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TO FIND CORRELATION BETWEEN STATURE & COMBINED LENGTH OF FOREARM & HAND

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Abstract

Background & Method: The aim of this study is to find correlation between stature & combined length of forearm & hand. Firstly detailed history was taken both regarding the incident & complete clinical history including operative procedures, if any. Detailed individual demographic data including the sex, age etc were also recorded on the pre-structured Performa. The procedure, aims & objectives of the study was explained to each relative of the study subjects.

Result: The range of the age in male subject was 21 to 80 years. While in this study maximum age for female subject was 90 years, whereas minimum age for female subject was 21 years. The range of the age in female subject was 21 to 90 years.

Conclusion: In the present study it was found that there exists a statistically significant correlation between combined length of forearm & hand & stature in both sexes. The correlation between combined length of forearm & hand & stature was found to be more in females than males, therefore indicating combined length of forearm & hand to be a better predictor of stature in females than males.

Keywords: stature, forearm & hand.
Study Designed: Observational Study

Introduction

The history of anthropometry includes & spans various concepts, both scientific & pseudoscientific, such as craniometry, paleoanthropology, biological anthropology, phrenology, physiognomy, forensics, criminology, phylogeography, human origins, & craniofacial description, as well as correlations between various anthropometrics & personal identity, mental typology, personality, cranial vault & brain size, & other factors. Anthropometry (from Greek anthropos, "human", & "measure") refers to the measurement of the human individual. The term „forensic anthropometry' can be coined for this branch of applied physical anthropology, involving the use of methods/techniques of anthropometry in forensic/legal context. In other words, "forensic anthropometry is a scientific specialization emerged from the discipline of forensic anthropology dealing with identification of human remains with the help of metric techniques".

It is a branch of anthropology that involves the quantitative measurement of the human body.[1,2&3]

Anthropometry is the systematic measurement of the physical properties of the human body, primarily dimensional descriptors of body size & shape.[4] It is the single most portable universally applicable inexpensive & non-invasive technique of assessing the size, proportion & composition of the human body.

Stature can also be calculated from one arm by multiplying the whole length with two & add 34 cm for chest or from distal half of upper limb (from tip of olecranon process to tip of middle finger) by multiplying with 19/5.[5] Identification may be complete (absolute) or incomplete (partial). Complete identification means absolute fixation of individuality of a person. Partial identification implies ascertainment of only some facts about the identity of the person while others still remains unknown.

Material & Method

The study was conducted in Dept. of Forensic Medicine & Toxicology at Index Medical College Hospital & Research Centre, Indore from May 2019 To April 2020 on 150 deceased male & 150 deceased female individuals. In the present study individuals of age more than 21 years were included. Bertillon system is based on the principle that after the age of 21 years the dimensions of the skeleton remain unchanged & also that the ratio in size of different parts to one another varies considerably in different individuals.

Firstly detailed history was taken both regarding the incident & complete clinical history including operative procedures, if any. Detailed individual demographic data including the sex, age etc were also recorded on the pre-structured Performa. The procedure, aims & objectives of the study was explained to each relative of the study subjects. Written informed consent was taken prior to the research after giving detailed information to the relatives of the subjects regarding the study. Anthropometric measurements of combined length of forearm & hand were

taken independently on the left & right side of each individual. Stature of each subject was also recorded.

Inclusion Criteria

All cases of post mortem examination where age is more than 21 years.

Exclusion Criteria

1. All subjects with skeletal abnormalities & deformities e.g., fracture, dislocations, poliomyelitis, osteoporosis, rickets, scoliosis & kypho-scoliosis etc.
2. Congenital anomalies.
3. Dwarfism & gigantism.
4. All Subjects with amputated upper limbs.

Results:

Table 1: Distribution of anthropometric parameters for age in male & female study subjects

VARIABLE	Age in years	
	Male	**Female**
MEAN	43.39	41.42
STD DEV	12.65	13.18
MAX	80	90
MIN	21	21
RANGE	21-80	21-90

The range of the age in male subject was 21 to 80 years. While in this study maximum age for female subject was 90 years, whereas minimum age for female subject was 21 years. The range of the age in female subject was 21 to 90 years.

Table 2: Distribution of anthropometric parameters for combined length of forearm & hand in male subjects

Variables	RCLF&H in cm	LCLF&H in cm	Av. CLF&H in cm
MEAN	44.61	44.03	44.27
STD DEV	2.67	2.56	2.18
Max	52.6	52.4	52.35
Min	41.0	41.2	41.1
Range	41-52.6	41.2-52.4	41.1-52.35

ANOVA Test:

Parameters	df	SS	MS	F	Significance F
Regression	**1**	**5689.4**	**5689.38**	**1031.29**	**0.000***

Table 3: Distribution of anthropometric parameters for combined Length of forearm & hand in female subjects

Variables	RCLF&H in cm	LCLF&H in cm	Av. CLF&H in cm
MEAN	43.27	43.11	43.86
STD DEV	1.72	1.73	1.69
MAX	45.7	45.4	45.55
MIN	38.5	38.2	38.4
RANGE	38.5-45.7	38.2-45.4	38.4-45.55

Discussion

The mean height was viewed as 163.82 cm in male subjects, while in females subjects mean height was viewed as 156.25 cm[6]. The guys were viewed as taller and had longer hands than females with the sexually open contrasts being measurably critical ($p<0.001$).

In the current review mean age of the male subjects was viewed as 44.14 years while in female subjects were viewed as 40.42years. An endeavor was made to relate joined length of lower arm and hand with height and determine relapse conditions to work out height from consolidated length of lower arm and hand[7]. The joined length of lower arm and hand and height connection coefficient (r) in guys and females were 0.668 and 0.900 separately. Based on this joined length of lower arm and hand and height was viewed as decidedly connected and the affiliation was profoundly critical in both sexes[8].

Relapse conditions were gotten to appraise height from joined length of lower arm and hand involving relapse examination for the two guys and females independently. In the current review an endeavor was made to connect consolidated length of lower arm and hand with height and determine augmentation factors for both sexes[9]. The augmentation factor for joined length of lower arm and hand was viewed as 3.57 and 3.64 for male and female individually. Duplication factors become fundamental in instances of criminological examination when just upper appendage is free for investigation and the rough height is to be assessed.

Conclusion

In the present study it was found that there exists a statistically significant correlation between combined length of forearm & hand & stature in both sexes. The correlation between combined length of forearm & hand & stature was found to be more in females than males, therefore indicating combined length of forearm & hand to be a better predictor of stature in females than males.

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