Nutritional Status and Its Reflection on Having Nutrition Deficiency and Others Diseases in Respondents of Sonbhadra District

*Dr.Vimalesh Kumar Singh, **Dr.K.C.Agrahari and, **Dr.Veena Singh

Address for correspondence
Dr. Veena Singh
Associate Professor
Department of Geography
G.D.Binani P.G.College, Mirzapur
U.P., India

Abstract: *The present study pointsout substantial variation in food consumption across the communities. Hindu respondents have a better dietary intake than Muslim counterparts. This statement is not inconformity to the NFHS-2 India survey report (2002). With regards to composite nutritional status index, 96.9 percent Muslim respondents fall in the category of poor nutritional status while in Hindu this proportion is 66.8 percent. Religion, education, occupation and income are an important predictors for having better nutritional status. Out of the total 420 respondents, about 63.3 percent respondents are suffering from some kind of deficiency diseases. This proportion is slightly higher (68.8 percent) in Muslms. Among Hindus, SC/ST respondents reveal worst condition (68.6 percent) than OBC and General caste. Among SC/ST respondents, asthma is more prevalent followed scurvy, amaemia and dental decay. Among OBC scurvy is at the top followed by anaemia and dental decay. Contrary, General caste respondents suffer more from diabetes followed by leprosy and asthma.*
Key words: Poverty, nutritional food intake, composite nutritional status index, multivariate analysis, nutritional deficiency and others diseases

I. Introduction

In order to achieve sustainable human development it seems imperative to workout the nutritional food intake and nutritional deficiency across the society so that the nutritional deficiency diseases could be brought in the limelight. This enables the planners for suggesting a sound and purposeful planning pertaining to well beings and health for the future. An assessment of the caloric intake has emerged as a significant geographical problem since long but no satisfactory and complete answer has so far been proposed (Singh, 1972).

Poverty is an enemy of the society and its elimination needs global attention through well formulated strategy. Poverty is the root cause for poor nutritional intake and low nutritional level in any society. Malnutrition adversely affects the mental development, physical growth, productivity and the span of working hours and as such that significantly influences the economic potential of men and thereby hinders the economic progress of the country (Chitralekha, 1982).

The nutritional availability study becomes essential on account of several reasons. On the one hand it provides reliable information for food planning. On the other hand nutritional deficiency affects the quality of population and its mobility behavior and as such it may be employed as a yardstick for measuring the level of socio-economic development (Singh et al., 1997). The nutritional availability reveals the actual food available for human consumption in an area at a given point of time. The measurement of nutritional availability rests on the determination of the quality of food that may fetch human consumption locally or otherwise (Dube et al., 1984). After having an idea of nutritional deficiency, the diseases related to it can be ascertained.

Objectives of the present study
The present study has been undertaken with the following major objectives:
(i) to know the status of nutritional food intake
(ii) to assess the composite nutritional status index and its association with socio-economic variables
(iii) to find out the pattern of nutrition and nutritional deficiency and others diseases

II.   Materials and methods

About the Study Area

Present study was conducted in Sonbhadra district which is located within latitudes 23º 51'22" N to 24º 53' 16" N and longitudes of 82º 31'55" E to 83º 33' 45" E covering an area of 6788 km^2. The Sonbhadra district is divided into eight community development blocks namely Robertsganj, Ghorawal, Chatara, Nagwa, Chopan, Meyorpur, Dudhi and Babhani. Sonbhadra district may be classified as largely rural district with merely 19 to 20 per cent population living in urban areas (Obra, Robertsganj, Churk, Duddhi, Chopan, Ghorawal, Renukoot and Pipri towns). According to 2001 census the study area was inhabited by 14,63,519 people and during the last decade (1991-2001), the population in each block has increased tremendously with an average increase of 36.49 per cent.

Database

Present work is an outcome of intensive field work. This study covers almost all salient features of nutrition and nutritional deficiency diseases in the people of Sonbhadra district. The primary information related to the nutrition and nutritional deficiency diseases has been generated through questionnaire based survey of 420 respondents. These respondents were taken from 28 villages (15 respondents from each village) based on purposive random sample. Infact samples had to be collected from 32 villages (4 villages from each development block) but due to naxalite effect 4 villages of Nagwa block were left in sample survey. Due to negligible share of Christian and Sikh and non existence of Baudh and Jain population in Sonbhadra district, they are not included in the sample survey.

Multivariate analysis has been used to show the association between nutritional diseases and socio-economic determinants. In order to know the important predictor for composite nutritional status index, logistic regression has been run. For multivariate and composite index analysis Strata SE 9.0 and SPSS 16.0 softwares are used and Sigmaplot 8.0 has been used for graph preparation.

III.   Result and discussion

Socio-economic profile of the respondents in Sonbhadra district

This study is based on 420 respondents selected from three caste categories such as General caste, Other backward caste and Scheduled caste/Scheduled tribe (table 1). Maximum respondents (173) belong to OBC caste followed by SC/ST (169) and General caste (78). These respondents have been taken according to their share in the total population.

Table 1: Castewise survey information in Sonbhadra district, 2008

Castes	Respondents	
	Number	Percent
SC/ST	169	40.2
OBC	173	41.2
General	78	18.6
Total	420	100.0

Source: Personal survey, 2008

Age groupwise classification of the respondents is given in table 2. This table revealed that more than 49 per cent respondents belong to age above 40 years. Only 11.2 per cent respondents are of lower age group (below 30 years). The number of respondents is increasing with increasing age groups.

Table 2: Age structure, 2008

Age group (years)	Respondents	
	Number	Percent
Below 30	47	11.2
30-35	58	13.8
35-40	108	25.7
Above 40	207	49.3
Total	420	100.0

Source: Personal survey, 2008

Out of the total respondents, 43.8 percent respondents are illiterate, 28.8 percent respondents are educated upto high school and 27.4 per cent respondents have education above high school (table 3).

Table 3: Level of literacy, 2008

Education level	Respondents	
	Number	%
Illiterate	184	43.8
Up to high school	121	28.8
Above high school	115	27.4
Total	420	100.0

Source: Personal survey, 2008

Table 4 indicates castewise grouping of the respondents according to their educational level. It is clear from this table that 87 per cent SC/ST respondents are illiterate leaving only 9.5 per cent literate upto high school and 3.5 per cent above high school. About 21.4 per cent OBC respondents are illiterate, 43.4 per cent literate upto high school and 35.3 per cent above high school. In General caste all respondents are literate.

Table 4: Castewise literacy, 2008

Castes	Education						Total	
	Illiterate		Up to high school		Above high school			
	Number	%	Number	%	Number	%	Number	%
SC/ST	147	87.0	16	9.5	6	3.6	169	100.0
OBC	37	21.4	75	43.4	61	35.3	173	100.0
General	-	-	30	38.5	48	61.5	78	100.0
Total	184	43.8	121	28.8	115	27.4	420	100.0

Source: Personal survey, 2008

Table 5 reveals that 44.3 per cent respondents belong to the lower income (below Rs 2000), 39.5 per cent belong to the category of Rs 2000-3500 monthly income, 9 per cent to the category of Rs 3500-5000 income and 7.1 per cent respondents possess income above Rs 5000 per month.

Table 5: Income groupwise respondents, 2008

Income (in Rs/month)	Respondents	
	Number	Percent
Below 2000	186	44.3
2000-3500	166	39.5
3500-5000	38	9.0
Above 5000	30	7.1
Total	420	100.0

Source: Personal survey, 2008

Analysis of nutritional food intake

The consumption of a variety of nutritious food is essential for keeping good health. A well balanced diet contains adequate amounts of protein, fat, carbohydrates, vitamins and minerals. Meat, fish, eggs, milk, and pulses are rich in protein. Green vegetables are rich sources of iron, folic acid, vitamin C, carotene, riboflavin and calcium. Vitamin C is also obtained from many fruits. Bananas are rich in carbohydrates. Papayas, mangoes and other yellow fruits contain carotene that is converted into vitamin A. Vitamin A is also present in milk and milk products as well as in egg yolks (Gopalan et al. 1996).

To get information about the nutritional food intake a question was asked from the people that how often they consume various types of food (daily, weekly, occasionally and never use). In the study area respondents consume pulses on daily basis and vegetables very often. 53.3 % respondents use milk and curd per day while 40.7% respondents use milk occasionally. A variety of fruits are not eaten every day. This food item is consumed weekly (29%) and occasionally (71%) basis. The majority of respondents (70.2%) take vegetables at least per day. Akin to fruits, in context of the consumption of eggs; and fish, meat and chicken, the condition of respondents is pitiable (table 6).

Table 6: Nutritional food intake, 2008

Food items	Condition of intake				Total
	Daily	Weekly	Occasional	Never use	
	%	%	%	%	
Milk/Curd	53.3	6.0	40.7	-	420
Fruits	-	29.0	71.0	-	420
Vegetables	70.2	21.2	8.6	-	420
Egg	2.4	29.0	56.9	11.7	420
Meet/fish	-	3.6	82.4	14.0	420
Sugar	95.0	-	5.0	-	420
Ghee/Oil	100.0	-	-	-	420

| Pulses | 61.4 | 31.7 | 6.9 | - | 420 |

Source: Personal survey, 2008

About 56.9% respondents eat eggs occasionally. In the case of meat and fish 82.40% use it occasionally. About 11.70% respondents say that they never eat eggs, and 14% respondents never eat meat/fish. Although the never say category for such items in Indian dietary system does not reveal true picture of non availability/affordability because the sizeable proportion of Hindus community respondents restrain themselves from consuming these food items due to the religious taboo.

The present survey pointouts substantial variation in food consumption of respondents across the communities. Hindu community respondents have a better dietary intake than Muslims. This statement is not in conformity to the NFHS-2 India survey report which states that Muslims consume every food item except dairy products more often than Hindus. The most interesting fact of this survey is that only in Muslim community there is not a single respondent who falls in a "never consume" category. A large number of the respondents of SC community consume fruits, meet/fish, egg and milk/curd occasionally. In context of dietary intake, OBC's respondents come next to SC's respondents. Thus, it can be inferred that respondents of SC and OBC communities have a relatively poor diet that is particularly deficient in milk and curd; fruits; eggs; and fish, meat and chicken.

Table 7: Religionwise nutritional food intake, 2008

Food items	Muslims				Hindus				Total
	Daily	Weekly	Occasional	Never use	Daily	Weekly	Occasional	Never use	
	%	%	%	%	%	%	%	%	
Milk/Curd	25.0	21.9	53.1	-	55.7	4.6	39.7	-	420
Fruits	-	3.1	96.9	-	-	31.2	68.8	-	420
Vegetables	37.5	62.5	-	-	72.9	17.8	9.3	-	420
Egg	3.1	25.0	68.8	3.1	2.3	29.4	55.9	12.4	420
Meet/fish	-	-	96.9	3.1	-	3.9	81.2	14.9	420
Sugar	96.9	-	3.1	-	94.8	-	5.2	-	420
Ghee/Oil	100.0	-	-	-	100.0	-	-	-	420
Pulses	59.4	40.6	-	-	61.6	30.9	7.5	-	420

Source: Personal survey, 2008

Table 8: Castewise nutritional food intake, 2008

Food items	SC/ST				OBC				General				Total
	Daily	Weekly	Occasional	Never use	Daily	Weekly	Occasional	Never use	Daily	Weekly	Occasional	Never use	
	%	%	%	%	%	%	%	%	%	%	%	%	
Milk/Curd	45.0	4.1	50.9	-	46.2	10.4	43.4	-	87.2	-	12.8	-	420
Fruits	-	11.2	88.8	-	-	21.4	78.6	-	-	84.6	15.4	-	420
Vegetables	46.2	32.5	21.3	-	80.3	19.7	-	-	100.0	-	-	-	420
Egg	-	24.9	70.4	4.7	2.9	36.4	59.0	1.7	6.4	21.8	23.1	48.7	420
Meet/fish	-	-	95.3	4.7	-	7.5	90.8	1.7	-	2.6	35.9	61.5	420
Sugar	95.9	-	4.1	-	96.5	-	3.5	-	89.7	-	10.3	-	420
Ghee/Oil	100.0	-	-	-	100.0	-	-	-	100.0	-	-	-	420
Pulses	30.8	54.4	14.8	-	76.3	21.4	2.3	-	94.9	5.1	-	-	420

Source: Personal survey, 2008

Multivariate analysis for composite nutritional status index

The binary logistic regressions to get the adjusted effect of the predictor variables on the dependent variables have been applied here. The results of the logistic regressions are presented in table 9. This table presents the results of logistic regression assessing the association between experience of the composite nutritional status and the explanatory variables. On account of smaller sample size the categories of religion and caste have been merged only in two categories. The 95 % confidence intervals are also presented in the table. The result shows that respondent's religion, education, income, and occupation are ($p<0.01$) high significantly associated with better CNSI and caste is ($p<0.05$) significantly associated with better CNSI. The probability for better CNSI is much higher in Hindus (odds ratio 30.77 times better condition) than Muslims. Similarly in comparison to SC/ST the probability for better CNSI is higher in non SC/ST castes (odds ratio 2.19). For a comparison of literate and illiterate respondents for having better CNSI illiterate has been taken as the reference category. High chance for better CNSI is in upto high school (odds ratio 3.46) and above high school educated respondents (odds ratio 4.63) than illiterate one. Income is most important factor for better CNSI. The analysis for this aspect indicates that for below Rs 2000 per month income group probability is one compared to Rs 2000-3500 income group (odds ratio 9.68), 3500-5000 income group (odds ratio 1.63) and above 5000 (odds ratio 16.73). Similarly, Occupation of the candidate is also

Table 9: Logistic regression results predicting the odds of composite nutritional status index (CNSI) according to selected socioeconomic and demographic characteristics

Covariates and Categories	Odds Ratio Exp(β)	95% Confidence interval	
Religion*			
Muslim®	1.00		
Hindu	30.77	3.60	262.52
Caste*			
SC/ST®	1.00		
Non SC/ST	2.19	0.96	4.97
Education*			
Illiterate®	1.00		
Up to high school	3.46	1.96	6.10
Above high school	4.63	2.63	8.15
Income groups*			
Below 2000®	1.00		
2000-3500	9.68	3.84	24.42
3500-5000	1.63	0.46	5.82
Above 5000	16.73	3.68	75.99
Occupation*			
Labour®	1.00		
Farmer	7.12	2.36	21.53
Govt. Job & Business	2.55	0.57	11.37
Family Type			
Joint®	1.00		
Nuclear	1.38	0.68	2.82
Age group			
Below 30®	1.00		
30-35	0.74	0.18	2.98
35-40	1.20	0.33	4.36
Above 40	3.82	1.11	13.12
Note: ***p<0.01, **p<0.05, *p<0.10			
Dependent variable: Better nutritional status (1); Poor nutritional status (0); ®- Reference category			
Comment: Religion, education, income, and occupation are important predictors of the having better nutritional status;			

Source: Personal survey, 2008

positively associated with better CNSI. In this analysis the labour category has been referenced one. The farmer category (odds ratio 7.12) and government job and business (odds ratio 2.55) category respondents have better

chance for nutritional status. Age group and family type have not appeared statistically significant in this analysis.

Nutritional deficiency and others diseases

In the study area scurvy, anaemia, asthma, dental decay, diabetes and leprosy have been found as the major deficiency diseases. Out of the total 420 respondents, about 63.3 per cent respondents are suffering with some kind of deficiency diseases. The percentage of respondents having no deficiency diseases is highest in OBC (42.19%) followed by General caste (35.9%) and SC/ST (31.36%). This means the highest percentage of respondents engulfed with deficiency diseases is recorded in SC/ST. Among SC/ST respondents, asthma is more prevalent followed by scurvy, anaemia and dental decay. Among OBC scurvy is at the top followed by anaemia and dental decay. Where as among respondents of General caste diabetes is more common followed by leprosy and asthma. The reason behind higher frequency of diabetes in General caste may be due to their less physical work than OBC and SC/ST respondents.

Table 10: Castewise information about nutritional deficiency diseases

Nutritional deficiency diseases	Castes						Total
	SC/ST		OBC		General		
	Number	%	Number	%	Number	%	
No deficiency	53	31.36	73	42.19	28	35.90	154
Anaemia	17	10.08	20	11.56	4	5.13	41
dental decay	15	8.88	19	10.98	4	5.13	38
Leprosy	10	5.92	9	5.20	12	15.38	31
Asthma	26	15.38	8	4.63	6	7.69	40
Diabetes	13	7.69	11	6.36	14	17.95	38
Scurvy	22	13.02	28	16.18	0	0	50
Others	13	7.69	5	2.90	10	12.82	28
Total	169	100.0	173	100.0	78	100.0	420

Source: Personal survey, 2008

IV. Multivariate analysis

The binary logistic regressions to get the adjusted effect of the predictor variables on the dependent variables have been applied here. The results of the logistic regressions are presented in table 11. This table presents the results of logistic regression assessing the association between nutritional deficiency diseases and the other explanatory variables. The relationship between religion and nutritional deficiency diseases is insignificant. The OBC category (2.59) and General category respondents reported higher odds ratio (1.71) compared to SC/ST reference category (one). Thus caste has been found to be ($p<0.05$) statistically significant. If a look is given on the educational category, ($p<0.01$) very significant association is observed with upto high school (odds ratio 0.51) and above high school (0.51) education than illiterate reference category (one). Similarly the income groups appeared ($p<0.01$) statistically

Table 11: Logistic regression results predicting the odds of having nutritional diseases according to selected socioeconomic and demographic characteristics

Covariates and Categories	Odds Ratio Exp(β)	95% Confidence interval	
Religion			
Muslim®	1.00		
Hindu	0.77	0.31	1.91
Caste**			
SC/ST®	1.00		
OBC	2.59	1.20	5.59
General	1.71	0.60	4.86
Education***			
Illiterate®	1.00		
Up to high school	0.51	0.31	0.82
Above high school	0.51	0.31	0.83
Income groups***			
Below 2000®	1.00		
2000-3500	0.31	0.15	0.65
3500-5000	0.25	0.07	0.85
Above 5000	0.23	0.05	1.18
Occupation***			
Labour®	1.00		
Farmer	0.42	0.18	0.96

Govt. Job & Business	0.17	0.05	0.59
Family Type*			
Nuclear®	1.00		
Joint	1.84	0.99	3.42
Age group			
Below 30®	1.00		
30-35	1.11	0.46	2.71
35-40	0.70	0.32	1.53
Above 40	0.71	0.34	1.47
Note: ***p<0.01, **p<0.05, *p<0.10			
Dependent variable: Having nutritional Disease (1); No nutritional disease (0); ®- Reference category			
Comment: Caste, education, income, occupation and family type are important predictors of the having nutritional diseases;			

Source: Personal survey, 2008

Significant because they revealed that income group second (odds ratio 0.31), third (odds ratio 0.25) and fourth (odds ratio 0.23) possess less odds ratio for having nutritional deficiency diseases compared to reference category (one). The table 24 indicated that occupations are (p<0.01) also significantly associated where farmers (odds ratio 0.42) and government job and business (odds ratio 0.17) respondents revealed less odds ratio than reference category labour (one) having higher percentage of nutritional deficiency disease. Family type is not as (p<0.10) significant as education, income and occupation. Age groups are also not statistically significant for having nutritional deficiency diseases.

V.   Summary and conclusion

In order to understand the nutritional food intake, nutritional status and nutritional deficiency diseases across various communities, this study has been carried out in Sonbhadra district of U.P. The substantial variation in nutritional food intake and nutritional status has been found across the communities as well as in terms of education, family type, occupation, income and age groups. Religion, occupation, income and education have been found important predictors for having better nutritional status. Scurvy, anaemia, asthma, leprosy, dental decay and diabetes are major nutritional deficiency diseases occurring in the area under study. Similarly education, income, occupation and caste appear important predictor for nutritional deficiency diseases. The results of this study hint at improving the educational and economic condition of rural masses of Sonbhadra district in particular and of India in general. Strong campaign for awareness towards nutritional food intake and nutritional deficiency diseases is must for reducing the suffering of people from nutritional deficiency diseases.

References

[1].   Chitralekha, R. (1982). Poverty and levels of nutrition: some more evidences, I.G.J., Madras, vol. 57, no. 1 & 2, pp. 58-61.
[2].   Dubey, R.S. and Mishra, R.P. (1984). Nutritional availability patterns in Madhya Pradesh, Trans., Inst. Of Indian Geographers, vol. 6, no. 2, pp. 79-89.
[3].   Gopalan et al. (1996).
[4].   NFHS-2, 2002.
[5].   Singh, B. (1972). A geographical appraisal of the caloric intake in Shahganj Tehsil, The N.G.J.I., Varanasi, vol XVIII, part -2, pp. 102-113.
[6].   Singh, M.B. et al. (1997) Poverty, nutrition and nutrition deficiency diseases in Kailhat village, Mirzapur district (U.P.), NGJI, vol. 43 (4), pp. 307-315, Dec. 1997.