

Socio-economic condition, dietary pattern and nutritional status of pre-school ethnic children in Bandarban district of Bangladesh

Abstract

Nutrition is a foundation to ensure good health. The geographic and demographic factors affect food and nutrition. This study focuses socio-economic condition, dietary pattern and nutritional profile of preschool ethnic children at a single point in a specified time in sadarupazila of Bandarban district. This area was conveniently selected to collect sample. Sample was collected by visiting door to door. The dietary energy intake was determined by three days 24hours recall method. Statistical Package for Social Sciences 22.0 version was used for data analysis. Nutritional status was determined by ENA for SMART - Software. Mean age of the children was 4.21 ± 0.80 years. Most of the parents completed primary education. Father of the children was day labor and mother were housewife. Average monthly family income was 10316.53 ± 10013.97 BDT. Average weight and height of children was 16.18 kg weight and 97.45 cm height. Normal and underweight ethnic children were 84.80% and 15.20% . Distribution of normal and stunted children were 62.80% and 37.20% . About 8.60% children were wasted. Average calorie intake was 1037.33 kcal per day. Protein, carbohydrate and fat intake were 30.39 gm, 175.78 gm and 21.31 gm respectively. Statistically significant association was found between condition of latrine and child nutritional status (HAZ) ($p=0.010 < 0.05$). Statistically significant association was found between source of drinking water and ethnic children nutritional status (WAZ) ($p=0.045 < 0.05$). Statistically significant association was found between immunization status and ethnic children nutritional status (WAZ, WHZ) ($p=0.004 < 0.05$, $p=0.015 < 0.05$). Statistically significant association was found between deworming status and ethnic children nutritional status (WAZ) ($p=0.004 < 0.05$). There was positive correlation between nutritional status (HAZ) of ethnic children and monthly family income and it is statistically significant ($p=0.024 < 0.05$). This research findings will be helpful for policy maker and planner to develop new plan and strategy to combat under nutrition.

Keywords: socio-economic condition, dietary pattern, nutritional status, pre-school ethnic children

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Background

World Health Organization clearly cites malnutrition in the form of under nutrition as the gravest single threat to the world's public health and requires immediate attention (BDA, 2012). World Bank¹ has given surprising information i.e. the global loss of social productivity in one year that is caused by three overlapping types of malnutrition (nutritional stunting, underweight and wasting), iodine deficiency disorder, deficiency of iron and vitamin A- is equivalent to 46 million years of productive, disability- free life. This is really a matter of thinking deeply. Rayhan & Khan² says that over population and poverty are huge problem in Bangladesh and tend to cause population hazards like malnutrition among pre-school children who are naturally innocent, vulnerable and dependent. Bangladesh has a number of ethnic minor group population and they lead their life in great ethnic diverse fashion.³ They constitute about 1% of total population.³ They are distributed in scattered way all over the hilly, riverine and dense forest region of the country.³ There are 45 different ethnic groups in Bangladesh with a total population of more than 12 lakh.³ Tribal people are distinct from Bengali people by their ethnic origin, culture, feeding practice, literacy rate and profession.⁴ Chittagong Hill Tract is a unique, charming and tourist friendly environment characterized by hilly and remote terrain, barrier in

communication, ethnic diversity a different settlement pattern.⁵ Both Government and Non-Government Organization (NGO) are trying to provide health and nutrition services in order to improve health and nutrition status of tribal people particularly women, children and adolescent girl in CHT.⁵ The majority of tribal population (778,425) live in rural, forest and hilly settings, where many practices shifting cultivation.⁵ Bandarban is a district in South-Eastern Bangladesh, and a part of the Chittagong Division.⁶ It is one of the three districts that make up the Chittagong Hill Tracts. One of the three hill districts of Bangladesh and a part of the Chittagong Hill Tracts,⁷ Bandarban (4,479 km²) is not only the remotest district of the country, but also is the least populated (population 4,04,093) where ethnic peoples were 1,79,400 and Bengali peoples were 2,24,693 (Population census 2011). Number of ethnic groups live in the district besides the Bengalis who settling there gradually. Life of these ethnic people is extremely different in terms of cultural variation. Usually ethnic women do hard work both in family, field and market. Ethnic groups are self-dependent because they produce their own food, made their own cloths and try to avoid complex life though each tribe has its own distinctive features. These salient features make them unique area of study. Many of setbacks cannot be well-perceived due-to short of necessary and sufficient information.

Materials and methods

This study focuses socio-economic condition, dietary pattern and nutritional status of preschool children at a single point in a specified time. Considering time period and resource availability, cross-sectional analytical study design was most feasible for this study. Apart from socio-economic condition, anthropometric measurement and food intake pattern of study population, information on various factors that affect the nutritional outcome were also obtained in a cross-cut way. Study duration was three years. This study was conducted at Bandarban sadarupazila. This area is purposively selected for data collection and to get adequate sample of study population. This study was carried out among pre-school children through household survey in Bandarban district. All pre-school children (age 3 to 5) years with a mother or caregiver present that signed the informed consent and children in both sexes were included. Those who refused to participate in interview and physically disabled were excluded. We know Bandarban sadar has 5 unions and 9 wards. Ethnic groups live in both wards and unions concurrently. I have collected 194 pre-school ethnic children (22 children from each ward) and rest 193 children from 5 unions (39 children from each union) by visiting door to door and asking people which house 3 to 5 years children until desired number has gathered. Simple random was not possible due to absence of sampling frame. Face to face interview of mother/caregiver was carried out by using pre-tested structure questionnaire. Before initiation of interview verbal and/or written consent was obtained from respondents as well as Councilor of ward. Detail procedure of the study and significance of the study were explained followed by rapport building with the respondents. The dietary energy intake of the study subjects was determined by three days 24hr recall method questionnaire. Two consecutive days and weekend were considered. The nutrient value of Bangladeshi food was calculated by using food composition data published by Institute of Nutrition & Food Science (INFS).

The standing height was measured with a stadiometer with minimal cloths. Three measurements were taken three times and if the difference among reading is less than 1 cm, the mean measurement was taken and recorded to the nearest 0.1cm. If the reading will fall between two values, the lower reading was recorded. The body weight was measured using a platform beam scale. Weight was recorded to the nearest 0.1kg. After collection, data were checked and rechecked thoroughly for consistency and completeness. Individual questionnaire was checked and cleaned to avoid any possible mistakes. Data were initially checked on the day of collection to exclude any error or inconsistency or incompleteness. Data were categorized and coded during entry into the SPSS software. After every two weeks interval data were submitted to supervisor for check. It was started by the participant identification number and other properties of the variables. Then specific value was entered into each variable for each independent source of data. Data were cleaned by detection and correction of data set. Errors were detected by descriptive statistic, scatter plots and histograms for checking any missing data, normality and after removal of outliers again normality was checked. Data were analyzed by computer technology SPSS version 22.0. ENA for SMART - Software for Emergency Nutrition Assessment was used to find out WAZ (Weight for age Z-score), HAZ (Height for age Z-score) and WHZ (Weight for height Z-score). WHO child growth standard 2005 was used as reference for Z-score value. Obtained information was presented in the form of tables (univariate, bivariate and multivariate) and graphs (pie chart, histogram, multiple bar diagram). Both descriptive statistics (mean, SD, frequency,

percentage) and inferential statistics (correlation, Chi-square) were done. Before parametric test i had to do normality test like histogram with normal curve, skewness and kurtosis to see whether data were normally distributed or not.

Results

Average age of the study subjects was 4.10±0.84 years. Big segment of children (41.6%) represented 5years age followed by 31.3% from 3years and 27.1% from 4years (Table 1). Most of the father and mother (34.6% and 37.0%) completed primary education followed by illiterate (16.5% and 16.5%), under SSC (13.7% and 11.6%) and SSC (9.6% and 8.5%) (Table 2). More than half (53.2%) father of children were day labor. Most of the mother (87.1%) of children were housewife (Table 3). Average monthly family income was 10316.53±10013.97 BDT where as median income was 4000 BDT. More than half (52.5%) family had low income. Lower middle-income family was 33.6%. Upper middle-income family was 14.0% (Table 4). Prevalence of underweight was 15.20% which was half to national figure. In case of stunting prevalence was 37.20% which was slightly higher than national data (36%). Wasting was quite well below than national figure i.e. 14% and 8.60% (Figure 1). The table showed association between nutritional status of ethnic children and condition of latrine. Statistically no significant association was found between condition of latrine and child nutritional status (WAZ) (p=0.170>0.05). Statistically significant association was found between condition of latrine and child nutritional status (HAZ) (p=0.010<0.05). In case of WHZ condition of latrine was not significantly associated with nutritional status of children (p=0.636>0.05) (Table 5).

Table 1 Age distribution of the study subjects (n=387)

Age in year	Number	Percentage
Mean±SD		4.10±0.84
3	121	31.3
4	105	27.1
5	161	41.6
Total	387	100.0

Table 2 Education of father and mother of the study subjects (n=387)

Education	Ethnic	
	Father	Mother
Illiterate	64(16.5)	64(16.5)
Can read only	3(0.8)	7(1.8)
Can sign only	39(10.1)	49(12.7)
Can read and write	6(1.6)	6(1.6)
Primary	134(34.6)	143(37.0)
Under SSC	53(13.7)	45(11.6)
SSC	37(9.6)	33(8.5)
HSC	31(8.0)	28(7.2)
Bachelor	13(3.4)	9(2.3)
Masters	7(1.8)	3(0.8)
Total	387(100.0)	387(100.0)

Results were expressed as number (percentage)

Table 3 Occupation of father and mother of the study subjects (n=387)

Occupation	Ethnic	
	Father	Mother
Day labor	206(53.2)	1(0.3)
Agriculture	70(18.1)	20(5.2)
Business	37(9.6)	6(1.6)
Service	74(19.1)	23(5.9)
Housewife	0(0.0)	337(87.1)
Total	387(100.0)	387(100.0)

Results were expressed as number (percentage)

The table showed association between nutritional status of ethnic children and source of drinking water. Statistically significant association was found between source of drinking water and ethnic children nutritional status (WAZ) ($p=0.045<0.05$). There was no statistically significant association was found between source of drinking water and child nutritional status (HAZ, WHZ) ($p=0.130>0.05$, $p=1.139>0.05$) (Table 6). The table showed association between nutritional status of ethnic children and immunization status. Statistically significant association was found between immunization status and ethnic children nutritional status (WAZ, WHZ) ($p=0.004<0.05$, $p=0.015<0.05$) but no association was found in case of HAZ ($p=0.081>0.05$) (Table 7). The table showed association between nutritional status of ethnic children and

deworming status. Statistically significant association was found between deworming status and ethnic children nutritional status (WAZ) ($p=0.004<0.05$). But no association was found in case of HAZ ($p=0.081>0.05$) and WHZ ($p=0.432>0.05$) (Table 8). Table shows positive correlation between nutritional status (HAZ) of ethnic children and monthly family income and it is statistically significant ($p=0.024<0.05$). So we can say that monthly family income influences ethnic children nutritional status (HAZ) (Table 9). Average energy intake per day was 1037.33 kcal. Protein, carbohydrate and fat intake were 30.39gm, 175.78gm and 21.31gm respectively (Table 10).

Table 4 Monthly family income of the study subjects (n=387)

Family income	Ethnic
Mean±SD	10316.53±10013.97
Median	4000
Minimum	2000
Maximum	50000
Low-income ($\leq \$75.41$ or $\text{BDT} \leq 5360$)	203(52.5)
Lower middle-income ($\$75.5 - \299.58 or $\text{BDT} 5361-21270$)	130(33.6)
Upper middle-income ($\$299.68 - \926.25 or $\text{BDT} 21271-65761$)	54(14.0)
High-income ($\geq \$926.33$ or $\text{BDT} \geq 65762$)	0(0.0)
Total	387(100.0)

Results were expressed as Mean±SD, Median, number (percentage)

Table 5 Association between nutritional status (WAZ<2Z, HAZ<2Z, WHZ<2Z) of ethnic children and condition of latrine (n=387)

Condition of latrine	Nutritional status (WAZ<2Z, HAZ<2Z, WHZ<2Z)		Total	χ^2	p-value
	Normal	Underweight			
Sanitary	196(50.6)	44(11.4)	240(62.0)	5.03	0.17
Partial sanitary	38(9.8)	3(0.8)	41(10.6)		
Non-sanitary	23(5.9)	3(0.8)	26(6.7)		
Open	71(18.3)	9(2.3)	80(20.7)		
Total	328(84.8)	59(15.2)	387(100.0)		
	Normal	Stunting		11.344	0.01
Sanitary	158(40.8)	82(21.2)	240(62.0)		
Partial sanitary	27(7.0)	14(3.6)	41(10.6)		
Non-sanitary	20(5.2)	6(1.6)	26(6.7)		
Open	38(9.8)	42(10.9)	80(20.7)		
Total	243(62.8)	144(37.2)	387(100.0)		
	Normal	Wasting		1.704	0.636
Sanitary	215(55.6)	25(6.5)	240(62.0)		
Partial sanitary	39(10.1)	2(0.5)	41(10.6)		
Non-sanitary	24(6.2)	2(0.5)	26(6.7)		
Open	74(19.1)	6(1.6)	80(20.7)		
Total	352(91.0)	35(9.0)	387(100.0)		

Results were published as number (%), χ^2 test was performed and $p<0.05$ was level of significance

Table 6 Association between nutritional status (WAZ<2Z, HAZ<2Z, WHZ<2Z) of ethnic children and source of drinking water (n=387)

Source of drinking water	Nutritional status (WAZ<2Z, HAZ<2Z, WHZ<2Z)		Total	χ^2	p-value
	Normal	Underweight			
Tube well	228(58.9)	35(9.0)	263(68.0)	8.062	0.045
Tap	49(12.7)	17(4.4)	66(17.1)		
Lake	9(2.3)	0(0.0)	9(2.3)		
Ghiri	42(10.9)	7(1.8)	49(12.7)		
Total	328(84.8)	59(15.2)	387(100.0)		
	Normal	Stunting			
Tube well	165(42.6)	98(25.3)	263(68.0)	0.13	0.988
Tap	42(10.9)	24(6.2)	66(17.1)		
Lake	6(1.6)	3(0.8)	9(2.3)		
Ghiri	30(7.8)	19(4.9)	49(12.7)		
Total	243(62.8)	144(37.2)	387(100.0)		
	Normal	Wasting			
Tube well	239(61.8)	24(6.2)	263(68.0)	1.139	0.768
Tap	59(15.2)	7(1.8)	66(17.1)		
Lake	9(2.3)	0(0.0)	9(2.3)		
Ghiri	45(11.6)	4(1.0)	49(12.7)		
Total	352(91.0)	35(9.0)	387(100.0)		

Results were published as number (%), χ^2 test was performed and $p < 0.05$ was level of significance

Table 7 Association between nutritional status (WAZ<2Z, HAZ<2Z, WHZ<2Z) of ethnic children and immunization status(n=387)

Immunization status	Nutritional status (WAZ<2Z, HAZ<2Z, WHZ<2Z)		Total	χ^2	p-value
	Normal	Underweight			
Yes	277(71.6)	58(15.0)	335(86.6)	8.251	0.004
No	51(13.2)	1(0.3)	52(13.4)		
Total	328(84.8)	59(15.2)	387(100.0)		
	Normal	Stunting			
Yes	216(55.8)	119(30.7)	335(86.6)	3.037	0.081
No	27(7.0)	25(6.5)	52(13.4)		
Total	243(62.8)	144(37.2)	387(100.0)		
	Normal	Wasting			
Yes	300(77.5)	35(9.0)	335(86.6)	5.973	0.015
No	52(13.4)	0(0.0)	52(13.4)		
Total	352(91.0)	35(9.0)	387(100.0)		

Results were published as number (%), χ^2 test was performed and $p < 0.05$ was level of significance

Table 8 Association between nutritional status (WAZ<2Z, HAZ<2Z, WHZ<2Z) of ethnic children and deworming status (n=387)

Deworming status	Nutritional status (WAZ<2Z, HAZ<2Z, WHZ<2Z)		Total	χ ²	p-value
	Normal	Underweight			
Yes	93(24.0)	28(7.2)	121(31.3)	8.492	0.004
No	235(60.7)	31(8.0)	266(68.7)		
Total	328(84.8)	59(15.2)	387(100.0)		
	Normal	Stunting		0.049	0.825
Yes	75(19.4)	46(11.9)	121(31.3)		
No	168(43.4)	98(25.3)	266(68.7)		
Total	243(62.8)	144(37.2)	387(100.0)		
	Normal	Wasting		0.618	0.432
Yes	108(27.9)	13(3.4)	121(31.3)		
No	244(63.0)	22(5.7)	266(68.7)		
Total	352(91.0)	35(9.0)	387(100.0)		

Results were published as number (%), χ² test was performed and p<0.05 was level of significance

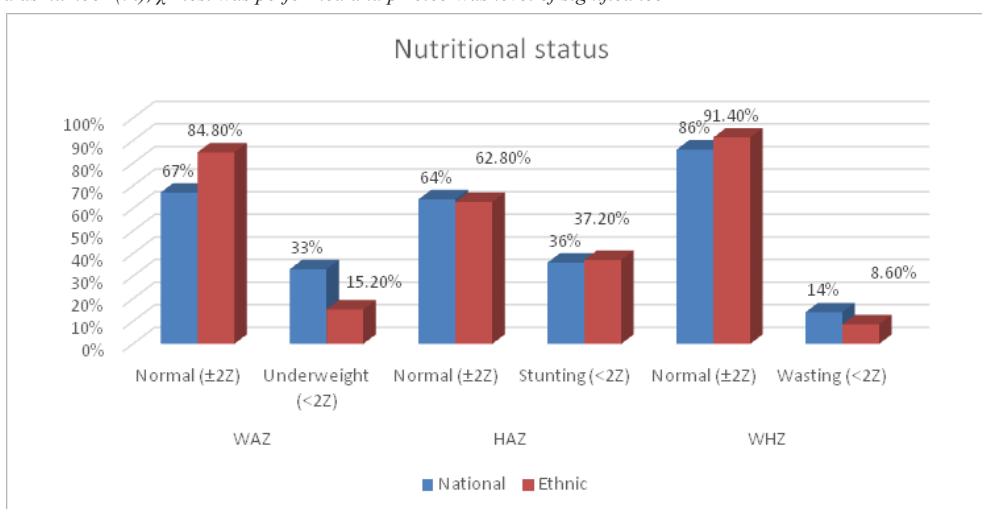


Figure 1 Nutritional status of children (n=387).

Table 9 Relation between nutritional status (HAZ) of ethnic children and monthly family income (n=387)

Correlation		HAZ	
Month family income	Pearson Correlation	1	0.117*
	Sig. (2-tailed)		0.021
	N	387	387
HAZ	Pearson Correlation	0.117*	1
	Sig. (2-tailed)	0.021	
	N	387	387

*. Correlation is significant at the 0.05 level (2-tailed).

Table 10 Mean calorie intake of the children (n=387)

Items	Mean intake	Standard deviation
Energy kcal per day	1037.33	2312.85
Protein gm per day	30.39	9.51
Carbohydrate gm per day	175.78	49.1
Fat intake	21.31	6.82

Discussion

Non-communicable diseases are increasing all over the world. No part of the globe is immune; more vivid and devastating scenario is seen in South-East Asia. Malnutrition is the root cause behind any type of non-communicable disease. Faulty food habit as well as sedentary life style and technology dependency make this scenario

more vivid. So improvement of diet and nutritional status is necessary from the very beginning of life. If we want to decrease burden of non-communicable diseases we can initiate or introduce healthy diets or nutrition dense food and active physical work according to lifestyles and multi-sectoral approach like food and nutrition, health and family planning, urbanization etc.⁸ To ensure quality diet for individual or population group we must emphasize agriculture and food sector. Food security at household level has closed link with child nutrition.^{9,10} The purpose of the present study was to pick up socio-economic condition, dietary pattern and nutritional status of preschool ethnic children of major ethnic groups in a cross cut way in sadarupazila of Bandarban district of Bangladesh. According to WHO nutritional status was determined by measuring height, weight and Z- scores (HAZ, WAZ, and WHZ). Here cut off point for Z score was taken as -2SD and those find below this level were considered as stunted, underweight and wasted as well. So finally, normal and underweight children were 67% and 33% (BDHS, 2014), 84.80% and 15.20% among national figure and ethnic group.

Recent report suggests that underweight children in Chittagong Hill Tract is 43%¹¹ though this survey was done among 0 to 23 months children but this figure is much higher than national data. This report also mentioned that children nutritional scenario is worst in Bandarban district among three districts of CHT. Distribution of normal and stunted children were 64% and 36% (BDHS, 2014), 62.80% and 37.20% among national figure and ethnic group and in case of wasting 86% and 88.70% were normal children whereas 14% (BDHS, 2014) and 8.60% were wasted respectively. Stunting and wasting are the real threat for their health condition. Nationally stunting scenario is not improving and more or less remains static. Environmental factors may contribute high rates of stunting. Actually, stunting is a chronic condition resulting from under nutrition. Stunting scenario is not improving along with speed of underweight and wasting. Large scale or depth study both quantitative as well as qualitative nature can be conducted to find out root causes, underlying causes and immediate causes of stunting. Children living in the coastal and wetland (haor) regions in Bangladesh are 1.5 times more likely to be stunted – one of the findings from a study conducted by LANSAs, led by BRAC (<https://newshour.online/2018/07/26>).

The study explores agricultural innovations to fight malnutrition in Bangladesh. The study identified haors and the coastal belt in Bangladesh, which are geographically distinct from other parts (waterlogged and salinity affected areas, respectively), as pockets of under nutrition. Analysis showed that overall prevalence of stunting ranged from 46.6% in the haor basin to 30.9% in other parts of Bangladesh, whereas the prevalence of underweight ranged from 44.5% in the haor basin to 34.1% in other areas (<https://newshour.online/2018/07/26>). This is a serious cause of concern for the country. Research revealed there is a strong interrelation between crop diversity, diet diversity and nutritional outcomes. It was found that the number of people with malnutrition will decrease if we increase production of diet-diverse and nutrition-rich food items (Research revealed there is a strong interrelation between crop diversity, diet diversity and nutritional outcomes. It was found that the number of people with malnutrition will decrease if we increase production of diet-diverse and nutrition-rich food items (<https://newshour.online/2018/07/26>). Just couple of months back honorable health minister of GoB stated in National Nutrition Week 2018 that prevalence of underweight, stunting and wasting of under five children were 32.4%, 36.1% and 14.33%. This is a big ask for policy planners.¹² found that under

nutrition was high in their study and about half of the children (49%) of were underweight followed by 43% stunted and 20% wasted. Similar type of study done by Ahmed, Jahan and Arefin in 1995-96 and found higher number of under nutrition among children i.e. 64.2% underweight, 60.4% stunted and 17% wasted¹³ which was much higher than national surveys.

Another study was conducted in all over Bangladesh and showed that 9.3% severe underweight and 31.4% moderate underweight of Khulna division, 12.9% severe underweight and 32.8% moderate underweight of Chittagong division, 11.1% severe underweight and 35.2% moderate underweight of Dhaka division, 12.8% severe underweight and 35.1% moderate underweight of Rajshahi division, 16.0% Severe underweight and 33.6% moderate underweight of Barisal division and 17.5% Severe underweight and 38.0% moderate underweight of Sylhet division.¹⁴ More than the half of the children (59.8%) were underweight and Rao et al.¹⁵ found similar findings among Sargujaethnic group in India.¹⁴ got 63.83% under-nourished children which was too much high and require urgent public health intervention. Bhattacharyya & Sarkar¹⁶ found quite similar findings in the Babina block of the Jhansi district (UP). Chakraborty et al.¹⁷ implemented a study among pre-school children in slum area of Udaipur and found highest prevalence (73%) of under nutrition as like Tripathi & Sharma¹⁸ in ethnic areas of Maharashtra (71.6%). Chirmulay & Nisal¹⁹ found two-third of the study subjects were thin.

From above findings it is observing that under nutrition is high enough in ethnic as well as slum or disadvantaged area or remote area. Poverty, lack of nutritional knowledge or inadequate health facility or combination of these may be responsible for this vulnerable situation. Bisai et al.²⁰ showed differentiation of ethnic boys and girls under nutrition in nine states of southern India where prevalence of under nutrition in boys and girls were 63% and 42%. Number of ethnic groups reside in different part of India. As a neighboring country of Bangladesh and close geographical attachment it is convenient or wise to compare or find similarity or dissimilarity of the findings of the present study with Indian studies. Sanitary status of latrine was significantly associated with ethnic children nutritional status. This is why their latrine was built maintaining sanitary status. Ethnic group were not aware about sanitary latrine even in union level they were habituate to use open area for defecation. Source of drinking water and ethnic children nutritional status are significantly related. Actually, ethnic group used lake, ghiri water along with tube well water. Quality of lake and ghiri water need to be checked and scope of another area of research. Average calorie intake of ethnic children was 1037.33 kcal per day.

Actually, ethnic children prefer natural. Food security is associated with nutritional status of any population and food should be distributed on equity based and to achieve food security we have to ensure availability of food all the year round and emphasize on purchasing power. Though in recent years purchasing power of Bangladeshi people has increased. The literature on the tribal nutrition is scarce particularly in Chittagong Hill Tracts Sharma et al.²¹ Diet is a strong determinant of nutritional status of the body because it contains nutrients which are responsible for metabolic integrity of body but problem creates when diet provides less or more nutrients than recommended value. If this condition sustains it may bring mild to severe health problem and welcome non-communicable diseases in own door. Chakraborty & Bharati²¹ rightly said that young children, pregnant women and lactating mothers usually suffer from various

health problems arising due to inadequate and imbalance nutrition which ultimately spreads to inter generation cycle and impact on whole country. Chittagong Hill Tract is a hilly terrain and hard-to-reach area with forest density.

A door to door comprehensive food and nutrition survey along with socio-demographic characteristics was carried out by United Nations Development Programme (UNDP)²³ in 2008 with the help of Helen Keller International among ethnic communities residing in the Chittagong Hill Tracts and they found that 30% under-5 children was underweight and >7% of these children suffered from severe malnutrition. They also alarmed on food insecurity because ethnic people depends on jhum cultivation or shifting cultivation. Food deposition tendency among tribal people was scanty. There is a chance of moderately undernourished children and mothers fall into categories of more severe malnutrition if this food insecurity continues or worsen with seasonal fluctuations (UNDP & KHI, 2008). Chakma et al.²⁴ found that Baigaethnic group consumed cereal based diet whereas other foodstuff was lower than the Recommended Dietary Allowance (RDA). As a result, malnutrition was widely prevalent among them. Inadequate dietary intake was main culprit. But this study did not show any quality of food. I used three days 24hr recall method questionnaire to calculate dietary energy intake of children.^{25,26} Two consecutive days and weekend were considered. This is the first time three days recall method has been used to get more accurate picture though it was hard task to visit same home three times a week. The nutrient value of Bangladeshi food and special ethnic food were calculated by using food composition data published by Institute of Nutrition & Food Science (INFS). Bashrool (bamboo root), dry fish, Mundi, banana was very much popular among tribal children.

Ahmed, Jahan and Arefin¹³ found that children whose diets had solid foods supplementations had a lower risk of being severely underweight. Document indicates that 3years, 4years and 5years children recommended to consume 1410 calorie (boy), 1140 calorie (girl); 1560 calorie (boy), 1310 calorie girl); 1690 calorie (boy), 1540 calorie (girl) respectively. But ethnic children consumed well below than the recommended allowance. Due to inadequate dietary intake than the recommended level may be responsible for wide prevalence of under-nourished children. Not only dietary but also environmental factors are contributing in growth pattern variation between children of both developed and developing countries.²⁷⁻²⁹ Supplementary feeding programmes and food security can solve this problem. Socio-economic profile is considered as strong determinant of nutritional status. Poverty is the root cause of all types of under nutrition. Poverty and under nutrition is interlinked. This study found that most of the parents passed primary level education. Father of the children was day labor and mothers were housewife. Average monthly family income among ethnic was 10316.53±10013.97 BDT. Socio-economic characteristics mainly parental education, occupation and household economic status were statistically associated with child nutritional status.^{30,31} Children of illiterate mothers had a higher risk of severe malnutrition and this inference is consistent with other studies.^{32,33} Bhattacharyya & Sarkar (2010) found that maximum and minimum under-nourished children was found among those fathers were agricultural laborers and service holder. Service holder are usually educated and conscious about health of children. In our culture illiterate or less educated people are commonly engaged in day labor or agricultural activities.

Conclusion

This study concludes that prevalence of under nutrition among ethnic children in sadarupazila, Bandarban of Bangladesh is not so good rather still quite high and a burning public health issue which demands urgent attention and intervention. Monthly family income, condition of latrine and source of drinking water were associated significantly with child nutritional status. This research finding will be helpful for policy maker and planner to develop new plan and strategy to combat under nutrition.

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Conflict of interest

The authors declare that there is no conflict of interest.

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