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ORIGINAL RESEARCH

ESTIMATION OF STATURE FROM LENGTH OF HAND: AN ANTHROPOMETRIC STUDY

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Abstract

Background: The present study was conducted for estimation of stature from length of Hand.

Materials & methods: 50 males and 50 females within the age group of 20 to 26 years were enrolled in the present study. Standard vernier caliper was used for measuring hand length. Total height of the subject was evaluated using standard flexible steel tape. Hand length was measured straight distance from the most laterally placed point on the head of 2nd metacarpal to the most medially placed point located on the head of 5th metacarpal. Measurements of lengths of right and left side were taken separately.

Results: Mean hand length of right and left side was 18.91 cm and 18.93cm respectively. Mean stature among males and females was 175.52 cm and 161.98 cm respectively. Significant correlation was seen while correlating length of stature and hand among males and females.

Conclusion: Hand length is considered as a criterion to estimate stature of a person.

Key words: Hand, Length, Stature

INTRODUCTION

Stature provides insight into various features of a population including nutrition, health and genetics. Stature is considered as one of the parameters for personal identification and one of the 'big fours' of forensic anthropology. The stature of an individual is an inherent characteristic; its estimate is considered to be an important assessment in the identification of unknown human remains. Adult height may be attained anywhere from the early teens to early twenties, though it is most commonly reached during mid-teens for females and the late-teens for males. For better accuracy, stature estimation may be attempted only after the attainment of maturity.[1- 3]

There is an established relationship between stature and various body parts like head, trunk, upper and lower extremities. This allows a forensic scientist to estimate stature from different parts of the body. With the increasing frequency of mass disasters, homicides, air plane crashes, train and road accidents etc., there is always need for such studies which help in identifying the deceased from fragmentary and dismembered human remains. In such a situation, measurements of hands and feet provide good approximation about the height of a person.[4- 6] Hence; the present study was conducted for estimation of stature from length of hand.

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MATERIALS & METHODS

The present study was conducted for estimation of stature from length of hand. 50 males and 50 females within the age group of 20 to 26 years were enrolled in the present study. Patients with history of any systemic illness, any bone pathology of any known drug allergy were excluded from the present study. The measurements were taken using standard anthropometric instruments. Standard vernier caliper was used for measuring hand length. Total height of the subject was evaluated using standard flexible steel tape. Hand length was measured straight distance from the most laterally placed point on the head of 2nd metacarpal to the most medially placed point located on the head of 5th metacarpal. Measurements of lengths of right and left side were taken separately. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software.

RESULTS

Mean hand length of right and left side was 18.91 cm and 18.93cm respectively. Mean stature among males and females was 175.52 cm and 161.98 cm respectively. Significant correlation was seen while correlating length of stature and hand among males and females.

Table 1: Hand length

Hand length (cm)	Males	Females
Mean of right hand	18.91	17.86
Mean of left hand	18.93	17.89

Table 2: Stature (cm)

Stature (cm)	Number
Males	175.52
Females	161.98

Table 3: Corelation of hand length with stature

Gender	R value	F change	p- value
Males	0.625	71.45	0.000 (Significant)
Females	0.711	13.87	0.002 (Significant)

DISCUSSION

The length of the body while alive is one of the key parameters of identity established in the course of the identification of unknown remains. The reconstruction of body length has been a subject of study since the beginning of the nineteenth century.[7- 10] Hence; the present study was conducted for estimation of stature from length of hand.

Mean hand length of right and left side was 18.91 cm and 18.93cm respectively. Mean stature among males and females was 175.52 cm and 161.98 cm respectively. A. Waninge et al attempted to find out possible correlations between hand dimensions and stature using linear and curvilinear regression models for both genders. The study was conducted amongst 250 medical students (125 male and 125 female) aged 18–30 years. Each student has been studied

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for measurements of stature, hand length and hand breadth. To explain stature, all the explanatory variables like age, sex, hand length (right and left) and hand breadth (right and left) were included for model generation using SPSS. A general linear regression model was found to be best explanatory in both males and females, however, amongst the curvilinear models; the exponential model emerged as the 'best' in explaining stature of the individual. Left hand length alone explained very significantly ($P < 0.001$).[11]

Significant correlation was seen while correlating length of stature and hand among males and females. A.M. Madden et al evaluated the prediction of height from ulnar length in adults from different ethnic groups. Ulnar length and standing height were measured using standardized procedures (Elia, 2003; Ruston et al., 2004) in a gender-stratified sample of 60 Asian, 69 Black and 65 White healthy adults aged 21–65 years. Ethnicity was defined using Office of National Statistics (2006) criteria. Predicted height was determined from ulnar length using the Malnutrition Universal Screening Tool (MUST) equations (Elia, 2003). Pearsons' correlation coefficient was used to examine the relationship between ulnar length and height according to gender and ethnicity. The difference between measured and predicted height was examined in each sub-group using paired t-tests to identify any systematic biases and assess the reliability of the prediction. Ethical permission was obtained from the London Metropolitan University. Ulnar length and height were significantly correlated among Asian, Black and White men and Black and White women at moderate levels with correlation coefficients between 0.68 and 0.43. Among the sample of Asian women the correlation was low and not significant. The means (SD) of the difference between predicted and measured height showed significant overestimates for all subgroups except White men and women. Simple predictions of height based on the application of MUST equations to ulnar measurements produced elevated estimates of height for Asian and Black groups. The wide standard deviation of the differences suggest relatively wide 95% limits of agreement using conventional analyses and, therefore, predicted values may be unreliable in individuals.[12]

CONCLUSION

From the above results, the authors concluded that hand length is considered as a criterion to estimate stature of a person.

REFERENCES

1. Altayeb Abdalla Ahmed, Estimation of stature from the upper limb measurements of Sudanese adults, Forensic Science International, 10.1016/j.forsciint.2013.03.008, 228, 1-3, (178.e1-178.e7), (2013).
2. Holland TD. Estimation of adult stature from fragmentary tibias. J Forensic Sci 1992;37(5):1223–9.
3. Campobasso CP, Di Vella G, Introna Jr F. Using scapular measurements in regression formulae for the estimation of stature. Boll Soc Ital Biol Sper 1998;74(7–8):75–82.
4. Ross C. Smith, James P. Ledgard, Gordon Doig, Douglas Chesher, Sarah F. Smith, An effective automated nutrition screen for hospitalized patients, Nutrition, 10.1016/j.nut.2008.09.007, 25, 3, (309-315), (2009).
5. Nagesh KR, Pradeep Kumar G. Estimation of stature from vertebral column length in South Indians. Leg Med (Tokyo) 2006;8(5):269–72.

ISSN: 0975-3583,0976-2833 VOL10, ISSUE 02, 2019

6. Krishan K, Sharma A. Estimation of stature from dimensions of hands and feet in a North Indian population. J Forensic Leg Med 2007;14(6):327–32.
7. Terazawa K, Alkabane H, Gotouda H, Mizukami K, Nagao M, Takatori T. Estimating stature from the length of the lumber part of the spine in Japanese. Med Sci Law 1990;30(4):354–7.
8. De Mendonca MC. Estimation of height from the length of long bones in a Portuguese adult population. Am J Phys Anthropol 2000;112(1): 39–48. May.
9. Warren MW, Smith KR, Stubblefield PR, Martin SS, Walsh-Haney HA. Use of radiographic atlases in a mass fatality. J Forensic Sci 2000;45(2):467–70.
10. Pelin C, Duyar I, Kayahan EM, Zagyapan R, Agildere AM, Erar A. Body height estimation based on dimensions of sacral and coccygeal vertebrae. J Forensic Sci 2005;50(2):294–7.
11. A. Waninge, W. Van Der Weide, I. J. Evenhuis, R. Van Wijck, C. P. Van Der Schans, Feasibility and reliability of body composition measurements in adults with severe intellectual and sensory disabilities, Journal of Intellectual Disability Research, 10.1111/j.1365-2788.2009.01153.x, 53, 4, (377-388), (2009).
12. A.M. Madden,T. Tsikoura,D.J. Stott. The estimation of body height from ulnar length in adults from different ethnic groups. Journal of human nutrition and diabetes. August 2008. 394-394