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Original Research Article

CORRELATION BETWEEN STATURE & INDEX FINGER AMONG ADULTS SUBJECTS IN SOUTH RAJASTHAN

Dr Anis Ahmed

Associate Professor, Dept. of Forensic Medicine and Toxicology, Pacific Institute of Medical Sciences, Umarda, Udaipur

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Corresponding author: Dr Anis Ahmed
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Abstract

Aim: The aim of the present investigation is to study the Correlation between Stature & Index Finger among Adults Subjects in South Rajasthan.

Material & Methods: The present study is descriptive cross-sectional study which was carried out in private medical college for the period of two year January 2017 to December 2018. The study comprised a total of 500 samples which includes 250 male and 250 female between the age group of 20-30 years. The study protocol was approved by the ethical committee with the inclusion and exclusion criteria of the study. Finger length of all fingers of both right and left hand was measured with the help of digital caliper. The finger length was measured as a straight linear distance between midpoints of proximal finger crease to the tip of finger of respectively. A simple linear regression analysis was performed to derive regression equation for estimation of stature from finger length.

Results: Standard deviation in years for age and in centimeters for all other measurements. The mean stature of male was found to be 172.22 ± 4.23 cm and the mean stature of female was found to be 154.18 ± 3.77 cm. There was no statistically significant difference between measured stature and estimated stature in both genders. Therefore, the regression formula derived from the finger length can effectively be applied to estimate stature in the studied group of students.

Conclusion: The present study concluded that finger length has a moderate and positive relationship with stature of an individual. Hence the stature of an individual can be successfully estimated from the finger length using different regression equation derived in the present study.

Keywords: Correlation, Stature & Index Finger, South Rajasthan, Pearson correlation, Stadiometer

Introduction

Estimation of stature is extremely important in forensic anthropology and may be very helpful within the cases where mutilated bodies are found. the present study aims to spot the stature from finger length and to seek out the foremost reliable finger for the estimation of stature. One such study conducted by Suseelamma D et al. [1] was the Correlation between stature and length of fingers during which the target of the study was to estimate stature from finger lengths and to predict the accuracy of regression models derived from such parameters [1]. The study was administered 200 subjects aged group 18-60 years. it had been found that there was significant difference ($P < 0.001$) between stature of male and feminine subjects and significant difference ($P < 0.001$) between male and feminine finger length. Pearson correlation between finger length and stature was higher among males as compared to females [2-4].

Basic and major component of anthropological research is that the estimation of stature which is beneficial for identification of a private and is of immense importance to medicolegal experts, forensic examiners and anatomist [5]. it's quite easy to estimate stature of a private if whole body is out there , but it's too difficult to estimate stature if only few parts of the body or skeletal remains are available [6].

Methodology

The present study is descriptive cross-sectional study which was administered privately medical college for the amount of two year January 2017 to December 2018. The study comprised a complete of 500 samples which incorporates 250 male and 250 female between the age bracket of 20-30 years. The study protocol was approved by the ethical committee with the inclusion and exclusion criteria of the study. The measurement of stature, right fingers length and left fingers length were taken. The measurement was taken twice and therefore the average was recorded to make sure accuracy. The measurement was taken by using standard anthropometric instruments like height board (stadiometer) and digital caliper.

The stature was measured because the vertical distance from vertex to the foot. the topic was asked to face with their heels placed together, touching the bottom of the vertical board while the top , scapulae, back and buttocks were positioned in touch with the vertical backboard. Arms were placed by the side of body with palm during a prone position. Then, the movable board was brought onto the foremost superior point on the top and stature was recorded. the topic was asked to take a seat comfortably during a chair and asked to put their hands supine on a flat hard level with fingers extended and adducted but not hyper extended. Finger length of all fingers of both right and left was measured with the assistance of digital caliper. The finger length was measured as a straight linear distance between midpoints of proximal finger crease to the tip of finger of respectively. an easy rectilinear regression analysis was performed to derive regression of y on x for estimation of stature from finger length.

Statistical Analysis

Mean difference between the measured stature and estimated stature was examined using dependent or paired t-test. Data analysis was done by using Statistical Package of Social Science.

Results

Data are presented in Table 1, as mean, standard deviation in years for age and in centimeters for all other measurements. The mean stature of male was found to be 172.22 ± 4.23 cm and therefore the mean stature of female was found to be 154.18 ± 3.77 cm. The normality of the info was verified using the test supported its p-value.

Table 1: Quantitative measurements data in males and females

S No.	PARAMETERS	MALE (n-250)	FEMALE (n-250)
1.	Age (years)	20.22± 1.21	19.44 ± 1.33
2.	Stature (cm)	172.25 ± 4.23	154.18 ± 3.77
3.	Right Thumb Finger Length (cm)	6.45 ± 0.46	5.84 ± 0.44
4.	Right Index Finger Length (cm)	7.18 ± 0.22	6.66 ± 0.66
5.	Right Middle Finger Length (cm)	7.86 ± 0.55	7.32 ± 0.23
6.	Right Ring Finger Length (cm)	7.38 ± 0.47	6.78 ± 0.62
7.	Right Little Finger Length (cm)	5.93 ± 0.25	5.44 ± 0.56
8.	Left Thumb Finger Length (cm)	6.38 ± 0.78	5.77 ± 0.77
9.	Left Index Finger Length (cm)	7.15 ± 0.48	6.65 ± 0.31
10.	Left Middle Finger Length (cm)	7.22 ± 0.11	7.37 ± 0.33
11.	Left Ring Finger Length (cm)	7.55 ± 0.56	6.78 ± 0.38
12.	Left Little Finger Length (cm)	5.76 ± 0.76	5.41 ± 0.33

As shown in Table No. 2, the correlation data shows that there's highly significant direct correlation between stature and finger length, in both male and feminine . Among the five fingers length, right index and left finger length shows the upper degree of correlation with stature. The positive and significant correlation between the bilateral finger measurements in both genders.

Table 2: Correlation for stature and finger measurements

S No.	PARAMETERS	MALE (n-250)	FEMALE (n-250)
1.	Right thumb finger length	0.46	0.55
2.	Right index finger length	0.65	0.58
3.	Right middle finger length	0.48	0.52
4.	Right ring finger length	0.57	0.47
5.	Right little finger length	0.53	0.44
6.	Left thumb finger length	0.48	0.43
7.	Left index finger length	0.55	0.57
8.	Left middle finger length	0.68	0.54
9.	Left ring finger length	0.63	0.46
10.	Left little finger length	0.47	0.42

Table 3 reveals that there was no statistically significant difference between measured stature and estimated stature in both genders. Therefore, the regression formula derived from the finger length can effectively be applied to estimate stature in the studied group of students.

Table 3: The measured and estimated stature of Right & Left hand finger

PARAMETERS	MALE				FEMALE			
	Measured stature (MS),	Estimated stature (ES)	Difference	P Value	Measured stature (MS),	Estimated stature (ES)	Difference	P Value
Right Index Finger Length	172.22	170.45	0	NS	157.88	156.11	0	NS
Left Index Finger Length	171.28	170.22	0.01	NS	158.22	156.54	0	NS

Discussion

The present study was performed to derive equation for stature estimation from fingers length and also to work out the connection between stature and finger length in both genders. This equation are often used as alternative mean of stature calculation when direct calculation of stature isn't possible thanks to various circumstances. Evaluation and comparison of present study findings with previous studies revealed several differences also as similarities. Most of the studies on estimation of stature from skeleton of human body were carried out in Nigerian population, [7] Indian population [8,9] and Thai population [10]. In our study, the mean stature of male was found to be 172.25 ± 4.23 cm and therefore the mean stature of female was found to be 154.18 ± 3.77 cm. The mean stature of male of present study was almost like Sri Lankans adults as shown by the study of Ilayperuma et al. [11] and therefore the study of Tang et al. [12] among people of china but the mean stature of female in their study was above this study. The mean stature of female of present study was almost like Bengali adult Muslim. The mean stature of both genders was comparatively above this study in North Indian population Guajarati population South Indian population and Thai population. The mean stature of both genders was comparatively lesser than present study in Tribal district population of India.

Such difference in stature could also be thanks to population variation which can be attributed to genetic and environmental factor. The mean of finger length in both genders was greater than present study in Western Australian population.

In the present study, it's evident from the Table 2 that each one the finger length measurements have a positive and highly significant correlation with the stature in both genders. Highly significant and direct correlation between the stature and finger measurements allowed this study to calculate the regression of y on x which was supported by many previous studies. Jasuja and Singh also observed statistically significant correlation between stature and hand length and phalanges length and concluded that stature might be estimated from their study parameters.

Similarly the equation derived for estimating stature from hand length and finger length differs from those presented by the previous studies who performed their among different population [13]. This observation might be attributed to population and ethnic difference between this study and other earlier study which might be influenced by genetic and environmental factor. Population difference in anthropological studies had been noted and it had been realized that they have to be studied separately.

Conclusions

The present study concluded that finger length features a moderate and positive relationship with stature of a private. Hence the stature of a private are often successfully estimated from the finger length using different regression of y on x derived within the present study. This research highlights that hand measurements are highly reliable for the estimation of stature in forensic examinations and stature estimation has practical use in medico-legal cases and forensic identification. Ways to determine Stature are plentiful but their significance lies in simplicity of measurement, applicability and accuracy in prediction.

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