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Assessment of stature from hand and phalange length

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Abstract
Anthropometric studies today are conducted to investigate the evolutionary significance of differences in body proportion between populations whose ancestors lived in different environments.
The study has planned in North Indian Hospital. The 50 patients were willing to participate in the study are enrolled. The various anthropometric measurements like stature, Hand Length, Proximal phalangeal length, distal phalangeal length were noted.
From the existing work it can be establish some multiplication factor. Multiplying these multiplication factors with particular parameter gives the idea about some estimated statures which were correlate with the measured stature .All the measurements in this study were a positive as well as a statistically significant correlation with the stature.
The study reveals that the multiplication factors are important for the establishing the stature from right hand length for both males and females.

Keywords: forensics anthropology, personal identification, stature, hand length, phalange length

Introduction
Anthropometry refers to the measurement of the human individual. An early tool of physical anthropology, it has been used for identification, for the purposes of understanding human physical variation, in palaeoanthropology and in various attempts to correlate physical with racial and psychological traits. Anthropometry involves the systematic measurement of the physical properties of the human body, primarily dimensional descriptors of body size and shape [1]. Alphonse Bertillon (1853-1914) is considered to be the father of anthropometry because of his many contributions to the field, including what we know today as the "mug shot." [2]
Today, anthropometry plays an important role in industrial design, clothing design, ergonomics and architecture where statistical data about the distribution of body dimensions in the population are used to optimize products. Changes in lifestyles, nutrition, and ethnic composition of populations lead to changes in the distribution of body dimensions (*e.g.* the rise in obesity), and require regular updating of anthropometric data collections.
Anthropometric studies today are conducted to investigate the evolutionary significance of differences in body proportion between populations whose ancestors lived in different environments. Human populations exhibit climatic variation patterns similar to those of other large-bodied mammals, following Bergmann's rule, which states that individuals in cold climates will tend to be larger than ones in warm climates, and Allen's rule, which states that individuals in cold climates will tend to have shorter, stubbier limbs than those in warm climates.
On a micro evolutionary level anthropologists use anthropometric variation to reconstruct small-scale population history. For instance John Relethford's studies of early 20th-century anthropometric data from Ireland show that the geographical patterning of body proportions still exhibits traces of the invasions by the English and Norse centuries ago.
Forensic anthropologists study the human skeleton in a legal setting. A forensic anthropologist can assist in the identification of a decedent through various skeletal analyses that produce a biological profile. Forensic anthropologists utilize the Fordisc program to help in the interpretation of craniofacial measurements in regards to ancestry or race determination.
One part of a biological profile is a person's racial or ancestral affinity. People with considerable European ancestry generally have relatively noprognathism; a relatively small face; a narrow, tear-shaped nasal cavity; a "silled" nasal aperture; tower-shaped nasal bones; a triangular-shaped palate; and an angular and sloping eye orbit shape. People with considerable African ancestry typically have a broad and round nasal cavity; no dam or nasal sill; Quonset hut-shaped nasal bones; notable facial projection in the jaw and mouth area (prognathism); a rectangular-shaped palate; and a square or rectangular eye orbit shape. People with considerable East Asian ancestry are often characterized by a relatively small prognathism; no nasal sill or dam; an oval-shaped nasal cavity; tent-shaped nasal bones; a horseshoe-shaped palate; and a rounded and non-sloping eye orbit shape. [3]

Methodology
The study has planned in North Indian Hospital. The 50 patients were willing to participate in the study are enrolled. The age group of the patients are from 20-40 years. All the patients are informed consents. The approval of the institutional ethical committee is taken for the planned study. The various anthropometric measurements like stature, Hand Length, Proximal phalangeal length, distal phalangeal length were noted and presented as below.
Stature: It is measured as the vertical distance from the vertex to the floor, where the vertex is the highest point on the head when the head is held in Frankfurt Horizontal (FH) plane. The subject was made to stand barefoot in an erect posture against

the wall with both feet kept close together and hands hanging down on the sides.
Hand Length: Distance from middle of the distal wrist crease to the distal end of most projecting point of hand.
Proximal phalangeal length (PPL): Distance from middle of metatarsophalangeal crease to proximal phalangeal crease. Middle phalangeal length; Distance from middle of proximal phalangeal crease to middle of distal phalangeal crease.
Distal phalangeal length (DPL): Distance from middle of distal phalangeal crease to the tip of the digit.

Results & discussion
The various anthropometric measurements from the enrolled study group patients were noted and presented as below

Table 1

(Measurements) C.M.	Somatometric data		Multiplication factors for correlated with stature	
	Male	Female	Male	Female
Stature	172.1 ± 5.5	163.6± 4.5	1	1
Hand length	18.5 ± 1.2	19.1 ± 1.3	8.2	7.9
Index finger ppl	4.95 ± 1.1	4.8 ± 0.9	32.9	31.5
Index finger mpl	3.8 ± 1.6	3.1 ± 0.7	47.5	45.8
Index finger dpl	2.9 ± 1.2	2.4 ± 1.6	58.2	53.8
Middle finger ppl	5.3 ± 1.3	5.1 ± 0.9	30.9	28.5
Middle finger mpl	3.9 ± 0.7	3.2 ± 0.8	44.5	42.6
Middle finger dpl	3.2 ± 1.0	2.4 ± 0.6	56.9	54.8
Ring finger ppl	5.0 ± 1.1	4.8 ± 0.9	31.9	30.5
Ring finger mpl	3.6 ± 2.1	3.8 ± 1.2	42.5	43.5
Ring finger dpl	2.7 ± 0.6	2.2 ± 0.7	62.9	64.5
Little finger ppl	4.3 ± 0.8	3.7 ± 0.7		
Little finger mpl	2.9 ± 0.5	2.5 ± 0.4		

From the existing work it can be establish some multiplication factor. Multiplying these multiplication factors with particular parameter gives the idea about some estimated statures which were correlate with the measured stature .All the measurements in this study were a positive as well as a statistically significant correlation with the stature.
As references indicate that very little work has been done for estimation of stature from phalange length except one reported by Shintaku and Furuya [4]. Kapoor [5] and Sharma and Kapoor [6] reported estimation of stature from fingertip length and fingerprint tip length among criminals. While Shintaku and Furuya studied proximal phalange in females only, Sharma and Kapoor [6] have studied distal phalange in males only. In present study, all the three phalanges of each finger have been studied for stature estimation in both the sex.

Conclusion
The study reveals that the multiplication factors are important for the establishing the stature from right hand length for both males and females.

Reference

1. Md. Ariful, Islam Md, Asadujjaman Md, Nuruzzaman Md. Mosharraf Hossain. Ergonomics Consideration for Hospital Bed Design: A Case Study in Bangladesh. Journal of Modern Science and Technology 01 (01): 30-44.
2. Anthropometry. Biology dictionary. Net. Retrieved 21 June 2017.
3. Forensic Anthropology - Ancestry Archived 2012-02-06 at the Way back Machine.
4. Shintaku K, Furuya Y. Estimation of stature based on the proximal phalangeal length of Japanese women's hands. JUEOH 1990; 12(2): 215-19.
5. Kapoor AK. Estimation of stature from hand length as obtained through palm prints among the Lodhas of district Midnapur, West Bengal. Indian journal of physical anthropology 1987; 13:139.
6. Sharma PK, Kapoor AK. Estimation of stature from fingertip length and finger print tip length among criminals, Recent advances in forensic biology edited, Kamla-Raj Publishers 2001, 117-127.