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Anthropometric study on children of Garo and non-Garo families in Netrakona district of Bangladesh

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Abstract

Anthropometric indicators such as weight-for-height (wasting), height-for-age (stunting) and weight-for-age (underweight) are important in evaluating the health and nutrition status of children in low-income areas of Bangladesh where malnutrition is still a large public health problem. Present investigation was carried out to assess the anthropometric status of tribal (Garo) and non tribal women of different villages of four Unions of Kalmakanada upazila under Netrakona district. Data were collected through well structured questionnaire. Total one hundred seventy families, ninety from tribal (Garo) and one hundred eighty from non-tribal constituted the sample of the study. The results show that malnutrition problem in this area is common due to poverty and children have low weight, under height, wasting and malnourished. The hierarchical interrelationships of potential determinants of malnutrition, wasting and underweight turned out to be independently predicted by morbidity factors. Stunting, however, was predicted by socioeconomic, environmental and health-care factors in addition to morbidity. Strategies aimed at improving the growth of infants and young children in rural communities should address morbidity due to common childhood illness coupled with environmental and socio-economically oriented measures.

Keywords: Anthropometric, Malnutrition, Tribes, Underweight, Wasting

Introduction

Peoples demographic characteristics, socioeconomic condition, adequate and appropriate nutrition, access to basic social amenities such as food, water and electricity have been found to be highly correlated to health and nutrition status (ACC/SCN, 1999). Bangladesh there are 29 indigenous groups, approximately 1.2 million and 1.13% of the total population (BBS, 2001; BPC, 1991). Among them the Garo is one of the largest indigenous communities of Bangladesh. They live in the north-eastern parts of the country especially in Gagipur, Mymensingh, Netrakona, Tangail, Sheerpur, Jamalpur and some in Syllet districts close to the Indian border. There are almost 100,000. Garos in Bangladesh, many more Garos live in the Meghaloya in Indian side but gaps exist between the government official figures and private estimates. A sample survey of 1979, conducted in Bangladesh, found that 20% of Garos do not possess any land, 30% have only a homestead, 30% worked as hired labourers and 20% cultivate mortgaged land. Almost all the Garos are bi-lingual because they have to speak Bengali in addition to their Garo language (Bal and Ellen, 1999). The Household Income Expenditure Survey showed that overall 61% of the households have less than 0.50 acres of land (BBS, 2000). The income inequality is highly skewed since 10% of the population owned about 40% wealth while poorest 20% of the population owned 6% wealth (Bangladesh Economic Review 2003) Anthropometric measures of weight and height are among the most practical means of comparing nutritional status among people. Economists use both individual observations and population-level statistics to model differences and changes in body size across populations, which is closely linked to other aspects of human welfare and economic development (Fogel, 1994, Deaton and Arora, 2009). Malnourished children are more likely to grow into malnourished adults who face heightened risks of disease and death (Sommerfelt, 1998). In low income countries 36% of children are malnourished compared with 12% and 1% in middle income countries and the United States, respectively (World Bank, 2000).The aim of present study was to investigate the anthropometric characteristics and malnutrition of infants from Netrakona district among Garo and non Garo families.

Material and Methods

Areas of study and sampling procedure

The area selected for this study is different villages of four Unions of Kalmakanada upazila under Netrakona district, Bangladesh. The tribal (Garo) and non tribal are predominantly living in these areas. Some are involved with agricultural practices, such as crop farming (especially cassava, yam and plantain), vegetables, poultry and livestock, mostly small ruminant animals.

Sampling procedure

The population targeted for the study comprised the family tribal (Garo) and non tribal. To be eligible for inclusion in the survey, each prospective respondent was required to reside in the study area for at least five years continuously. A multistage sampling procedure was adopted.

Selection of household

In each of the purposively selected communities, total one hundred seventy households were selected using systematic random sampling to represent four Unions from tribal (Garo) and non tribal families. Households were randomly selected from the four Unions.

Selection of respondents from households

At least one respondent was selected which must have attained the children. This sampling option was considered expedient in the absence of valid and comprehensive sampling frame in each zone. This approach was found to be culturally expedient and ensured maximum cooperation of members (Asika, 199; Yates, 1971).

Instrument for Data collection

Questionnaire method: Demographic information was collected using structured household questionnaire while the non-demographic characteristics were by interview.

Anthropometric measurement: Anthropometrical data of the elderly were obtained using international standards and procedures (DFIID 1999; WHO 1985). Heights of the elderly were taken using a locally produced stadiometer, whilst weight was measured by using the sensitive Handerson bathroom scale.

Measurement of nutritional vulnerability: Nutritional vulnerability was measured by applying a checklist modified from the Nutrition Screening Initiative (Ismail and Manandhar, 1999; Nutrition Screening Initiative, 1992) the checklist was modified to suit the environment of local area. These parameters were included because of their potential to expose people to irregular eating habits. The scores show the degree of vulnerability i.e. the higher the score the more vulnerable the person was likely to become. In interpreting the scores of different respondents, the standard of the Nutrition Screening Initiative was adopted where 10% was regarded as not vulnerable, 10-30% as moderately vulnerable and >40% as highly vulnerable.

Results and Discussion

Majority (27.8%) of the children of Garo were age from 11 months to 12 months, while the lowest proportion (6.7%) of children's age was 3 to 4 months. On the other hand, majority (27.8%) of the children of non-Garo were aged between 3 to 4 months, while the lowest proportion (8.3%) of children's age was 9 to 10 months. It appears from that 45.6% of Garo and 48.9% of non-Garo children were male in sex and 54.4% of Garo and 51.1% of non-Garo children were female in sex. The results in Table 2 show the mean and standard deviations of the anthropometric indicators of the surveyed children aged 1-11 months

among Garo and non-Garo. The mean height and weight of the children were 63.66 cm and 6.63 kg for Garo and 62.34 cm and 6.70 kg for non-Garo, which were 95.85% and 89.46% for Garo and 93.50% and 90.17% for non-Garo of NCHS median height for age and weight for age, respectively. The mean weight for height was 99.81% for Garo and 109.30% for non-Garo of the reference weight for height.

Table 1. Distribution of infants by age

Age (months)	Garo		Non Garo	
	Frequency	Percent	Frequency	Percent
1 to 2 months	21	23.3	8	4.4
3 to 4 months	6	6.7	50	27.8
5 to 6 months	17	18.9	47	26.1
7 to 8 months	11	12.2	30	16.7
9 to 10 months	10	11.1	15	8.3
11 to 12 months	25	27.8	30	16.7
Total	**90**	**100.0**	**180**	**100.0**

Table 2. Mean, standard deviation of anthropometric indicators of infants

Indicators	Garo (n= 90)		Non Garo (n=180)	
	Mean	Standard deviation	Mean	Standard deviation
Length (cm)	63.66	8.956	62.34	6.906
Weight (Kg)	6.63	2.224	6.70	2.071
Height for age Z-score	-1.02	1.805	-1.61	1.578
Weight for age Z-score	-.86	1.36	-.79	1.791
Weight for height Z-score	-.17	2.170	.668	2.618
Height for age (% median)	95.85	7.395	93.50	6.382
Weight for age (% median)	89.46	16.82	90.17	22.705
Weight for height (% median)	99.81	25.359	109.30	31.11

The results in Table 3, show a comparative picture of malnourishment between male and female. It shows that 10% of Garo and 21.1% of non-Garo children were severely undernourished according to height for age z-score of which 5.6% were male & 4.4% were female and 9.4% male and 11.7% female, respectively for Garo and non-Garo. In terms of moderately stunted, it was found that 16.7% of Garo and 16.7% of non-Garo children were malnourished at which 7.8% was male and 8.9% was female and 6.1% was male and 10.6% was female, respectively for Garo and non-Garo. The results in Table 3 show a comparative picture of malnourishment between male and female. It shows that 5.5% of Garo and 12.2% of non-Garo children were severely undernourished according to weight for age z-score of which 3.3% were male & 2.2% were female and 6.1% male & 6.1% female respectively for Garo and non-Garo. In terms of moderately under weight, it was found that 11.1% of Garo and 6.1% of non-Garo children were malnourished in which 4.4% were male and 6.7% was female and 4.4% was male and 1.7% was female, respectively for Garo and non-Garo. The results in Table 3 show a comparative picture of malnourishment between male and female. It shows that 5.5% of Garo and 2.8% of non-Garo children were severely undernourished according to weight for height z-score of which 1.1% was male and 4.4% was female and 1.1% male and 1.7% female, respectively for Garo and non-Garo. In terms of moderately wasted, it was found that 15.6% of Garo and 15.6% of non-Garo children were malnourished which was (6.7%) male and(8.9%) was female and 5.6% was male and 10% was female, respectively for Garo and non-Garo. The results in Table 4 show the distribution of the mother's nutritional status according to Body Mass Index (BMI) and indicated that more than fifty percent (51.1% Garo and non-Garo) of the mothers were

normal and a considerable number (26.7% of Garo and 22.8% non-Garo) of mothers were deficient in chronic energy –I and 7.8% of Garo and 6.7% of non-Garo mothers were deficient in chronic energy –II. Moreover 13.3% of Garo and 15.6% of Non Garo mothers were deficient in chronic energy. Results in Table 5, show that malnutrition rate between different age groups. The highest rate was found in 1 to 2 months for Garo children (3.3% of severely and 6.7% moderately stunted) and 3 to 4 months for non-Garo children (12.8% of severely and 8.3% moderately stunted). The lowest rate of malnutrition was 0.0% for Garo at age group of 3 to 4 months and 0.6% severe and 0.6 moderate stunted for non-Garo at age group of 9 to 10 months. The results in Table 5, show that malnutrition rate between different age groups. The highest rate was found in 5 to 6 months for Garo children (1.1% of severely and 4.4% moderately under weight) and 5 to 6 months for non-Garo children (5.0% of severely and 1.1% moderately under weight). The lowest rate of malnutrition was 0.0% for Garo at age group of 1 to 2 months and 3 to 4 months and 0.0% for non-Garo at age group of 9 to 10 months. The results in Table 5 show that malnutrition rate between different age groups. The highest rate was found in 5 to 6 months for Garo children (3.3% of severely and 4.4% moderately wasted) and 5 to 6 months for non-Garo children (0.6% of severely and 4.4% moderately wasted). The lowest rate of malnutrition was 0.0% for Garo at age group of 3 to 4 months and 0.0% for non-Garo at age group of 9 to 10 month.

Table 3. Gender variations in malnutrition in the prevalence of stunting, underweight and wasting

Variations	Gender	Garo		Non Garo	
		Severe (Z-score <-3)	Moderate(Z-score -3 to -2.1)	Severe (Z-score <-3)	Moderate(Z-score -3 to -2.1)
Height for age Z-Score (Stunting)	Boys	5(5.6)	7(7.8)	17(9.4)	11(6.1)
	Girls	4(4.4)	8(8.9)	21(11.7)	19(10.6)
	Total	**9(10.0)**	**15(16.7)**	**38(21.1)**	**30(16.7)**
Weight for age Z-Score (Underweight	Boys	3(3.3)	4(4.4)	11(6.1)	8(4.4)
	Girls	2(2.2)	6(6.7)	11(6.1)	3(1.7)
	Total	**5(5.5)**	**10(11.1)**	**22(12.2)**	**11(6.1)**
Weight for height Z-Score (Wasting)	Boys	1(1.1)	6(6.7)	2(1.1)	10(5.6)
	Girls	4(4.4)	8(8.9)	3(1.7)	18(10.0)
	Total	**4(5.5)**	**14(15.6)**	**5(2.8)**	**28(15.6)**

Table 4. Gender distribution of the mother's nutritional status according to Body Mass Index (BMI)

Body Mass Index (BMI)	Nutritional Status	Garo		Non Garo	
		Frequency	Percent	Frequency	Percent
<16.0	*CED–III	12	13.3	28	15.6
16.0-16.99	CED–II	7	7.8	12	6.7
17.0-18.49	CED–I	24	26.7	41	22.8
18.5-24.99	Normal	46	51.1	92	51.1
25.0-29.99	Overweight	0	0.0	7	3.9
30.0-39.99	Obese	1	1.1	0	0.0
Total	**-**	**90**	**100.0**	**180**	**100.0**

*CED= Chronic Energy Deficiency

Table 5. Variations in malnutrition in the prevalence of stunting by age groups stunting, underweight and wasting

Variations	Age group	Garo		Non Garo	
		Severe (Z-score <-3)	Moderate (Z-score -3 to -2.1)	Severe (Z-score <-3)	Moderate (Z-score -3 to -2.1)
Height for age Z-Score (Stunting)	1 to 2 months	3(3.3)	6(6.7)	1(0.6)	1(0.6)
	3 to 4 months	0(0.0)	0(0.0)	23(12.8)	15(8.3)
	5 to 6 months	1(1.1)	3(3.3)	2(1.1)	10(5.6)
	7 to 8 months	3(3.3)	3(3.3)	2(1.1)	1(0.6)
	9 to 10 months	2(2.2)	1(1.1)	1(0.6)	1(0.6)
	11 to 12 months	0(0.0)	2(2.2)	9(5.0)	2(1.1)
	Total	**9(10.0)**	**15(16.7)**	**38(21.1)**	**30(16.7)**
Weight for age Z-Score (Underweight)	1 to 2 months	0(0.0)	0(0.0)	0(0.0)	1(0.6)
	3 to 4 months	0(0.0)	0(0.0)	3(1.7)	7(3.9)
	5 to 6 months	1(1.1)	4(4.4)	9(5.0)	2(1.1)
	7 to 8 months	3(3.3)	1(1.1)	2(1.1)	1(0.6)
	9 to 10 months	1(1.1)	2(2.2)	0(0.0)	0(0.0)
	11 to 12 months	0(0.0)	3(3.3)	8(4.4)	0(0.0)
	Total	**5(5.6)**	**10(11.1)**	**22(12.2)**	**11(6.1)**
Weight for height Z-Score (Wasting)	1 to 2 months	1(1.1)	2(2.2)	0(0.0)	2(1.1)
	3 to 4 months	0(0.0)	0(0.0)	2(1.1)	3(1.7)
	5 to 6 months	3(3.3)	4(4.4)	1(0.6)	8(4.4)
	7 to 8 months	0(0.0)	1(1.1)	1(0.6)	8(4.4)
	9 to 10 months	0(0.0)	2(2.2)	0(0.0)	0(0.0)
	11 to 12 months	1(1.1)	5(5.6)	1(0.6)	7(3.9)
	Total	**5(5.6)**	**14(15.6)**	**5(2.8)**	**28(15.6)**

The value of P=0.001 for Garo and P=0.00 for Non-Garo

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