

Original Article

Prediction of Stature by Right Middle Finger Length in Males among South Indian

Shivakumar AH¹, Raju GM², Vijayanath V³

¹Associate Professor, Department of Anatomy, S.S. Institute of Medical Sciences and Research Centre, Davangere-577005, Karnataka

²Associate Professor, Department of Forensic Medicine and Toxicology, J.J.M. Medical College, Davangere-577005, Karnataka, India

³ Professor, Department of Forensic Medicine and Toxicology, Vinayaka Mission's Kirupnanda Variyar Medical College and Hospital, Salem, Tamil Nadu, India

E-mail: ¹drshivakumarah@gmail.com; ²drrajugm@gmail.com; ³drvijayanath@gmail.com

ABSTRACT

Stature is important parameter of personal identification of individual there are many studies conducted along with others parameters such as age, sex, race, etc. The present study is an attempt to examine the relationship between the stature and right middle finger length of 100 males of Karnataka, in South Indian Population in age ranging from 17 to 22 years. Linear and multiple regression equations formula for stature estimation were calculated. The co-relation co-efficient between stature and right middle finger length were found to be positive and statistically highly significant ($P < 0.01$). The highest co-relation co-efficient is + 0.35. The regression formula was checked for their accuracy, applicability and reliability.

Keywords: Human Anatomy, Anthropology, Stature, South Indian

INTRODUCTION

Identification of individual is a prime most task for investing officer when the decapitation deceased found, at list by estimation of stature of an individual from the skeletal remains from the mutilated and amputated limbs, has obvious significance in the personal identification. Studies on the estimation of stature from skeletal remains or from the mutilated limbs, mostly of the long bones have been reported as indicated by the published work of ^{1,2,3}. The Indian perspective of the problem of stature estimation has been studied by the ^{4,5,6,7,8}. Estimation of stature from hand, finger and phalangeal length has been reported ^{4,5,9,10,11,12}. To the best of our knowledge ^{8,12} have reported from this aspect, therefore, in present study, an attempt has been made to estimate the stature from right middle finger length measurements.

MATERIAL AND METHODS

Present study is based upon various measurements of

stature individual phalangeal length of right middle finger. Subjects included 100 males of age ranging from 17 to 22 years. Data were collected from the students of SSIMS and RC campus. Care has been taken for inclusion of the unrelated subjects only. Subjects were mostly having right handed preponderance. Measurement of stature was taken by a standard anthropometer¹³ and right middle finger length was taken by sliding caliper¹⁴.

Measurements

1. Stature: It was measured as vertical distance from the vertex to the heel. Measurement was taken by making the subject stand erect on a horizontal resisting plane with bare foot. Palms of hand were turned inwards and fingers were placed horizontally pointing downwards¹⁵. Anthropometer was placed in straight vertical position in front of the subject with head oriented in eye-ear-eye Plane¹⁵. The movable plate of the anthropometer is brought in contact with vertex in the mid-sagittal plane.

2. Right Middle Finger Length: It was measured as the distance from the most proximal flexion crease of middle finger, till the projecting point on the tip of the finger. It was measured with the help of a sliding caliper¹⁴.

RESULTS

The results of stature and the right middle finger length measurements of 17–22 years. The present study is evident as shown in the Tables 1 and 2 and Figure 2 and 3 that mean stature in the males is higher as compared with previous studied conducted^{4,12,8}. Right middle finger length statistics are shown in Table 3. Present study is there exists statistically significant ‘P’ value <0.01.

Statistical Correlation Coefficient

Present study is evident as shown in the Tables 3 and 4

Table 1: Age with related to right mid finger length and actual stature

Age (years)	Right mid finger	Stature (cm)
17	10.20	175.00
18	10.15	167.21
19	10.14	166.17
20	10.19	166.46
21	10.60	167.00
22	10.10	176.00

Table 2: Right mid finger length and calculated Stature

Right mid finger length (cm)	Stature (cm)
9.2–9.6	167.00
9.6–10.0	166.53
10.0–10.4	166.56
10.4–10.9	167.66

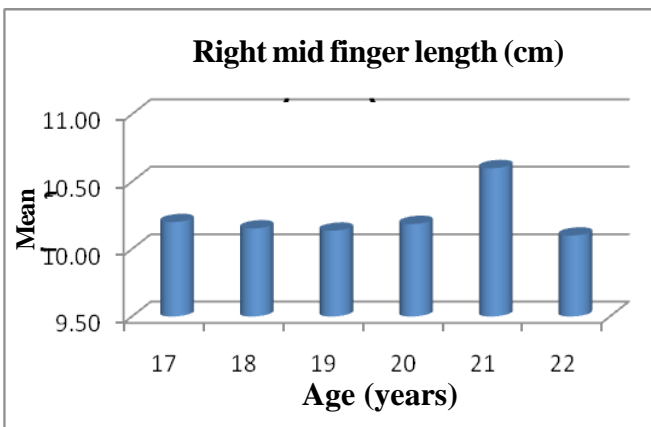


Figure 1: Age and mean of right mid finger length

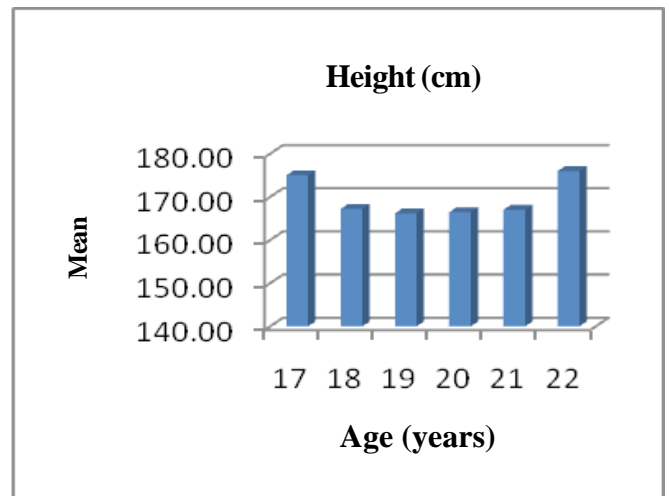


Figure 2: Age and actual height

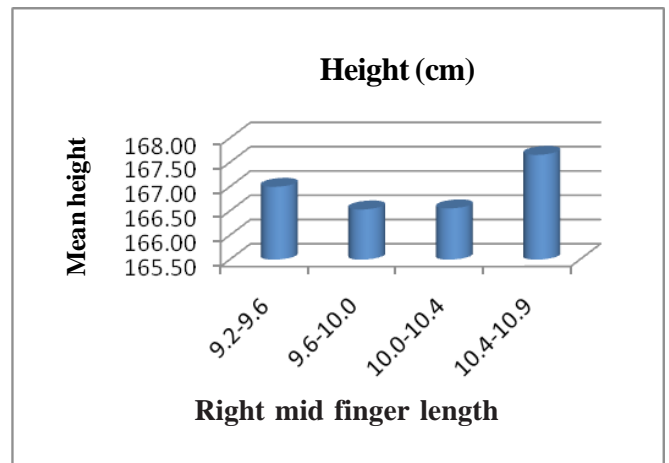


Figure 3: Right mid finger length and calculated height

that the measurements have a positive as well as statistically significant correlation with stature. ⁸reported statistically significant correlation between stature and middle finger length. ⁹reported for Japanese women a correlation of proximal phalange and stature ranging from 0.29 to 4.31, therefore, present study is an attempt has been made to draw the regression equations to estimate stature from middle finger length.

Right Middle Finger Length and Medium Regression Equation

The present study, regression equations have been formulated with the standard error ranging from 0.21 to

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Table 3: Correlation between right middle finger length and actual stature

Age (years)	Number	Right middle finger length (cm)		Stature (cm)	
		Mean	SD	Mean	SD
17	1	10.20	-	175.00	-
18	53	10.15	0.29	167.21	4.31
19	39	10.14	0.35	166.17	5.36
20	7	10.19	0.37	166.46	6.78
21	1	10.60	-	167.00	-
22	1	10.10	-	176.00	-
Total	102	10.15	0.31	166.92	4.99

Table 4: Correlation between right middle finger length and standard deviation of calculated stature

Right middle finger length (cm)	Number	Stature (cm)	
		Mean	SD
9.2-9.6	2	167.00	4.24
9.6-10.0	30	166.53	4.56
10.0-10.4	36	166.56	5.35
10.4-10.9	34	167.66	5.14
Total	102	166.92	4.99

Regression equation

$$S = 152.02 + 1.47 (\text{right middle finger length})$$

Measurements can calculate by using regression equation for stature (S) estimation from right middle finger length. $S = 152.02 + 1.47 (R M F L)$

R M F L - Right middle finger length

Table 5: Predicted statures by right middle finger length with standard deviation

Right middle finger length (cm)	Number	Predicted stature (cm)	SD
9.2-9.6	2	165.69	0.21
9.6-10.0	30	166.42	0.17
10.0-10.4	36	167.00	0.10
10.4-10.9	34	167.42	0.16
Total	102	166.94	0.46

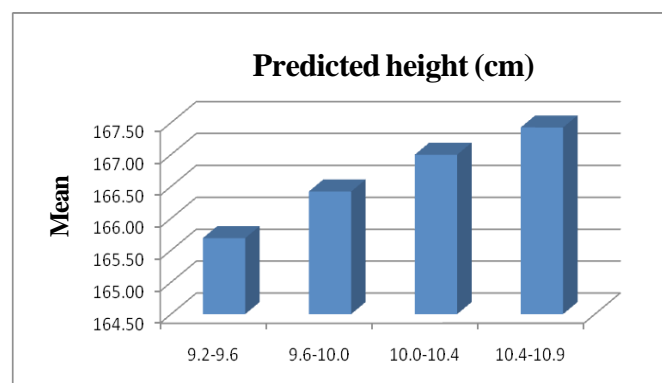


Figure 4: Predicted statures by right middle finger length

0.16 cm in males. The standard error difference measured ranges from 4.31 to 6.78 cm, which again indicates that both the parameters are efficient to indicate the stature estimation. It also indicates that either of two can be used for stature estimation, which is of great significance. As references indicate that very little work has been conducted for estimation of stature from middle finger length reported by Shintaku and Furuya⁹. Sharma and Kapoor¹² and Rastogi⁸ reported estimation of stature from middle finger length and finger print length among criminals. While Shintaku and Furuya⁹ studies proximal phalange in females only, Sharma and Kapoor¹² have studied distal phalange in males only. In present study, right middle finger length has been studied for stature estimation in male individual of South Indian population.

CONCLUSION

Stature is a prime task for identification of an individual. One hundred male subjects have been studied for their stature by right middle finger length. Statistically significant correlation is present among the stature and right middle finger length measurements. Present study (Table 5) reveals that the right middle finger length can be used to predict stature among South Indian Population. The regression equations have been derived from these measurements and concluded that stature can be estimated from actual as well as measurements of right middle finger length by the regression formulae $S = 152.02 + 1.47 X (R M F L)$.

REFERENCES

1. Pearson K. Mathematical contributions to the theory of evaluation: on the reconstruction of the Stature of prehistoric races. Philos Trans R Soc Lond 1899; 192: 169-244.
2. Trotter M, Gleser GC. A Re-evaluation of estimation of stature based on measurements of Stature taken during life and long bones after death. Am J Phys Anthropol 1958; 16: 79-123.
3. Steel DG. Estimation of stature from fragments of long limb Bones. In Stewart TD (editor), Person Identification in Mass Disaster. Washington D C: Smithsonian Institute Press 1970; pp-85-97.
4. Thakur SD, Rai KS. Determination of Stature from hand measurement. Med Sci Law 1987; 78: 25-28.
5. Saxena SK. Study of correlations and estimation of stature from hand length, hand breadth and sole length. Anthropol Anz 1984; 42: 271-276.

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6. Bhatnagar DP, Thapar SP, Batish MK. Identification of personal height from somatometry of hands in the Punjabi males. *J Forensic Sci Int* 1984; 24: 137- 141.
7. Abdel-Malek AK, Ahmed AM, el-Sharkawi SA, el-Hamid NA. Prediction of stature from hand measurements. *J Forensic Sci Int* 1990; 46(3): 181-87.
8. Prateek Rastogi, Tanuj Kanchan, Ritesh G. Menezes, Yoganarasimha K. a predictor of stature by middle finger length in the Indian population. *Med Sci Law* 2009; 49(2): 123-126.
9. Shintaku K and Furuya Y. Estimation of stature based on the proximal phalangeal length of Japanese women's hands. *JUEOH* 1990; 12: 215-219.
10. Tyagi AK, Kohli A, Verma SK, Aggarwal BB. Correlation between stature and finger Length. *Int J Med Toxicol Legal Med* 1999; 1: 20-22.
11. Begum E. Estimation of Stature from Hand Measurements in Assamese Muslims, *Bulletin of Department of Anthropology, University of Guwahati, Assam* 1999.
12. Sharma PK, Kapoor AK. Estimation of stature from finger tip length and finger print tip length among criminals. *Recent advances in forensic biology* (edited), Kamla-Raj, Uttar Pradesh 2001; pp-117-127.
13. Wilder HH. Wentworth. *Personal Identification*. Boston: The Goraham Press, 1923.
14. Muller, Guzzar B, *Der lange Bechatigter Extremitatenknochen*. *Anthrop Anz* 1935; 12: 70-72.
15. Nath S, Sehgal VN. *Forensic – Anthrtropology Science and Medicine*. Delhi, India: Kamdargi EN Delhi, 2005; p-28.