

Household food security in an urban slum: Determinants and trends

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ABSTRACT

Introduction: As we are moving from millennium development goals to sustainable development goals, food insecurity is imposing a formidable challenge to the policymakers, especially in developing countries such as India. A survey conducted in the urban slum areas of Vellore district, 6 years back, had reported food insecurity as high as 75%. The current study was a resurvey to assess the food security status in the aforementioned area. **Materials and Methods:** A community-based survey was conducted in which data were collected using a self-administered questionnaire from 150 households, selected through multistaged cluster sampling, who had given oral consent to be a part of the survey. The prevalence of food security calculated from this study was compared with the results from a previous survey to look for any significant improvement. **Results:** Nearly 42.7% of the households were food secure, while 26.7% were food insecure without hunger and 30.6% were food insecure with some degree of hunger. Low socioeconomic status (odds ratio [OR]: 3.25, 95% confidence interval [CI]: 1.29–8.16; $P < 0.012$) and presence of debt (OR: 3.84, 95% CI: 1.90–7.73; $P < 0.001$) were the major risk factors for food insecurity. A comparison with the findings from the previous study has shown a statistically significant improvement in food security from 25.4% to 42.7% (Chi-square: 27.072, df: 2, $P < 0.0001$). **Conclusion:** Although food security levels have shown marked improvement over the years, much needs to be done for India to be free from the shackles of hunger.

Keywords: Food security, nutrition, sustainable development goal

Introduction

According to United Nations, >750 million are estimated to be undernourished and almost 90 million children are undernourished and underweight.^[1] Multiple studies have shown that the children in families with poor household food security are more at risk of undernourishment and stunting, when compared to children from families who have adequate levels of food security.^[2,3] The aim of the current study was to reassess the burden of food insecurity in urban slums of Vellore city in

the state of Tamil Nadu in South India, where very high levels of household food insecurity (75%) and hunger (61%) were reported earlier.^[4]

Materials and Methods

The study was conducted during August–September 2014 in five urban slums of Vellore city. The slum areas are densely populated and majority of the tenements are made on encroached government land, without a proper title deed in the name of the people living in them. The predominant occupation is rolling of beedis, which is a handmade cigarette made of locally produced tobacco. Young adult men also work as unskilled laborers in

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the local vegetable market and also in the nearby construction sites. The unorganized nature of work makes these occupations vulnerable to exploitative practices followed by the business owners and, as a result, the wage levels are generally much below the minimum wages prescribed by the government.^[5]

A structured questionnaire was administered to 150 households who had given oral consent for being part of the survey and were randomly selected from five urban clusters, using multistage sampling technique. The house surgeons posted in the Department of Community Medicine collected the data. Sociodemographic and occupational characteristics of the family members were obtained. The socioeconomic status (SES) of the families was assessed using the modified Kuppaswamy scale 2012 which classifies households into “Upper,” “Upper middle,” “Lower middle,” “Upper lower,” and “Lower” socioeconomic strata.^[6,7] Food security status of the households was assessed using a Household Food Security Survey (HFSS) questionnaire which was developed by the United States Department of Agriculture. The validity of this survey instrument has been demonstrated worldwide and it classifies the household as “Food secure,” “Food insecure without hunger,” “Food insecure with hunger-moderate,” or “Food insecure with hunger-severe.”^[8]

The data entry and analysis was done using Epi-Info 7.0, a free software developed by the Centers for Disease Control and Prevention, Atlanta, USA. The prevalence of various categories of food security was calculated. To measure the association of food insecurity with factors such as socioeconomic class, utilization of public distribution system (PDS), family size, and family type, prevalence odds ratio (OR) with 95% confidence interval (CI) was also calculated. The prevalence of food security was compared with the data obtained from the previous survey conducted and published^[4] by the same department few years back. This was done for measuring any increase in prevalence and the significance of the observed difference was analyzed using Chi-square test for independence of two attributes.

Results

A total of 150 households were contacted for the survey and all the households were willing to participate. Majority of the households (64%) were nuclear families and most (93.3%) of the participants were Hindus. Even though the survey was conducted in urban slums, the proportions of huts were relatively low (18%). The mean family size was 4.64, with maximum size being 9 and minimum being 1; 54.7% of the respondents had household size of 5 or more. Seventy-eight percentage of the households had head of the families being unemployed or employed as unskilled/semiskilled workers and only 6% of the head of families had been to college. Majority (73.3%) of the households belonged to upper lower socioeconomic class. Almost 80% of the households had a valid ration card and 81.3% received some form of ration through the PDS. Out of the 150 households, 45% reported to have household debts. The households were assessed for food security status using the HFSS questionnaire. Of the 150 surveyed, 64 (42.7%) were food

secure households, while 26.7% were food insecure without hunger. A total of 30.6% of the households reported food insecurity with some degree of hunger [Table 1].

Table 1: Baseline characteristics of the households surveyed

Characteristics	Frequency (%)
Type of family	
Nuclear	96 (64)
Joint	54 (36)
Type of house	
Hut	27 (18)
Mixed house	44 (29.3)
Pucca house	76 (50.7)
Mansion	3 (2)
Religion	
Hindu	140 (93.3)
Christian	5 (3.3)
Muslim	5 (3.3)
Household size	
Up to four members	68 (45.3)
Five or more members	82 (54.7)
Occupation of head of household	
Unemployed	17 (11.3)
Unskilled worker	62 (41.3)
Semi-skilled worker	39 (26)
Skilled worker	13 (8.7)
Farmer/clerk/shop-owner	16 (10.7)
Semi-professional	3 (2)
Professional	0
Education of head of household	
Illiterate	45 (30)
Primary school	31 (20.7)
Middle school	37 (24.7)
High school	28 (18.7)
Posthigh school diploma	7 (4.7)
Graduate or postgraduate	2 (1.3)
Professional or honors	0
Socioeconomic status	
Lower	16 (10.7)
Upper lower	110 (73.3)
Lower middle	20 (13.3)
Upper middle	4 (2.7)
Upper	0
Ration card	
Yes	119 (79.3)
No	31 (20.7)
PDS coverage	
Yes	122 (81.3)
No	28 (18.7)
Household debt	
Yes	67 (44.7)
No	83 (55.3)
Food security status	
Food secure	64 (42.7)
Food insecure, without hunger	40 (26.7)
Food insecure, with hunger-moderate	41 (27.3)
Food insecure, with hunger-severe	5 (3.3)

PDS: Public Distribution System

Families having household debts were at significantly higher risk of being food insecure when compared to families without debt (OR: 3.84, 95% CI: 1.90–7.73; $P < 0.001$). When the food security status of households was compared against SES, it was observed that food insecurity levels increased with lowering of SES. The proportion of households which had food security in upper middle, lower middle, upper lower, and lower classes was 75%, 65%, 39%, and 30%, respectively [Figure 1]. This difference between upper and lower SES was found to be statistically significant (OR: 3.25, 95% CI: 1.29–8.16; $P < 0.012$). No statistically significant association was observed between food insecurity and factors such as family type, family size, and PDS coverage [Table 2]. The study showed a statistically significant increase in the food security status when compared with the data from the previous study conducted in the same area (Chi-square: 27.07, df: 2, $P < 0.0001$) [Table 3].

Discussion

Prevalence of food security

The prevalence of food security was found to be 42.7% (95% CI: 34.6–50.7). This is lower than the percentage of food secure households found in studies conducted in other developing nations such as Iran (59.1%) and the Philippines (65%).^[9,10] The prevalence is better than the estimates from countries such as Bangladesh, Burkina Faso (27%), and Bolivia (30%),^[10,11] but the tools used in studies for measuring food security in each of these countries were different. A high degree of correlation has been found between the gross domestic product (GDP) per capita of a country and the level of food security. The Global Food Security Index, 2015, supports these findings and points out that the food security situation across regions is improving with the increase in GDP and other indices of economic productivity.^[12] India enjoys a relatively higher degree of food security among the low-middle income nations and this phenomenon can be explained partially through the rapid growth in economy witnessed in the late 1990s and 2000s. Even though the focus of economic reforms undertaken in the 1990s was on service sector, the primary and secondary sectors benefitted collaterally due to a very rapid growth in service sector. Furthermore, the impact of “Green Revolution” on

agricultural productivity lasted for a very long time, propelling the food security status of the nation. The Food and Agricultural Organization also states that more progress could have been made if agricultural reforms and restructuring of the PDS were undertaken on time.^[13]

Comparison with the previous study

On comparison with a similar survey done in the same area 6 years back, the findings on household food security show significant improvement. The prevalence of any form of household food insecurity decreased from 74.6% to 57.3%. A more dramatic change was observed in households having food insecurity with hunger; the prevalence reduced from 61.5% to 30.6%. The PDS coverage in Tamil Nadu remained relatively unaltered for many years now; approximately 80% of the total population.^[4] Despite this, the significant improvement in figures may be attributed to the increase in the quality of Tamil Nadu PDS, in terms of the number of items available and the measures taken to bring down pilferage.^[14] The household food security figures obtained in the present study are similar to the findings of studies done elsewhere in the state.^[15] This shows that the PDS has performed consistently throughout the state.

Table 2: Factors associated with household food insecurity

Characteristics	Food secure (%)	Food insecure (%)	P	OR (95% CI)
Family type				
Nuclear	30 (55.6)	24 (44.4)	0.741	0.89 (0.45-1.75)
Joint/extended	56 (58.3)	40 (41.7)		
Family size				
Five or more members	51 (62.2)	31 (37.8)	0.186	1.55 (0.81-2.98)
Up to four members	35 (51.5)	33 (48.5)		
PDS coverage				
Yes	71 (58.2)	51 (41.8)	0.655	1.20 (0.53-2.75)
No	15 (53.6)	13 (46.8)		
Household debt				
Yes	50 (74.6)	17 (25.4)	<0.001	3.84 (1.90-7.73)
No	36 (43.4)	47 (56.6)		
Socioeconomic class				
Higher	78 (61.9)	48 (38.1)	0.012	3.25 (1.29-8.16)
Lower	8 (33.3)	16 (66.7)		

OR: Odds ratio; CI: Confidence interval; PDS: Public Distribution System

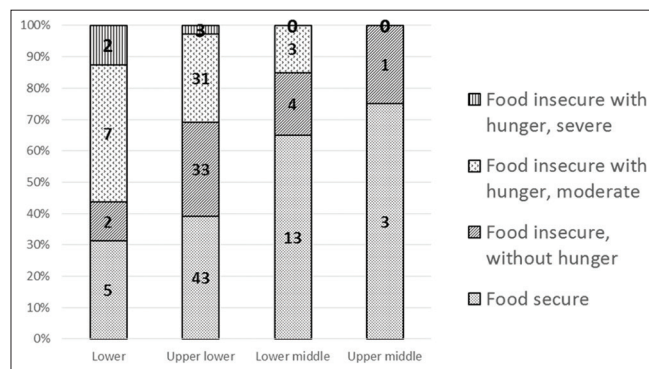


Figure 1: Food security status in different socioeconomic classes. *The numbers written on the stacks indicate the number of households with the respective food security status

Table 3: Food security data in comparison with the previous study

Food security status	Current study		Previous study	
	Frequency (%)	95% CI	Frequency (%)	95% CI
Food secure	64 (42.7)	34.6-50.7	33 (25.4)	17.8-33
Food insecure, without hunger	40 (26.7)	19.5-33.9	17 (13.1)	7.2-19
Food insecure, with hunger	46 (30.6)	23.3-38	80 (61.5)	52.9-70

CI: Confidence interval

Influence of socioeconomic status and debt

As found in previous studies, household food insecurity has an inverse correlation with SES assessed using objective scoring systems.^[4] More than 50% of the lower SES households reported hunger associated with food insecurity while no household in upper middle class has any forms of hunger. Another important finding was the significant association between household debt and food insecurity. Those households with debts were at higher risk of household food insecurity (OR: 3.84, 95% CI: 1.90–7.73) when compared to household with no debts. The rise of a class of moneylenders who provide faster short-term loans to those outside the banking system at interest rates as high as 100% is a major concern. Even though the government has passed several legislations against their operations, there is a vast population still dependent on them for emergency finance.^[16]

Strength and limitations

The Department of Community Medicine has a strong rapport with the community where the survey was conducted. This gave us good physical access to the area to collect data, which increased the robustness of the data collected. The study was intended to find out only the prevalence of food security. It was not powered enough to find out any potential risk factors.

Conclusions

The household food security situation in urban slums of Vellore is still precarious, but rapid strides have been made in the recent times. The level of hunger associated with food insecurity has been halved over the period of last 6 years, but it is still at unacceptably high levels. More research is needed to find out the reasons behind the high levels of food insecurity and hunger in spite of a relatively high coverage of universal PDS.

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Conflicts of interest

There are no conflicts of interest.

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