BioGecko
Vol 13 Issue 01 2024
ISSN NO: 2230-5807

# A Cross-Sectional Study of Body Weight among the Nath Boys of Kamrup District, Assam

**Bikash Ranjan Tahbildar [1], Dr. Tiluttoma Baruah [2]**
[1] Ph.D Scholar, Department of Anthropology, Cotton University, Assam, India
[2] Retd. Associate Professor, Department of Anthropology, Cotton University, Guwahati Professor, Department of Humanities & Social Sciences, Assam Down Town University. Guwahati.

**Abstract**
Anthropologists have traditionally been associated with the study of human physical growth. One of the main objectives of physical growth study in Biological anthropology is to understand the process of human evolution and the cause of human variation.
The purpose of present paper is to describe the body weight as a somatometric character of 430 Nath boys of Kamrup District, Assam. For this present study the boys of 8 years to 18 years of age group were measured. All the data were arranged in 11 different age groups in the class intervals of one year. The present study is confined to the Nath inhabited three villages named, Changsari, Maniari and Dalang of Kamrup District, Assam. Here an attempt has been made to study the adolescent growth spurt, percentage of growth per annum and level of maturity in body weight among the Nath boys. An attempt has also made to compare the present data with the Indian rural boys (ICMR, 1989) and National Centre for Health Statistics (NCHS).
**Keyword:** Human physical growth, cross-sectional study, Nath.

## INTRODUCTION

Physical growth is referred to as mirror of the condition of a society. (Tanner, 1963). The physical growth rate of children is an important measuring scale to understand the health and nutritional status of a population. Heredity and different socio-economic conditions effect the physical growth of an individual. So, it is an important area of study to evaluate the nutritional
status as well as rate and pattern of physical growth. According to Bogin (1991), growth is a quantitative increase in size or mass. According to Tanner (1962), growth is a product of continuous and complex interaction of heredity and environment. In every speech the word “growth” is used as a synonym for “development”. Growth may be defined as a quantitative increase in size or mass. But development is defined as progressing of changes, either quantitative or qualitative (Medawar, 1959). Since human physical growth is a complex phenomenon, the attempts to define it varies from individual to individual.
According to Das (2000), physical growth of an individual is affected by several factors which may be categorized as intrinsic and extrinsic factors. Intrinsic factors include genetic material and hormones. While, extrinsic factors include nutrition, psychological disturbance, rural-urban, socio-cultural condition, ecology and secular trend.
The area selected for the present study is constituted by the Nath community of Assam. The name of the villages selected for the data collection are Changsari, Dalang and Maniari. Nath is one of the important communities of Assam. They are categorized under the “Other Backward Class” in India. Before 1922 they were known as Yogi. But when in the year 1922 the Assam Bengal Yogi Sanmelon was held in Changsari, Assam, they came to know as Nath. According to Nath (2013), they are also known as *katani* in Assam. The belief of the community is that they are the descendents of Lord Siva. They have migrated from the south and in course of time they settled in Changsari where they came via Jogigopa and after that they dispersed to other parts of Assam. Though the major concentration of this community is found in Kamrup and Barpeta District of Assam, they are also

found all over Brahmaputra and Barak valley. Two types of clan namely *Siva* and *Kashyap* are found among them. They are the follower of Hindu religion. It is also found that some of them have accepted neo- Vaishnsvism faith propounded by Sri Shankardev of Assam. They are mainly wet cultivators. Their economy depend on agricultural resources. (Singh, 2003)

**Methodology :**

There are two different methods of studying human growth- longitudinal and cross- sectional. To these may be added the third approach called mixed-longitudinal method. For this present paper a cross-sectional investigation was undertaken among the 430 Nath boys. These
boys were in the range of 8 to 18 years of age. The data were arranged in 11 different age groups from 8 years to 18 years. Proper care was taken to obtain the actual age of each individual. The number of boys in each age group is as below:

**Table- 1**

| Age in year | No. of boys | Age in year | No. of boys |
|---|---|---|---|
| 8+ | 47 | 14+ | 35 |
| 9+ | 35 | 15+ | 45 |
| 10+ | 32 | 16+ | 49 |
| 11+ | 36 | 17+ | 39 |
| 12+ | 26 | 18+ | 51 |
| 13+ | 35 | | |

Body weights of the subjects are measured in kilogram with a new portable weighing machine. The data have been analyzed statistically to calculate the mean value, standard deviations and their respective standard errors for all the age groups. Data are also analyzed to find out the nature of growth in body weight and rate of growth. Growth gradient is also calculated to indicate the level of maturity at a particular age.
Following are the statistical considerations used for this study.

a) Mean $(\bar{x})$ = $AM \pm \frac{\sum fd}{n}$

where, A.M = Assumed mean

f = Frequency
d = Deviation and
n = Total number of observations.

b) Standard deviation (SD)

S.D. = $\sqrt{\frac{\sum fd^2}{n} - \left(\frac{\sum fd}{n}\right)^2}$

Where , f = Frequency

d = Deviation and
n = Total number of observations.

c) Standard error for mean

It is calculated by the formula –

$$SE_{\bar{x}} = \frac{SD}{\sqrt{n}}$$

d) Standard error for standard deviation It is calculated by the formula –

$$SE_{SD} = \frac{SD}{\sqrt{2n}}$$

e) Absolute growth = $\bar{x}_2 - \bar{x}_1$

Where, $x_1$ stands for the mean value of the lower age group and $x_2$ stands for the mean value of the next higher age group.

f) Growth percent per-annum

It is calculated by using the formula-

$$\frac{\bar{x}_2 - \bar{x}_1}{\bar{x}_1} \times 100$$

g) Growth gradient =

$$\frac{M_8, M_9, M_{10}, \ldots M_{18}}{M_A} \times 100$$

Where, M (8 or 9 or 10 or 11 ..... 18) is the mean value at particular age of a particular variable and $M_A$ is the mean value of the adults of a particular variable.

**Results :**

In the Table- 2 the mean value, standard deviations, absolute growth, percentage of growth per annum and growth gradient for body weight at different age levels are presented. It reflects from the Table- 2 that the mean value of the body weight continuously increases from 8 years to 18 years. The magnitude of increment is however not uniform throughout the ages. Tanner (1962) also explained that human growth is not a steady and uniform process of accretion in which all parts of the body enlarge at the same rate and the increment of one year is equal to that of the preceding and succeeding year. The highest increment in body weight i.e. 5.95 kg. is found between the ages 13 and 14 years. The total increment from 8 years to 18 years is 26.74 kg.

The distance curve (Fig- A) reflects that there is a gradual increment of growth from 8 to 18 years. It is also observed that after 16 years the trend of increment is slow.

The velocity curve (Fig- B) shows that there are three growth spurts. These spurts are found between the ages 11and 12 years, 13 and 14 years and 15 and 16 years. The adolescent growth spurt for the body weight is found between the age 13 years and 14 years. There is a pre- adolescent growth spurt between the ages 11 and 12 years. Besides these two spurts a relatively small post-adolescent growth

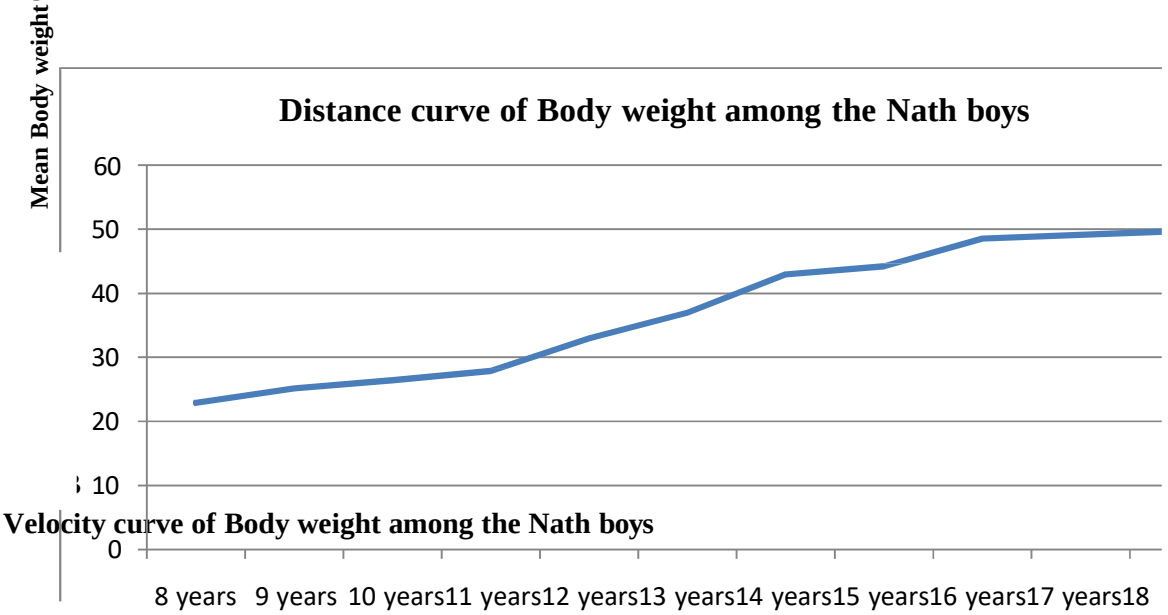
spurt is also evident between the ages 15 and 16 years.

The column growth gradient in the Table- 2 and Fig- C reflects the level of maturity in the body weight. At 8 years the Nath boys have achieved 46.179% of growth in their body weight and 53.82% of growth remains to be completed after 8 years.

**Table-2 Statistical Constants of Body Weight (kg.) among the Nath boys**

| Age (in years) | No. of boys measured | Mean ± Standard error | Standard deviation ± Standard error | Growth | | Growth Gradient |
|---|---|---|---|---|---|---|
| | | | | Absolute | % per annum | |
| 8+ | 47 | 22.94±0.389 | 2.672±0.275 | | | 46.179 |
| | | | | 2.225 | 9.699 | |
| 9+ | 35 | 25.165±0.727 | 4.306±0.514 | | | 50.658 |
| | | | | 1.27 | 5.046 | |
| 10+ | 32 | 26.435±1.002 | 5.671±0.708 | | | 53.214 |
| | | | | 1.431 | 5.413 | |
| 11+ | 36 | 27.866±0.720 | 4.322±0.509 | | | 56.095 |
| | | | | 5.124 | 18.387 | |
| 12+ | 26 | 32.99±0.932 | 4.757±0.659 | | | 66.410 |
| | | | | 3.974 | 12.046 | |
| 13+ | 35 | 36.964±0.746 | 4.416±0.527 | | | 74.410 |
| | | | | 5.95 | 16.096 | |
| 14+ | 35 | 42.914±0.810 | 4.794±0.573 | | | 86.387 |
| | | | | 1.302 | 3.033 | |
| 15+ | 45 | 44.216±0.951 | 6.381±0.672 | | | 89.00 |
| | | | | 4.29 | 9.702 | |
| 16+ | 49 | 48.506±0.683 | 4.781±0.482 | | | 97.644 |
| | | | | 0.623 | 1.284 | |
| 17+ | 39 | 49.129±0.587 | 3.671±0.415 | | | 98.898 |
| | | | | 0.547 | 1.113 | |
| 18+ | 51 | 49.676±0.624 | 4.463±0.441 | | | 100.00 |

**Fig-A**




**Velocity curve of Body weight among the Nath boys**

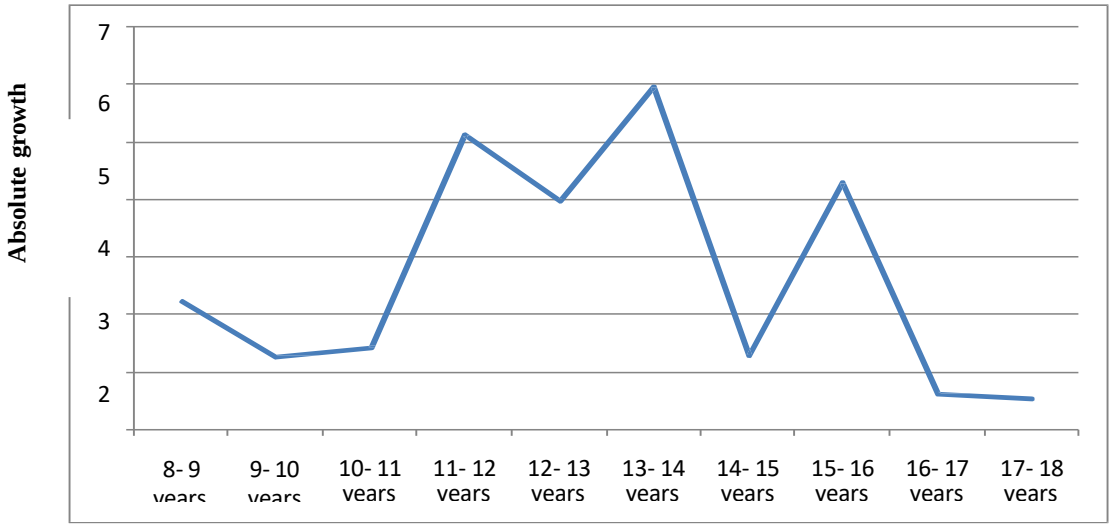
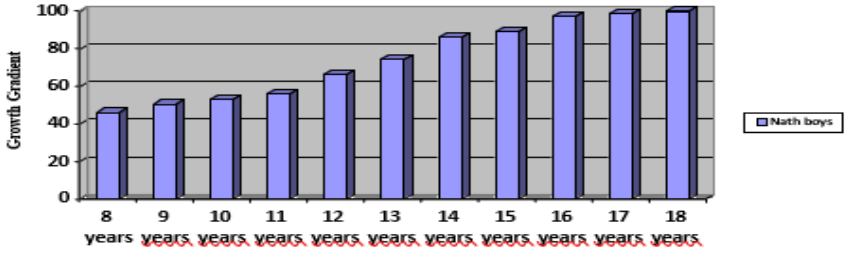



**Fig- C**

**Growth Gradient of Body Weight**



**Comparison of Body weight of Present study with that of Indian rural boys (ICMR, 1989):**

It is interesting to note that the studied population (Nath boys) are heavier at 8 to 18 years age group than Indian national average (Table- 3). The highest mean body weight 49.676 kg. and 45.8 kg. are evident at 18 years of age among the Nath boys and Indian rural boys respectively. While, at 8 years of age the lowest mean body weight 22.94 kg. and 19.3 kg. are reflected among the studied subjects and Indian rural boys respectively (Table- 3).

**Table- 3Comparison of body weight of Nath boys with Indian rural boys (ICMR)**

| | Nath Boys | | Indian rural boys | |
|---|---|---|---|---|
| Age (in years) | Mean | S.D | Mean | S.D |
| 8+ | 22.94 | 2.672 | 19.3 | 3.60 |
| 9+ | 25.165 | 4.306 | 21.1 | 3.80 |
| 10+ | 26.435 | 5.671 | 23.1 | 3.96 |
| 11+ | 27.866 | 4.322 | 25.1 | 4.66 |
| 12+ | 32.99 | 4.757 | 27.8 | 6.42 |
| 13+ | 36.964 | 4.416 | 31.0 | 6.11 |
| 14+ | 42.914 | 4.794 | 33.7 | 7.36 |
| 15+ | 44.216 | 6.381 | 37.1 | 7.66 |
| 16+ | 48.506 | 4.781 | 41.2 | 7.34 |
| 17+ | 49.129 | 3.671 | 43.9 | 6.72 |
| 18+ | 49.676 | 4.463 | 45.8 | 7.01 |

**Comparison of Body weight of Present study with National Centre for Health Statistics (NCHS) data:**

It is apparent from the Table- 4 that the mean values of body weight of Nath boys are less than the NCHS reference from 8 years to 18 years except at 14 years. Nath boys are found heavier than the NCHS data only at 14 years of age. the highest mean value for body weight among the studied boys is 49.676 kg. While, it is found 55.6 kg. in the NCHS data.

**Table- 4Comparison of Body weight of Nath boys with National Centre for Health Statistics (NCHS) data**

| | Nath Boys | NCHS | |
|---|---|---|---|
| Age (in years) | Mean | Mean | Difference |
| 8+ | 22.94 | 23.3 | 0.36 |
| 9+ | 25.165 | 25.3 | 0.135 |
| 10+ | 26.435 | 27.6 | 1.165 |
| 11+ | 27.866 | 30.3 | 2.434 |
| 12+ | 32.99 | 33.4 | 0.41 |
| 13+ | 36.964 | 37.0 | 0.036 |
| 14+ | 42.914 | 41.0 | - 1.914 |
| 15+ | 44.216 | 45.1 | 0.884 |
| 16+ | 48.506 | 49.0 | 0.494 |
| 17+ | 49.129 | 52.5 | 3.371 |
| 18+ | 49.676 | 55.6 | 5.924 |

**References**

1. Bogin, B. 1991. *Patterns of Human Growth*. Cambridge University Press.
2. Das, B.M. 2000. *Outline of Physical Anthropology*. Kitab Mahal, 22-A Sarojini Naidu Marg, Allahabad.
3. ICMR. 1989. Growth and Physical Development of Indian Infants and Children. Indian Council of Medical Research, New Delhi
4. Medawar, P.B. 1959. "Growth" *Chamber's Encyclopedia (ed).* H. Frangquelin London, George Newness Limited.
5. Medhi, B.K. 1979. *Nrigostitattar Ruprekha*. Guwahati, Gauhati University.
6. Nath, P.K. 2013. *Asomor Nath Sampradayar Sanskriti*, Chandra Prakash Panbazar, Guwahati-1
7. Singh, K.S. 2003. *People of India: Assam.* Anthropological Survey of India, Seagull Books Calcutta. P.P 628- 633
8. Tanner, J.M. 1962. *Growth at Adolescence*. Oxford, Blackwell Scientific Publications.
9. ---------- 1963. The Regulations of Human Growth. Child Development, 34: 871 Thakur, R. and R.K. Gautam. 2014. Prevalence of Undernutrition among School going boys
10. (5- 18 years) of a Central Indian city (Sagar). *Human Biology Review* 3(4) 2014
11. :344-383