

Somatometric Variations Among the Lotha Naga of Wokha District, Nagaland

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INTRODUCTION

The range of variation in various human groups with respect to their body shape and size can be determined by taking accurate measurements on different parts of the body. In the present study an attempt has been made to estimate the somatometric status of the adult male and female Lotha Nagas, a heterogeneous scheduled tribe population of Wokha District, Nagaland.

MATERIALS AND METHODS

Three sets of somatometric measurements, viz., (a) on head and face, (b) on body and (c) on subcutaneous fat content and fifteen indices were considered for the present study. Sample comprised of 110 adult Lotha males and 100 adult Lotha females. Altogether 33 measurements were taken on each subject following the basic techniques suggested by Weiner and Laurie (1969). Martin and Saller's classification (cf. Singh and Bhasin 1989) has been followed in the analysis of indices.

RESULTS AND DISCUSSION

Variation on Head and Face: Table 1 shows that the Lotha males had significantly higher mean values ($p < .01$) than their females with respect to variation on head and face excepting bizygomatic breadth and ear breadth ($p > .9$).

Variation on Body: With respect to variation on body the t-test revealed significant differences in body measurements between males and females with the males having higher mean values (Table 2).

Variation in Subcutaneous Fat Content: It is evident from the t-test (Table 3) that the Lotha females have a significantly higher mean values than the males with respect to skin fold measurements at namely, biceps, triceps, subscapular and calf. Thus the Lotha females seem to have accumulated higher amount of subcutaneous fat than their male counter-parts.

Variation in Somatometric Indices: In table 4, nine out of fifteen indices namely, relative lower

Table 1: Sex differences in the measurements on the head and face of adult Lotha males (M) and females (F)

Name of the measurement (cm.)	Mean $\pm$ SE	Value of t
Head Length	M 18.92 $\pm$ 0.06 F 18.12 $\pm$ 0.05	10.26*
Head Breadth	M 15.74 $\pm$ 0.02 F 15.24 $\pm$ 0.03	9.62*
Head Circumference	M 56.81 $\pm$ 0.11 F 54.92 $\pm$ 0.10	12.60*
Bizygomatic Breadth	M 14.04 $\pm$ 0.05 F 14.07 $\pm$ 0.06	0.38
Morphological Facial Height	M 11.85 $\pm$ 0.09 F 11.03 $\pm$ 0.07	7.45*
Nasal Height	M 5.17 $\pm$ 0.04 F 4.81 $\pm$ 0.04	5.32*
Nasal Breadth	M 3.98 $\pm$ 0.03 F 3.64 $\pm$ 0.04	5.80*
Ear Length	M 6.44 $\pm$ 0.06 F 6.06 $\pm$ 0.02	3.32*
Ear Breadth	M 3.08 $\pm$ 0.04 F 3.08 $\pm$ 0.04	0.00*

* Significant

extremity index, relative biacromial breadth index, relative bicristal index, ponderal index, relative chest girth index, length breadth index of hand, cephalic index, morphological facial height index and physiognomic ear index are found to be statistically significant between the Lotha males and females. However, the mean values of indices excepting a few are more or less similar between both sexes.

Classification of Stature: When stature was classified after Martin (cf. Singh and Bhasin, 1989), 31.82% males and 33.00% females fell under medium stature class, the modal values of stature of males and females being 165.8 cm and 156.3 cm, respectively. Therefore, the Lothas are medium statured people with males being, on the average, 9.5 cm taller than the females.

Classification of Indices: It appears from the somatometric indices that the Lothas in general are found to be having broad head followed by medium headed individuals (Table 6), broad face followed by medium face with quite a few having a very broad face (Table 7), and medium nose

Table 2: Sex differences in the body measurements of adult Lotha males (M) and females (F)

Measurement (cm.)		Mean $\pm$ SE	Value of <i>t</i>
Stature	M	166.81 $\pm$ 0.54	14.39*
	F	156.16 $\pm$ 0.50	
Sitting Height	M	89.37 $\pm$ 0.33	
	F	82.83 $\pm$ 0.31	14.53*
Span	M	171.13 $\pm$ 0.40	16.38*
	F	159.98 $\pm$ 0.34	
Height	M	96.74 $\pm$ 0.23	8.32*
Iliospinale	F	94.16 $\pm$ 0.21	
Biacromial	M	40.07 $\pm$ 0.12	15.22*
Diameter	F	36.22 $\pm$ 0.15	
Biliocristale	M	27.68 $\pm$ 0.14	2.23*
Diameter	F	27.21 $\pm$ 0.19	
Chest Circumference (inspiration)	M	89.27 $\pm$ 0.56	7.90*
	F	82.71 $\pm$ 0.61	
Chest Circumference (expiration)	M	87.56 $\pm$ 0.56	6.87*
	F	81.86 $\pm$ 0.61	
Total Arm Length	M	74.25 $\pm$ 0.30	11.85*
	F	69.51 $\pm$ 0.27	
Upper Arm Length	M	32.65 $\pm$ 0.18	14.59*
	F	29.07 $\pm$ 0.17	
Upper Arm Circumference	M	27.37 $\pm$ 0.20	13.37*
	F	22.70 $\pm$ 0.25	
Fore Arm Length	M	27.09 $\pm$ 0.12	13.37*
	F	23.51 $\pm$ 0.12	
Hand Length	M	18.52 $\pm$ 0.06	9.92*
	F	17.33 $\pm$ 0.08	
Hand Breadth	M	10.37 $\pm$ 0.03	20.21*
	F	9.17 $\pm$ 0.03	
Wrist Breadth	M	5.04 $\pm$ 0.04	
	F	4.38 $\pm$ 0.03	13.2*
Wrist Circumference	M	16.41 $\pm$ 0.11	22.14*
	F	12.07 $\pm$ 0.06	
Foot Length	M	24.72 $\pm$ 0.01	12.87*
	F	22.79 $\pm$ 0.08	
Foot Breadth	M	9.67 $\pm$ 0.04	16.42*
	F	8.66 $\pm$ 0.03	
Calf Circumference	M	34.84 $\pm$ 0.31	7.72*
	F	31.52 $\pm$ 0.30	
Body Weight (kg.)	M	59.50 $\pm$ 0.70	5.26*
	F	54.50 $\pm$ 0.65	

* Significant; M = Male; F = Female

Table 3: Sexual difference in the skinfold measurements on adult Lotha males (M) and females (F)

Skinfold measurements (mm.)		Mean $\pm$ SE	Value of <i>t</i>
Biceps	M	3.73 $\pm$ 0.31	7.45*
	F	7.33 $\pm$ 0.50	
Triceps	M	6.47 $\pm$ 0.45	7.13*
	F	11.39 $\pm$ 0.52	
Subscapular	M	9.53 $\pm$ 0.49	3.15*
	F	11.58 $\pm$ 0.43	
Calf	M	8.90 $\pm$ 0.50	3.52*
	F	11.61 $\pm$ 0.59	

* Significant; M = Male; F = Female

Table 4: Sex differences in somatometric indices among adult Lotha males and females

Name of the index		Mean $\pm$ SE	Value of <i>t</i>
Relative sitting height index	M	53.68 $\pm$ 0.16	
	F	53.24 $\pm$ 0.16	
Relative span index	M	102.67 $\pm$ 0.16	0.52
	F	102.52 $\pm$ 0.17	
Relative upper extremity index	M	44.81 $\pm$ 0.19	0.23
	F	44.87 $\pm$ 0.18	
Relative lower extremity index	M	58.09 $\pm$ 0.19	7.5*
	F	60.19 $\pm$ 0.19	
Relative biacromial breadth index	M	24.23 $\pm$ 0.04	10.78*
	F	23.29 $\pm$ 0.04	
Relative bicristal breadth index	M	16.78 $\pm$ 0.08	3.18*
	F	17.32 $\pm$ 0.08	
Relative chest girth index	M	53.20 $\pm$ 0.28	
	F	52.37 $\pm$ 0.26	2.18*
Ponderal index	M	23.28 $\pm$ 0.08	6.81*
	F	24.35 $\pm$ 0.08	
Length breadth index of hand	M	55.69 $\pm$ 0.10	18.21*
	F	52.46 $\pm$ 0.10	
Length breadth index of foot	M	39.18 $\pm$ 0.12	1.63
	F	38.92 $\pm$ 0.11	
Cephalic index	M	83.32 $\pm$ 0.40	2.02*
	F	84.41 $\pm$ 0.37	
Morphological facial height index	M	82.55 $\pm$ 0.33	6.37*
	F	78.45 $\pm$ 0.36	
Nasal index	M	76.69 $\pm$ 0.78	1.21
	F	75.38 $\pm$ 0.75	
Physiognomic ear index	M	47.49 $\pm$ 0.37	3.96*
	F	50.71 $\pm$ 0.40	
Sagittal naso-facial index	M	43.80 $\pm$ 0.30	0.30
	F	43.67 $\pm$ 0.32	

* Significant; M = Male; F = Female

followed by broad nose (Table 8). It also appears that the Lotha females tend to be more mesocephalic and dolicho-cephalic, more mesoprosopic and more leptorrhine, respectively than the males.

Earlier anthropometric studies among the Nagas of Nagaland included that on the Angami Naga, Ao Naga, Chang Naga, Konyak Naga, Lotha Naga, Sema Naga and Rengma Naga (Gupta et al., 1966 (cf. Kalla, 1994). Significance of the difference between the Lotha Naga and any of the other studied Nagas with respect to any of the somatometric measurements could not be ascertained because the values of SD for the other samples other than the present sample are not available.

KEY WORDS Somatometric Variations. Lotha Naga, Scheduled Tribe, Nagaland

ABSTRACT Data on somatometric variations on head and face, on body and on subcutaneous fat content were collected among the Lotha Nagas of Nagaland. In all these variables the Lotha males showed higher mean values except for the measurement on the subcutaneous fat content where the females were found to have much higher mean values. The Lothas are found to be

Table 5: Distribution of different classes* of stature among the Lothas

Stature class	Male			Female		
	Range (cm)	No.	%	Range (cm)	No.	%
Short	150.0 - 159.9	14	12.73	140.0 - 148.9	9	9.00
Lower medium	160.0 - 163.9	19	17.27	149.0 - 152.9	15	15.00
Medium	164.0 - 166.9	35	31.82	153.0 - 155.9	33	33.00
Upper medium	167.0 - 169.9	25	22.73	156.0 - 158.9	27	27.00
Tall	170.0 - 179.9	17	15.45	159.0 - 167.9	16	16.00
Total	-	110	100.00	-	100	100.00

*After Martin (see Singh and Bhasin, 1989)

Modal value of stature in male = 165.8 cm

Modal value of stature in female = 156.3 cm

Table 6: Distribution of different classes* of cephalic index among the Lothas

Classification of cephalic index	Male			Female		
	Range (cm)	No.	%	Range (cm)	No.	%
Dolichoecephalic	71.0 - 75.9	10	9.09	72.0 - 76.9	12	12.00
Mesocephalic	76.0 - 80.9	38	34.54	77.0 - 81.9	39	39.00
Brachycephalic	81.0 - 85.4	50	45.45	82.0 - 86.4	40	40.00
Hyperbrachycephalic	85.5 - 90.9	12	10.91	86.5 - 91.9	9	9.00
Total	-	110	100.00	-	100	100.00

*After Saller (see Singh and Bhasin, 1989)

Modal value of cephalic index in male = 82.2

Modal value of cephalic index in female = 82.8

Table 7: Distribution of different classes* of morphological facial index among Lothas

Classification of morphological facial index	Male			Female		
	Range (cm)	No.	%	Range (cm)	No.	%
Hyperuryprosopic	X - 78.9	24	21.82	X - 76.9	14	14.00
Euryprosopic	79.0 - 83.9	52	47.27	77.0 - 80.9	48	48.00
Mesoprosopic	84.0 - 87.9	34	30.91	81.0 - 84.9	38	38.00
Total	-	110	100.00	-	100	100.00

*After Martin and Saller (see Singh and Bhasin, 1989)

Modal value of morphological facial index in male = 81.3

Modal value of morphological facial index in female = 79.2

Table 8: Distribution of different classes* of nasal index among the Lothas

Classification of nasal index	Range (cm)	Male		Female	
		No.	%	No.	%
Leptorrhine	55.0 - 69.9	19	17.27	23	23.00
Mesorrhine	70.0 - 84.9	53	48.18	49	49.00
Chamaerhine	85.0 - 99.9	38	34.55	28	28.00
Total		110	100.00	100	100.00

*After Martin and Saller (see Singh and Bhasin, 1989)

Modal value of nasal index in male = 73.4

Modal value of nasal index in female = 73.1

medium- statured people with brachycephalic head, euryprosopic face and mesorrhine nose.

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