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NUTRITIONAL STATUS, DIETARY DIVERSITY AND SOCIOECONOMIC CONDITIONS OF SELECTED TRIBAL WOMEN IN NORTHERN BANGLADESH

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Abstract

The consequences of low diversified diets among rural women are profound. Therefore, increasing dietary diversity based on food group indicators (FGIs) acts as a proxy indicator for nutrient adequacy of women in rural settings. A cross sectional observational study was design to assess the nutritional status, habitual food intake pattern and women's diet diversity scores (WDDS) of tribal women in Northern Bangladesh. A total of 106 women aged 15-49 years were selected purposively. The (mean ± S.D) age of the women was 32.1±9.9 years old and 90% were currently married. Around 36.8% women were illiterate and 39.6% studied up to secondary level. Average monthly family income was Taka 4918 and 82% women were housewife. The rate of women empowerment is very low, only 33% women felled little decision power over the use of income. Around 83% households faced financial crisis during the lean period (Asyshin- 93.5% and Katric-88.3%). Mean weight of the tribal women was 45.5±7.6 kg and there was no increasing trend of weight with the increase of age. Mean height and Mid Upper Arm Circumference (MUAC) was determined as 149.9±5.4 cm and 25.3±10 cm. Though the mean Body Mass Index (BMI) (20.1 ± 2.8 kg/m^2) of tribal women identified as normal, 29% women were assessed as underweight (BMI<18.5 kg/m^2) and 15% were overweight (BMI>23 kg/m^2) based on Asian BMI criteria. The food frequency questionnaire (FFQ) results showed that most of the women consumed rice daily and fewer women consumed less frequently wheat flour; vitamin-A rich fruits and vegetables, legumes, flesh meat, organ meat and dairy products. The mean women's diet diversity scores (WDDS) corresponding to 9 and 10 food group indicators (FGI-9 and FGI-10) were almost same; 3.25 ± 0.81 and 3.26 ± 0.79 except for non-pregnant and non-lactating women (NPNL); 3.5 for FGI-10 and 3.0 for FGI-9. Only 7% women consumed at least 5 or more major food groups (≥ 5 foods). The WDDS of most women (>50%) clustered on 3 points out of 9 or 10 FGI scores.

Key words: Nutritional status, Dietary diversity, Tribal women

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Introduction

The Oxford Poverty and Human Development Initiative in 'Bangladesh Country Briefing-2015' reported that Bangladesh is a land of 162.42 million people in which more than 77.4 million people are living in multidimensional poverty, representing 49.5% of the national population. A striking feature of this multidimensional poverty is the strong contribution of malnutrition to poverty vicious cycle. In Bangladesh, malnutrition is the single largest contributor to the Multidimensional Poverty Index (MPI) representing 0.253 of the overall MPI; and 37.3% of poor people with severe poverty 13.2%. Other nutrition related components of the MPI include nutrition (12%), child mortality (13%) and sanitation (9%) and years of schooling (14%). MPI in rural area is 0.195 whereas in Rangpur district, (Northern part), it is 0.217 and in Rajshahi (North-West part); MPI is 0.108. A still high level 47.3% of Rangpur citizens live in multidimensional poverty and among them 14.1% are suffering from extreme poverty. The corresponding figures for Rajshahi district are 25.5% and 6.9 % respectively (OPHI, 2015).

There are 2 million of tribal people living in different parts of Bangladesh. The North-West parts are also home to many indigenous communities representing mainly plain tribal (PT) where the Santal people with various ethnicity represent one of the largest tribal groupings and traditionally live on land currently located at Rangpur and Rajshahi division. These people practice own social organization, marital customs, food beliefs, and other social tradition (Mullah *et al*., 2007). The objectives of the study as follows: i) to know the socioeconomic condition of tribal women of the north part, ii) to identify the food security status of studied tribal women, iii) to study the anthropometric measurements such as weight, height, mid upper arm circumference (MUAC) and body mass indexes (BMI) of the studied women, and iv) to investigate the women dietary diversity scores (WDDS) for various food group indicators (FGIs).

Materials and Methods

This observational and cross-sectional study was conducted at Betdhigi, Aladipur (from Fhulbari sub-district) and Khanpur (from Birampur sub-district) in the Dinajpur district and Bhadsa and Mohammadabad in the Joypurhat district. The study population comprised of 106 women aged 15-49 years were selected purposively. The parameters taken to assess the dietary diversity and nutritional status of the tribal women of reproductive age were demographic, socioeconomic, anthropometric, food security and dietary information.

The questionnaire was used, which is an instrument specially designed for 15-49 aged women. It comprised 7 sections, which are based on the following components-demographic information, anthropometry, socio-economic, agricultural, household food security and coping strategies, dietary information (diet diversity scores, food frequency questionnaire) and women empowerment. All questions were designed, pre-tested, modified and resettled to obtain and record information easily. Any modification

necessary were then made and a final pre-coded, pre-tested questionnaire was drawn up. The determination of sample size was based on the WDDP-I & II project carried out by Food and Nutrition Technical Assistant-II (FANTA-2) in Bangladesh during the period of 2005-06 (Arimond *et al*., 2009).

Results and Discussion

Socioeconomic Information

Socioeconomic and Demographic characteristics of the studied women are presented in Table 1. The Table 1 shows that around 46.2% of women (n= 49) were sampled from Dinajpur district (Rangpur division) and 53.8% (n=57) from Joypurhat district (Rajshahi division). Approximately one third of women (27.4%) were in between the age of 20-24 years followed by 14% of women whose age between 25-29 years and minimum numbers of respondents' (4.7%) age were between 15-19 years. Almost all of the women (89.6%) were currently married, followed by never married (7.5%) and widowed (2.8%). In case of women by physiological status, two-thirds of the women were mother/caregiver who had the children above two years, 22.6% women were non-pregnant and non-lactating women (NPNLW), 13.2% were lactating mother, and only 1.9% was pregnant.

Table 1. Frequency distribution of the Characteristics of studied tribal women

No	Characteristics	Value[1]
1	**Total number of Women**	106
	Dinajpur	49 (46.2)
	Joypurhat	57 (53.8)
2	**Age**	
	15-19 yrs	5 (4.
	20-24 yrs	29 (27.4)
	25-29 yrs	15 (14.2)
	30-34 yrs	13 (12.3)
	35-39 yrs	8 (7.5)
	40-44 yrs	17 (16)
	45-49 yrs	19 (17.9)
3	**Marital status**	
	Currently married	95 (89.6)
	Never married	8 (7.5)
	Widowed	3 (2.8)
4	**Number of children in each households**	
	0 children	11 (11.1)
	1 children	22 (20.2)
	2children	39 (39.4)
	3children	20 (20.2)
	4children	6 (6.1)
	5children	1 (1)

5	**Physiological status of the female**	
	Non-pregnant non-lactating women	24(22.6)
	Lactating mothers	14(13.2)
	Pregnant mother	2(1.9)
	Mother/care giver of children ≥ 2 years	66(62.3)
	Pregnancy status	
	Yes	2 (2%)
	No	97 (98%)
7	**Religion**	
	Hinduism	60 (56.6)
	Christianity	46 (43.4)
8	**Educational qualification**	
	Illiterate	39(36.8)
	Primary	17(16.0)
	Secondary	42(39.6)
	Higher Secondary	3 (2.8)
	Graduate	5 (4.7)
9	**Occupation**	
	Housewife	87(82.1)
	Farming own land	1 (0.9)
	Day labor(farming, fishing)	11 (10.4)
	Nonfarm worker	7 (7)
10	**Family Income & expenditures (Tk)**	
	Average monthly income	4918.10 ± 4532.96
	Average monthly expenditures	4161.04 ± 2549.14
	Average monthly food expenditures	1592.90 ± 1010.433
11	**Average land assets (Decimal)**	(mean ± S.D)
	Homestead	7.13 ± 7.01
	Cultivable land	34.03± 66.33
	Land share	22.89 ± 30.75
	Pond	1.71 ± 9.84
	Kashland	0.64 ± 3.49
	Total land under cultivation	49.19± 61.69
12	**Income apart from household's work**	
	Yes	63 (59.4)
	No	43 (40.6)

[1]*Figure in parenthesis indicates percentage.*

From the Table 1. it is also shown that, the literacy rate among tribal women were as follows, 36.8% were illiterate, 16.0% of women had completed primary level, 39.6% women up to secondary level, 2.8% higher secondary level and 4.7% up to graduate level. Regarding to the occupation status among the tribal women, eight out of ten (82%) women were housewife, 10.4% women were day laborer, 7% women were non-farm worker and very negligible (0.9%) used to work their own land. Approximately two-thirds (59.4%) of studied women earned money apart from household tasks (Table 1).

The mean monthly family income was Tk. 4918.10± 4532.96 which was lower than the average monthly income reported by the Households Income and Expenditure Survey (HIES, 2010), estimated at national level (Tk.11479) and rural level (Tk.9648). The reason for low income is that this tribal community mainly depends on agriculture.

Food Security Status

The Food security status of studied tribal women is shown in Table 2. Most of the households (89.5%) faced crisis last year, among them 83% households faced financial crisis. 88.7% households believed that they had capacity to cope crisis. Regarding to coping with stress, 48.9% households compromised their livelihoods by taking loan, others (21.3%) eat 2 meals a day, and remaining (8.5%) eat 1 meal a day to cope crisis. One of the reasons of their households' food insecurity was that, during lean period most of them became unemployed and due to severe economic hardship many of them had to consume less meals.

Table 2. Characteristics of the Studied Households by Food Security Status

Characteristics	Value[1]
Crisis faced last year	
Yes	94 (89.5)
No	11 (10.5)
Type of crisis faced	
Natural disaster	7 (7.4)
Financial crisis	78 (83)
Catastrophic healthcare payment	9 (9.6)
Capacity to cope crisis	
Yes	94 (88.7)
No	12 (11.3)
Mechanism adopted to cope crisis	
Take loan	46 (48.9)
Eat 2 meals a day	20 (21.3)
Eat 1 meal a day	8 (8.5)
Credit from shop to purchase foods	14 (14.9)
Others	5 (5.3)
Households feel food unsecured	
Yes	77 (73)
No	29 (27)
Most vulnerable months in year	
Baishak (April-May)	29 (17.2)
Asyshin (Sep-Oct)	72 (42.6)
Katric (Oct-Nov)	68 (40.2)
Crisis faced for total months in year	
<1 month	2 (1.9)
1- 2 months	36 (33.96)
2- 3 months	12 (11.32)
3-4 months	25 (23.58)
≥ 5 months	2 (1.9)
No problem	29 (27.36)

[1]*Figure in parenthesis indicates percentage*

In relation to food security status of tribal population, (Samad, 2006) that the most of the people do not have alternative skill or scope for employment, sometimes they are compelled to sell their labor at a low rate.

The percentage of households who felt food unsecure were 73%. Most vulnerable months faced by households were Asyshin (93.5% households faced crisis) and katric (88.3%

households faced crisis). In rural areas of Bangladesh, Asyshine and kartic are usually known as pre-harvesting period (Monga) and households are facing the problem of short term food security. There would be shortage of food supply and availability of firming work to earn money to buy foods. From the Table 2, around 2.6% of households faced crisis for 1 month followed by 46.8% households who faced crisis more than 2 months, and 2.6% households faced crisis 5 months or above. The most common types of crisis were natural disasters (7.4%), financial crisis (83%) and health care payment (9.6%) as already mentioned.

Anthropometry

Mean anthropometric measurements such as weight, height, mid upper arm circumference (MUAC) and body mass indexes (BMI) of the studied women (n=106) are shown in Table 3 according to age, physiological status and division. The mean weight of the tribal women was 45.5±7.6 kg and there was no increasing trend of weight with the increase of age. The mean height of women was 149.9±5.4 cm-lower than the values reported by, (Subramanian, S. V.; Özaltin, Emre; Finlay, Jocelyn E. (2011) where the mean height for Bangladeshi women is 150.6 cm.

Table 3. Distribution of anthropometric data of studied women (n=106) by age, sex and division

Measurement	Weight (kg) (mean ± sd)	Height (cm) (mean ± sd)	BMI (kg/m^2) (mean ± sd)	MUAC (cm) (mean ± sd)
Age				
15-19 (n=5)	49.52±5.34	154.08±3.04	20.81±1.52	24.68±1.61
20-24 (n=29)	45.67±7.49	150.13±4.14	20.20±2.73	24.49±2.39
25-29 (n=15)	45.87±10.3	150.61±4.54	20.08±3.63	24.21±3.64
30-34 (n=13)	45.33±9.38	147.48±5.87	20.70±3.06	32.24±27.82
35-39 (n=8)	43.65±6.71	147.92±7.33	20.00±3.23	24.34±3.39
40-44 (n=17)	44.52±5.90	149.99±6.14	19.79±2.36	24.19±2.37
45-49 (n=19)	45.67±6.82	150.34±6.10	20.18±2.75	24.35±1.89
Type of Women				
NPNLW (n=24)	40.71±8.85	151.43±6.38	20.27±2.96	24.38±2.57
Lactating (n=14)	46.06±8.65	151.27±3.60	20.06±3.31	24.12±2.77
Pregnant (n=2)	45.0±2.83	159.25±2.89	20.19±0.48	23.42±0.11
Mother (n= 66)	44.96±7.06	149.09±5.32	20.18±2.62	25.98±12.56
Division				
Rangpur (n= 49)	45.58±8.99	149.58±5.45	20.24±2.99	24.53±2.84
Rajshahi (n=57)	45.44±6.27	150.19±5.42	20.13±2.54	26.00±13.46
Total (n=106)	45.5±7.6	149.9±5.4	20.1±2.8	25.3±10

Mean MUAC of the women was 25.3±10 cm which is in the normal range according to WHO/WFP cut-off for adult women. The MUAC is increasingly being used to assess nutritional status and determine eligibility for nutrition support among adolescents and adults in low-resource settings, especially among pregnant women and people living with HIV (PLHIV) who are eligible for antiretroviral therapy (ART) (Bahwere, P. 2011; Tumilowicz, 2010; Ververs 2013). As with children, the use of MUAC among

adolescents and adults offers the advantages of being a simple and relatively inexpensive measure that can be carried out at both community and facility based settings.

Dietary Analysis

For each woman, information was gathered on all meals eaten in or away from home in the previous 24 hours using a single day 24 hours dietary recall method. The results of dietary analysis in this section are organized as follows:

- Construction of food group diversity indicators (FGIs)
- Food group diversity scores especially women dietary diversity scores (WDDS)
- Food frequency questionnaire (FFQ)

Table 4. Distribution of Mean women dietary diversity scores (WDDS) for various food group indicators (FGIs), all women (n=106)

Indicators	Number of food groups and level	Mean ± SD	Median	Range
FGI-4	4 major food groups	2.01 ± 0.64	2	1-4
FGI-6	6 major food groups	2.94 ± 0.72	3	1-5
FGI-9	9 major food groups	3.25 ± 0.81	3	2-6
FGI-10	10 major food groups	3.26 ± 0.79	3	2-6
FGI-12	12 major food groups	5.84 ± 0.83	6	4-8
FGI-16	16 major food groups	6.14 ± 0.91	6	4-9

Construction of food group diversity indicators (FGIs)

The distribution of women in percent consuming different major and sub-food groups (e.g., 4 major food groups, 6 major food groups, 9 sub-food groups, 12 sub-food groups, and 16 sub-food groups) are presented through Table 4 with the food groups indicators (FGI-4, FGI-6, FGI-9, FGI-10, FGI-12) are aggregated from 16 sub-food groups recommended by 2010 FAO guidelines, for measuring households and individual diet diversity (Swindale and Bilinsky, 2000).

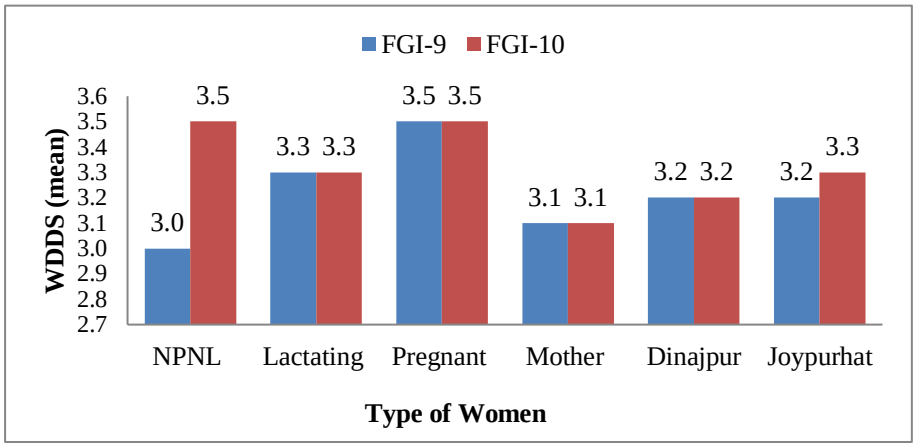

Fig. 1. Mean dietary diversity scores (WDDS) for food group indicators (FGI-9 and 10)

Conclusion

In respect to place of residency, and physiological status of women, virtually there were no differences of mean WDDS for 9 and 10 sub-food groups except for non-pregnant and non-lactating women; scored was higher (3.5) for 10 food group indicators than the 9 food group indicators. The total mean WDDS score based on 12 and 16 sub-food groups were 5.84 ± 0.83 and 6.14 ± 0.91 respectively with median value 6 for each indicators. The inclusion of white roots and tubers, fats and oils, spices and sweets increased the mean scores at 6 mid-points.

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