Original Research Paper

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Household Food Security with special reference to Individual Food Security of Rural Women

Food and Nutrition

KEYWORDS: Food Adequacy, Food Insecurity of Women, Household food security.

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ABSTRACT

Raising the nutritional status of the population has been a global concern and therefore food security has been the major concern of governments particularly in developing countries. With this interest, a cross-sectional study was conducted to investigate the extent of household as well as individual food security of rural women in Varanasi district of Uttar Pradesh state, India. In case of 29.8% and 15.9% of households, level of food security was high/marginal and low, respectively. More than half (54.3%) households had very low food security. 69.8% subjects had inadequate consumption at household level and with respect to RDA 37.4% subjects had adequate calorie consumption. Of those having adequate household consumption, 51.6% subjects had adequate calorie consumption at individual level ($p<0.001$). There existed significant ($p<0.001$) association between SES and calorie adequacy of subjects. In comparison to lower class odds of calorie inadequacy was low for lower middle class (AOR 0.30; CI: 0.19-0.47).

INTRODUCTION:

The term food security has many conceptual facets. A group of experts primarily consider food security synonym to availability of food at national, regional, household and individual level. The amount and quality of food available globally, nationally and locally can be affected temporarily or for long periods by many factors including climate, disasters, wars, civil unset, population size and growth, agricultural practices, environment, social status and trade. Food security exists when all people, at all times have physical and economic access to sufficient safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. There are evidences based on programme evaluations of Applied Nutrition Programme, White and Blue revolutions that even those who produce food do not consume adequately in terms of quality and quantity for economic gains [Planning Commission (2008); XIth five year plan, (2007-2012)].

Hunger is the primary concern of mankind. It refers to a strong desire or craving for food at individual level as well as the want or scarcity of food in a country or region. Widespread scarcity of food is termed as famine. On the composite index food insecurity of rural India, states like Jharkhand and Chhattisgarh were found in the very high level of food insecurity, followed by Madhya Pradesh, Bihar and Gujarat. Even economically developed states like Gujarat, Maharashtra, Andhra Pradesh and Karnataka find themselves in the category of high food insecurity, a reflection perhaps the manifestation of the agrarian crisis in the states and its consequents negative impact on the health and well being of the rural population. In order to resolve the issue of food insecurity India has launched a campaign '*Hunger Free India*' on February 20, 2009 to rededicate its efforts in terms of Public Distribution System (PDS), Integrated Child Development Scheme (ICDS) and Mid Day Meal Programme for improved performance (Singh, 2009). Women play very important role in providing food and nutrition for their families through their roles as food producers, processors, traders and income earners. Yet their lower social and economic status (SES) limits their access to education, training, land ownership, decision making , credit and consequently their ability to improve their access to and use of food. Ignorance of women itself or associated with poverty, leads to poor infant and child rearing practices, misconceptions about the use of certain foods inadequate feeding during illness and improper food distribution may be equally as important as production and preservation, this consequently results in starvation, malnutrition, and increased mortality of women.

OBJECTIVE: Present study was aimed to investigate the extent of household as well as individual food security of rural women.

METHODOLOGY

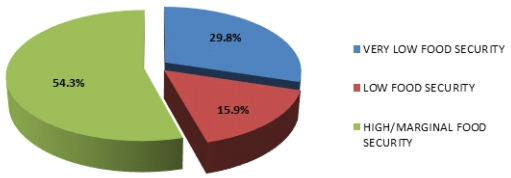
This community based cross sectional study was conducted in 5 villages of Chiraigaon community development block of Varanasi district, Uttar Pradesh, India. Women of reproductive age group (15-49 years) were considered as subjects for this study excluding the pregnant and seriously ill women. Computation of required sample size of 610 was based on the assumption that prevalence of CED in the rural reproductive age group women is around 40% (NFHS-3, 2005-2006). The required sample size was selected by adopting multi stage random sampling procedure (Khanam et al. 2014). The study had prior approval of the academic bodies of Banaras Hindu University, Varanasi, and prior consent was taken from the study subjects for their participation.

Household food security was assessed by interviewing subjects using pre-designed and pre-tested schedule. Energy intake of the study subjects was assessed by 24 hour recall method. A modified 6-item US household food security survey module (2012) was used to score regarding food security in the household. The questionnaire was first tested for validity in Indian rural areas. After some modifications questions were modified in interview schedule. Present study is based on 3 point scale of this module. In order to find out the relationship between Household Food Security and Individual food security of subjects, and to find out their socio-demographic co-relates, cross tables were generated and logistic regression was applied for drawing statistical inferences.

RESULTS AND DISCUSSION:

Distribution of study subjects according to level of food security is given in figure1**.** In case of 29.8% and 15.9% level of food security (FS) was high/marginal and low, respectively. It is disheartening to know that more than half (54.3%) households had very low food security. In order to assess adequacy of food in terms of energy at household level family consumption per consumption unit was taken as criteria. Total family consumption in terms of energy was assessed by 24 hours recall oral questionnaire method. In case of 184 (30.2%) subjects, energy consumption PCU was adequate and thus more than two third (69.8%) subjects had inadequate consumption at household level. This finding is in conformity with the level of food insecurity prevailing in the study area (Figure.1). When calorie adequacy of women of reproductive age group included in this study was assessed against RDA it was found that 228 (37.4%) subjects had adequate calorie consumption. It reflects that inadequate consumption with respect to RDA of subjects was considerably high (62.6%).

Figure:1. Distribution of Food Security among Study Subjects



While examining the relationship between household food adequacy and adequacy at individual level (Table: 1), it was found that out of 184 subjects having adequate household consumption 51.6% subjects had adequate calorie consumption at individual level whereas those having inadequate consumption at family level 133 (31.2%) had calorie adequacy at individual level. Therefore, it can be internalized that household calorie adequacy and individual calorie adequacy does not go hand in hand. The associations between individual and household energy adequacy was statistically significant (p<0001).

Table: 1 Calorie Adequacy Household Vs Individual Consumption.

PCU OF FAMILY	INDIVIDUAL CALORIE INTAKE ACCORDING TO RDA						TEST OF SIGNIFICANCE
	ADEQUATE CONSUMPTION		INADEQUATE CONSUMPTION		TOTAL		
	NO.	%	NO.	%	NO.	%	
ADEQUATE CONSUMPTION	95	51.6	89	48.4	184	100	$\chi 2$ =22.868 df=1 p<0.001
INADEQUATE CONSUMPTION	133	31.2	293	68.8	426	100	
TOTAL	228	37.4	382	62.6	610	100	

Food Availability has been considered as an important facet of Food Security by FAO. The other dimensions of FS include food access, food use and stability (Agricultural, F. A. O., 2012). The 4 pillars of FS have been further endorsed by World Summit on FS (FAO, 2009). There are sufficient treatise on the various dimensions of food viz. availability (Latham, 1997; (Godfray et al., 2010; Gregory et al., 2005), access (Ecker, Breisinger, 2012; Garrett, Ruel, 1999; Gregory et al., 2005; Tweeten, (1999), utilization (Ecker, Breisinger, 2012; FAO, 1997; Tweeten, (1999) and stability (Ecker, Breisinger, 2012; Latham, 1997).

At global level 12.5% population or 1 in 8 people are victims of under nutrition (FAO, WFP, IFAD, 2013). Although several countries have achieved MDG targets at national level, this is difficult to be realized in India (FAO, WFP, IFAD. 2012). In spite of the fact that food security has been major development objective of India and the country achieved self sufficiency in food in1970s, FS is still high [NFHS-2 (1998-99); NFHS-3 (2005-06); Vyas, 2008]. This could be a reflection of Agrarian crises (Singh, 2009).

Although threat for food, food security prevails in many countries, there is another potential threat of over-weight and obesity. In fact numbers of people who are over-weight surpassed the number of under nourished in 2006 and many countries in the world are marching towards obesity epidemics.

Adequate calorie consumption by study subjects did not differ significantly (p>0.05) with respect to their age, religion, caste, type of family, marital status and educational status of subjects. Adequate consumption was maximum (40.3%) in PG or above and least in graduate subjects (26.2%). In case of 38.0% Hindu and 29.5% Muslim subjects calorie consumption was adequate with respect to RDA. Extent of adequate calorie consumption was 41.9%, 38.2%, and 29.1% in SC and ST, OBC and other caste category subjects, respectively.

Adequate energy intake prevailed in 36.5% unmarried, 38.1% married and 26.7% widow and separated subjects. Primary occupation of subjects exerted significant influence (p<0.001) on caloric adequacy; 43.0% housewives and 46.2% students had adequate consumption of calorie whereas none of the subjects having primary occupation as domestic worker, agriculture labor, service or skilled worker belonged to this category. There existed significant (p<0.001) association between SES and calorie adequacy of subjects. As much as 55.0% middle and 32.0% lower class subjects had calorie adequacy. None of the subjects from upper and upper middle class belonged to this category. It appears that subjects from upper and upper middle class had restricted their dietary intake to avoid over weight and obesity in them. Although maximum education in the family of study subjects was significantly associated with calorie adequacy, there was no discernible trend. Higher level of caloric adequacy prevailed for subjects having maximum education in the family above middle and up to intermediate level (Table: 2).

Table: 2. Association of socio-demographic variables with Food Adequacy of Study Subjects.

	PARTICULARS (N=610)	INDIVIDUAL CALORIE INTAKE OF STUDY SUBJECTS ACCORDING TO RDA						TEST OF SIGNIFICANCE
		ADEQUATE CONSUMPTION		INADEQUATE CONSUMPTION		TOTAL		
		NO.	%	NO.	%	NO.	%	
1	**AGE OF THE SUBJECTS (in years)**							
	15-24	86	39.3	133	60.7	219	100.0	$\chi 2$=1.288 df=3 p>0.05
	25-34	67	34.2	129	65.8	196	100.0	
	35-44	58	38.4	93	61.6	151	100.0	
	≥45	17	38.6	27	61.4	44	100.0	
2	**RELIGION**							
	Hindu	215	38.0	351	62.0	566	100.0	$\chi 2$=1.243 df=1 p>0.05
	Muslim	13	29.5	31	70.5	44	100.0	
3	**CASTE**							
	SC & ST	80	41.9	111	58.1	191	100.0	$\chi 2$= 5.668 df=2 p>0.05
	OBC	109	38.2	176	61.8	285	100.0	
	Others	39	29.1	95	70.9	134	100.0	
4	**TYPE OF FAMILY**							
	Nuclear	127	39.7	193	60.3	320	100.0	$\chi 2$= 2.487 df=2 p>0.05
	Joint	93	35.8	167	64.2	260	100.0	
	Three Generation Family	8	26.7	22	73.3	30	100.0	
5	**MARITAL STATUS OF SUBJECTS**							
	Unmarried	58	36.5	101	63.5	159	100.0	$\chi 2$=0.880 df=2 p>0.05
	Married	166	38.1	270	61.9	436	100.0	
	Widow & Separated	4	26.7	11	73.3	15	100.0	
6	**EDUCATIONAL STATUS OF SUBJECTS**							
	Illiterate	28	40.0	42	60.0	70	100.0	$\chi 2$=4.533 df=5 p>0.05
	Primary	33	36.7	57	63.3	90	100.0	
	Middle	33	38.4	53	61.6	86	100.0	
	H. School	34	36.6	59	63.4	93	100.0	
	Intermediate	34	36.6	59	63.4	93	100.0	
	Graduate	17	26.2	48	73.8	65	100.0	
	PG or Above	83	40.3	123	59.7	206	100.0	
7	**PRIMARY OCCUPATION OF SUBJECTS**							
	Housewife	166	43.0	220	57.0	386	100.0	$\chi 2$=60.773 df=5 p<0.001
	Domestic Worker*	0	0.0	36	100.0	36	100.0	
	Agriculture Labor	0	0.0	19	100.0	19	100.0	
	Service	2	18.2	9	81.8	11	100.0	
	Student	60	46.2	70	53.8	130	100.0	
	Skilled Worker	0	0.0	28	100.0	28	100.0	
	* performed domestic work in the family of others to earn.							

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8	**SOCIO-ECONOMIC STATUS**							
	Upper Class	0	0.0	28	100.0	28	100.0	$\chi2$=85.527 df=4 p<0.001
	Upper Middle Class	0	0.0	56	100.0	56	100.0	
	Middle Class	55	55.0	45	45.0	100	100.0	
	Lower Middle Class	102	51.3	97	48.7	199	100.0	
	Lower Class	71	32.0	151	68.0	222	100.0	
9	**MAXIMUM EDUCATION IN THE FAMILY**							
	Illiterate	5	26.3	14	73.7	19	100.0	$\chi2$=24.57 Df=6 p<0.001
	Upto Primary	29	42.6	39	57.4	68	100.0	
	Upto Junior High School	31	37.8	51	62.2	82	100.0	
	Upto High School	55	45.8	65	54.2	120	100.0	
	Upto Intermediate	62	47.0	70	53.0	132	100.0	
	Upto Graduation	32	25.4	94	74.6	126	100.0	
	Above Graduation	14	22.2	49	77.8	63	100.0	
10	**MAIN OCCUPATION OF HEAD OF THE FAMILY**							
	Farmer	26	33.3	52	66.7	78	100.0	$\chi2$=9.492 df=4 p>0.05
	Labor	102	44.7	126	55.3	228	100.0	
	Service	41	29.9	96	70.1	137	100.0	
	Business	35	36.5	61	63.5	96	100.0	
	Skilled Worker	24	33.8	47	66.2	71	100.0	

Logistic analysis for food inadequacy is given in table: 3**.** Taking student as reference it was observed that the odds of inadequate calorie consumption was high for housewives (AOR 1.69; CI: 1.02-2.81) and other occupations (AOR 85.59; CI: 18.87-379.27). In comparison to lower class odds of calorie inadequacy was low for lower middle class (AOR 0.30; CI: 0.19-0.47). Although AOR for inadequate consumption was 1.04 for upper + upper middle + middle class; however this was not statistically significant (CI: 0.65-1.68). The overall percentage for correct classification of logistic model was 69.8%, which is acceptable.

Table: 3. Logistic Analysis for Food Inadequacy of study subjects.

Sl. No.	Variable	β	S.E.	Wald	df	Sig.	AOR	C.I. (95.0%)	
								Lower	Upper
1	**PRIMARY OCCUPATION OF SUBJECTS**								
	Housewives	0.52	0.26	4.08	1	0.04	1.69	1.02	2.81
	Other Occupations	4.44	0.77	33.61	1	0.00	84.59	18.87	379.28
	Students	R		33.70	2	0.00			
2	**SOCIO-ECONOMIC STATUS**								
	Upper + Upper middle + Middle class	0.04	0.24	0.03	1	0.85	1.04	0.65	1.68
	Lower Middle Class	-1.21	0.23	27.14	1	0.00	0.29	0.19	0.47
	Lower Class	R		36.82	2	0.00			
3	**MAXIMUM EDUCATION IN THE FAMILY**								
	Illiterate	-0.03	0.32	0.01	1	0.94	0.97	0.52	1.84
	Primary	0.44	0.31	2.06	1	0.15	1.56	0.85	2.85
	Middle	0.54	0.34	2.50	1	0.11	1.71	0.88	3.32
	H. School	0.42	0.33	1.68	1	0.19	1.53	0.80	2.89
	Intermediate	0.87	0.37	5.49	1	0.02	2.38	1.15	4.91
	Graduate	-0.03	0.32	0.01	1	0.94	0.97	0.52	1.84
	PG or Above	R		7.06	5	0.22			

CONCLUSION:

Based on energy intake per consumption unit nearly seven out of ten subjects had unsatisfactory consumption at household level. Individual food insecurity expressed in terms of energy intake vis-à-vis recommended dietary allowances prevailed in six out of ten subjects. Calorie inadequacy was universal in subjects primarily engaged as domestic worker, agriculture laborers, in service and skilled workers. Although calorie adequacy at individual level was significantly influenced by socioeconomic status; their relationship was reciprocal in nature.

High level of food insecurity at household level prevailing in the study area requires measure at household level in terms of improving food production, storage and preservation and instituting measures for enhancing their capabilities for promoting diversity in food consumption and calls for efficient nutritional counseling.

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