (which is frequently the case). Agricultural production is severely impacted by a lack of farm inputs. Low productivity and food insecurity may occur when farmers are unable to purchase the necessary inputs. A lack of money for expensive inputs such as agricultural

Table 3: Causes of Food Insecurity

Causes of food insecurity	Responses	
	Frequency (N)	Percent
Drought	471	94.2%
Diseases and insects	289	57.8%
Lack of enough labor	208	41.6%
Flooding	181	36.2%
Soil infertility	310	62.0%
Lack of enough inputs	292	58.4%
Land not enough	226	45.2%
Lack of money	282	56.4%
Increased in food prices	359	71.8%



Empirical Results and Discussion

Factors Affecting Food Security

Table 4 displays the findings of a binary logistic regression that examines the factors that influence food security (ration always enough for all household members). As shown by the model's overall predictive power (75 percent), the substantial Chi square ($\chi^2 =$

184.057, $p < 0.01$ with $df = 17$) and pseudo- R^2 suggest that the variables' combined influence on household members' likelihood to have an adequate daily ration is strong. The Wald values showed the relative importance of several factors in determining whether or not a home had enough food to feed all of its inhabitants. According to the regression model, there is a considerable rise in the likelihood that the family will have enough food for each day.

Table 4: Logistic Regression Coefficients of The Factors Affecting the Household Food Security Status

Variables	<i>B</i>	<i>Standard Error</i>	<i>Wald</i>	<i>p-value</i>	<i>E (B)</i>
EHH	0.227	0.270	0.705	0.401	1.255
Gender	0.955	0.365	6.993	0.008 ***	2.624
HHAge	0.003	0.010	0.103	0.749	1.003
HSize	-0.043	0.028	2.491	0.114	0.957
Asset	0.880	1.023	0.740	0.390	2.412
Drought	0.160	0.543	0.087	0.768	1.173
Diseases and insects	-0.586	0.313	3.515	0.061 *	0.556
Labor	0.618	0.303	4.159	0.041 **	1.854
Floods	-0.784	0.311	6.347	0.012 **	0.457
Soil infertility	0.131	0.280	0.217	0.641	1.140
Farm inputs	-0.047	0.292	0.026	0.872	0.954
Land	0.214	0.284	0.570	0.450	1.239
Lack of money	-1.181	0.309	14.598	0.000 ***	0.307
Food prices	-0.440	0.288	2.339	0.126	0.366
Market	-1.081	0.294	13.538	0.000 ***	0.339
Distance from main road	0.148	0.022	44.671	0.000 ***	1.160
FA	-0.974	0.261	13.909	0.000 ***	0.378
Constant	-0.135	1.233	0.012	0.913	0.874
Pseudo- R^2	0.411				
LR test ^a	508.442				



Food security was positively associated with the gender of the home's head of household, according to our findings. Families led by a man had better access to food than those headed by a woman. Men have a 2.64 expected odd ratio, which means they have a 2.6 times greater likelihood of being food secure than women in their home. Felker-Kantor and Wood conducted similar research on female-headed families and food poverty in Brazil and found similar findings. They found that food insecurity is more common in families headed by women than in households headed by men. Female-headed families in India tend to be less well-off than those led by men, and the majority of them are widows. Researchers have discovered that the independent variable is negatively correlated with the dummy variables (illness and insect assaults). Food insecurity is exacerbated by the spread of disease and pest infestations in the home. Floods have a major and detrimental impact on the food security of households. Flooding may result in significant production losses or even the complete abandonment of a farm, reducing the amount of food that a family has access to. In addition, the data showed a negative and substantial link between food insecurity and a lack of money (poverty). Food insecurity is a big problem in India because of the country's large population and high level of poverty. Despite the fact that food is readily accessible on the market, many families lack the buying capacity to feed their family members. 65.7 percent of rural residents are living below the poverty line compared to 55.5 percent of urban residents, according to a World Bank study. This is a significant difference. Distance from the major road may affect the chances of a household's food security positively and dramatically. Infrastructure such as roads are vital in the rapid transportation of agricultural goods, promoting market integration across areas. This will assist to decrease the effect of food

shortages on families by moving excess items from surplus regions to deficit ones.

CONCLUSION

The outcomes of this research show that food insecurity continues to influence the Indian populace and the country's progress. Less than ten percent of respondents were able to say they were food secure, indicating that food insecurity affects a large number of people (as 92.6 percent of respondents reported fearing running out of food stocks). Food may be accessible at all times, but it's impossible to guarantee that the diet delivers enough calories to provide food security for the family members. Household food security is negatively affected by these variables, but there are also long-term effects on the lives and survival of household members as a whole. As in most countries in sub-Saharan Africa, 80 percent of the Indian population relies on food produced on their own farms, so increasing productivity at the household level through government assistance, adequate supplies of farm inputs, and proper use of those inputs will be essential if this goal is to be achieved. Adolescents' health will benefit as a result of this effort, which will assist to minimize the long-term effects of food poverty on their health. To put it another way, the research found that other socioeconomic determinants of health such as educational attainment and religion may be linked to greater quality of life. Other factors, on the other hand, require additional investigation.



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