



MEASUREMENT AND DISTRIBUTION OF HOUSEHOLD FOOD INSECURITY IN AN EASTERN DISTRICT IN ASSAM: A CROSS SECTIONAL STUDY

Community Medicine

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ABSTRACT

Background: Food security is a crucial determinant of the development of a nation. The household food security is seen to be influenced by a multitude of factors in various studies. But most of these studies were done in affluent nations or in random households. This study focuses on households with small children.

Objectives: To assess household food insecurity and its related factors in preschool children in Dibrugarh district.

Methods: Cross sectional study among 510 randomly selected children attending AWCs in each of the 8 ICDS blocks in Dibrugarh was done. Data on socio-demographic details Household Food Insecurity was obtained.

Results: Only 44.5% (227) households among the surveyed 510 households were categorized as food secure and 67 (13.1%) households as having severe food insecurity. Food security of the household was significantly associated with the socio-economic class of the household as well as the literacy status of the parents of the surveyed children.

Conclusions: Food insecurity is common in study population. Along-with access to food, an integrated approach that improves the overall socioeconomic well-being of families and parental education is needed.

KEYWORDS

INTRODUCTION

Food security is defined as a state in which, "all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life." (*POLICY DETERMINATION #19: Definition of Food Security*, n.d.)⁽¹⁾ Availability of food, access to food, and risks related to either availability or access are the essential determinants of food security. (*125542.pdf*, n.d.)⁽²⁾ At the household level, "a household is food secure when it has access to the food needed for a healthy life for all its members (adequate in terms of quality, quantity, safety, and culturally acceptable), and when it is not at undue risk of losing such access". (*Nutrition-relevant Actions—Nutrition policy discussion paper No. 10*, n.d.)⁽³⁾ Food security is built on three pillars: first, food availability (sufficient quantities of food available on a consistent basis); second, food access (having sufficient resources to obtain appropriate foods for a nutritious diet) and third, food use (appropriate use based on knowledge of basic nutrition and care, as well as adequate water and sanitation.)

Because food security is a complex, multidimensional concept, measuring food security has been an ongoing challenge to researchers and practitioners alike. There has been renewed impetus in fighting food insecurity, which can be gauged from the 2nd SDG i.e. "end hunger, achieve food security, improve nutrition and promote sustainable agriculture" by 2030. Various studies have been done to determine the food security status of households. Whereas the prevalence of household food insecurity was found to be between 8-20% in developed countries, it is expected to be much higher in developing countries like India. (Pollard & Booth, 2019)⁽⁴⁾ A study done in Bankura, West Bengal, which is a nearby state, the prevalence of household food insecurity was found to be as high as 53%. (Mukhopadhyay, Mukhopadhyay, & Biswas, 2010)⁽⁵⁾ Sufficient literature is not available for the north eastern part of India. However, it is found that the prevalence of household food insecurity was highest among the families with young children. (Mukhopadhyay et al., 2010)⁽⁶⁾ This study, therefore, focuses on the measurement of Household Food insecurity and factors associated with it in the households of young children in an eastern district of the north eastern state of Assam.

MATERIALS AND METHODS:

This study was conducted in Dibrugarh district of Assam to measure the household food insecurity and factors associated with it. Taking the prevalence of household food insecurity as 53%, confidence level of 95% and relative error of 9%, the minimum sample size was calculated to be 421. (Mitra, Mukhopadhyay, Sarkar, & Saha, 2019)⁽⁶⁾ Taking 15% non-response, the sample size obtained was 485. The children attending AWCs in different blocks of Dibrugarh district were included in the study in a probability proportionate to size of the number of AWCs in the given block (as given below)

ICDS Project	No. of AWCs	% of AWCs	No of AWCs required	Sample Drawn*
Khowang	341	16	77.6	80
Tingkhong	202	10	48.5	50
Joypur	263	13	63.05	70
Panitola	238	12	58.2	60
Lahowal	202	10	48.5	50
Tengakhath	418	20	97	100
Barbaruah	276	13	63.05	70
Dibrugarh Urban	133	6	29.1	30
Total	2073	100	485	510

*(numbers rounded to nearest multiple of 10)

10 children were randomly selected from the nominal rolls of each of the selected AWC. Then the households of the selected children were visited. Socio-demographic data was collected using a pre-designed, pre-tested structured questionnaire and data on food security was collected from the child's guardian/ mother using HFIA. ("Household Food Insecurity Access Scale (HFIA) for Measurement of Food Access: Indicator Guide | Food and Nutrition Technical Assistance III Project (FANTA)," n.d.)⁽⁷⁾ Data was collected after obtaining informed written consent from the responder. Ethical Clearance for the study was obtained from the Institutional Ethics Committee of Assam Medical College, Dibrugarh.

RESULTS AND OBSERVATIONS:

A total of 510 children were included in the study which had 249 (48.8%) female children. Fig 1 represents the population pyramid of the study subjects. Out of the 510 children, 108 (21.2%) were between 31 and 36 months of age. The 61-66 month age group had no male participants. Maximum numbers of female children belonged to 31-36 and 43-48 months age group whereas maximum male children belonged to 31-36 and 55-60 months as revealed by Fig 1.

Fig. 1. Population pyramid of the study subjects

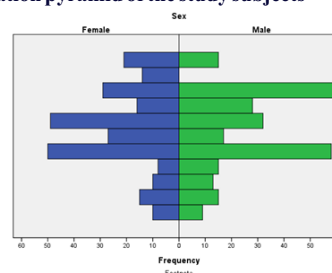


Table 1. Baseline socio- demographic characteristics of the study subjects

Characteristic		Number	Percentage
Religion	Hindu	358	70.2
	Muslim	125	24.5
	Christian	27	5.3
Caste	General	176	34.5
	OBC	241	47.3
	SC	75	14.7
	ST	18	3.5
Type of family	Nuclear	324	63.5
	Joint	186	36.5
Type of house	Kutcha	293	57.5
	Pucca	153	30
	Semi pucca	64	12.5
Method of excreta disposal	Sanitary	365	71.6
	Insanitary	145	28.4
Type of kitchen	Separate	0	0
	Attached	510	100
Socioeconomic class	I	3	0.6
	II	36	7.1
	III	69	13.5
	IV	251	49.2
	V	151	29.6
	Total	510	100

Table 1 shows the baseline characteristics of the study participants. The mean age of the study participants was found to be 43.4 months (± 15.8 months). The study subjects mostly followed Hinduism, belonged to OBC or general caste category, had nuclear families, lived in kutcha house and belonged to socioeconomic class V and IV. More than two-thirds (71.6%) households had sanitary excreta disposal. National Health Profile 2018 reports suggest that 67.8% of the households had access to toilet facility in rural areas of Assam. (NHP 2018.pdf, n.d.)⁽⁹⁾

Table 2: Distribution of households according to positive responses to questions in HFIAS tool

Q No	Question	Response	
		Negative	Positive
1	Worry that you would not have enough to eat	343(67.3)	167(32.7)
2	Not able to eat the kinds of foods preferred because of a lack of resources	384(75.3)	126(24.7)
3	Eat a limited variety of foods due to a lack of resources	274(53.7)	236(46.3)
4	Eat some foods that you/they really did not want to eat because of a lack of resources to obtain other types of food	344(67.5)	166(32.5)
5	Eat a smaller meal than you/they felt you/they needed because there was not enough food?	389(76.3)	121(23.7)
6	Eat fewer meals in a day because there was not enough food?	423(82.9)	87(17.1)
7	No food of any kind to eat in your household because of lack of resources to get food?	452(88.6)	58(11.4)
8	Go to sleep at night hungry because there was not enough food?	482(94.5)	28(5.5)
9	A whole day and night without eating anything because there was not enough food?	493(96.7)	17(3.3)

(Row-wise percentages in parentheses)

Table 2 shows that the question with most number of positive responses was question 3 which assessed if the family had to eat a limited variety of foods due to lack of resources. 46.3% households had to eat a limited variety of food due to lack of resources in the 4 weeks preceding the interview. 32.5% households reported having to eat something which they didn't want to as there was nothing else to eat. 11.4% households faced condition of no food of any kind, 5.5% households had to go to sleep hungry and 3.3% households reported of staying whole day and night without food.

Out of the 510 households surveyed, fewer than half 44.5% (227) households were categorized as food secure. 17.5% (89) households

were categorized as mildly food insecure, 24.9% (127) as moderately food insecure and 13.1% (67) as severely food insecure household.

Table-3: Distribution of the children according to their age and household food insecurity status

Age (months)	HFIA category				p value
	1 (n=227)	2 (n=89)	3 (n=127)	4 (n=67)	
6-12	8(3.5)	1(1.1)	4(3.1)	6(8.9)	p=0.000
13-24	24(10.6)	7(7.9)	10(7.9)	12(17.9)	
25-36	62(27.3)	23(25.8)	34(26.8)	12(17.9)	
37-48	60(26.4)	35(39.3)	12(9.4)	18(26.9)	
49-60	47(20.7)	13(14.6)	54(42.5)	18(26.9)	
61-72	26(11.4)	10(11.2)	13(10.2)	1(1.5)	

(columnwise percentages in parentheses)

The association between the age of children and household food insecurity status was found to be statistically significant.

Table-4: Distribution of the study participants according to their caste category and household food insecurity status

HFIS Category	Caste of the children				p value
	General	OBC	ST	SC	
1	71(40.3)	112(46.5)	4(22.2)	40(53.3)	p=0.016
2	34(19.3)	44(18.3)	7(38.9)	4(5.3)	
3	50(28.4)	50(20.7)	6(33.3)	21(28.0)	
4	21(11.9)	35(14.5)	1(5.6)	10(13.3)	
Total	176(100)	241(100)	18(100)	75(100)	

(columnwise percentages in parentheses)

Highest prevalence (77.8%) of household food insecurity was found in children belonging to Scheduled Tribes. The association between caste of the children and their household food security status was observed to be statistically significant.

Table-5: Relationship between literacy status of both parents of the children and their household food insecurity access status

HFIS Category	Literacy status of parents			p-value
	Both illiterate	One literate	Both literate	
1	40 (55.6)	52 (43.3)	135 (42.5)	p=0.011
2	7 (9.7)	13 (10.8)	69 (21.7)	
3	15 (20.8)	32 (26.7)	80 (25.2)	
4	10 (13.9)	23 (19.2)	34 (10.7)	
Total	72 (100)	120 (100)	318 (100)	

(columnwise percentages in parentheses)

The prevalence of household food insecurity was found to be higher (57.5%) in households of children with both parents literate whereas it was lowest in households with both parents illiterate and this association between the literacy status of both parents of the children and their household food insecurity access was found to be statistically significant.

Table-6: Relationship between the household size (number of members in the family) of the study children and their household food security status

HFIA Category	No. Of family members			p-value
	≤ 4	5-7	> 7	
1	84(42.2)	108(44.4)	35(51.5)	p=0.044
2	32(16.1)	40(16.5)	17(25.0)	
3	59(29.6)	55(22.6)	13(19.1)	
4	24(12.1)	40(16.5)	3(4.4)	
Total	199(100)	243(100)	68(100)	

(columnwise percentages in parentheses)

The average size of the household as observed to be 5.39 (+ 1.98). The association between number of members in the family and the household food insecurity access was found to be statistically significant.

Table-7: Relationship between socioeconomic class of the family of study children and household food insecurity access status

HFIA Category	Socioeconomic class (Modified B. G. Prasad Classification)				p value
	I and II	III	IV	V	

1	8(20.5)	34(49.3)	118(47.0)	67(44.8)	p=0.000
2	15(38.5)	18(26.1)	35(13.9)	21(13.9)	
3	6(15.4)	14(20.3)	69(27.5)	38(25.2)	
4	10(25.6)	3(4.3)	29(11.5)	25(16.6)	
Total	39(100)	69(100)	251(100)	151(100)	

(columnwise percentages in parentheses)

The association between the socioeconomic class of the children and their household food insecurity status was found to be statistically significant.

Table-8: Relationship between occupation of fathers of the study children and household food insecurity access status

HFIA category	Fathers Occupation			p-value
	Service	Business	Labourer	
1	37(47.4)	48(51.6)	142(41.9)	p=0.008
2	20(25.6)	20(21.5)	49(14.4)	
3	16(20.5)	18(15.3)	93(27.4)	
4	5(6.4)	7(7.5)	55(16.2)	
Total	78(100)	93(100)	339(100)	

(columnwise percentages in parentheses)

Overall household food insecurity was found to be most common (58.1%) among children whose fathers were working as labourers. The association between occupation of the fathers of study children and their household food insecurity access status was found to be statistically significant.

DISCUSSION:

The present study intended to estimate the extent and associated factors for Household Food Insecurity among the households of children attending AWCs in Dibrugarh District. Among the baseline characteristics if the households it was observed that 71.6% households had sanitary excreta disposal as against 67.8% as suggested by the National Health Profile 2018 reports. (NHP 2018.pdf, n.d.)⁽⁸⁾

Out of the 510 households surveyed, fewer than half 44.5% (227) households were categorized as food secure. (17.5%) 89 households were categorized as mildly food insecure, 127 (24.9%) as moderately food insecure and 67 (13.1%) as severely food insecure household. These rates were a little higher than those found by Hackett et al in their study done on pre-school children in Colombia (Hackett, Melgar-Quinonez, & Álvarez, 2009)⁽⁹⁾ In another study on a sample of 250 women by Chinnakali et al in North India, the prevalence of food insecurity using the same scale was found to be 77.2%. (Chinnakali et al., 2014)⁽¹⁰⁾ Differences in socio-demographic construction, scale used for determination of HFIA or differences between perceptions may be attributed to this observed difference. The findings of this study are consistent with those found by Agarwal S et al in their study done in north India. (Agarwal et al., 2009)⁽¹¹⁾

There was statistically significant association between the caste category of the subject and the HFIA score. These differences may arise due to differences in customs, traditions and food storing and consumption behavior of different communities.

Food insecurity was found to be more prevalent among households of children where both parents were literate. However this contrasts with the finding by Chinnakali et al. (Chinnakali et al., 2014)⁽¹⁰⁾ Information was collected based on the perceptions of the mother/guardian without validation of the real scenario. This might be responsible for the increased perception of insecurity among literate parents in present study.

The strength of the study lies in being a community-based study which considered the most vulnerable households with a small child. Moreover, this is one of the very few studies on food security that was done in Assam. The tool used for the assessment of Household Food insecurity was also validated and reliable. The study also had its limitations. In the present study, food security was measured as insecurities perceived by the responder without validation of the same. The scale used here did not take into account other factors that may have a bearing on the food security status of the household. As the respondents were mostly mothers of small children, their perceptions and attitudes might be different from general population. Further

studies in different population groups are warranted to determine the real scenario.

CONCLUSION:

Household food insecurity was found to be significantly associated with age and caste of the children. Significant association was also found between household food insecurity and literacy status of parents, household size, socio-economic status and occupation of the fathers of the study children. More such studies are warranted to generate enough evidence for policy making to address this problem of food insecurity. Extensive and focused IEC activities in the form of social and behavior change communication strategies can be rolled out in groups along with some interactive sessions in different villages to improve the nutritional status and food storing behavior of the households. Promotion of kitchen garden and rearing of poultry and cattle for household food security can be helpful. Awareness should be raised regarding different schemes like PDS so that the household food security is ensured along with making the services available, so that both demand and supply can be balanced.

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