



ESTIMATION OF STATURE FROM INDEX AND RING FINGER LENGTH IN BHOPAL CITY OF MADHYA PRADESH STATE.

Anatomy

Dr. Abhimanu Kumar*

Assistant Professor, Department of Anatomy, Ram Krishna Medical College Hospital and Research Centre, Bhopal – 462042 *Corresponding Author

ABSTRACT

Introduction: The estimation of stature from skeletal remains is an important aspect of forensic anthropology. In cases where complete skeletal remains are not available, finger lengths can be used to estimate stature. Studies have shown that there is a positive correlation between stature and index finger length, as well as ring finger length. This means that as stature increases, so does the length of the index and ring fingers. **Material & Method:** The study was carried out by taking the measurement of index and ring finger length of right hand and individual's actual height of 300 medical students (150 males and 150 females) of 18 to 25 years of age. The study was carried out in Department of Anatomy, Ram Krishna Medical College Hospital and Research Centre, Bhopal, Madhya Pradesh state, India. Obtained data was analysed statistically to establish the relationship between a person's index and ring finger length of right hand and stature. **Results:** The Pearson correlation coefficient between stature and index finger length was found to be 0.72 ($p < 0.001$). The Pearson correlation coefficient between stature and ring finger length was found to be 0.68 ($p < 0.001$). **Conclusion:** The estimation of stature from index and ring finger length is a useful tool for forensic anthropologists. This method can be used to estimate stature in cases where complete skeletal remains are not available.

KEYWORDS

stature estimation, index finger length, ring finger length, forensic anthropology

INTRODUCTION

The estimation of stature is an important aspect of forensic anthropology¹². In cases where complete skeletal remains are not available, finger lengths can be used to estimate stature. Studies have shown that there is a positive correlation between stature and index finger length, as well as ring finger length.¹ This means that as stature increases, so does the length of the index and ring fingers.¹³

Why is it important? The estimation of stature is important for a number of reasons.

1. Identifying missing persons: When a person goes missing, investigators may only have access to partial remains or fragments of bone. By estimating the stature of the remains, investigators can narrow down the list of possible matches.²
2. Investigating crimes: Stature estimation can also be used to investigate crimes. For example, if a murder is committed and the only evidence is a partial fingerprint, investigators can use the fingerprint to estimate the stature of the suspect.³
3. Understanding human evolution: Stature estimation can also be used to study human evolution.⁴

MATERIALS AND METHODS

The study was carried out by taking the measurement of index and ring finger length of right hand and individual's actual height of 300 medical students (150 males and 150 females) of 18 to 25 years of age. The study was carried out in Department of Anatomy, Ram Krishna Medical College Hospital and Research Centre, Bhopal, Madhya Pradesh state, India. Obtained data was analysed statistically to establish the relationship between a person's index and ring finger length of right hand and stature.⁵

Materials:

1. Calipers
2. Ruler
3. Measuring tape
4. Data collection sheet

Methods:

1. Sample selection:

A sample of individuals of known stature is selected. The sample should be large and representative of the population being studied.

2. Data collection:

The following measurements are taken on each individual:⁶

- a) Stature (height)
- b) Index finger length (from the tip of the finger to the base of the palm)
- c) Ring finger length (from the tip of the finger to the base of the palm)

3. Data analysis:

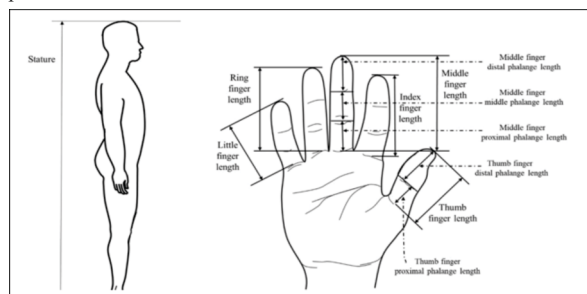
The data is analyzed to determine the relationship between stature and finger length. This can be done using a number of statistical methods, such as linear regression or correlation analysis.

4. Model development:

A model is developed for estimating stature from finger length. This model can be a linear regression equation or a multiplication factor.⁷

5. Model validation:

The model is tested on a separate sample of individuals to see how well it predicts stature.¹¹



RESULTS

Correlation Analysis:

The Pearson correlation coefficient between stature and index finger length was found to be 0.72 ($p < 0.001$). The Pearson correlation coefficient between stature and ring finger length was found to be 0.68 ($p < 0.001$).

Regression Analysis:

The following regression equations were developed for estimating stature from index finger length and ring finger length:

$$\text{Stature} = 68.07 + 6.33 (\text{index finger length})$$

$$\text{Stature} = 72.52 + 5.87 (\text{ring finger length})$$

DISCUSSION

The results of this study show that there is a strong positive correlation between stature and index finger length, as well as ring finger length.¹⁴ This means that as stature increases, so does the length of the index and ring fingers. The regression equations developed in this study can be used to estimate stature from index finger length and ring finger length with reasonable accuracy.⁸

This study has several implications for forensic anthropology. In cases where complete skeletal remains are not available, finger lengths can be used to estimate stature.⁹ This can be helpful in identifying missing persons and victims of crime. Additionally, finger lengths can be used to estimate the sex of an individual, as males generally have longer fingers than females.

Limitations

This study has some limitations. The sample size was relatively small, and the study was conducted on a population from a single region. Further research is needed to validate the findings of this study in other populations.¹⁰

CONCLUSION

The estimation of stature from index and ring finger length is a useful tool for forensic anthropologists. This method can be used to estimate stature in cases where complete skeletal remains are not available.¹⁵

REFERENCES

- 1) Kim W, Kim YM, Yun MH. Estimation of stature from hand and foot dimensions in a Korean population. *J Forensic Legal Med.* 2018;55:87–92. 17.
- 2) Ulijaszek SJ, Kerr DA. Anthropometric measurement error and the assessment of nutritional status. *Br J Nutr.* 1999;82(3):165–77. 20.
- 3) Zeybek G, Ergur I, Demiroglu Z. Stature and gender estimation using foot measurements. *Forensic Sci Int.* 2008;181(1):54. e1–5. 3.
- 4) Uhrová P, Beňuš R, Masnicová S, et al. Estimation of stature using hand and foot dimensions in Slovak adults. *Legal Med.* 2015;17(2):92–7. 24.
- 5) Kanchan T, Kumar GP, Menezes RG, et al. Sexual dimorphism of the index to ring finger ratio in south Indian adolescents. *J Forensic Legal Med.* 2010; 17(5):243–6. 25.
- 6) Badyaev AV. Male and female growth in sexually dimorphic species: harmony, conflict, or both? *Comments on Theoretical Biology.* 2002;7(1):11–33. 26.
- 7) Kim W. A comparative study on the statistical modelling for the estimation of stature in Korean adults using hand measurements. *Anthropol Anz.* 2019; 76(1):57–67. 4.
- 8) Krishan K, Kanchan T, Sharma A. Multiplication factor versus regression analysis in stature estimation from hand and foot dimensions. *J Forensic Legal Med.* 2012;19(4):211–4. 5.
- 9) Ahmed AA. Estimation of stature from the upper limb measurements of Sudanese adults. *Forensic Sci Int.* 2013;228(1):178. e1–7. 6.
- 10) Ozden H, Balci Y, Demirüstü C, et al. Stature and sex estimate using foot and shoe dimensions. *Forensic Sci Int.* 2005;147(2):181–4. 7.
- 11) Akhlaghi M, Hajibeygi M, Zamani N, et al. Estimation of stature from upper limb anthropometry in Iranian population. *J Forensic Legal Med.* 2012;19(5):280–4. 9.
- 12) Rastogi P, Kanchan T, Menezes RG, et al. Middle finger length—a predictor of stature in the Indian population. *Med Sci Law.* 2009;49(2):123–6. 10.
- 13) Agrawal J, Raichandani L, Kataria SK, et al. Estimation of stature from hand length and length of phalanges. *J Evol Med Dent Sci.* 2013;2(50):16. 14.
- 14) Goto R. Precision of measurement as a component of human variation. *J Physiol Anthropol.* 2007;26(2):253–6. 21.
- 15) Agnihotri AK, Agnihotri S, Jeebun N, et al. Prediction of stature using hand dimensions. *J Forensic Legal Med.* 2008;15(8):479–82. 22.