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Hand dimensions as predictive tools in gender determination: a Nigerian study

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ABSTRACT

Introduction: Forensic anthropology deals with crime investigation, as such; detection and gender determination are key aspects in the medico-legal field. Gender is vital in personal identification; however this is difficult in cases of mass disasters, explosions, and assaults where the body is dismembered or mutilated. The study aims to seek a reliable, quick and easy anthropometric method to confirm the identity of victims using only the hand. Material and Methods: This cross sectional descriptive study was carried out on 384 student volunteers of Delta State University, Abraka. The sample consisted of 192 males and females of Nigerian decent to the second generation, aged between 18-30 years. The hand lengths, breadths and indices as well as the index finger lengths (IFL), ring finger lengths (RFL) and ratios were estimated only on right handed subjects using standard techniques. Results: The mean hand dimensions and indices were statistically longer in males than females ($p < 0.05$). Similarly mean index and ring finger lengths were significantly longer in males than females ($p < 0.05$) but not between the right and left hands ($p > 0.05$). However, there was no significant differences in the index, ring finger ratios between gender and side of the body ($p > 0.05$). Hand lengths and breadths were the greatest predictors of gender, followed by index and ring finger lengths. Conclusion: This study has demonstrated that hand dimensions can be very useful predictive tools in gender determination in medico-legal examination.

Keywords: forensic science, gender determination, hand dimensions, predictive tools, Nigerians

INTRODUCTION

Forensic anthropology is a branch of physical anthropology vital for the investigation and determination of crime in a given population. Determination of gender is one of the "big four" of anthropology relevant to Anatomists and Obstetricians in medico-legal practice.

Gender is an important parameter in forensic identification. In medico-legal investigations, the determination of gender from anthropometric measurements is an essential component of personal identification [1, 2]. Gender determination can be very difficult in cases of mass disasters, explosions and assault cases where the body is dismembered or when in mutilated states [3]. Similarly in crime scenes, forensic anthropometric methods can be used as reliable ways to quickly confirm the identity of victims using only a few body parts [4]. The human hand has the most multifaceted bony structure and in mass disasters, can be useful in forensic identification [5, 6]. Hence in humans, the finger length ratio of the index and ring fingers (2D:4D) have been reported to be sexually dimorphic and this has been correlated with in utero testosterone levels [7, 8]. Males are said to have on the average longer 4th digits relative to their 2nd digits hence showing a low 2D:4D ratio than females. Since the relative lengths of the digits occur before birth, at about the 14th week of

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pregnancy, they are not influenced by environmental factors after birth [7, 9]. Similarly a low 2D:4D ratio has been shown to correlate with high testosterone levels which are the characteristic of males while the reverse is correlated with low testosterone levels, a characteristic of females [10].

Several previous studies had indicated that 2D:4D ratios differ between males and females with males having low 2D:4D ratios while females have high 2D:4D ratios. This phenomenon has been attributed to the high levels of testosterone and low levels of estrogen in prenatal age [4, 11, 12]. Siti and Gargi (2018) [12] also showed race differences on 2D:4D ratios only in Malay, Indian and Chinese males ($P<0.05$). Similarly, Soo-Chan et al. (2015) [4], suggested that the dimensions of hand parts which are not affected by age or gender such as hand length, palm length, hand breath and maximum hand thickness, are recommended to be used first in gender determination for a wide range of age group. They however, concluded that detailed hand dimensions can be used for better accurate gender determination provided the ageing effects are considered in aged subjects. Furthermore, it has been shown that significant differences exist in anthropometric measurements between nationalities [13, 14].

As such, there is a need for regional studies in the process of human remains identification since humans inhibit different environments all over the world, with a lot of racial and ethnic variations. Furthermore, a limited number of studies were found in the course of detailed literature search using the following data bases “PubMed”, “Science Citation index” and “ Thomson Reuters [8, 15, 16] as regards to Nigerians, despite the high rate of natural disasters that have occurred and still occurring in this populous African Nation. It is in the light of the above that this study was carried out to assess the importance of hand dimensions in gender determination in our studied population.

MATERIAL AND METHODS

A cross sectional descriptive study was carried out on 384 volunteer students of Delta State University, Abraka consisting of 192 males and 192 females who are all Nigerians to the second generation aged between 18-30 years.

Hand lengths, breadths and hand indices as well as index and ring finger ratios were estimated. Only right-handed subjects were used, to avoid the influence of handedness on the data standards. Subjects with deformities, injuries, fractures, or history of surgery involving the hands or ring and index fingers of both hands were also excluded.

Anatomically, the ring finger is the fourth digit of the human hand and the second most ulnar finger located between the middle finger and the little finger [17] while the index finger also known as forefinger, is the first finger and the second digit of the human hand and his usually located between the thumb and the middle finger. It is the most dexterous and sensitive finger of the hand [18].

Hand lengths, breadths and hand indices (breadth divided by length × 100), index finger length (IFL), ring finger length (RFL) as well as IFL/RFL ratios were estimated. The measurement techniques used was as described by Weiner and Lourie (1969) [19]. The measurements were taken in cm to two decimal places using a digital sliding caliper. The instrument was calibrated regularly for accurate readings and other necessary precautions were taken while the subjects were being measured.

The readings and measurement were done twice for each subject and the average was taken as the correct value provided the readings and measurements agreed within 0.40 ranges. When this condition was not met, two further measurements were taken and the mean of the closest readings taken as the best estimate [20]. All the readings and measurements were taken by one of the researcher with each subject placing his or her hand on a regular surface with the forearm directed upwards and the fingers outstretched and close to each other. It was also ascertain that adduction and abduction of the wrist joint did not take place

- The hand length (A-B) was measured as the projected distance between the midline of a line joining the styloid process of radius and ulna bones of the forearm which passed through the distal crease of the wrist joint and the middle finger tip (Figure 1);

- The hand breadth (C-D) was obtained by measuring a straight distance from the most laterally placed point of the head of the 2nd metacarpal bone to the most medially placed point located on the head of the 5th metacarpal bone (Figure 1);

- Hand index: This is the hand breadth divided by hand length multiplied by 100;

- IFL: This is the distance between the tip of the index finger and the metacarpophalangeal crease (E-F) (Figure 1);

- RFL: This is the distance between the tip of the ring finger and the distal metacarpophalangeal crease (G-H) (Figure 1);

- The IFL/RFL ratio was calculated by dividing the index finger length by the ring finger length.

A previous pilot study using 50 volunteers was carried out by the same researcher to estimate intra-observer error and all the parameters measured were not statistically significant ($p > 0.05$). This was an indication that the measurements were valid and reliable.

A study protocol followed was in compliance with the Helsinki declaration and according to the ethics committee for Human Experimentation of the Faculty of Basic Medical Sciences of Delta State University, Abraka that approved the study (Ref. no: DELSU/CHS/ANA/68/104, 2018).

Statistical analysis

The data obtained were entered into Microsoft office excel worksheet and analysed statistically using SPSS (Statistical Programme for Social Sciences, version 22.0) computer software. Means, standard deviations (SD) and standard errors (SE) were calculated. The student's t-test was performed to compare the hand lengths, breadths and hand indices, IFL, RFL and IFL/RFL ratios in both hands and in both gender. Bilateral variations in measurements were analyzed using the paired t-test, $p < 0.05$ was considered statistically significant [21].

Furthermore, a sectioning point for all the dimensions between genders was calculated using the following equation:

- Sectioning point= mean male value + mean female value/ divided by two and this was found to be more accurate and of higher sensitivity.

Finally, all the measurements in this study were subjected to normal distribution test using Shapiro-Wilk tests and they were found to be normally distributed with a p value > 0.05.

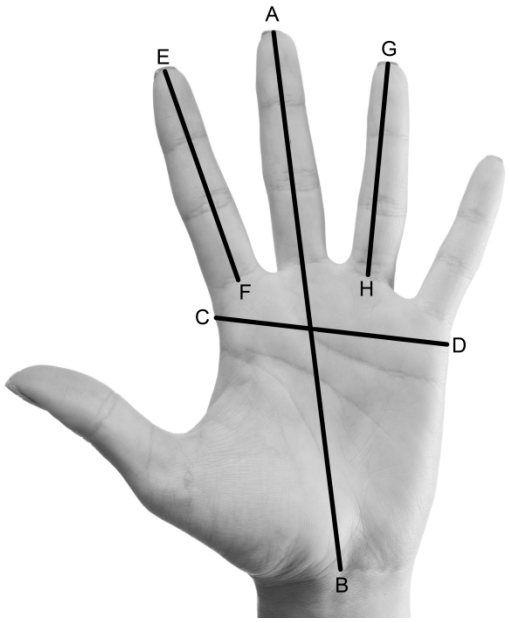

Figure 1: Scheme representing the performed measurements.

RESULTS

Hand lengths

Table 1 shows the descriptive statistics of hand lengths in both genders. In males, the right hand lengths varied from 17.23 cm to 22.96 cm (mean 19.65 cm ± SD 0.86) while the left hand lengths varied from 17.42 cm to 23.09 cm (mean 19.78 ± 0.92). In females, the right hand lengths varied from 15.93 cm to 20.15 cm (mean 18.03 ± SD 0.86) with the left hand lengths varying from

16.00 cm to 20.21 cm (mean 18.09 ± SD 0.84). The mean hand length was significantly different between males and females in both hands ($p< 0.05$), but there was no difference between the right and left hand lengths in both gender ($p > 0.05$). The average hand length was found to be longer with about 1.60cm in males than females.

Table 1: Descriptive statistics (cm) of hand length in males and females.

	Males		Females	
	Rt Hand	Lt Hand	Rt Hand	Lt Hand
Minimum	17.23	17.42	15.93	16.00
Maximum	22.96	23.09	20.15	20.21
Mean	19.6531*	19.7844*	18.0308*	18.0935*
SD	0.86147	0.91843	0.86028	0.83655
SE	0.06217	1.05225	0.06209	0.06037

SD: Standard Deviation; SE: Standard Error; Rt: Right; Lt; Left. Sample = 192.

* = $p < 0.05$ (for corresponding Male-Female Values).

Hand breadths

Table 2 shows the descriptive statistics of hand breadths in both genders. In males, the right hand breaths varied from 7.74 cm to 9.94 cm (mean 8.84 ± SD 0.39) while the left hand breadths varied from 7.52 cm to 9.77 cm (mean 8.67 ± SD 0.44). In females, the right hand breaths varied from 7.11 cm to 9.04 cm (mean 7.92 ± SD 0.380 while the left hand breadths varied from 6.89 cm to 8.82 cm (mean 7.76 ± SD 0.04). There was significant difference between the right and left hand breadths in both genders ($p < 0.05$). Similarly, the average hand breadth was found to be longer with about 0.9 cm in males than females.

Table 2: Descriptive statistics (cm) of hand breadth in males and females.

	Males		Females	
	Rt Hand	Lt Hand	Rt Hand	Lt Hand
Minimum	7.74	7.52	7.11	6.89
Maximum	9.94	9.77	9.04	8.82
Mean	8.840*	8.6747*	7.9231*	7.7588*
SD	0.39203	0.44037	0.38525	0.40448
SE	0.02829	0.03178	0.02780	0.02919

SD: Standard Deviation; SE: Standard Error; Rt: Right; Lt; Left. Sample = 192.

* = $p < 0.05$ (for corresponding Male-Female Values).

Hand Indices

The hand indices in males varied from 39.28cm to 51.80cm for the right hands (mean 44.04 ± SD 1.91) and 39.05cm to 49.37cm for the left hands (mean 43.88 cm ± SD 2.00). In females, however, it varied from 38.46cm to 50.16cm for the right hands (mean 44.00 cm ± SD 2.23) and 37.47cm to 49.47cm (mean 42.94 cm ± SD 2.17) for the left hands respectively. The mean hand index differed significantly between the mean right and left hand indices in males and females ($p < 0.05$). Table 3 shows the descriptive statistics of hand indices in both genders.

Table 3: Descriptive statistics (cm) of hand index in males and females.

	Males		Females	
	Rt Hand	Lt Hand	Rt Hand	Lt Hand
Minimum	39.28	39.05	38.46	37.47
Maximum	51.08	49.37	50.16	49.47
Mean	44.044*	43.8830*	44.008*	42.9381*
SD	1.90655	2.00396	2.23089	2.17389
SE	0.13759	0.14462	0.16100	0.15689

SD: Standard Deviation; SE: Standard Error; Rt: Right; Lt; Left. Sample = 192.

* = $p < 0.05$ (for corresponding Male-Female Values).

Index finger lengths

Table 4 shows the descriptive statistics of index finger lengths in both genders. In males, it varied from 6.32 cm to 9.13 cm (mean 7.57 ± SD 0.46) while the left varied from 6.40 cm to 9.23 cm (mean 7.62 ± SD 0.49). In females, it varied from 5.83 cm to 8.14 cm for the right hands (mean 6.98 cm ± SD 0.43) and 5.84 cm to 8.75 cm (mean 6.96 cm ± SD 0.45) for the left hands respectively. There was significant difference between genders in both hands ($p < 0.05$) but not between the right and left index fingers of both gender ($p > 0.05$).

Ring finger lengths

Table 5 shows the descriptive statistics of ring finger lengths in both genders. In males, the ring finger lengths varied between 6.74 cm to 9.43 cm (mean 7.89 cm ± SD 0.48), and the left varied from 6.27 cm to 9.66 cm (mean 7.91cm ± SD 0.52). For females, it varied from 5.94 cm to 9.06 cm, right

hands (mean 7.27 cm ± SD 0.49) and 6.00cm to 8.82cm (mean 7.24 cm ± SD 0.49) for the left hands respectively. The ring finger lengths showed significant difference between males and females in both hands ($p < 0.05$) but the difference between right and left finger lengths was not significant in both gender ($p > 0.05$).

Table 4: Descriptive statistics (cm) of index finger length in males and females.

	Males		Females	
	Rt Hand	Lt Hand	Rt Hand	Lt Hand
Minimum	6.32	6.40	5.83	5.84
Maximum	9.13	9.23	8.14	8.75
Mean	7.5740*	7.6201*	6.9810*	6.9612*
SD	0.46059	0.48850	0.42995	0.45350
SE	0.03324	0.03525	0.03103	0.03273

SD: Standard Deviation; SE: Standard Error; Rt: Right; Lt; Left. Sample = 192.

* = $p < 0.05$ (for corresponding Male-Female Values).

Table 5: Descriptive statistics (cm) of ring finger length in males and females.

	Males		Females	
	Rt Hand	Lt Hand	Rt Hand	Lt Hand
Minimum	6.74	6.27	5.94	6.00
Maximum	9.43	9.66	9.06	8.82
Mean	7.8870*	7.9111*	7.2712*	7.2385*
SD	0.48502	0.52039	0.48655	0.48997
SE	0.03500	0.03756	0.03511	0.03536

SD: Standard Deviation; SE: Standard Error; Rt: Right; Lt; Left. Sample = 192.

* = $p < 0.05$ (for corresponding Male-Female Values).

Index/Ring finger length ratios

Table 6 shows the descriptive statistics for IFL/RFL ratios of both genders. In males, the index/ring finger length ratios varied from 0.80 cm to 1.66 (mean 0.96 ± SD 0.06) right hands and 0.86 cm to 1.16 cm (mean 0.96 ± SD 0.04) for the left hands respectively. In females, however, it varied from 0.87 cm to 1.08 cm (mean 0.96 cm ± SD 0.40) for the right hands and from 0.87 cm to 1.08 cm (mean 0.96 cm ± SD 0.04) for the left hands respectively. There were, however, no significant differences in the ratios for male and females in both hands ($p > 0.05$).

Table 6: Descriptive statistics (cm) of IFL/RFL ratio in males and females.

	Males		Females	
	Rt Hand	Lt Hand	Rt Hand	Lt Hand
Minimum	0.80	0.86	0.87	0.87
Maximum	1.66	1.16	1.09	1.08
Mean	0.9649*	0.9649*	0.9605*	0.9618*
SD	0.06334	0.04474	0.3969	0.04134
SE	0.00457	0.0323	0.0286	0.078

SD: Standard Deviation; SE: Standard Error; Rt: Right; Lt; Left. Sample = 192.

* = $p < 0.05$ (for corresponding Male-Female Values).

Table 7 shows the descriptive statistics of hand dimensions and the percentage accuracy that can be derived from them using the sectioning points for each of the parameters. Hand lengths and hand breadths were the greatest predictors of gender with 83% and above in accuracy. This was followed by index finger and ring finger lengths with 70% and above in accuracy with Index/Ring Finger ratios the least in accuracy but more accurate in males than females.

Tables 8 and 9 shows the comparative mean values of hand dimensions, hand indices, mean index finger lengths to ringer finger lengths ratios in males and females of different population previously studied. The mean values of the parameters were different between gender and different population groups.

However, hand index was equivocal with the right hands showing more accuracy in males while the reverse was the case in females.

DISCUSSION

Our study has demonstrated that hand lengths and breadths were significantly longer in males (length 1.60cm) than females (breadth 0.9cm), thus showing that both parameters are sexually dimorphic ($p < 0.05$). This was found to be significant in both hand lengths and breadths but was not significant between the right and left hands in both genders.

However, these dimensions could be influenced by the body size of the individuals, hence the need for determination of mean hand index, a more reliable gender determination tool. Previous studies using hand dimensions have validated the above findings [13-15].

Table 7: Descriptive statistics (cm) of hand dimensions with percentage accuracy using sectioning points in Males and Females of our studied population.

	Males		Females	
	Rt Hand	Lt Hand	Rt Hand	Lt Hand
		Hand Length		
Mean	19.65	19.78 (19.71)	18.03	18.09 (18.06)
SD	0.86	0.92	0.86	0.84
SP		18.88		
% Accuracy	84.37	86.46	83.85	83.85
		Hand Breadth		
Mean	8.84	8.67 (8.75)	7.92	7.76
SD	0.39	0.44	0.38	0.40
SP		8.29		
% Accuracy	92.19	83.85	83.33	88.02
		Hand Index		
Mean	44.04	43.88 (43.96)	44.01	42.94 (43.47)
SD	1.91	2.00	2.23	2.17
SP		43.70		
% Accuracy	78.12	53.64	43.23	63.54
		Index Finger Length		
Mean	7.57	7.62 (7.59)	6.98	6.96 (6.97)
SD	0.46	0.49	0.43	0.45
SP		7.28		
% Accuracy	72.39	73.96	76.04	76.04
		Ring Finger Length		
Mean	7.89	7.91 (7.90)	7.27	7.24(7.25)
SD	0.48	0.52	0.49	0.49
SP		7.57		
% Accuracy	71.87	76.56	80.21	74.48
		Index/Ring Ringer Ratio		
Mean	0.96	0.96 (0.96)	0.96	0.96 (0.96)
SD	0.06	0.04	0.04	0.04
SP		0.96		
% Accuracy	53.14	57.29	46.35	46.35

SD: Standard Deviation; SE: Standard Error; Rt: Right; Lt; Left. Sample = 192. Data between () are the means. * = $p < 0.05$ (for corresponding Male-Female Values).

The hand lengths and breadths demonstrated in this study were longer than those reported by Kanchan and Rastogi for North and South Indians [21], Aboul- Hagag et. al., for a population of Upper Egyptians [22] and Agnihotri et. al., in a Mauritius population [23].

The study has also shown that the mean hand index was significantly higher in males than females ($p < 0.05$) as indeed were the studies carried out among the populations of Koreans [4] , Northern Nigerians [15] , Indians [21], Indo – Mauritius people [23] as well as in North Saudis [24].

The index was also significantly higher in the right and left hands of both genders, similar to results of previous studies in other population groups [22, 23]. Since indices do not significantly relate to stature or age, they are more independent of body size. We have also shown that the index finger and ring finger lengths vary considerably with the mean ring finger length longer than the mean index finger length in males and females. Kanchan et. al., also showed that gender differences exist in the lengths of the hand fingers [5]. This view was however, not supported by the study of Tarsen et al., [25].

Our results are similar to previously reported studies [5, 24] with only the Indian population showing similar values in these lengths in both genders [21].

Table 8: Comparison of mean values of hand dimensions and hand indices in males and females of different population groups previously studied.

Previous Studies	Males				Females				Population Groups
	Side	HL	HB	HI	Side	HL	HB	HI	
Aboul- Hagag et. al., 2011[22]	Right	19.47	8.13	41.78	Right	18.13	7.16	39.53	Upper Egyptians
	Left	19.49	8.14	41.79	Left	18.16	7.17	39.50	
Danborno et. al., 2007[15]	Right	19.85	8.90	44.92	Right	18.51	7.82	42.27	Northern Nigerians
	Left	19.93	8.68	43.65	Left	18.52	7.72	41.74	
Agnihortri et. al., 2015[23]	Right	18.89	8.45	44.02-45.05	Right	17.22	7.48	43.06-43-79	Mauritius
	Left	18.90	8.42	44.15-44.80	Left	17.22	7.42	42.65-43.56	
Tarsem et. al, 2015[25]	Right	18.17	8.29	43.05	Right	17.08	7.58	43.32	Kashmiri Pandits
	Left	18.26	8.12	44.05	Left	17.07	7.49	43.15	
	Left	17.84	7.96	44.66	Left	16.35	7.38	45.16	
Uzun et. al., 2018[2]	Right	18.31	7.79		Right	16.90	7.18		Turkey
	Left	18.26	7.74		Left	16.86	7.12		
Sonia et. al., 2017[11]	Right	18.09	8.32	46.04	Right	17.13	7.15	41.84	Uttar Pradesh India
	Left	17.97	8.20	45.69	Left	17.05	7.06	41.53	
Mahrous et. al., 2016[24]	Right	19.56	8.23	42.87	Right	18.24	7.28	39.95	North Saudi
	Left	19.64	8.34	42.87	Left	18.26	7.29	39.90	
Present Study 2018	Right	19.65	8.84	44.04	Right	18.03	7.92	44.01	Delta Nigeria
	Left	19.78	8.67	44.88	Left	18.09	7.76	42.94	

HL: Hand Length; HB: Hand Breadth; HI: Hand Index

We have equally shown that morphological gender differences exist in the absolute lengths of the index and ring fingers with males having a significant longer lengths compared to females ($p < 0.05$). This finding has also been substantiated by several previous authors [5, 6, 21]. This was as a result of size and shaped based differences among gender [25].

The hand lengths and breadths demonstrated in this study were longer than those reported by Kanchan and Rastogi for North and South Indians [21], Aboul- Hagag et. al., for a population of Upper Egyptians [22] and Agnihotri et. al., in a Mauritius population [23].

The study has also shown that the mean hand index was significantly higher in males than females ($p < 0.05$) as indeed were the studies carried out among the populations of Koreans [4] , Northern Nigerians [15] , Indians [21], Indo – Mauritius people [23] as well as in North Saudis [24].

The index was also significantly higher in the right and left hands of both gender, similar to results of previous studies in other population groups [22, 23]. Since indices do not significantly relate to stature or age, they are more independent of body size. We have also shown that the index finger and ring finger lengths vary considerably with the mean ring finger length longer than the mean index finger length in males and females. Kanchan et. al., also showed that gender differences exist in the lengths of the hand fingers [5]. This view was however, not supported by the study of Tarsen et al., [25].

Table 9: Comparison of mean index finger length ratios in males and females among different population.

Previous Studies	Side	Males	Females	Population
Jayaseelan *et. al.*, 2014[27]	Right	0.98	0.98	Malaysia
	Left	0.99	0.98	
Chakraborty *et. al.*, 2014[28]	Right	0.99	1.02	Polish
	Left	0.99	1.02	
Chakraborty *et. al.*, 2014[28]	Right	0.97	1.03	Indian
	Left	0.97	1.02	
Oladipo et. al., 2009[29]	Right	0.96	0.97	Igbo Ethnicity Nigeria
	Left	0.94	0.95	
Oladipo et. al., 2009[36]	Right	0.96	0.97	Yoruba Ethnicity Nigeria
	Left	0.94	0.95	
Sonia et. al., 2017[11]	Right	0.98	1.01	Uttar Pradesh India
	Left	0.98	1.01	
Aboul-Hagag et. al., 2011[22]	Right	0.97	0.99	Upper Egyptians
	Left	0.97	0.99	
Mahrous et. al., 2016[24]	Right	1.01	1.06	North Saudi
	Left	1.05	1.06	
Present Study 2018	Right	0.96	0.96	Delta Nigeria
	Left	0.96	0.96	

Our results are similar to previously reported studies [5, 24] with only the Indian population showing similar values in these lengths in both genders [21]. We have equally shown that morphological gender differences exist in the absolute lengths of the index and ring fingers with males having a significant longer lengths compared to females ($p < 0.05$). This finding has also been substantiated by several previous authors [5, 6, 21]. This was as a result of size and shaped based differences among gender [25].

Equally of note from our study was the fact that the index/ring finger ratios were the same in both gender and in both left and right hands. To the best of our knowledge, this was peculiar to our studied population; however, more work may be needed to validate this claim. Previous studies have shown that females have significantly higher index finger length and ring finger length ratio than males and this was attributed to testosterone levels in females and males [25, 26].

Despite the foregoing, it has been generally reported that hand dimensions have been found to be greater in males than females and has been documented by several other authors [21, 24, 25]. This stated difference can be explained on the early occurrence of maturity in females than males who have up to two years of physical development [24].

Using the sectioning points derived from this study, we have shown that the best predictors of gender from hand dimensions were hand lengths and hand breadths which gave 83% and above accuracy, followed by index finger and ring finger lengths with 70% and above in accuracy. The index/ring finger ratios were the least in accuracy, however, they were more in males than females in both right and left hands (Table 7).

CONCLUSION

Hand dimensions are very useful predictive tools in gender determination for medicolegal examination provided the dismembered hands are fresh, not embalmed and measurements taken quickly before putrefaction steps in. We also recommend measurements of many dimensions for greater accuracy. However, the dimensions are ethnic and population specific and these must be taken into account when utilized as predictive tools in forensic anthropology.

CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest, financially or otherwise regarding the publication of this manuscript.

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RESUMO

Dimensões da mão como ferramentas preditivas na determinação de gênero: um estudo Nigeriano

Introdução: A antropologia forense lida com investigação criminal, dessa maneira, a detecção e determinação de gênero é fundamental em questões pertinentes ao tema médico-legal. O gênero é vital na identificação pessoal, porém isso é difícil em casos de desastres em massa, explosões e agressões em que o corpo é desmembrado ou mutilado. O objetivo deste presente trabalho é buscar um método antropométrico confiável, rápido e fácil para confirmar a identidade das vítimas utilizando apenas a mão. Materiais e Métodos: Este estudo descritivo de corte transversal foi realizado em 384 estudantes voluntários da Universidade Delta State, em Abraka - Nigéria. A amostra foi composta por 192 homens e 192 mulheres com idades entre 18 e 30 anos. Os comprimentos de mão, larguras e índices, bem como o comprimento do dedo indicador, comprimentos anulares e suas respectivas proporções foram estimados apenas em indivíduos destros utilizando técnicas padrão. Resultados: As dimensões e os índices médios da mão foram estatisticamente maiores no sexo masculino que no feminino ($p < 0,05$). Da mesma forma, o índice médio e o comprimento dos dedos anulares foram significativamente maiores nos homens do que nas mulheres ($p < 0,05$), mas não entre as mãos direita e esquerda ($p > 0,05$). No entanto, não houve diferenças significativas no índice do dedo anelar entre gênero e o lado do corpo ($p > 0,05$). Comprimentos e largura das mãos foram os maiores preditivos em relação ao gênero, seguidos dos comprimentos do dedo indicador e anular.

Conclusão: Este estudo demonstrou que as dimensões da mão podem ser ferramentas preditivas muito úteis na determinação do sexo no exame médico-legal, proporcionando maior precisão.

Palavras-chave: ciência forense, determinação de gênero, dimensões da mão, ferramentas preditivas, nigerianos