

Evaluation of Height from Lengths of Second and Fourth Digits of Hand: An Institutional Based Study

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ABSTRACT

Background: Human beings are considered to be bilaterally symmetrical, though, there is an asymmetry in the length of the thumb and fingers of both hands irrespective of sex or handedness; estimation of stature of an individual plays an important role for medico-legal fixation of individuality. Aim of the present study was for estimating the height from the lengths of second and fourth digits of hand in a known population.

Materials & Methods: A total of 100 males and 100 females were enrolled. All the subjects belonged to the age range of 20 to 25 years. All the study subjects were given adequate information about the study and informed consent is taken. Each person's height, left and right second and fourth digit lengths, and length were noted. The participants were instructed to lay with their hands out in a supine position on a level, hard horizontal surface. A linear distance separates the proximal crease of the fingers and the distal end of the most anterior projecting tip. All the results were subjected to statistical analysis using SPSS software.

Results: Among male population, mean height, length of right 2nd digit, right 4th digit, left 2nd digit, left 4th digit was 169.3 cm, 7.35 cm, 7.51 cm, 7.38 cm and 7.49 cm respectively. Among female subjects, mean height, length of right 2nd digit, right 4th

digit, left 2nd digit, left 4th digit was 159.31 cm, 6.86 cm, 6.99 cm, 6.91 cm, 6.93 cm respectively. While assessing the correlation of height with digit's length, significant results were obtained both in males and females.

Conclusion: Height among males and females are significantly correlated with lengths of second and fourth digits of hand.


Key words: Digit, Height, Hand.

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INTRODUCTION

A longest middle finger followed by ring, index, and small fingers is the typical finger-length pattern in humans. Empirical research on height and success in the U.S. labor market dates back at least a century. Gowin, for example, presents survey evidence documenting the difference in the distributions of heights of executives and of "average men." Gowin also compares the heights of persons of differing status in the same profession, finding that bishops are taller on average than preachers in small towns, and sales managers are taller than salesmen, with similar results for lawyers, teachers, and railroad employees. Height continues to be highly correlated with labor market success in developed countries.¹⁻³

Human beings are considered to be bilaterally symmetrical, though, there is an asymmetry in the length of the thumb and

fingers of both hands irrespective of sex or handedness; estimation of stature of an individual plays an important role for medico-legal fixation of individuality.⁴⁻⁶ Hence; the present study was conducted for estimating the height from the lengths of second and fourth digits of hand in a known population.

MATERIALS & METHODS

A total of 100 males and 100 females were enrolled. All the subjects belonged to the age range of 20 to 25 years. All the study subjects were given adequate information about the study and informed consent is taken.

Each person's height, left and right second and fourth digit lengths, and length were noted. Those with severe illnesses or deformities that could have an impact on skeletal or general

development are not allowed. Height To measure height, a standard anthropometer was employed. The individual was instructed to stand straight on a horizontal plane, with their fingers pointing down and their hands turned inward, while measuring the vertical distance from the floor to the vertex. The length of the digits was measured with a sliding caliper. The participants were instructed to lay with their hands out in a supine position on a level, hard horizontal surface. A linear distance separates the proximal crease of the fingers and the distal end of the most anterior projecting tip. All the results were subjected to statistical analysis using SPSS software.

RESULTS

A total of 100 males and 100 females were enrolled. Mean age of the male and female subjects was 22.8 years and 23.7 years respectively. Among male population, mean height, length of right 2nd digit, right 4th digit, left 2nd digit, left 4th digit was 169.3 cm, 7.35 cm, 7.51 cm, 7.38 cm and 7.49 cm respectively. Among female subjects, mean height, length of right 2nd digit, right 4th digit, left 2nd digit, left 4th digit was 159.31 cm, 6.86 cm, 6.99 cm, 6.91 cm, 6.93 cm respectively. While assessing the correlation of height with digit's length, significant results were obtained both in males and females.

Table 1: Descriptive variables

Variable	Males	Females
Height (cm)	169.3	159.3
Right 2 nd digit (cm)	7.35	6.86
Right 4 th digit (cm)	7.51	6.99
Left 2 nd digit (cm)	7.38	6.91
Left 4 th digit (cm)	7.49	6.93

Table 2: Correlation of height with digits among males and females

Variable	Pearson's correlation with height	
	Males	Females
Right 2 nd digit (cm)	r-value: 3.125	r-value: 2.332
	p-value: 0.007*	p-value: 0.000*
Right 4 th digit (cm)	r-value: 2.131	r-value: 1.645
	p-value: 0.007*	p-value: 0.000*
Left 2 nd digit (cm)	r-value: 0.995	r-value: 1.946
	p-value: 0.000*	p-value: 0.008*
Left 4 th digit (cm)	r-value: 2.919	r-value: 2.465
	p-value: 0.004*	p-value: 0.000*

DISCUSSION

A total of 100 males and 100 females were enrolled. Mean age of the male and female subjects was 22.8 years and 23.7 years respectively. Among male population, mean height, length of right 2nd digit, right 4th digit, left 2nd digit, left 4th digit was 169.3 cm, 7.35 cm, 7.51 cm, 7.38 cm and 7.49 cm respectively. Among female subjects, mean height, length of right 2nd digit, right 4th digit, left 2nd digit, left 4th digit was 159.31 cm, 6.86 cm, 6.99 cm, 6.91 cm, 6.93 cm respectively. While assessing the correlation of height with digit's length, significant results were obtained both in males and females. Cagatay Barut et al, in a previous study assessed the correlation of height and weight with second to fourth digit ratio (2D:4D) and sex differences. Sex difference in 2D:4D digit ratio was studied in 386 right-handed students. The lengths of index (2D) and ring (4D) fingers were measured using a caliper. Height and weight of participants were recorded. Body height correlated negatively with right- and left-hand digit ratios in the total sample (N = 386); correlations were significant for the left-hand digit ratio of men and for the right-hand digit ratio of women (no significant correlations with weight). Males had a significantly lower 2D:4D ratio than females. After controlling for height, sex differences in

right- and left-hand digit ratios completely disappeared. The results suggested that height of adults reflecting prenatal hormone status may play a role in differences between men and women in 2D:4D digit ratio for right-handers.¹⁰

Basnet B et al evaluate the correlation between the length of the thumb and OVD in Aryan and Mongoloid ethnic groups. The secondary aim was to compare the correlation between OVD and other anatomic measurements (eye-ear distance and pupil-to-rima oris distance) in these ethnicities. The OVD, thumb length, eye-ear distance and distance between pupil of eye and rima oris were measured in a total of 500 adult dentulous volunteers. The correlation between OVD and thumb length as well as other anatomic measurements was checked with Pearson's product moment correlation coefficient. Linear regression analysis was performed to determine the relationship of OVD to the length of the thumb. The thumb length was significantly ($P \leq 0.05$) correlated with strong and positive values (Pearson's coefficient = 0.874 in the whole population, 0.826 in Aryans, and 0.944 in Mongoloids). Regression analysis showed that thumb length was significantly related to OVD in both ethnic groups.¹¹ Monyeki, KD et al determine whether arm span, mid-upper arm and waist

circumferences and sum of four skinfolds can be used to predict height, the relationships between these anthropometric variables were assessed among Ellisras rural children aged 8–18 years. The following parameters were measured according to the International Society for the Advancement of Kinanthropometry: height, arm span, mid-upper arm circumference, waist circumference and four skinfolds (suprailiac, subscapular, triceps and biceps). Associations between the variables were assessed using Pearson correlation coefficients and linear regression models. Mean height was higher than arm span, with differences ranging from 4 cm to 11.5 cm between boys and girls. The correlation between height and arm span was high (ranging from 0.74 to 0.91) with $P < 0.001$. The correlation between height and mid-upper arm circumference, waist circumference and sum of four skinfolds was low (ranging from 0.15 to 0.47) with $P < 0.00$ among girls in the 15–18 years age group. Arm span was found to be a good predictor of height. The sum of four skinfolds was significantly associated with height in the older age groups for girls, while waist circumference showed a negative significant association in the same groups.¹²

CONCLUSION

Height among males and females are significantly correlated with lengths of second and fourth digits of hand.

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