

Poster 81

## Exploring the complex web of body measurements: what is the relationship between human height and cranial and facial measurements?

**Diana Silva Santos**<sup>1,2,\*</sup> and **Inês Morais Caldas**<sup>1,2,3</sup>

<sup>1</sup> Associate Laboratory i4HB – Institute for Health and Bioeconomy, University Institute of Health Sciences – CESPU, 4585-116 Gandra, Portugal.

<sup>2</sup> UCIBIO – Applied Molecular Biosciences Unit, Forensics and Biomedical Sciences Research Laboratory, University Institute of Health Sciences (1H-TOXRUN, IUCS-CESPU), 4585-116 Gandra, Portugal.

<sup>3</sup> Faculdade de Medicina Dentária, Universidade do Porto, Rua Dr. Manuel Pereira da Silva 4200-393, Porto, Portugal

\* Correspondence: a31396@alunos.cespu.pt

### Abstract

**Background:** Some studies focusing on craniometric analysis have been conducted, and not all of them seem to agree with their conclusions. For instance, Sarangi et al. (1981) and Introna et al. (1993) [1]: the former argues that there is no significant correlation between stature and cranial measurements, while the latter believes in such a relationship, developing a regression formula for stature estimation from the skull. In fact, subsequent works, such as those by Chiba and Terazawa (1998) and Patil and Mody (2005) [2-3], have supported Introna et al.'s conclusions, endorsing the establishment of the mentioned correlation. Nevertheless, for the Portuguese population, there are still few methods correlating the stature estimated by mathematical methods with cranial dimensions. **Objective:** To assess the existence of a relationship between the estimated stature from the femur and humerus with cranial and facial measurements in a sample of Portuguese skeletons. **Methods:** Twenty skeletons were studied, of which 14 (70%) were male. The following measurements were taken: total length of the humerus, maximum length of the femur, physiological length of the femur, maximum length of the skull, maximum width of the skull, maximum height of the skull, and upper facial height. Stature was calculated by applying the mathematical models by Mendonça (2000) [4], using the physiological length of the left femur and the maximum length of the left humerus. The chi-square test was used to assess any potential association between the cranial measurements under consideration and the estimated stature, while Spearman's correlation was applied to establish correlations between cranial measurements and estimated stature. **Results:** No significant associations were found between the cranial measurements taken and the estimated stature using any of the models, in both sexes ( $p > 0.05$ ). However, in terms of correlation, in males, the maximum height of the skull showed a moderate and statistically significant correlation with stature (0.658,  $p = 0.011$  for stature estimated with the humerus, and 0.633,  $p = 0.015$  for stature estimated using the femur). In females, the highest correlation value with estimated stature was -0.725, with the maximum width of the skull, followed by the maximum length of the skull (-0.464), both values lacking statistical significance ( $p > 0.05$ ). **Conclusions:** The obtained results show a correlation between the maximum height of the skull and stature in men, whereas this correlation is not observed in women; it is acknowledged that these differences may be related to sampling issues, particularly sample size. Despite being a preliminary study with a small sample size, it became evident that the relationship between estimated human stature using the femur and humerus, and cranial and facial measurements is worth exploring.

**Keywords:** biological profile; stature estimation; cranial measurements

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