A Comparative Study of Food Consumption and Nutritional Status of Women in West Bengal

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ABSTRACT The study tries to assess the nutritional status of women of age 15-49 years and draws a comparative picture of food intake and BMI of women residing in West Bengal. It also tries to understand the effect of the food intake, wealth index, education and occupation on anemia and BMI. Logistic regression, Pearson Chi-square test and t test have been used for analysis of the data provided by NFHS 3 (2005-2006). It is observed that 45.3 percent of rural women and 19.7 percent of urban women were underweight. Prevalence of anemia was high in rural areas. In case of food consumption, economic status and education; urban women are in better position than rural women. Women's health in rural West Bengal is thus facing a serious nutritional challenge. The study calls for immediate improvement of food consumption and nutritional status of women, especially in rural areas.

INTRODUCTION

Nutrition is the most important contributory factor for human resource development for a country. In developing countries, malnutrition that is, undernutrition and overnutrition, has become a serious and important public health issue. After liberalization, it is observed that the percentage of malnutrition is still high in west Bengal, as a result, productivity of the population is found to be affected. Simultaneously, proportion of over nourished population is increasing, particularly among urban women in West Bengal, whereas in rural areas prevalence of undernutrition is remaining at a high level. Maternal under nutrition plays a crucial role in influencing maternal, neonatal and child health outcomes (Mason et al. 2012). According to the data revealed by The Global Nutrition Report (2017) globally, 614 million women aged 15-49 years were affected by anemia. India had the largest number of women impacts, followed by China, Pakistan, Nigeria and Indonesia. In India and Pakistan, more than half of women of repro-

ductive age have anemia. It is a global issue that many women in high-income countries also suffer from obesity; prevalence rates may be as high as eighteen percent in countries such as France and Switzerland. According to Rousseau, "No mother, no child. Between them the duties are reciprocal; and if they are fulfilled badly on one side, they will be neglected on the other." (Rousseau 2009). This quotation is very appropriate to the subject of adequate nutrition for each woman.

Women are usually vulnerable to malnutrition for both social and biological reasons, throughout their life cycle. Reproductive aged women are subject to numerous stresses affecting the health and wellbeing. India is rapidly changing socio-economically. Now-a-days, women are not bound only in household activities, but they are also participating in different fields. And it has become a common feature. However, the changed social status of women has resulted in additional workload and stress. The aggregate workload placed on the women tends to be high thereby lowering efficiency and

leading to irreparable damage to body in the long run. It is necessary to take more care of women than men, who are vulnerable to malnutrition for both social and biological reasons throughout their life. Reproductive aged women are subject to numerous stress affecting health and wellbeing. According to Radhika et al. (2018), more than one-third of the adult women (20-49 years) in India are undernourished. Malnutrition in women is further aggravated by repeated pregnancies and lactation (Ronzio 2004).

Healthy lifestyle and high intake of nutritious food can provide good health throughout life to the humans. The poor nutrition and unawareness on the utilization of health facilities during their childhood and reproductive age are the major factors responsible for the high maternal mortality. Adequate nutrition for women would help them to serve as productive members of the society to develop the subsequent health generations (Kowsalaya and Manoharan 2017). The period of Adolescence appears to be the next available critical period to improve inadequacies in nutrition, growth and development from childhood (Radhika et al. 2018). Vatsala et al. (2017) explores that nutritional status is directly related to health of population and is influenced by the level of education, standard of living and social status. The study was carried out in South India. Study reveals that majority of the subject belonged to low income group in agriculture sector and rest produced food items from external sources. Income was found to be the major constraint restricting the adequate access to food which is evident from the study that majority of subjects show lower consumption of protective foods in daily diet.

Another study, conducted by Agarwal et al. (2016) in Lucknow city among urban women, finds that the employment opportunities to the women is not enough to bring change in their nutritional status. Increase in women's educational level and raising their awareness about balanced diet and nutritional requirement is also very important.

Bharati et al. (2008) investigates the severity and distribution of anemia among non-pregnant and pregnant women aged 15 to 49 years in urban and rural sectors of 26 States in India and its association with certain economic and biosocial factors. The study explores the severity of anemia among pregnant than non-pregnant women.

Objectives

1. To assess the nutritional status of women (15-49 year) of rural and urban areas in West Bengal based on BMI.
2. To draw a comparative picture of the food intake and BMI between rural and urban women.
3. To know the effect of food intake, wealth index, education and occupation on anemia and BMI.

METHODOLOGY

The data extracted from National Family Health Survey (NFHS-3 2005-06), are used in this study, which comprised of 6794 women of West Bengal. Among the total participants 3642 are from urban sector and 3152 from rural sector. All the respondents are females, aged between 15 to 49 years. Both married and unmarried women with working and non-working demarcation are considered.

The researchers use raw data of NFHS 3 for the state West Bengal. The variables like occupation (not working, labour, sales and service, clerical, professional, technical and managerial), education (No education, primary educated, secondary educated, highly educated), body mass index (underweight, normal, overweight and obese), anemia (severe anemia, mild and moderate, not anemic), wealth index (poorest, poorer, middle, richer and richest) and food intake (milk or curd, pulse or beans, green leafy vegetables, fruits, eggs, chicken or meat) are recorded as per the requirements. Pearson Chi-square and t-tests have been used. SPSS and Microsoft Word are used to analyze the data and report writing.

RESULTS

Table 1 reveals the variation of socio-demographic and nutritional status of women by rural and urban sectors in West Bengal. Percentage of not working women is found to be more in urban area (69.1%) than in rural area (62.8%). In rural area, most of the women are occupied in the category designated as 'others', which comprises of manual (labor), clerical and sales related jobs. The percentages of women engaged in this category are 35.4 percent and 23.3 percent in rural and urban areas respectively. Professional, Technical and managerial occupation are more

Table 1: Rural and urban differentials in percentage distribution of women15-49 years in West Bengal

Indicators	Level	Rural	Urban
Occupation	Not working	1979 (62.8)	2515 (69.1)
	Professional, technical and managerial	56	276
	Others	(1.8) 1117 (35.4)	(7.6) 851 (23.4)
	Total	3152 (100)	3642 (100)
Education	Not literate	1355 (43)	756 (20.8)
	Literate	1797 (57)	2886 (79.2)
	Total	3152 (100)	3642 (100)
Anemia	Anemic	1992 (64.8)	1902 (56.4)
	Not anemic	1084 (35.2)	1471 (43.6)
	Total	3076 (100)	3373 (100)
BMI	Underweight	1409 (45.3)	688 (19.7)
	Normal	1533 (49.3)	1862 (53.3)
	Overweight and obese	165 (5.3)	944 (27)
	Total	3107 (100)	3494 (100)
Wealth Index	Poor	2070 (65.7)	175 (4.8)
	Non poor	1082 (34.3)	3467 (95.2)
	Total	3152 (100)	3642 (100)

Source: Data extracted from NFHS 3
The values in parenthesis () represent the percentages for each category

frequent among urban women. The percentage of women who are not literate is very high among rural women (43%), compared to urban woman (20.8%). In higher levels of education, urban women are way ahead of the rural woman. Anemia is the most common health problem suffered by Indian women. Among the participants, 64.8 percent women from rural area and 56.4 percent women from urban area are suffering from the burden of anemia. Trend of underweight is more among rural women that is, 45.3 percent in rural in comparison to 19.7 percent in urban. On the other hand, overweight and obesity tend to be more among urban women (27%) than among

rural women (5.3%). Wealth Index plays a significant role in determining the women's health condition. 65.7 percent women in rural sector belong to poor wealth index group which is much more in comparison to urban sector of 4.8 percent. According to wealth index urban women are in a much better position than the rural women.

Regarding the food consumption pattern differential as shown in Table 2, rural women in West Bengal are found to be in very bad situation. Many of the urban women are taking puls-

Table 2: Rural-urban differentials in percentage distribution of women in West Bengal with respect to their food consumption pattern

Food consumption	Rural		Urban	
	Number	(%)	Number	(%)
Milk/Curd				
Daily	539	(17.1)	960	(26.4)
Weekly	285	(9)	608	(16.7)
Occasionally	1517	(48.1)	1474	(40.5)
Never	811	(25.7)	600	(16.5)
Total	3152	(100)	3642	(100)
Pulses or Beans				
Daily	1054	(33.4)	2486	(68.3)
Weekly	1604	(50.9)	974	(26.7)
Occasionally	408	(12.9)	129	(3.5)
Never	86	(2.7)	53	(1.5)
Total	3152	(100)	3642	(100)
Green Leafy Vegetables				
Daily	2192	(69.5)	2709	(74.4)
Weekly	884	(28)	814	(22.4)
Occasionally	71	(2.3)	97	(2.7)
Never	5	(0.2)	22	(0.6)
Total	3152	(100)	3642	(100)
Fruits				
Daily	112	(3.6)	786	(21.6)
Weekly	452	(14.3)	1047	(2.7)
Occasionally	2201	(69.8)	1700	(46.7)
Never	387	(12.3)	109	(3)
Total	3152	(100)	3642	(100)
Eggs				
Daily	250	(7.9)	333	(9.1)
Weekly	1693	(53.7)	2095	(57.5)
Occasionally	997	(31.6)	794	(21.8)
Never	212	(6.7)	420	(11.5)
Total	3152	(100)	3642	(100)
Fish				
Daily	891	(28.3)	1362	(37.4)
Weekly	1768	(5.1)	1811	(49.7)
Occasionally	444	(14.1)	239	(6.6)
Never	49	(1.6)	230	(6.3)
Total	3152	(100)	3642	(100)
Chicken or Meat				
Daily	66	(2.1)	181	(5)
Weekly	546	(17.3)	1820	(50)
Occasionally	2335	(74.1)	1355	(37.2)
Never	205	(6.5)	286	(7.9)
Total	3152	(100)	3642	(100)

es or beans (68.3% of urban women) and milk or curd (26.4% of urban women) daily, but among rural women only 33.4 percent are taking pulses or beans and 17.1 percent are taking milk or curd daily. The difference, however, is less in case of vegetables. Urban women are enjoying a better position also in case of fruits, eggs, chicken or meat and fish consumption. The respective percentages are 21.6 percent, 9.1 percent, 5 percent and 37.4 percent for urban women and 3.6percent, 7.9 percent, 2.1 percent and 28.3 percent for the rural counterpart. This clearly indicates the low status of rural women in West Bengal in consumption of food in comparison to urban women.

Table 3 shows the relation of anemia and women's occupation in rural and urban places of residence. This table reveals that prevalence of anemia is more among women, who are in the 'not working' category (urban 55.78% and rural 65.02%). Many of the rural women who were engaged in 'others' category (laborious, sales and clerical work) are suffering from the burden of anemia (65%). Not anemic women are more in urban than in rural areas.

Table 3: Relation between anemia and occupation of rural and urban women of age 15-49 years, West Bengal

Occupation Anemia	Not working	Professional technical and managerial	Others	Pearson Chi-square value
Rural				
Anemic	1253 (65.02)	26 (50)	713 (65)	5.049*
Not anemic	674 (34.98)	26 (50)	384 (35)	
Total	1927 (100)	52 (100)	1097 (100)	
Urban				
Anemic	1297 (55.78)	128 (50.2)	477 (60.15)	8.886**
Not anemic	1028 (44.22)	127 (49.8)	316 (39.85)	
Total	2325 (100)	255 (100)	793 (100)	

Source: Data extracted from NFHS 3
The value in parenthesis () represent the percentages for each category
**P<0.05, *p<0.1

Table 4 reveals that women with literacy are less likely to develop anemia. This is true for both rural and urban areas. The prevalence of anemia among literate women is 62.18 percent as against 68.18 percent among not-literate women in rural West Bengal. These percentages in urban areas are 55.33 percent and 60.37 percent respectively. This also shows that rural women are more prone to be anemic.

Table 4: Relation between anemia and education of rural and urban women of age 15-49 years, West Bengal

Education BMI	Not literate	Literate	Pearson Chi-square value
Rural			
Anemic	900 (68.18)	1092 (62.18)	11.867***
Not anemic	420 (31.82)	664 (37.82)	
Total	1320 (100)	1756 (100)	
Urban			
Anemic	428 (60.37)	1474 (55.33)	5.776**
Not anemic	281 (39.63)	1190 (44.67)	
Total	709 (100)	2664 (100)	

Source: Data extracted from NFHS 3
The value in parenthesis () represent the percentages for each category
***P<0.01, **p<0.05

In Table 5, the researchers find the relationship of anemia and wealth index separately for rural and urban women. Women with poor wealth index suffer more from the burden of anemia.

Table 6 similarly shows the relation between BMI and wealth index among rural and urban women. It is found that the percentages of underweight women are more among poor rural women. Urban women are more prone to become over-weight or obese. Percentage of healthy (that is, with normal health according to BMI criterion) women among non-poor households in rural and urban areas are 57.1 percent and 53.45 percent respectively. Prevalence of overweight and obesity are high among women with non-poor wealth index category. It is observed that high wealth index increases the tendency of over-weight and obesity among urban women.

From Table 7, it is observed that not literate women suffer more from being underweight both in rural and urban areas. Literacy among women

Table 5: Relation between anemia and wealth index of rural and urban women of age 15-49 years, West Bengal

WI Anemia	Poor	Non-poor	Chi-square value
Rural			
Anemic	1368 (67.32)	624 (43.55)	17.238***
Not anemic	664 (32.68)	420 (56.45)	
Total	2032 (100)	744 (100)	
Urban			
Anemic	125 (75.76)	1777 (55.39)	26.465***
Not anemic	40 (24.24)	1431 (44.61)	
Total	165 (100)	3208 (100)	

Source: Data extracted from NFHS 3
The value in parenthesis () represent the percentages for each category
***p<0.01

Table 6: Relations between BMI and wealth index of rural and urban women of age 15-49 years, West Bengal

Wealth BMI	Poor	Non-poor	Chi-square value
Rural			
Underweight	1068 (52.3)	341 (32.01)	178.275***
Normal	925 (45.3)	608 (57.1)	
Overweight and obese	49 (2.4)	116 (10.89)	
Total	2042 (100)	1065 (100)	
Urban			
Underweight	75 (44.64)	613 (18.44)	86.809***
Normal	84 (50)	1778 (53.45)	
Overweight and obese	9 (5.36)	935 (28.11)	
Total	168 (100)	3326 (100)	

Source: Data extracted from NFHS 3
The value in parenthesis () represent the percentages for each category
***P<0.01

reduces the incidences of underweight among rural and urban women. Naturally, overweight or obese women are found to be more among educated mothers in both rural and urban areas.

Table 7: Relations between BMI and education of rural and urban women of age15-49 years, West Bengal

Education BMI	Not	Literate	Chi-square test
Rural			
Underweight	677 (50.9)	732 (41.2)	178.275***
Normal	612 (46.02)	921 (51.82)	
Overweight and obese	41 (3.08)	124 (6.98)	
Total	1330 (100)	1777 (100)	
Urban			
Underweight	178 (24.38)	510 (18.45)	86.809***
Normal	410 (56.16)	1452 (52.53)	
Overweight and obese	142 (19.46)	802 (29.02)	
Total	730 (100)	2764 (100)	

Source: Data extracted from NFHS 3
The value in parenthesis () represent the percentages for each category
***P<0.01

Tendency of obesity are more among literate mothers in both urban (29.02%) and rural women (6.98%) areas.

Table 8 shows the relation of BMI and occupation among rural and urban women. Women, who are in the 'not working' category, are more undernourished compared to those in the 'Professional, Technical and Managerial' category. In both the categories, women suffer from dual burden of malnutrition. However, the highest percentages of underweight women are found among women in 'others' category. Also, in this category, there are less numbers of overweight and obese women. Better nutritional condition is found among professionals.

Table 9 shows rural and urban differences in BMI according to food consumption frequencies. Since the mean food consumption among urban women is more, we get mean BMI also more among urban women. This is reflected in all the tests. There may be one more reason for mean BMI of urban women to be more than that of rural women. The urban women lead a more sedentary life. The researchers thus do not get any difference of pattern of BMI between 'Never or occasionally' and 'Daily or weekly' groups. The only thing that the mean BMI among wom-

Table 8: Relation between BMI and occupation of rural and urban women of age 15-49 years, West Bengal

Occupation BMI	Not working	Professional technical and managerial	Others	Pearson Chi-square value
Rural				
Underweight	831	18	560	46.394***
	(42.62)	(33.33)	(50.78)	
Normal	982	32	519	
	(50.36)	(59.26)	(47.05)	
Overweight	137	4	24	
and obese	(7.02)	(7.41)	(2.17)	
Total	1950	54	1103	
	(100)	(100)	(100)	
Urban				
Underweight	440	40	208	41.195***
	(18.29)	(14.81)	(25.42)	
Normal	1274	141	447	
	(52.95)	(52.22)	(54.65)	
Overweight	692	89	163	
and obese	(28.76)	(32.97)	(19.93)	
Total	2406	270	818	
	(100)	(100)	(100)	

Source: Data extracted from NFHS 3
The value in parenthesis () represent the percentages for each category
***P<0.01

en in the 'Daily or weekly' group is more than those in the 'Never or occasionally' group. This has been found to be significant for almost all the items of food consumption except for 'Green leafy vegetables' in rural areas (Table 10). In urban areas, significant difference has been found for 'Milk or curd', 'Fruits', and 'Meat and chicken' only, which are costly items.

Table 11 shows logistic regression of anemia on consumption of different food items, wealth index, education and occupation of rural women of age (15-49) years. Since the value 1 has been assigned to an anemic woman, the negative value of the coefficient will imply that the chance of a rural woman to be non-anemic is higher with the increase in the value of the variable. It is thus found that household economic status (Wealth Index) is an important variable towards reduction of anemia of rural women, that is poor rural women are more likely to be anemic compared to non-poor rural women. Consumption of the most of the food items has also negative effect towards anemia of rural mothers, though the researchers did not get the coefficients to be significant. The chance of anemia is significantly (at 10% level) lower in rural women with high education level.

The results of the logistic regression of anemia on consumption of different food items,

Table 9: Rural-urban difference of average BMI by intensity of food consumption

Variable	Rural		Urban		
	Mean	SD	Mean	SD	t
Milk or curd					
Never or occasionally	19.1239	2.8937	22.2163	4.47307	27.248***
Daily or weekly	19.8692	3.13137	22.959	4.40188	17.770***
Pulse or Beans					
Never or occasionally	18.9371	2.69357	21.9621	5.0367	9.872***
Daily or weekly	19.3899	3.01984	22.5649	4.42384	37.478***
Green Vegetables					
Never or occasionally	18.8533	2.53351	22.5286	4.90213	5.881***
Daily or weekly	19.3304	2.98463	22.5286	4.90213	33.587***
Fruits					
Never or occasionally	19.1592	2.8816	21.821	4.43466	23.871***
Daily or weekly	20.0569	3.27763	21.821	4.43466	15.836***
Eggs					
Never or occasionally	19.0982	2.80039	22.7133	4.51343	23.463***
Daily or weekly	19.4572	3.07226	22.4463	4.42719	25.048***
Fish					
Never or occasionally	18.9325	2.78036	22.523	4.66108	14.167***
Daily or weekly	19.3909	3.00524	22.5474	4.4269	30.942***
Meat or Chicken					
Never or occasionally	19.2137	2.88874	22.1572	4.38616	25.881***
Daily or weekly	19.756	3.27674	22.8451	4.49209	15.673***

Source: Data extracted from NFHS 3
***p<0.01

Table 10: Difference of mean BMI between 'low' and 'high' frequency of consumption of different food items separately for rural and urban

	Daily or weekly		Never or occasionally		
	Mean	*SD*	*Mean*	*SD*	*t*
Milk or curd					
Rural	19.8692	3.13137	19.1239	2.8937	6.183***
Urban	22.959	4.40188	22.2163	4.47307	4.911***
Pulses or Beans					
Rural	19.3899	3.01984	19.9371	2.69357	3.083***
Urban	22.5649	4.42384	21.9621	5.0367	1.74
Green Leafy Vegetables					
Rural	19.3304	2.984633	18.8533	2.53351	1.345
Urban	22.5354	4.44235	22.5286	4.90213	0.016
Fruits					
Rural	20.0569	3.27763	19.1592	2.8816	6.485***
Urban	23.2412	4.36724	21.821	4.43466	9.576***
Eggs					
Rural	19.4572	3.07226	19.0982	2.80039	3.278***
Urban	22.4463	4.42719	22.7133	4.51343	1.675
Fish					
Rural	19.3909	3.00524	18.9325	2.78036	3.125***
Urban	22.5474	4.4269	22.4523	4.66108	0.424
Meat or Chicken					
Rural	19.756	3.27674	19.2137	2.88874	4.035***
Urban	22.8451	4.49209	22.1572	4.38616	4.571***

Source: Data extracted from NFHS 3
***p<0.01

Table 11: Logistic regression of anemia of rural women of age 15-49 years on frequency of consumption of different food items, wealth index, education and occupation

Name of the variables	Coefficient	Significance	Exp (B)
Fish	-0.163	0.158	0.849
Milk/curd	-0.102	0.269	0.903
Pulse/beans	-0.086	0.442	0.918
Vegetables	0.372	0.13	1.45
Fruits	-0.045	0.674	0.956
Eggs	-0.055	0.521	0.947
Chicken/meat	0.1	0.319	1.105
Household wealth index	-0.243	.006***	.784***
Education	-0.156	.065*	.856*
Occupation	-0.136	0.106	0.877
Constant	0.732	0.006	2.079

Source: Data extracted from NFHS 3
***p<0.01,**p<.0.05, *p<0.1

wealth index, education and occupation of urban women of age (15-49) years are shown in Table 12. The results for urban women is similar to those of rural women except the fact that the researchers have not found the coefficient of education to be significant here. The effect of household wealth index remains to be significant as strongly as that of rural women. Since urban women consume fish, chicken and fruit

with high frequency, the effect of these three variables have been found to be significant. However, it is not clear why the coefficient of 'Fish consumption' shows positive value.

Table 12: Logistic regression of anemia of urban women of age 15-49 years on frequency of consumption of different food items, wealth index, education and occupation

Name of the variables	Coefficient	Significance	Exp (B)
Fish	0.285	0.012	1.33
Milk/curd	0.061	0.429	1.063
Pulse/beans	-0.094	0.57	0.91
Vegetables	-0.078	0.696	0.925
Fruits	-0.197	.011**	.822**
Eggs	0.033	0.686	1.033
Chicken/meat	-0.205	.006***	.815***
Household wealth index	-0.799	.000***	.450***
Education	-0.043	0.646	0.958
Occupation	-0.016	0.837	0.984
Constant	1.141	0	3.131

Source: Data extracted from NFHS 3
***p<0.01,**p<.0.05, *p<0.1

In a similar manner the researchers have carried out the logistic regressions of BMI on consumption of different food items, wealth index, education and occupation of women of age (15-

49) years separately for rural and urban sectors. Here also the underweight women received value 1 as against 0 for non-underweight women. The results are shown in Tables 13 and 14. Consumption of fruit is seen to have significant effect on the BMI for both rural and urban sectors. Thus, women who consume fruits daily or weekly have less chance to become underweight. The food item 'pulse/beans' is coming as a significant variable for urban women. As in the case of anemia, 'Household Wealth Index' is seen to be a strongly significant factor towards reducing the chance of becoming underweight for both rural and urban women. Women's occupation also plays significant role in determining the nutritional status, especially in rural areas. The women with low occupation (manual labors, etc.) in rural areas are found to have more chance to become undernourished and it is significant at one percent level.

Table 13: Logistic regression of BMI of rural women of age 15-49 years on frequency of consumption of different food items, wealth index, education and occupation

Name of the variables	Coeffi-cient	Signifi-cance	Exp (B)
Fish	-0.09	0.405	0.914
Milk/curd	-0.142	0.12	0.868
Pulse/beans	0.027	0.797	1.027
Vegetables	-0.137	0.579	0.872
Fruits	-0.262	.015**	.769**
Eggs	0.053	0.522	1.054
Chicken/meat	-0.068	0.49	0.934
Household wealth index	-0.703	.000***	.495***
Education	-0.081	0.314	0.922
Occupation	0.136	.081*	1.146*
Constant	0.289	0.271	1.335

Source: Data extracted from NFHS 3
***p<0.01,**p<.0.05, *p<0.1

Tables 15 and 16 show the effect of same set of variables on anemia and BMI of women respectively after combining the rural and urban data. The logistic regression of anemia shows that 'Fruit consumption' and 'Household Wealth Index' are two main overall factors towards improvement of health of women so far as anemia and underweight are concerned. Women's education again has come out as a significant factor in reducing the chance of becoming anemic for women, whereas 'Eggs', Chicken/Meat' and 'Women Occupation' become the significant factors in reducing the chance of becoming underweight for women.

Table 14: Logistic regression of BMI of urban women of age 15-49 years on frequency of consumption of different food items, wealth index, education and occupation

Name of the variables	Coeffi-cient	Signifi-cance	Exp (B)
Fish	-0.187	0.173	0.83
Milk/curd	-0.05	0.615	0.952
Pulse/beans	-0.408	.023**	.665**
Vegetables	-0.184	0.416	0.832
Fruits	-0.685	.000***	.504***
Eggs	0.15	0.138	1.161
Chicken/meat	-0.043	0.638	0.958
Household wealth index	-0.954	.000***	.385***
Education	0.048	0.663	1.049
Occupation	0.13	0.166	1.139
Constant	0.376	0.238	1.457

Source: Data extracted from NFHS 3
***p<0.01,**p<0.05,*p<0.1

Table 15: Logistic regression of anemia of women of age 15-49 years on frequency of consumption of different food items, wealth index, education and occupation

Name of the variables	Coeffi-cient	Signifi-cance	Exp (B)
Fish	0.069	0.39	1.071
Milk/curd	-0.019	0.746	0.981
Pulse/beans	-0.103	0.26	0.902
Vegetables	0.108	0.488	1.114
Fruits	-0.152	.013**	.859**
Eggs	0.004	0.945	1.004
Chicken/meat	-0.09	0.122	0.914
Household wealth index	-0.358	.000***	.699***
Education	-0.117	.060*	.890*
Occupation	-0.056	0.311	0.945
Constant	0.785	0	2.192

Source: Data extracted from NFHS 3
***p<0.01,**p<0.05, *p<0.1

Table 16: Logistic regression of BMI of women of age 15-45 years on frequency of consumption of different food items, wealth index, education and occupation

Name of the variables	Coeffi-cient	Signifi-cance	Exp (B)
Fish	-0.086	0.307	0.917
Milk/Curd	-0.083	0.212	0.92
Pulse/Beans	-0.111	0.224	0.895
Vegetables	-0.148	0.375	0.863
Fruits	-0.557	.000***	.573***
Eggs	0.111	.079*	1.117*
Chicken/Meat	-0.155	.017**	.856**
Household wealth index	-1.073	.000***	.342***
Education	-0.024	0.709	0.976
Occupation	0.109	.068*	1.115*
Constant	0.372	0.047	1.451

Source: Data extracted from NFHS 3
***p<0.01,**p<0.05, *p<0.1

DISCUSSION

The present study reveals that about 45.3 percent rural women and only 19.7 percent urban women are found to be underweight in terms of BMI. Similar results were found in a recent study among women of Rajasthan, India. It was observed that inadequate nutrition food has led to under nutrition problem among women. About forty-two percent of women fall under the grip of moderate to severe malnutrition. As a result of which malnourished mothers give birth to low weight babies (Jukariya et al. 2018). According to Rout (2009), maternal literacy has a significant relationship with the nutritional status of children. A study by Kaur and Kochar (2009) on rural and urban Jat women in Haryana State shows an alarming condition of the prevalence of anemia and dietary intake of rural and urban middle aged (40-59 years) and older (60 and above) Jat women. Daily dietary intake of rural and urban subject was below the recommended dietary allowances. Anemia among these women may be attributed to inadequate dietary intake, illiteracy and poor access to health services. In the present study it is seen that literacy among women reduces the incidences of underweight among rural and urban women. Naturally, overweight or obese women are found to be more among educated mothers in both rural and urban areas. Maternal education is important in reducing the risk of anemia and in increasing children's healthy food consumption. Women's education has come out as a significant factor in reducing the chance of becoming anemic for women, whereas 'Eggs', Chicken/Meat' and 'Women's Occupation' become the significant factors in reducing the chance of becoming underweight for women. 'Fish consumption' does not have a significant effect. The women's employment increases household income, which directly benefits household nutrition in general and women's nutritional status, in particular. Rout (2009) concluded that most of the rural women when categorized were found to be taking less food than their requirements.

Household wealth index, which is directly related with the economic status, appears to be an important determinant of nutritional status in women. The wealth index is a composite measure of a household's cumulative living standard. The wealth index is calculated because it is easy to collect data on a household's ownership of selected assets, such as televisions and bicycles; materials used for housing construction; and types of water access and sanitation facilities. Study of Maiti et al. (2013) revealed that the overall prevalence of anemia among women was 70.1 percent in Paschim Medinipur, India. Lower body mass index is also associated with higher prevalence of anemia. It is reflected from the present study that household economic status (Wealth Index) is an important variable towards reduction of anemia of rural women, that is, poor rural women are more likely to be anemic compared to non-poor rural women. Consumption of most of the food items has also negative effect towards anemia of rural mothers, though the researchers did not get the coefficients to be significant. The chance of anemia is significantly (at 10% level) low in rural women with high education level. As in the case of anemia, 'Household Wealth Index' is also seen to be a strongly significant factor towards reducing the chance of becoming underweight for both rural and urban women. Women's occupation also plays significant role in determining the nutritional status, especially in rural areas. The women with low occupation (manual labors, etc.) in rural areas are found to have more chance to become undernourished and it is significant at one percent level.

CONCLUSION

There is much variation of socio-demographic and nutritional status of women between rural and urban sectors of West Bengal. Professional, technical and managerial occupations are found more among urban women. Prevalence of anemic and underweight women are more in rural areas than in urban areas. Economic status has a profound positive effect on the status of health of women.

RECOMMENDATIONS

All these clearly suggest a condition of emergency for improving the nutritional status of women in West Bengal especially in rural areas. Government of India has adopted several programs and policies for development of health; still target rates are yet to be achieved. However, there are several obstacles like lack of education, poverty etc., that stand in the way to achieve the target.

To conclude, 'Fruit Consumption' and 'Household Wealth Index' are the two main overall factors towards improvement of health of women so far as anemia and underweight are concerned. Thus, increase of fruit consumption is recommended for women, especially for rural women.

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