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Hand and its relationship to stature of adult population: An anthropological study

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Abstract

Aims & Objectives: To assess the hand length and stature of the individual and to correlate between the hand length and the stature.

Conclusion: The present study has shown the usefulness of hand length & foot length measurement in the estimation of stature amongst medical students age b/w 17-27 years belonging to Different regions of Rajasthan.

Keywords: Stature meter, spreading caliper (blunt ended), vernier calliper, frankfurt plane

1. Introduction

Anthropometry is a systematized measuring tool that expresses dimension of the human body and skeleton. Height estimation by measurement of various long bones has been attempted by several workers with variable degree of success. Each worker has derived his own formula for calculating the stature from long bones. However, foot measurement has not frequently been used for this.

2. Materials and Methods

200 objects (100 males and 100 females) in the age group of 17-21 years. The study was conducted on the medical students of Jhalawar Medical College, Jhalawar (Rajasthan).

Data Collected

- Stature: (Standing height of an individual's).
- Hand length (B/w midpoint interstyloid line to tip of middle finger)

Methodology: By Regression Equation

Apparatus used in this study

1. Stature meter.
2. Spreading Caliper (Blunt Ended)
3. Vernier Calliper

3. Inclusion Criteria

- Similar socio-economic status.
- Age group of students ranged from 17 to 27 years

Measurements were taken at fixed time b/w 2 to 5 p.m. to eliminate the discrepancies due to diurnal variation.

4. Exclusion

- Age above 27 and below 17 year excluded
- Time other than b/w 2 to 5 p.m. excluded

Measurement of Stature

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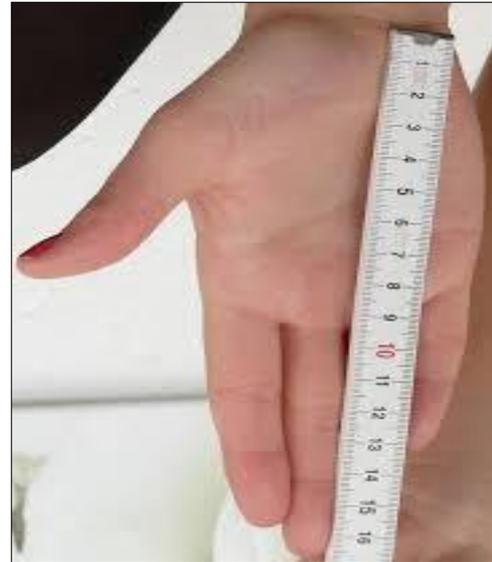
Fig 1: Stature is measures of vertical distance from vertex to floor

Vertex: It is the highest point on the head in mid saggital plane, when the head is held erectly or in Frankfurt’s plane. Height was measured from vertex to floor by stadiometer (wall fixing type) with subject standing barefooted, erect on an even floor, in the Frankfurt’s plane.

Subject’s head was positioned parallel to the floor with heels together and weight evenly distributed between both feet. The distance was measured from the highest point on the subject’s head to ground with the head piece of contacting the scalp.

Frankfurt’s Plane: The plane determined by the lowest points on the infra orbital margins and the tragion (the notch immediately above the tragus of the ear). This corresponds almost exactly to the plane of visual axis, which is obtained when the individual is looking straight ahead of him.

Measurement of hand length

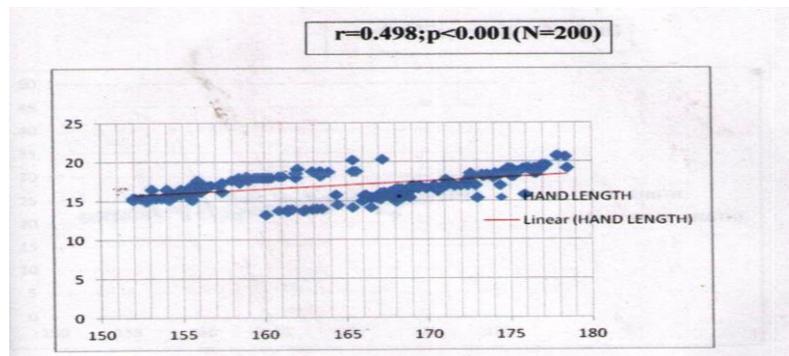


4. Reults

Table 1: Person correlation of hand length and body height.

	Male (n=100)	Female (n=100)	P value	All cases
Hand Length (cm)	.941	.946	0.000	.498

The Correlations of hand length and height in cm was observed to be statistically significant with respect to gender. When both male and female are observed together (n=200), the degree of relationship between body height and hand length is significant.



Graph 1: Pearson correlation between hand length and body height

Correlation Coefficient and Regression analysis for all cases. prediction of total height for Hand length and foot length in

	All cases	
	Coefficient of Correction (r)	Coefficient of Determination (R ²)
Hand Length (cm)	.498	.24

The regression analysis was carried out to find the strength of relationship of hand length with body height. The relationship between hand length and body length is positive and for every unit increase in head length there is significant (2.41 in male & 2.75 in female) increase in body height.

Discussion

Chikhalkar b.g. Derived a regression equation b/w hand length & height, their correlation coefficient b/w hand

length & height was +0.5902. Aged b/w 19-23 year with 300 subjects where hand length measurements were taken from mid-point below radial & ulnar tuberosity to tip of middle finger.

The study comprised of 150 subjects studying in various colleges of Delhi B/w 18-22 year of age. Their correlation coefficient b/w hand length & height was +0.7.

Isurani hayperuma was conducted on 258 medical students Galle, Sri Lanka. The age of subjects ranged from 20-23

years, hand length was measured b/w distal wrist crease & distal end of most anterior projecting point, i.e. tip of middle

finger. Their correlation coefficient b/w hand length & height was +0.58 in male, & +0.59 in Female.

Table 2: Comparison of similar previous studies with present study.

Workers	Chikhalkar b.g.	Isurani Hayperuma	Present Study
Age of the study Group in years	19-23 years	20-23 years	17-25 years
Mean hand length (cm)	18.938	19.01 (Male) 17.62 (Female)	16.95 (Male) 16.97 (Female)
Mean Total Height (cm)	167.265	170.14 (Male) 157.55 (Female)	170.69 (Male) 157.25 (Female)
Correlation Coefficient	+0.5902	+0.58 (Male) +0.59 (Female)	+0.947 (Male) +0.946 (Female) +0.498(combined)

Table 3: Comparison of similar previous studies with present study.

Workers	Chikhalkar b.g.	Patel S.M.	Present Study
Age of the study Group in years	19-23 years	20-23 years	17-25 years
Mean hand length (cm)	24.008	24.44 (Male) 22.34 (Female)	24.41 (Male) 22.77 (Female)
Mean Total Height (cm)	167.265	170.96 (Male) 156.14 (Female)	170.692 (Male) 157.25 (Female)
Correlation Coefficient	+0.6102	+0.65 (Male) +0.80 (Female)	+0.564 (Male) +0.902 (Female) +0.637(combined)

6. Conclusion

With respect to age, sex and racial groups, dimensions and body proportions are widely variable. The present study has shown the usefulness of hand length & foot length measurement in the estimation of stature amongst medical students age b/w 17-27 years belonging to Different regions of Rajasthan. Regression formulae for stature estimation from hand length, & foot length measurement were derived in both males and females.

Correlation coefficient of

Hand length & height +0.947 in males and +0.946 in females

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