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A Comparative Study of Anthropometry between Right and Left Hand of Bangladeshi Male Potters

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Abstract

Context: *Anthropometry is a series of systematized measuring techniques that quantitatively express the dimensions of the human body and skeleton. The study was aimed to measure the length, breadth, thickness and span of right and left hand of Bangladeshi male potters.*

Materials and Methods: *One hundred adult Bangladeshi male potters age ranging from 25-55 years were enrolled in this study. Anthropometric measurements, e.g. hand length, breadth, thickness and span were measured with the help of anthropometric equipments such as digital slide calipers and ruler. The measurements were made by same person on both hand for three times. The median value was taken for reliable values.*

Results: *Hand breadth and span were significantly higher ($p<0.05$) in right hand than left hand of Bangladeshi male potters.*

Conclusion: *In the present study significantly higher value of breadth and span in right hand than left hand was found in male potters of Bangladesh.*

Keywords: *Anthropometry, hand length, hand breadth, hand thickness, hand span*

Introduction:

The human hand is one of the most sophisticated and complex anatomical structures in the body.[1] The extensive manipulatory capabilities of the hand and upper extremity aggregate in general, permit a person to manipulate various tools and devices.[2]

Human hand has great scientific importance to investigators in the field of anthropometry.[3] Anthropometric measurement is one of the essential factors in designing machines and devices. Mismatches between human anthropometric dimensions and equipment dimensions are known to be contributing factors for decreased productivity, discomfort, accidents, stress, fatigue and injuries.[4]

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Pottery is one of the oldest handicraft industries in Bangladesh. Potter artisans artistic touch of hand adds value to the clay and gives life to the crafts.[5] They work for twelve to thirteen hours a day, use their hand regularly and repeatedly for creating and shaping wide range of pottery crafts.[6] Different tools are used in this profession, including carving tools, molds, pottery wheels, and kilns.[7]

Materials and Method

The study was conducted on 100 adult Bangladeshi male, were selected from Rayer bazar kumarpara, Dhaka and kumarpara, Faridpur, age ranging from 25-55 years having working experience of five years or more.

Procedure of measurement of various hand anthrpometric dimensions

Before any measurement of hands and fingers were proceeded for, it was ensured that the subjects had their finger nails properly cut. Finger or hand ornaments (finger ring, bracelet, wrist watch, hand band etc) were removed during the time of measurement. Subjects were requested to

wash their hands properly to remove any temporary stain.

A. Hand length: The subject was requested to put his palm extended and facing up with digits in extended and adducted position. Hand length was measured from the midpoint of the distal transverse wrist crease to the midpoint of the tip of the middle finger along the long axis of the hand. Fixed jaw of the caliper was placed on the midpoint of the distal transverse wrist crease and the sliding jaw of the caliper was placed on the midpoint of the tip of the middle finger. This reading was recorded as hand length.[8]

B. Hand breadth: The subject was put his palm extended and facing up with digits in adducted position except the thumb. Hand breadth was measured by sliding caliper as a straight distance from the radial side of the second metacarpophalangeal joint to the ulnar side of the fifth metacarpophalangeal joint.[8]

C. Hand thickness: Subject's hand was extended; maximum thickness of the metacarpophalangeal joint of digit-3 identified visually and pointed out by a marker pen at palmar and dorsal aspect. One jaw of the slide caliper was placed so as to touch the point at dorsal aspect in such a way that there was no indentation of skin, then the other jaw was placed in similar manner to the opposite side of the joint and in this way hand thickness was measured by slide caliper.[8]

D. Hand span: At first the ruler was placed on the table. Then the subject was asked to open his hand as wide as possible and put the thumb finger of the hand on the ruler at the '0' mark. Measurement was taken from the tip of the thumb to the tip of the little finger in cm.[9]

Comparison between right and left hand was done by Paired Student's 't' test

Results

In right, hand length ranged from 180.23-190.31 mm and the mean was 185.52±3.40 mm. In left, hand length ranged from 180.20-190.40 mm and the mean was 185.51±3.43 mm. No significant difference was observed between right and left mean hand length.

Breadth of right and left hand was ranged from 79.30-86.35 mm and 79.26-86.40 mm respectively, and the mean was 81.97±1.52 mm and 81.92±1.52 mm respectively. Mean breadth was significantly higher ($p<0.05$) in right than left hand.

In right, hand thickness ranged from 18.12-22.75 mm and the mean was 19.89±1.20 mm. In left, thickness ranged from 18.00-22.60 mm and the mean was 19.92±1.23 mm. There was no significant difference between right and left mean hand thickness.

Span of right and left hand was ranged from 19.10-25.30 cm and 19.00-22.50 cm and the mean span was 21.05±0.80 cm and 20.94±0.91 cm respectively. Mean span was significantly higher ($p<0.05$) in right than left hand.

Table - I

Comparison of anthropometric dimensions in right and left hand of Bangladeshi male potters

Variables	Right Mean±SD (Range)	Left Mean±SD (Range)	p value
Hand length (mm)	185.52±3.40 (180.23-190.31)	185.51±3.43 (180.20-190.40)	0.227^{ns}
Hand breadth (mm)	81.97±1.52 (79.30-86.35)	81.92±1.52 (79.26-86.40)	0.002^{**}
Hand thickness (mm)	19.89±1.20 (18.12-22.75)	19.92±1.23 (18.00-22.60)	0.119^{ns}
Hand span (cm)	21.05±0.80 (19.10-25.30)	20.94±0.91 (19.00-22.50)	0.014^{*}

SD = Standard Deviation, ns = not significant, * = significant at $p<0.05$

Discussion

In present study, significant difference was observed in right and left hand anthropometry of Bangladeshi male potters. Breadth and span of hand were significantly higher ($p<0.05$) in right than left hand of potters. But no significant difference was observed in length and thickness of hand.

Kumar et al[10] conducted a study on Kashmiri Pandits where no significant difference was recorded between mean length of right and left hand but mean breadth of right hand was found significantly higher than that of left hand. Kar et al[4] carried out study on agricultural workers and found that mean thickness of right hand was significantly higher than that of left hand. Mohammadian et al [9] reported a study on Iranian adults and found mean hand span was significantly higher in right hand than left hand.

Conclusions

In the present study significantly higher value of breadth and span is found in right hand than left hand of male potters.

References

1. Dianat I, Feizi H, Hasan-Khali K. Pinch strength in healthy Iranian children and young adult population. Health promotion perspectives. 2015;5(1),52-58.
2. Dempsey PG, Ayoub MM. The influence of gender, grasp type, pinch width and wrist position on sustained pinch strength. International Journal of Industrial Ergonomics. 1996;17(3):259-73.
3. Kar SK, Ghosh S, Manna I, Banerjee S, Dhara P. An investigation of hand anthropometry of agricultural workers. J. Hum. Ecol. 2003; 14(1):57-62.
4. Mandahawi N, Imrhan S, Al-Shobaki S, Sarder B. Hand anthropometry survey for the Jordanian population. International Journal of Industrial Ergonomics. 2008;38(11-12): 966-76.
5. Akilandeeswari SV, Pitchai C. Prosperous of pottery industry and the artisans of Manamadurai. Inter J Res-Granthaalayah. 2016;4(5):44-52.
6. Sahu S, Moitra S, Maity S, Pandit AK, Roy B. A comparative ergonomics postural assessment of potters and sculptors in the unorganized sector in West Bengal, India. International journal of occupational safety and ergonomics. 2013;19(3):455-62.
7. Thorp H. Basic pottery for the student, 1st ed, 1971;25-28.
8. Garrett WJ. Anthropometry of the Air Force Female Hand. Journal of aerospace medical research laboratory. 1970;11-48.
9. Mohammadian M, Choobineh A, Haghdoost AA, Hashemi Nejad N. Investigation of grip and pinch strengths in Iranian adults and their correlated anthropometric and demographic factors. Work. 2016;53(2):429-37.
10. Tarsem K, Vishram S, Matto MK, Sunil SG. Effect of hand preference on hand length, hand breadth and shape indices and its role in sexual dimorphism: a study in 300 Kashmiri Pandits. IOSR J Dental Med Sci (IOSR-JDMS). 2015;14(3):10-6.