

## Nutritional Status of Sonowal Kachari Children of Dibrugarh District, Assam

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**ABSTRACT** A sample of 256 boys and 257 girls aged 6 – 10 years of Sonowal Kacharis of Dibrugarh, Assam forms the material for present study. The nutritional status has been assessed with the help of some anthropometric indices. The study records relatively fewer incidences of underweight, stunting and undernourished Sonowal children.

### INTRODUCTION

Nutritional status is defined as the physical expression of the relationship between the nutrient intake, or bio-availability of nutrients, and the physiological requirement of an individual (Brown, 1984). Anthropometry is a widely accepted tool for assessing the nutritional status of children. Studies in this regard reveal that weight for height (%) and BMI are good indicators of current nutritional status than any other measurement or indices. BMI ratio is also found to be a reliable index for assessing malnutrition in growing children. Prevalence rates of under nutrition and over nutrition were found to vary by age, sex and socio-economic status. Environmental stress, particularly nutritional deficiencies and associated infections, reduces childhood growth rates and delays maturation. Inadequate or unbalanced diet during childhood also has long-term repercussions on both physical growth and intellectual performance in later life.

Very few nutritional anthropometric studies have been done in the State of Assam (Choudhury and Bhuyan, 1994; Choudhury et al., 1995; Begum, 1996; Begum and Choudhury, 1996). All these studies reveal that majority of the children of the region suffers various forms of malnutrition.

The present study is based on a cross-sectional sample of 513 children (Boys=256, Girls=257) aged 6 - 10 years from the Sonowal Kacharis of Dibrugarh district, Assam. The Sonowals are one of the Kachari tribes of Assam. At present, their concentration is found in Dibrugarh, Tinsukia, Sibsagar, Jorhat, Golaghat, and North Lakhimpur districts of upper Assam. They are mainly agriculturist.

An attempt has been made in the present study

to assess the nutritional status of the Sonowal Kachari boys and girls based on anthropometry.

### MATERIAL AND METHODS

For assessing the nutritional status of children, we have adopted three anthropometric indices – weight for age, height for age and Body Mass Index (BMI) for age, which are considered as good indicators of nutritional status. BMI was calculated as weight in kg divided by square of height in metre. These indices were derived as Z-scores (as recommended by WHO, 1986) of the International standards or references, i.e., the growth references of the U.S. National Centre for Health Statistics (NCHS) (Kuczmarski et al., 2000). The children were then categorized into three levels of nutritional status, following the cut-off points proposed by Visweswara Rao (1996).

A beam-balance scale (100 gm precision) was used to weigh the subject barefoot, wearing light apparel. The balance was checked against a standard weight after weighing each subject. The height was measured with an anthropometer (1 mm precision). Standard anthropometric technique as recommended by Weiner and Lourie (1981) were used to take all these measurements. No sampling technique was applied for the selection of subjects at individual levels.

Data on age were based on school records and birth certificates given by the parents. However, individuals with doubtful age were excluded from the study.

### RESULTS AND DISCUSSION

In Table 1 mean values of weight and height of boys and girls along with their standard

deviation are shown. In all the ages boys are heavier and taller than girls except in age 10 years, where girls are taller but the difference is not significant ( $t$  value = 1.12, d.f. = 120,  $0.30 > P > 0.20$ )

Table 2 shows the percentage distribution of children according to weight for age. A total of 67.97% boys and 64.20% girls are normal with a highest of 82.00% in age 9 and 10 years in case of boys and 81.13% in age 10 years in case of girls. Moderately malnourished are 24.61% and 22.18% for boys and girls respectively. In age 6 years, 54.00 % boys are moderately malnourished. Severely malnourished children range from 2.00 % to 14.55 % among boys and 7.84 % to 33.96 % among girls, with a total of 7.42 % boys and 13.62 % girls. In age 9 and 10 years, there are no severely malnourished girls. Also in age 6 and 7 years, normal girls are more than boys.

Height for age (Table 3) shows 78.13 % boys and 67.70 % girls are normal. Highest number of normal are in the age 10 years (94.00 % boys, 86.79 % girls) while lowest is in age 6 years (62.00 % boys, 58.00 % girls). With the increase of age, numbers of normal gradually increases and severely stunted gradually decreases. Highest percentage of moderately stunted is 28.00 % in age 6 years and age 9 years in case of boys and girls respectively. In all the age group normal boys are more than girls.

Again in Table 4, BMI for age shows that 82.42 % boys and 84.44 % girls are normal. In age 9

years, 90.00 % boys and 92.00 % girls are normal which is highest. Severely malnourished is only 5.08 % in boys and 2.33 % in girls.

It is found that the prevalence of underweight is slightly higher in girls (35.80 %) than in boys (32.03 %). Severe forms of under weight girl children (32.03 %) are more in number than their counterparts (7.42 %). However, the difference is statistically non-significant ( $\chi^2 = 5.28$ , d.f. = 2;  $0.10 > P > 0.05$ ).

With respect of height for age, an indicator of growth retardation, about 21.86% of boys and 32.30 % of girls in the Sonowal population are stunt. With regard to sex difference in nutritional status, the test of significance reveal statistically significant sex-dimorphism ( $\chi^2 = 8.52$ , d.f. = 2;  $0.02 > P > 0.01$ ).

Body mass index is generally considered as the best indicator of fatness or thinness and chronic energy deficiency. The prevalence of under-nourished Sonowal children according to BMI is not as high (girls = 15.86 %, boys = 17.58 %) as indicated by weight for age and height for age. There is not much difference between boys and girls in respect of BMI ( $\chi^2 = 2.72$ , d.f. = 2;  $0.30 > P > 0.20$ ).

The results of the present study indicate that the nutritional status of the Sonowal Kachari children is better than the other population groups of North East India so far studied. As observed in other populations, BMI seems to be the better

**Table1: Statistical constants of weight and height among Sonowal Kachari children.**

| Age in years | Boys |             |      |             |      | Girls |             |      |             |      |
|--------------|------|-------------|------|-------------|------|-------|-------------|------|-------------|------|
|              | (N)  | Weight (kg) |      | Height (cm) |      | (N)   | Weight (kg) |      | Height (cm) |      |
|              |      | $\bar{X}$   | SD   | $\bar{X}$   | SD   |       | $\bar{X}$   | SD   | $\bar{X}$   | SD   |
| 6            | 50   | 16.17       | 1.46 | 106.66      | 3.87 | 50    | 15.51       | 1.70 | 105.96      | 5.01 |
| 7            | 55   | 18.71       | 1.97 | 114.58      | 4.74 | 51    | 18.74       | 2.10 | 113.84      | 4.05 |
| 8            | 51   | 20.67       | 2.61 | 119.93      | 5.47 | 53    | 20.18       | 2.65 | 119.77      | 5.57 |
| 9            | 50   | 23.90       | 3.04 | 126.12      | 6.26 | 50    | 23.73       | 3.68 | 126.03      | 6.63 |
| 10           | 50   | 26.23       | 3.33 | 131.32      | 4.78 | 53    | 26.13       | 3.17 | 132.45      | 5.27 |

**Table 2: Nutritional Status according to weight for age.**

| Age in years | Boys      |         |          |         |           |         | Girls     |         |          |         |           |         |
|--------------|-----------|---------|----------|---------|-----------|---------|-----------|---------|----------|---------|-----------|---------|
|              | $\geq -2$ | Z Score | -2 to -3 | Z Score | $\leq -3$ | Z Score | $\geq -2$ | Z Score | -2 to -3 | Z Score | $\leq -3$ | Z Score |
| 6            | 20        | 40.00   | 27       | 54.00   | 3         | 6.00    | 25        | 50.00   | 12       | 24.00   | 13        | 26.00   |
| 7            | 38        | 69.09   | 9        | 16.36   | 8         | 14.55   | 37        | 72.55   | 10       | 19.61   | 4         | 7.84    |
| 8            | 34        | 66.67   | 13       | 25.49   | 4         | 7.84    | 28        | 52.83   | 7        | 13.21   | 18        | 33.96   |
| 9            | 41        | 82.00   | 6        | 12.00   | 3         | 6.00    | 32        | 64.00   | 18       | 36.00   | 0         | 0.00    |
| 10           | 41        | 82.00   | 8        | 16.00   | 1         | 2.00    | 43        | 81.13   | 10       | 18.87   | 0         | 0.00    |
| Total        | 174       | 67.97   | 63       | 24.61   | 19        | 7.42    | 165       | 64.20   | 57       | 22.18   | 35        | 13.62   |

Note:  $\geq -2$  Z Score = Normal, -2 to -3 Z Score = Moderate,  $\leq -3$  Z Score = Severe under weight

**Table 3: Nutritional Status according to height for age.**

| Age in years | Boys         |                  |              |              |                  |              | Girls        |                  |              |              |                  |              |
|--------------|--------------|------------------|--------------|--------------|------------------|--------------|--------------|------------------|--------------|--------------|------------------|--------------|
|              | ≥ -2 Z Score | -2 to -3 Z Score | ≤ -3 Z Score | ≥ -2 Z Score | -2 to -3 Z Score | ≤ -3 Z Score | ≥ -2 Z Score | -2 to -3 Z Score | ≤ -3 Z Score | ≥ -2 Z Score | -2 to -3 Z Score | ≤ -3 Z Score |
| 6            | 31           | 62.00            | 14           | 28.00        | 5                | 10.00        | 29           | 58.00            | 11           | 22.00        | 10               | 20.00        |
| 7            | 40           | 72.73            | 11           | 20.00        | 4                | 7.27         | 33           | 64.71            | 14           | 27.45        | 4                | 7.84         |
| 8            | 42           | 82.36            | 8            | 15.68        | 1                | 1.96         | 34           | 64.15            | 14           | 26.42        | 5                | 9.43         |
| 9            | 40           | 80.00            | 9            | 18.00        | 1                | 2.00         | 32           | 64.00            | 14           | 28.00        | 4                | 8.00         |
| 10           | 47           | 94.00            | 3            | 6.00         | 0                | 0.00         | 46           | 86.79            | 6            | 11.32        | 1                | 1.89         |
| Total        | 200          | 78.13            | 45           | 17.56        | 11               | 4.30         | 174          | 67.70            | 59           | 22.96        | 24               | 9.34         |

Note: ≥ -2 Z Score = Normal, -2 to -3 Z Score = Moderate, ≥ -2 Z Score = Severely Stunted

**Table 4: Nutritional Status according to BMI for age.**

| Age in years | Boys         |                  |              |              |                  |              | Girls        |                  |              |              |                  |              |
|--------------|--------------|------------------|--------------|--------------|------------------|--------------|--------------|------------------|--------------|--------------|------------------|--------------|
|              | ≥ -2 Z Score | -2 to -3 Z Score | ≤ -3 Z Score | ≥ -2 Z Score | -2 to -3 Z Score | ≤ -3 Z Score | ≥ -2 Z Score | -2 to -3 Z Score | ≤ -3 Z Score | ≥ -2 Z Score | -2 to -3 Z Score | ≤ -3 Z Score |
| 6            | 40           | 80.00            | 6            | 12.00        | 4                | 8.00         | 39           | 78.00            | 7            | 14.00        | 4                | 8.00         |
| 7            | 41           | 74.55            | 11           | 20.00        | 3                | 5.45         | 46           | 90.20            | 5            | 9.80         | 0                | 0.00         |
| 8            | 41           | 80.39            | 8            | 15.69        | 2                | 3.92         | 41           | 77.36            | 11           | 20.75        | 1                | 1.89         |
| 9            | 45           | 90.00            | 4            | 8.00         | 1                | 2.00         | 46           | 92.00            | 4            | 8.00         | 0                | 0.00         |
| 10           | 44           | 88.00            | 3            | 6.00         | 3                | 6.00         | 45           | 84.91            | 7            | 13.21        | 1                | 1.89         |
| Total        | 211          | 82.42            | 32           | 12.50        | 13               | 5.08         | 217          | 84.44            | 34           | 13.23        | 6                | 2.33         |

Note: ≥ -2 Z Score = Normal, -2 to -3 Z Score = Moderate, ≥ -2 Z Score = Severe under Nourished

indicator of nutritional status than any other indices taken for the present study. Nevertheless, the present findings also indicate that nutritional status of the Sonowal children improves along with increase in age.

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