Original Article

Morphometric study of left sided finger length of medical student in Bangladesh

Munni T A[1], Sultana J[2], Morium U[3], Naznin R[4], Yousof SA[5], Sultana N[6]

1. **Dr. Tajrin Akter Munni, MBBS, M.Phil (Anatomy), Associate Professor, Department of Anatomy, Jahurul Islam Medical College, Kishoregonj, Bangladesh*
2. *Dr. Jiasmin Sultana, Assistant Professor, Department of Anatomy, Jahurul Islam Medical College, Kishoreganj*
3. *Dr. Umma Morium, Associate professor, Department of Anatomy, US-Bangla Medical College, Dhaka*
4. *Dr. Rawshon Naznin, Associate professor, Department of Anatomy, United Medical College, Dhaka*
5. *Dr. Syed Abu Yousof, Assistant professor, Department of Anatomy, President Abdul Hamid Medical College, Kishoreganj*
6. *Dr. Naznin Sultana, Department of Anatomy, Dhaka Dental Medical College, Dhaka*

****For Correspondence***

Abstract

Background: *There exists relationship between stature and several bodily parts, including fingers. The relationship between body parts has been the focus of anthropologists, anatomists, and scientists for a long time. But still very few data are available in these regards*

Objectives*: To find out the variations of morphometric dimensions of different fingers of hands among the students of both sexes of Jahurul Islam Medical College*

Methods*: From January to April 2025, 100 medical students—50 male and 50 females—at Jahurul Islam Medical College participated in this cross-sectional study conducted in the department of anatomy. Digital slide calipers were used to measure the length of each hand's five fingers. The study found that men's five finger lengths were substantially longer than women's ($p<0.001$).*

Result: *The study demonstrated that all five finger lengths (thumb, index, middle, ring, and little fingers) were significantly higher in males compared to females, with a statistically significant difference ($p < 0.001$), indicating sexual dimorphism. In both sexes, the middle finger was the longest, whereas the thumb was the shortest. The mean finger lengths (in mm) in males were: thumb 55.28 ± 3.61, index 67.69 ± 2.50, middle 72.72 ± 3.31, ring 69.01 ± 2.95, and little finger 56.86 ± 3.01. In females, the corresponding values were: thumb 51.13 ± 3.32, index 61.74 ± 2.24, middle 67.35 ± 3.65, ring 63.61 ± 3.34, and little finger 52.62 ± 3.44.*

Conclusions*: All the measured values of different variables of left sided finger were greater in males than females*

Key words*: Sexual dimorphism, Finger measurements, Anthropometry*

Introduction

Anthropometry is the scientific study of the measurement and proportions of the human body, widely used in anatomy, ergonomics, and forensic science [1,2]. It provides essential data for understanding human variation and for applications such as identification, clinical assessment, and the design of tools and equipment. The major determinants of anthropometric variation include sex, age, stature, and ethnicity[3]. Sexual dimorphism refers to the systematic differences in size, shape, and proportions between males and females of the same species. In humans, these differences are evident in various body dimensions, including hand and finger measurements, and play an important role in sex determination[4]. Finger anthropometry has gained increasing importance due to its wide range of applications. It is useful in ergonomic design to reduce discomfort and prevent upper extremity injuries[5]. Moreover, in forensic and medicolegal investigations, particularly in cases of dismemberment or mass disasters, finger measurements can assist in identifying individuals when only partial remains are available[6]. Despite its importance, there is limited data on finger anthropometry and sexual dimorphism among the Bangladeshi population. Therefore, the present study aims to establish baseline data on finger measurements and to evaluate sexual dimorphism among medical students in Bangladesh.

Methods

The cross-sectional study was conducted on 100 medical students (50 male and 50 female) on Jahurul Islam Medical College. From January to April 2025, this study was conducted in the anatomy department. Convenient purposing sampling was used to gather samples in accordance with inclusion and exclusion criteria. Digital slide calipers were used to measure the hand dimensions in the following categories in millimeters.

Five fingers' length was measured from the palmer side of the hand while the fingers were fully extended and adducted on the flat surface and thumb outstretched. The five fingers' lengths were measured from the tips to the distal metacarpo-phalangeal crease[7]. Following data collection, the distribution of measurement values was established. From this data, results were generated for each parameter in terms of range, mean, and standard deviation. The unpaired "t" test was used to compare all measurement values between males and females. The significance level for the unpaired t test in all statistical analyses was set at $p<0.000$. The statistical software for social sciences (SPSS version 26.0) was used to conduct the statistical study. The outcome was then explained using tables and diagrams.

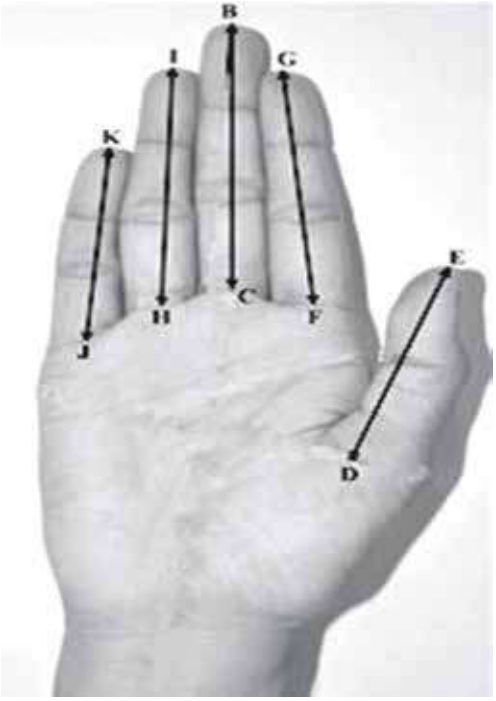

Figure 1: Photograph showing the ED, GF, BC, IH and KJ line which represents the five-finger length (Superior view)

Result

Male values were found to be considerably higher than female values displayed in Table 1 and Figure 2.

Table 1: Five finger length in males and females (N = 100)

Variable in mm	Male (Mean ± SD)	Female (Mean ± SD)	p value
Thumb finger length	55.28 ± 3.61 (61.35 - 50.21)	51.13 ± 3.32 (57.68 - 46.06)	.000*
Index finger length	67.69 ± 2.50 (72.74 - 63.68)	61.74 ± 2.24 (66.49 - 57.73)	.000*
Middle finger length	72.72 ± 3.31 (79.48 - 66.38)	67.35 ± 3.65 (74.71 - 61.01)	.000*
Ring finger length	69.01 ± 2.95 (75.64 - 64.60)	63.61 ± 3.34 (70.32 - 59.21)	.000*
Little finger length	56.86 ± 3.01 (61.04 - 49.40)	52.62 ± 3.44 (56.80 - 45.16)	.000*

Values in parentheses indicate range. Comparison of values between male and female was done by Unpaired Student's 't' test.

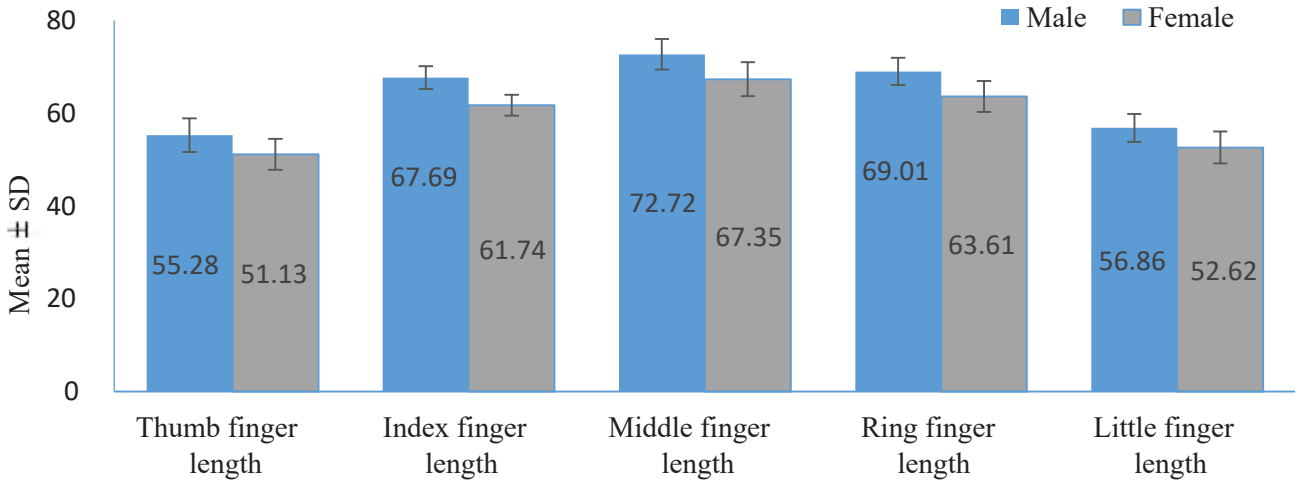

Figure 2: Bar diagram showing thumb, index, middle, ring and index finger length in male and female

Discussion

The current study was conducted to create a standard for estimating sex based on hand measurements, particularly for the population in and around the geographical area of Bangladesh. A review of the literature reveals that numerous studies on anthropometric measurements of the hand have been conducted in foreign countries. It is known that there is no published research on finger anthropometry among Bangladeshi medical students. Therefore, the results of this study were compared with those of other researchers.

In this study, males exhibited higher average values across all measured parameters compared to females and these differences were found to be statistically significant. Under the influence of testosterone, guys continue to grow for a longer amount of time even though the growth spurt happens relatively later. For this reason, separate equations for men and women are required. As in the present study significantly higher value in male than female found was similar to other studies done[7-10] in different population of the world. Regarding middle finger length, it was highest in male students of present study. Similar value was found by Moorthy and Zulkifly[11] and Tandon et al[12].

It was found that little finger length was shorter than thumb. Highest value of this finger was found in the male students of the present study and similar value was found by Moorthy and Zulkifly[8] in Malaysian males and Chandra et al. [13] in male workers of Haryana, India. In the human hand, middle finger is the longest and the thumb is the shortest, followed by the little finger. The thumb is the shortest and the middle finger is the longest on a human hand, followed by the little finger**.**

Conclusion

The results of the current study and several previous studies of similar communities in other parts of the world have shown that males have greater dimensions than females and that most finger measurements are sexually dimorphic. Forensic science will be affected by these findings, especially when estimating stature from incomplete remains is required.

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