



Review

The determination of correlation between stature and upper limb and hand measurements in Iranian adults



S. Mahakizadeh^a, F. Moghani -Ghoroghi^a, Gh Moshkdanian^{a,b}, T. Mokhtari^a,
G. Hassanzadeh^{c,*}

^a Anatomy, Department of Anatomy, Faculty of Medicine, Tehran University of Medical Sciences, Tehran, Iran

^b Anatomical Sciences Research Center, Kashan University of Medical Sciences, Kashan, Iran

^c Department of Anatomy, Faculty of Medicine, Tehran University of Medical Sciences, Tehran, Iran

ARTICLE INFO

Article history:

Received 15 April 2015

Received in revised form 7 September 2015

Accepted 2 December 2015

Available online 15 December 2015

Keywords:

Stature

Upper limb length

Hand length

Regression equation

Forensic anthropology

ABSTRACT

Estimation of stature is an important issue, which is significantly considered in forensic anthropology. It will be difficult to predict the identification of an individual when only some parts of dead body are discovered following disasters or criminal events. The aim of this study was to assess the relationship between stature and upper limb and hand length in Iranian adults to generate regression formulae for stature estimation. Three anthropometric measurements; Stature, Upper Limb Length (ULL) and Hand Length (HL) were taken on subjects, comprising 142 male students (18–25 years) using standard measuring instruments. The data were analysed using SPSS 16. Then linear regression models were used to estimate stature. The results indicated a positive correlation between stature and upper limb and hand measurements.

The correlation coefficient with upper limb length was $r=0.89$ & $p=0.0001$ and with hand length was $r=0.78$ & $p=0.0001$. In conclusion, we found a strong correlation between stature and upper limb and hand length. The regression analysis also showed that the Upper Limb Length give better prediction of stature compared to Hand length measurements.

© 2015 Elsevier Ireland Ltd. All rights reserved.

Contents

1. Introduction	28
2. Materials and Methods	28
2.1. Techniques for measuring anthropometric indexes:	28
2.1.1. Stature	28
2.1.2. Upper limb length (ULL)	28
2.1.3. Hand length (HL)	28
2.1.4. Statistical Analysis	28
3. Results	28
4. Discussion	29
5. Conclusion	29
Acknowledgements	29
References	29

* Corresponding author.

E-mail address: hassanzadeh@tums.ac.ir (G. Hassanzadeh).

1. Introduction

Identification is prominently considered in forensic medicine.

Fragmented or mutilated human bodies discovered following catastrophic events, wars or in a murder have created problems to identify the victims [1].

In this respect, designing a biological profile is needed. This profile can simplify and confirm the process of final identification. Estimation of stature, as one of the big four parameters, will be helpful to develop the anthropometrical databases.

Many studies have used body remains especially long bones to estimate stature.

Although lower limb measurements have correlation more directly with stature than upper limbs in some situations, it is critical to find the association of the upper limb with stature due to the loss of the lower limb [2]. Despite an abundance of research, in the Middle East [3–7] there is no specific standard for Iranian population. Since, various races and ethnicities reside in different regions in Iran, regional studies become necessary [8].

According to our knowledge, few data for the estimation of stature from various parts of the body is available in our country. So, present study was undertaken to create a regression equation for determination of relationship between stature and length of upper limb and hand in Iran.

2. Materials and Methods

A sample of 142 normal healthy Iranian volunteers Males was taken from medical students studying at Tehran University of Medical Sciences, in the range 18–25 years old. All the subjects were right-handed and non-athletic. According to standard ethics drawn by the Tehran University ethical committee for human experimentation, subjects were examined for stature, upper limb and hand lengths.

2.1. Techniques for measuring anthropometric indexes:

2.1.1. Stature

Stature was measured in centimeters. Each subject was asked to stand barefoot on flat surface. Upright height was taken from the vertex to the floor according to the anatomical position and Frankfurt Plane [2,8].

2.1.2. Upper limb length (ULL)

ULL was measured in centimeters as the distance between the marked inferior border of the acromion process to the tip of the middle finger in anatomical position [5,9].

Table 1

Descriptive statistics of stature and Upper Limb Length and Hand Length (Cm).

	N = 146		
	Range	Mean	SD
Stature	159 - 185	174.04	5.81
ULL	67 - 76	71.14	2.04
HL	19- 24	21.21	1.21

ULL: Upper Limb Length (cm), HL: Hand Length (cm)

Table 2

Pearson correlation(*r*) between Upper Limb Length and Hand Length and stature(cm).

Variable	<i>r</i>	P- value
ULL	0.89	0.0001
HL	0.78	0.0001

ULL: Upper Limb Length (cm), HL: Hand Length (cm)

2.1.3. Hand length (HL)

HL was measured from the mid-point of distal wrist crease to the tip of the middle finger in centimeters. Subjects were asked to sit down and place their hands in supine position on a flat hard horizontal surface with thumb in abduction and other fingers in extension and adduction positions [8].

2.1.4. Statistical Analysis

The data obtained were analysed using SPSS statistical software for windows version 16. Association of parameters was assessed by Pearson's correlation coefficient *r*. Regression equations were computed to examine the relationship between stature to upper limb length and hand length.

3. Results

The stature ranged from 159 to 185 cm.

Mean Upper limb length and Hand length was 71.14 and 21.21 respectively.

Descriptive statistics of stature, Upper limb length and Hand length are shown in Table 1. Statistically significant correlation was observed between stature and Upper limb length and Hand length. Pearson correlation (*r*) for stature and Upper limb length and Hand length were 0.89 and 0.78 respectively (Table 2).

The relationship between Upper limb length and Hand length, and stature (P-value < 0.001) is shown in scatter graphs (Fig. 1).

Linear regression models were determined for the estimation of stature.

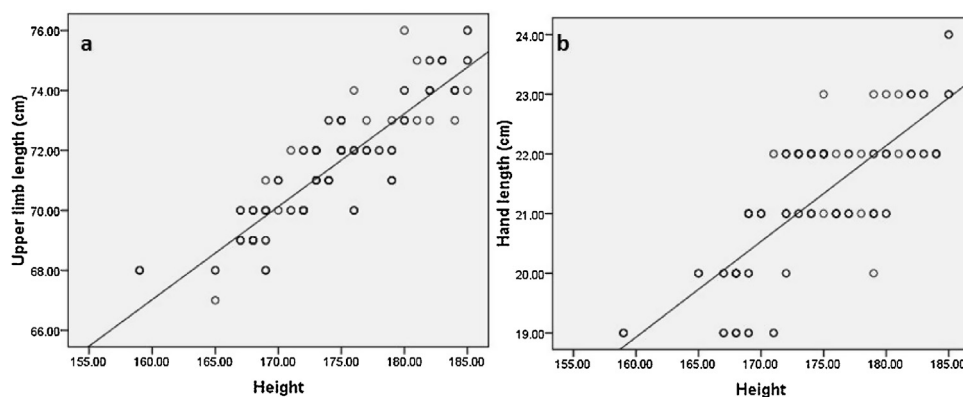


Fig. 1. Correlation between stature (cm) and **a)** Upper Limb Length (cm) and **b)** Hand Length (cm).

Download English Version:

<https://daneshyari.com/en/article/95202>

Download Persian Version:

<https://daneshyari.com/article/95202>

[Daneshyari.com](https://daneshyari.com)