

Estimation of stature using hand dimension

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ABSTRACT

Background: An attempt is made to find the height of the body using hand dimension. Nowadays, stature or height of the body is the most important and useful anthropometric parameter for the determination of physical identity of an individual. This is also useful in forensic study. Identification of the height of the dead body which is in pieces due to massive blast or disaster can be done by measuring the hand length. **Materials and Methods:** The study includes 100 students from Saveetha Dental College. The hand length, direct linear distance between the distal wrist crease and the distal end of the most anterior projecting point of the middle finger, was measured using a Vernier caliper. The resulting data will indicate that the hand length provides means of estimating stature of individual by doing calculation. Both the left hand (LH) and right hand (RH) dimension were taken. The age group was from 17 to 22 years and measurements were taken from the 1st to 2nd year BDS students. **Results and Discussion:** Height of 20 males and 21 females was divided by their hand dimension (LH and right). Average and standard deviation were calculated. It shows that there is no much difference in the LH and RH of male and female. The height of male and female is 9 times bigger than their hand dimension. **Conclusion:** It is concluded that the height of the individual is roughly 9 times of their hand length. Stature is almost same either using the LH or RH in both male and female; furthermore, there is no much difference between the LH and RH of males or females. This study can be useful in identification aspect.

KEY WORDS: Anthropometric measurements, Hand length, Standard deviation, Stature

INTRODUCTION

This is an attempt which is made to find the height of the body by measuring the length of hand.^[1] Nowadays, stature or height of the body is one of the most important and useful anthropometric parameters for identifying the physical identity or height of an individual.^[2] This is also useful in forensic study. Identification of the height of the dead body which is in pieces due to massive blast or disaster can be done by measuring the hand length.

Measuring the shape and size of the body can be done by anthropometric measurements. It is one of the main tools of physical anthropology.^[3]

Anthropometric Measurements

Stature

Stature can be defined as the distance between the top of the head to the base of the foot. It was measured

in with a meter rule in the erect vertical position with the subject standing barefooted and head in plane as described by Ilayperuma.^[4]

Hand length

The hand length can be measured as a straight distance between the distal crease of the wrist joint and the most anterior projecting point (the middle finger) as described by Ibeachu *et al.*^[5]

The relation between height and hand length was first described by Marcus Vitruvius Polliono (BC) and was popularized by Leonardo da Vinci's "Vitruvian Man" from 1487.^[6-9]

MATERIALS AND METHODS

The study includes 100 students from Saveetha Dental College. The hand length, direct linear distance between the distal wrist crease and the distal end of the most anterior projecting point of the middle finger, was measured using a Vernier caliper. The resulting data will indicate that the hand length provides means of estimating stature of individual by doing

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calculation. Both the left hand (LH) and right hand (RH) dimension were taken. The age group was from 17 to 22 years and measurements were taken from the 1st to 2nd year BDS students.

Stature

The student was asked to stand barefoot on the base in a standing position, heels are separated, and weight is borne evenly on both feet. The handpiece of the stadiometer is kept firmly over the head to compress the hair and height is then measured.^[10]

Hand Length

The student was asked to place hand on the flat hard table, and measurements were taken from Vernier calipers. The length is measured from distal transverse crease to wrist to tip of the middle finger.^[11]

RESULTS

Dimension of hand and stature was taken from 20 males [Table 1] and 21 females [Table 2].

In males, the height of body was divided into hand dimension of the LH and RH. Average and standard deviation were calculated of both the LH and RH.

Standard deviation of the LH and RHs is 9.08565 and 9.127186, respectively, as shown in Figure 1.

In females, standard deviation of the LH and RH is 9.280362 and 9.047619, respectively, as shown in Figure 2.

DISCUSSION

The human hand which mostly they use for writing, eating, drinking, working, playing, and many more things and is the versatile part of the body and it plays an important role in the investigations of forensic study.

In both the figures, standard deviations of the LH and RH are almost same, which show that there is almost no difference between the LH and RH according to dimensions.

The figures also show that there is no difference in estimating stature using hand dimension between males and females.

The height of male and female is roughly 9 times bigger than their hand dimension. Rastogi *et al.*,^[12] Jakhar *et al.*,^[13] Pawar and Dadhich,^[14] and Pandhare *et al.*^[15] from India used HL for the estimation of stature.

This study was done with dental students of Saveetha Dental College, age group of 17–22 which are from

Table 1: Hand length (right and left) and height of male

Male	Height	Left hand	Right hand
1	180	20	20.4
2	183	20.5	20.5
3	153	17.5	17
4	180	20	19.7
5	165	18.5	18.4
6	176	19	19.2
7	177	20.5	19.5
8	168	18.6	18.3
9	177	18.6	18.3
10	183	19	19.5
11	170	18.5	18
12	182	20.5	20
13	160	19	19.5
14	189	19.5	19.5
15	160	18.2	18
16	162	16.5	17.5
17	154	17.5	17
18	165	17.5	17.5
19	158	17.5	17.3
20	171	19	19

Table 2: Hand length (right and left) and height of female

Female	Height	Left hand	Right hand
1	151	17.5	17.5
2	160	18	17.5
3	165	17	17.5
4	150	16.5	17.5
5	163	18	17.5
6	160	18	17.5
7	155	18	17.5
8	153	16	17.5
9	148	16.4	17.5
10	156	17.2	17.5
11	161	17.5	17.5
12	158	18	17.5
13	163	17.3	17.5
14	157	16	17.5
15	161	16.9	17.5
16	165	17.2	17.5
17	162	16.5	17.5
18	165	17.5	17.5
19	152	16	17.5
20	158	16.2	17.5
21	162	17	17.5

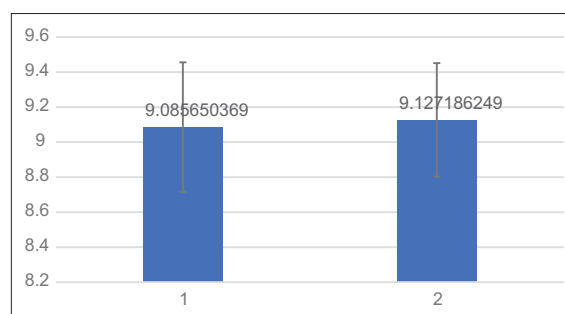


Figure 1: Standard deviation of male (left and right hand)

middle to higher socioeconomic class. This shows that anthropometric measurements can also be used on higher side when it is compared with general population.^[16]

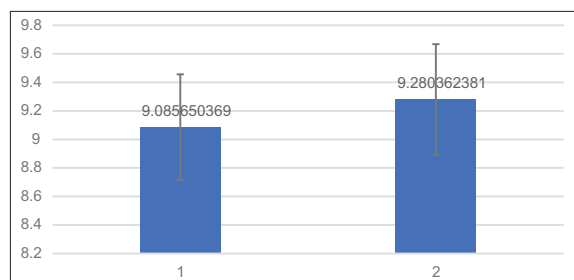


Figure 2: Standard deviation of female (left and right hand)

Other studies show positive and statistically significant correlation of hand length and handbreadth with stature.^[17]

One study showed that the paramount importance to forensic experts and anthropologists is the estimation of stature. A strong relationship found between the stature and hand length.^[18]

CONCLUSION

It can be concluded that the height of the individual is roughly 9 times of their hand length. Stature is almost same either using the LH or RH in both male and female and also there is no much difference between the LH and RH of males or females. This study can be useful in identification aspect.

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