How to Cite:
Tahbildar, B. R., & Baruah, T. (2023). An anthropometric study of stature among the Nath Girls of Kamrup District, Assam. *International Journal of Health Sciences*, *7*(S1), 2630–2638. Retrieved from
https://sciencescholar.us/journal/index.php/ijhs/article/view/7266

An anthropometric study of stature among the Nath Girls of Kamrup District, Assam

Bikash Ranjan Tahbildar
Ph.D Scholar, Department of Anthropology, Cotton University, Assam, India

Dr. Tiluttoma Baruah
Retd. Associate Professor, Department of Anthropology, Cotton University, Guwahati,Assam, India Professor, Department of Humanities & Social Sciences, Assam Down Town University, Guwahati,Assam, India

***Abstract*---**The study of physical growth in different human populations is one of the central themes in biological anthropology. One of the main objectives of the physical growth studies is to understand the process of human evolution and variation. In this present paper an attempt has been made to understand the growth of stature among the Nath girls of three Nath inhabited villages of Kamrup district, Assam. The name of the studied villages is Changsari, Dalang and Saraighat. This study consists of the measurements of 380 Nath girls from 4 years to 18 years. The present study is a cross-sectional and the measurements were collected as prescribed by the Martin. In this paper an attempt has been made to study the adolescent growth spurt, percentage of growth per annum and growth gradient. An attempt has also made to compare the present study with the Indian rural girls (ICMR, 1989) and National Centre for Health Statistics (NCHS) data.

***Keywords*---**Human physical growth, Nath, cross-sectional study.

Introduction

People like all animals start their life as a single cell, the fertilized ovum. Guided by the interaction of the genetic information provided by each parent and the environmental milieu, this cell divides one grows, differentiate and develops into the embryo, fetus, child and adult. Growth may be defined as a quantitative increase in size or mass. Measurements of height in centimeters or weight in kilograms indicate how much growth of a human body taken place. Additionally the growth of a body organ, such as liver or brain may also be described by measuring the number, weight or size of cells present. (Bogin 1991)

Human physical growth refers to the progressive development through a series of changes by which an individual embryo becomes a mature organism. Growth remains the chief phase of biological activity up to 20 years of age, whereby weight, height, body build of a person increase till he/ she reaches adult age (Sarmah, 2021).

According to Tanner (1962), human physical growth is not a steady and uniform process of accretion. Hooton (1959) divided the phases of human physical growth into two main stages- a) Prenatal growth and b) Postnatal growth. The prenatal or Antenatal growth is associated with the process in which an embryo or foetus gestates during pregnancy from fertilization until birth. While, postnatal period of growth begins immediately after birth of a child. Tanner (1978) advocated that growth is the continuous and complex interaction of heredity and environment.

The villages where the field work were done are Changsari, Dalang and Saraighat of Kamrup district,Assam. These villages are homogeneous and inhabited by the Nath community. The Nath community is one of the important communities of Assam. They are also known as *Yogi* and *Katani* in Assam. Nath community of Assam are listed as Other Backward Class (OBC). The people of the community believe that they are originated and gained knowledge from lord Shiva and also belong to the clan Shiva. Their society is patriarchal and the follower of Hindu religion. (Nath, 2013).

Methodology

The present study is based on anthropometric methods of data collection through the intensive field work. There are three main methods of studying human physical growth i.e. longitudinal, corss-sectional and mixed- longitudinal method. For this present paper cross- sectional method has been followed for the collection of data. In cross-sectional study each subjects is measured once only and the person of one age group are pooled together to obtain the average value. Stature of 380 Nath girls from the age group of 4 years to 18 years is measured as prescribed by the Martin. The girls who have completed the age of 4 years but were less than 5 years are put at the age group of 4 years. In the same manner all the age groups were arranged. For the present study following numbers of Nath girls in each age group were measured.

Table- 1

Age in year	**No. of girls**	**Age in year**	**No.of girls**
4	28	12	23
5	29	13	31
6	25	14	26
7	28	15	15
8	32	16	12
9	23	17	30
10	22	18	25
11	31		

All the measurements are statistically analyzed to understand the growth in stature at different age groups from 4 years to 18 years. For this purpose mean value, standard deviations and their respective standard errors, absolute growth, growth percent per- annum and growth gradient are calculated.

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

where, A.M = Assumed mean

f = Frequency

d = Deviation and

n = Total number of observations.

b) Standard deviation (SD) $\sqrt{\frac{\Sigma fd^2}{n} - \left(\frac{\Sigma fd}{n}\right)^2}$

Where , f = Frequency

d = Deviation and

n = total number of items

c) Co-efficient of variation (C.V.)= $\frac{SD \times 100}{\bar{x}}$

Where, S.D. stands for standard deviation and $\bar{x}$ stands for mean.

d) Standard error for mean = $\frac{SD}{\sqrt{n}}$

e) Standard error for standard deviation = $\frac{SD}{\sqrt{2n}}$

f) Standard error for Co-efficient of variation= $\frac{CV}{\sqrt{2n}}$

g) 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.

h) Growth percent per-annum = $\frac{\bar{x}_2 - \bar{x}_1}{\bar{x}_1} \times 100$

i) Growth gradient = $\frac{M_4 M_5 M_6 \ldots M_{18}}{M_A} \times 100$

Where, M (4 or 5 or 6 or 7 .....18) is the mean value at particular age of a particular variable.

M_A is the mean value of the adults of a particular variable.

Results

Table- 2 reflects that the mean value of stature increases steadily from 4 years to 18 years. The highest increment is noticed between the age group 4 and 5 years (8.54 cm) and next highest is in between 10 – 11 years (7.38 cm) and then between 5 – 6 Years (7.25 cm). The total increment between 4 years and 18 years is 55.17 cm (Table- 2).

The distance curve (Fig- i) shows that from 4 to 18 years there is a gradual increment of stature. It is also observed that the increment is slow from 15 years to 18 years of age. In case of Nath girls the velocity curve (Fig- ii) reflects that there are three growth spurts. The spurts are found between the ages 4 -5, 10- 11 and 14 -15 years. The adolescent growth spurt is found between the ages 4 -5 years. The second highest spurt for stature among the Nath girls is evident between the age groups of 10 and 11 years.

The growth gradient of stature reflects that the Nath girls have attained 64.318% of total growth at 4 years of age and 35.682% of growth remain to be completed after 4 years.

Table- 2
Statistical constant of Stature

Age (in years)	No. of Girls	$\bar{x}$ ± S.E.	S.D ± S.E	C.V ± S.E	Growth		Growth Gradient
					Absolute	% per annum	
4+	28	99.45 ± 0.81	4.29 ± 0.573	4.313 ± 0.576			64.318
					8.54	8.58	
5+	29	107.99 ± 0.87	4.71 ± 0.618	4.361 ± 0.572			69.842
					7.25	6.713	
6+	25	115.24 ± 1.13	5.66 ± 0.800	4.911 ± 0.694			74.531
					5.01	4.347	
7+	28	120.25 ± 1.07	5.68 ± 0.763	7.723 ± 0.631			77.771
					4.66	3.875	
8+	32	124.91 ± 0.88	4.99 ± 0.623	3.994 ± 0.499			80.785
					5.98	4.787	
9+	23	130.89 ±	7.63 ±	5.829 ±			84.652

		1.59	1.125	0.859			
					6.79	5.187	
10+	22	137.68 ± 2.03	9.52 ± 1.435	6.914 ± 1.042			89.044
					7.38	5.360	
11+	31	145.06 ± 1.34	7.45 ± 0.946	5.135 ± 0.652			93.817
					3.18	2.192	
12+	23	148.24 ± 1.05	5.04 ± 0.743	3.399 ± 0.501			95.873
					2.6	1.753	
13+	31	150.84 ± 0.70	3.92 ± 0.497	2.598 ± 0.239			97.555
					0.09	0.059	
14+	26	150.93 ± 1.07	5.47 ± 0.758	3.633 ± 0.503			97.613
					3.28	2.173	
15+	17	154.21 ± 1.29	5.32 ± 0.912	3.449 ± 0.591			99.734
					0.19	0.123	
16+	12	154.40 ± 0.99	5.39 ± 1.100	3.490 ± 0.712			99.857
					0.09	0.058	
17+	30	154.49 ± 1.05	5.75 ± 0.742	3.775 ± 0.487			99.915
					0.13	0.084	
18+	25	154.62 ± 0.96	4.80 ± 0.678	3.145 ± 0.444			100

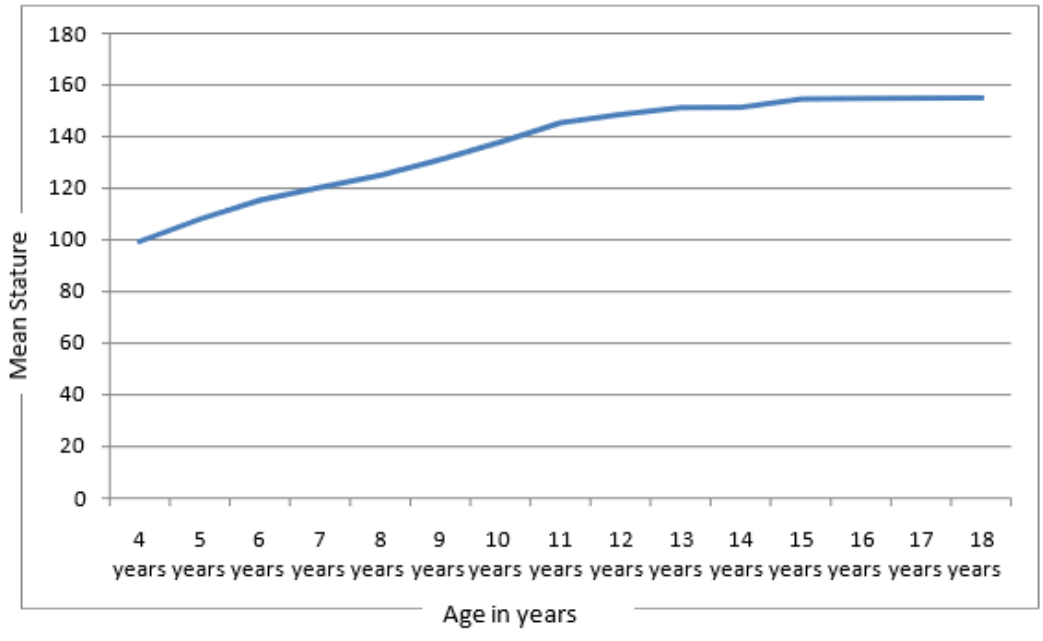

Fig- i Distance curve: Stature

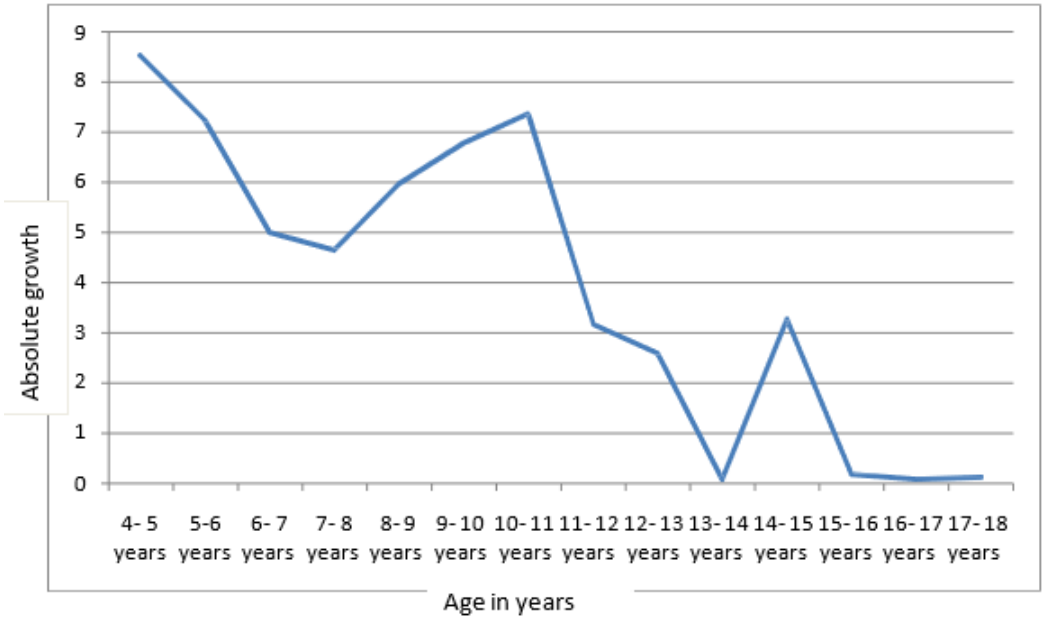

Fig- ii Velocity curve: Stature

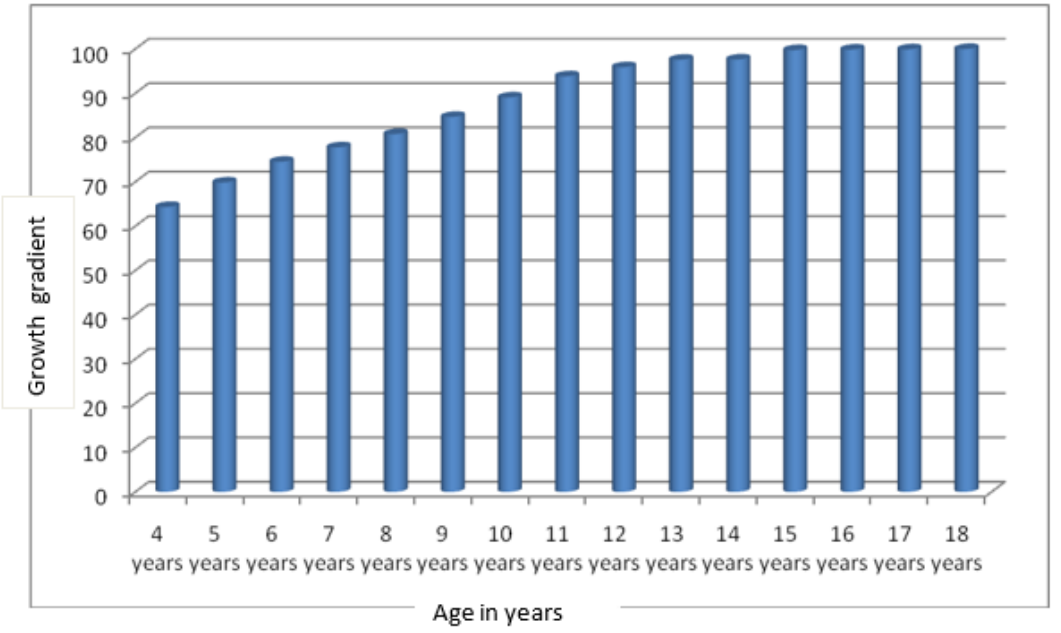

Fig.- iii Growth Gradient of Stature

Comparison of Stature of Present study with Indian rural girls (ICMR, 1989):

It is evident that the Nath girls are taller than the Indian rural girls at all the age groups from 4 years to 18 years.(Table- 3). The highest mean value of stature 154.62 cm. and 150.0 cm. are found among the Nath girls and Indian rural girls respectively at the age of 18 years. While, at 4 years Nath girls represented with mean stature 99.45 cm. and 93.1 cm by the Indian rural girls.

Table- 3
Comparison of Stature of Nath girls with Indian rural girls (ICMR, 1989)

Age (in years)	Nath girls		Indian rural girls (ICMR,1989)	
	Mean	S.D.	Mean	S.D.
4+	99.45	0.81	93.1	6.10
5+	107.99	0.87	99.5	7.18
6+	115.24	1.13	106.3	7.92
7+	120.25	1.07	111.9	7.25
8+	124.91	0.88	117.2	7.40
9+	130.89	1.59	122.2	6.51
10+	137.68	2.03	126.7	7.01
11+	145.06	1.34	131.2	7.25
12+	148.24	1.05	136.7	8.16
13+	150.84	0.70	141.5	7.26
14+	150.93	1.07	145.3	7.22

Age (in years)	Nath girls		Indian rural girls (ICMR,1989)	
	Mean	S.D.	Mean	S.D.
15+	154.21	1.29	147.7	6.87
16+	154.40	0.99	149.6	5.99
17+	154.49	1.05	150.1	5.96
18+	154.62	0.96	150.0	5.92

Comparison of stature of Nath girls with National Centre for Health Statistics (NCHS) reference data:

Table- 4 shows that from 4 years to 9 years of age Nath girls are shorter than the NCHS data. But from 10 years to 13 years Nath girls are found taller than the NCHS reference. While, it is also apparent that from 14 years to 18 years NCHS data overtakes the present studied data.

Table- 4
Comparison of Stature of Nath girls with National Centre for Health Statistics (NCHS)

Age (in years)	Nath girls		NCHS data	
	Mean	S.D.	Mean	Difference
4+	99.45	0.81	102.7	3.25
5+	107.99	0.87	109.4	1.41
6+	115.24	1.13	115.5	0.26
7+	120.25	1.07	121.2	0.95
8+	124.91	0.88	126.5	1.59
9+	130.89	1.59	131.2	0.31
10+	137.68	2.03	136.0	- 1.68
11+	145.06	1.34	140.7	- 4.36
12+	148.24	1.05	145.6	- 2.64
13+	150.84	0.70	150.6	- 0.24
14+	150.93	1.07	155.0	4.07
15+	154.21	1.29	158.5	4.29
16+	154.40	0.99	161.1	6.7
17+	154.49	1.05	162.9	8.41
18+	154.62	0.96	164.2	9.58

References

Bogin, B. 1991. *Patterns of Human Growth.* Cambridge: Cambridge University Press.

Das, B.M. 2000. *Outline of Physical Anthropology.* Kitab Mahal, 22-A Sarojini Naidu Marg, Allahabad.

Hooton, E.A. 1959. *The Individual Life cycle in Up from the Ape***.** New York. The Macmillan Co.

Nath, P.K. 2013. *Asomor Nath Sampradayar Sanskriti*, Chandra Prakash Panbazar Guwahati- 1

Saikia, R.R. 2011. *The Nath Community of Assam: A Study in Historical Perspective with Particular Reference to the erstwhile Sibsagar District*. Ph.D Thesis. Dibrugarh University

Sarmah, M. 2021. *Human Growth and Development.* Global Net Publication, New Delhi Tanner, J.M. 1962. *Growth at Adolescence*, Oxford. Blackwell Scientific Publications.

Tanner, J.M. 1978. *Foetus into Man : Physical Growth from Conception to Maturity*, Open Books, Havard University Press

Thakur, R. and R.K. Gautam. 2014. Prevalence of Undernutrition among School going boys (5- 18 years) of a Central Indian city (Sagar). *Human Biology Review* 3(4) 2014:344-383