

# The Study of Variations in Head Dimensions among Haryanvi Adults

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## Abstract

The present study was conducted on 600 Haryanvi adults comprising of 300 males and 300 females aged 18 to 40 years. Prior written consent was obtained from subjects. Inclusion and exclusion criteria for the study were predefined. Two cephalic measurements, maximum head length and maximum head breadth were taken by using standard anthropometric instruments. From the study it was concluded that the mean head length was 18.80 cm in males and 17.85 cm in females. So all the measurements were more in males as compared to females. The head length frequency showed that 58% males and 21.33% females have very long head length, 24.33% males and 56% females have long, 16% males and 24% females have medium, 0.66% males and 7.33% females have short and 1% males and 2.66% females have very short head length. Head breadth frequency showed that 79% males and 76.33% females have very narrow, 17% males and 19.33% females have narrow and 3.33% and 4.33% females have medium head breadth.

**Keywords:** Anthropometry, Haryanvi, Variation, Cephalic.

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## INTRODUCTION

Variation is one of the most important phenomenon occurring in human populations on this globe attributable to interaction of many factors such as mutation, natural selection, hybridization etc.(1). It is quite certain that heredity and interlocking environmental factors are the determinants of physical makeup of organism. Hardlika [1], Montague [2] and Comas [3] have emphasized importance of anthropometric measurements as a mean of studying human population [4]. The head of the Dinaric type of humans is characterized with a high breadth of the head, a medium length of the neurocranium (often back part is somewhat flattened), the vertical height of the cranium is high, and the face is long and wide [5-7]. The types of the head and face depend on many factors, such as racial and ethnical affiliation, genetic influence, traditions, nutrition, environment and climate [8]. Although the human race must be regarded as a unit intellectually and physically, from the anthropologists viewpoint the particular set of bones most often measured for purposes of ethno-anthropological researches are those of the head [9-10]. For evaluation of variations in craniofacial morphology, standards of

anthropometric measurements should be established for particular population [11].

## MATERIAL AND METHODS

The present study was conducted on 600 adult Haryanvi Baniyas. Prior informed consent both in English and Vernacular were obtained from subjects in writing. The subjects of age group 18-40 years were included in the study. A series of two somatometric landmarks and two anthropometric measurements were taken. The subjects were apparently healthy and without any cephalo-facial deformity.

### Somatometric Measurements

- **Maximum Head length-** it measures the straight distance between glabella (g) and opisthocranion (op).
- **Maximum Head Breadth-** it measures the straight distance between the two eurya (eu).

## OBSERVATIONS AND RESULTS

On the basis of two measurements the usual constants for various head measurements like Mean, SD, SEE of male and female under the study are presented in Table-1.

**Table-1:**

Parameters	sex	Mean (cm)	SD	SEM	Range	
					Min.	Max.
Maximum Head Length	M	18.80	1.055	0.0611	16	22.2
	F	17.85	0.779	0.0451	13.6	20
Maximum Head Breadth	M	12.96	1.095	0.0634	10.6	16
	F	12.89	0.823	0.047	10	14.7

**Table-2: Classification of Maximum head length among Haryanvi adults (Male & Female)**

Class	Males (300)			Females (300)		
	Range (cm)	Number observed	% age	Range(cm)	Number observed	% age
Very short	X-169	3	1	X-161	8	2.66
short	170-177	2	0.66	162-169	22	7.33
medium	178-185	48	16	170-176	72	24
long	186-193	73	24.33	177-184	168	56
Very long	194-X	174	58	185-X	64	21.33

**Table-3: Classification of Maximum head breadth among Haryanvi adults (Male & Female)**

Class	Males (300)			Females (300)		
	Range (cm)	Number observed	% age	Range(cm)	Number observed	%age
Very Narrow	X-139	237	79	X-134	229	76.33
Narrow	140-147	51	17	135-141	58	19.33
Medium	148-155	10	3.33	142-149	13	4.33
Broad	156-163	2	0.66	150-157	0	0

All the classification and ranges are as per Martin and Saller [12, 13].

In the present study, males head length ranges from 16 cm to 22.2 cm with mean of 18.80 cm and head breadth from 10.6cm to 16cm with mean of 12.96cm. In females head length ranges from 13.6 cm to 20 cm with mean of 17.85 cm and head breadth ranged from 10cm to 14.7cm with mean of 12.89cm. The mean values were more in males as compared to females. Head length and Head Breadth were classified according to Lebzelter and Saller and our results showed that head length in males had majority of very long type with 58%, followed by long and medium with 24.33% and 16%

respectively. Least common was very short type and short type with 1% and 0.66% respectively. Whereas head length in female had long type with 56%, followed by very long and medium type with 21.33% and 24% respectively with 7.33% short and 2.66% as very short. Head breadth in males showed majority with very narrow type 79%, followed by narrow type 17%, medium type with 3.33% and broad type 0.66%. In females very narrow type was commonest 76.33%, followed by narrow 19.33%, medium type 4.33% and none as broad and very broad.

**Table-4: Showing comparison of classification of head length of previous studies with present study**

Class	Males (300)			Females (300)		
	Yagain <i>et al.</i> , study (%)	Pandey study on Onges (%)	Present study (% age)	Yagain <i>et al.</i> , study (%)	Pandey study on Onges (%)	Present study(%age)
Very short	0	22.22	1	0	8	26.92
short	6	70.37	0.66	18	22	57.69
medium	45	7.40	16	41	72	15.38
long	17	0	24.33	12	168	0
Very long	0	0	58	29	64	0

All the classification and ranges are as per Martin and Saller [12]

**Table-5: Showing comparison of classification of head breadth of previous studies with present study**

Class	Males (300)			Females (300)		
	Yagain <i>et al.</i> study	Pandey study on Onges	Present study (% age)	Yagain <i>et al.</i> study	Pandey study on Onges	Present study (%age)
Very Narrow	20	7.40	79	9	15.38	76.33
Narrow	39	70.37	70.07	35	65.38	19.33
Medium	35	7.40	14.81	50	10.23	4.33
Broad	0	2	3.70	6	0	0
Very Broad	0	0	0	0	0	0

## DISCUSSION

A variety of factors such as age, race, gender and nutritional status affect the human growth and development. So the different standards are required for different populations. It must be remembered that the reaction to a given environment represents the interaction of the genotype of the population being studied with environment [14]. In present study, head length in males varies from very long to long but medium to long head length was observed in Yagain *et al.*, [15] study on 100 students and short head length was commonest variety seen in Onges [4]. In female, long type head length was commonest in present study but medium type in Yagain *et al.*, [15] study and short type in Onges. Also regarding head breadth, very narrow type to narrow type was observed in both sexes in present study but medium to narrow type was observed in Yagain *et al.* study on medical students and narrow to medium in Pandey's study on Onges in both sexes. The mean head length in both sexes is more than these studies, but the mean head breadth in both sexes is less in present study as compared to these studies. When compared with Ilperuma (Srilanka) and Akhtar Z on Bengladeshi Gro studies, head length was more in present study both in males & females but head breadth was less than Ilperuma I study. Gupta S *et al.*, study on North Indian population have more head length but less head breadth, as compared to Srilankan and Bengladeshi Garo, Which is in agreement with the present study. It shows that it is not necessary that if head is longer in certain population it will be broader also [16].

## CONCLUSION

On the basis of anthropometric measurements it can be concluded that Haryanvi Bania's mean head length was 18.80cm with minimum 16cm and maximum 20cm in males & 17.85cm (mean) with minimum 13.6 cm and maximum 20cm in females. Head length range variation among males was, very short 1%, short 0.66%, medium 16%, long 24.33% and very long 58%. In female the range variation was, very short 2.66%, short 7.33%, medium 24%, long 56% and very long 64%. The head breadth varies from 10.6cm to 16cm with mean 12.96cm in males and 10cm to 14.7 cm with mean 12.89cm in females. The head breadth range variation among males was, very narrow 79%, narrow 17%, medium 3.33% & broad 0.66%. In females the range variation was very narrow 76.33%, narrow 19.33%, followed by medium 4.33%. Data of this study will be very useful to anatomists, anthropologist and forensic experts.

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