

A Descriptive Study of Gender Difference in Digit Ratio among Bini Ethnic Group of southern Nigeria

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Abstract

Background: This study investigated gender variation in digit ratios of the Bini ethnic group. The study had a descriptive cross-sectional design with volunteer's age ranging from 18-60 years. For the purpose of this study, an individual was considered to be a Nigeria of a particular ethnic group if the parents and four grandparents are of the same ethnic group.

Materials and Methods: Cluster sampling method was used for the study. The selection and collection of required parameters relied on informed consent of volunteers. This was done by giving them a copy of the informed consent letter which was signed and dated. A total of 400 subjects (225 males, 175 females) subjects were recruited for the study. The fingerprints were obtained using print scanner (Hp G3110 Photo scanner).

Results and Discussion: Descriptive statistics of digit length of Bini ethnic group. In the males the following Mean±SD were seen: Left L2D (cm) 7.93±0.20, Right L2D (cm) 7.90±0.56, Left L4D (cm) 8.09±1.22, Right L4D (cm) 8.13±1.29; while in females, Left L2D (cm) was 8.05±0.27, Right L2D(cm) 8.06±0.31, Left L4D(cm) 8.10±1.19, Right L4D(cm) 8.12±1.21. The males had the Left Digit Ratio 0.98±0.03, Right Digit Ratio 0.97±0.02. While in the females the Left Digit Ratio was 0.98±0.05, Right Digit Ratio 0.99±0.04. The comparison between both sexes were significant with p=0.001.

Conclusion: The Bini ethnic group has shown a marked difference in the digit ratio between both sexes. The shorter digit length and a lower digit ratio in males are considered to be typical masculine features, as such could be used as a marker for gender differentiation in a forensic investigation.

Keywords: Gender, Digit Ratio, Bini, Southern, Nigeria.

1. INTRODUCTION

Digit ratio is defined as the ratio of the second digit length (2D) to the fourth digit length (4D) of the hand. [1]

$$\text{Digit Ratio} = \frac{2D}{4D} = \frac{\text{Length of the second digit of the finger}}{\text{Length of the fourth digit of the finger}}$$

There are divers works on digit ratio as a subject matter insinuating that it expresses dimorphism in sexes. If this is true, it means that it could serve as a means of identification in forensic and population studies. Digit ratio has also been used to investigate interpopulation affinity stating tribal or population similarity. [2]

It has been speculated that sexual differences in 2D:4D are mainly caused by the shift along the common allometric line with non-zero intercept, which means 2D:4D necessarily decreases with increasing finger length, and the fact that men have longer fingers than women (which may be the basis for the sex difference in digit ratios and/or any putative hormonal influence on the ratios [3-5].

This gender difference has not been investigated amongst Bini tribe before, as such the study was done to know whether the ethnic group under investigation has this feature has have been reported by other authors. This study will add to the body of knowledge information on the

population characteristics of the indigenous populations especially in Sub-Saharan Africa.

The Edo or Bini (from the word "Benin") people are an ethnic group primarily found in Edo State, and spread across the Delta and Ondo states of Nigeria. They speak the Edo languages and are the descendants of the founders of the Benin Empire. They are closely related to other ethnic groups that speak Edo languages, such as the Esan, the Anemia and the Owan. They have been estimated to have a population of 2,208,700 million [6-8]. There are some reports on investigations by other researchers on digit ratios in various indigenous populations. [9-20]

There is paucity of information on gender difference in digit ratio in Bini tribe.

1.1. Aim and Objective

This study was aimed at gender variation in digit ratio of the Bini ethnic group.

1.2. Scope of the Study

This study was done specifically on the second- and fourth-digit lengths.

1.3. Significance of the Study

This study will benefit the body of knowledge on population studies of ethnic groups in Nigeria which will be significant to historians,

sociologists, anthropologists, and the Bini people of Nigeria specifically.

2. METHODS

2.1. Research Design

The study was descriptive and cross-sectional. For the purpose of this study, an individual was considered to be a Nigeria of a particular ethnic group if the parents and four grandparents are of the same ethnic group. Volunteers with age ranging from 18-60 years from the Bini extractions were recruited for this study by purposive sampling. The study was conducted from March 6- October 20, 2019.

2.2. Data Collection

The lengths of the second and fourth digits of the left and right hands were measured on the ventral (inferior) surface of the hand from the basal crease of the 2nd and 4th digits to the tip of the finger of the subjects. In situations where there was a band of creases at the base of the digit, the most proximal crease was used. All measurements were done with a digital vernier caliper having an accuracy of $\pm 0.2\text{mm}$ [1-3]. The measurements were done three times and the average value was recorded. The lengths of the second digits were divided by the lengths of the fourth digits to obtain the digit ratios [1-3].



Figure 1: Digit ratio measurement from the study

2.3. Data Analysis

The data obtained were analysed using SPSS version 21; independent t-test was used to determine the mean values and comparison between both sexes.

2.4. Criteria for Subject Selection

Volunteers recruited were indigenes of the ethnic groups under investigation with no form of anatomical abnormality of the hands.

2.5. Ethical Consideration

Ethical clearance was obtained from the Research Ethics Committee of the University of Port Harcourt with REC Number: UPH/CEREMAD/REC/MM59/036 before commencement of the study.

3. RESULTS

In table 1, descriptive statistics of digit length of Bini ethnic group. In the males the following

Mean±SD were seen: Left L2D (cm) 7.93±0.20, Right L2D (cm) 7.90±0.56, Left L4D (cm) 8.09±1.22, Right L4D (cm) 8.13±1.29; while in females, Left L2D (cm) was 8.05±0.27, Right L2D (cm) 8.06±0.31, Left L4D (cm) 8.10±1.19, Right L4D (cm) 8.12±1.21.

In table 2, the males had the Left Digit Ratio 0.98±0.03, Right Digit Ratio 0.97±0.02. While in the females the Left Digit Ratio was 0.99±0.05, Right Digit Ratio 0.99±0.04. In table 3, the comparison between both sexes were significant with p=0.001.

Table 1: Descriptive statistics of digit lengths of Bini ethnic group

BINI ETHNIC GROUP		
Parameters	Male [N = 225]	Female [N =175]
	Mean±SD	Mean±SD
Left L2D(cm)	7.93±0.20	8.05±0.27
Right L2D(cm)	7.90±0.56	8.06±0.31
left L4D(cm)	8.09±1.22	8.10±1.19
Right L4D(cm)	8.13±1.29	8.12±1.21

L2D (cm) < L4D (cm), Females > Males

Table 2: Descriptive statistics of digit ratios of Bini ethnic group

BINI ETHNIC GROUP		
Parameters	Male [N = 225]	Female [N =175]
	Mean±SD	Mean±SD
Left L2D(cm)	0.98±0.03	0.99±0.04
Right L2D(cm)	0.97±0.02	0.99±0.03

L2D (cm) < L4D (cm), Females > Males

Table 3: Comparison between both sexes in Bini ethnic group

Parameters	Male [N = 225]	Female [N =175]	t(p-value)	Inference
Left L2D(cm)	0.98±0.03	0.99±0.04	10.134(0.001)	Significant
Right L2D(cm)	0.97±0.02	0.99±0.03	12.835(0.001)	Significant

P<0.05

4. DISCUSSIONS

The ability to distinctively tell the difference between males and females is a desired feature of an anthropological study. The result of the study depicted sexual dimorphism in the digit ratios with the females having higher digit ratios than the males. This dimorphism could have been a result of the difference in androgen level between both genders. The more exposure to testosterone, the lower the digit ratio. This further strengthens what has been reported in the digit lengths. The result of this present study agrees strongly with the reports of previous investigators who have expressly stated that there is sexual dimorphism in the digit ratios. [9-14] in this study, it was found that the males repeatedly had low digit ratios compared to the females.

This low digit ratio seen in men is considered a positive trait as several other authors who have worked on this subject reported that low digit ratios are typical masculine traits. Alonso *et al.* [15] reported that low digit ratio correlates with high social preference. Again, Aycinena *et al.* [16] in his study asserted that women with low digit ratio tend to be more patient; motioned that a low digit ratio positively correlates with static

and explosive strength, speed and agility which is a typical masculine trait exemplified in digit ratio. Furthermore, it was also mentioned that a study on sports activities showed that those who got to the highest level of competition in their respective games had low digit ratios [17] which were mostly men. All these reports from the previous authors affirm the results got from this present study which showed that males had lower digit ratios than the females.

5. CONCLUSION

The Bini ethnic group has shown a marked difference in the digit ratio between both sexes. The shorter digit length and a lower digit ratio in males are considered to be typical masculine features, as such could be used as a marker for gender differentiation in a forensic investigation.

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