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Comparison of Inter pupillary distance and Mesiodistal width of central incisors among genders- an observational study

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Abstract

Aim: To compare the mean interpupillary distance and mean mesiodistal width of central incisors among different genders. **Background:** For a successful rehabilitation of missing teeth, selection of teeth is of paramount importance. Among the anthropometric measurements, only interpupillary distance probably remains constant irrespective of age changes which give a definite guideline in selecting the size of the teeth. **Materials and methods:** A total of 102 participants, 74 females and 28 males of first year dental students from Saveetha dental college. Both male and female of age group 17-20 years having full complement of natural teeth were selected. To minimise sampling bias, the selection of participants was random. The mean interpupillary distance and mean mesiodistal width of central incisors were measured using a digital vernier caliper. Data collected was tabulated and analysed using the Statistical Package for the Social Sciences (SPSS) software version 23.0 (IBM, Chicago, USA). **Result:** The mean interpupillary distances of males (66.91±2.0) were significantly

greater than that of females (63.39±2.9). The p-value is 0.051. The mean Mesiodistal widths of maxillary central incisors were greater in male (8.56±0.2) when compared to females (8.43±0.2). The p-value is 0.166. **Conclusion:** The present study concluded that there was a significant difference in mean interpupillary distance and mean mesiodistal width of maxillary central incisors between males and females. These parameters can potentially find its application in prosthetic rehabilitation and forensic identification of individuals.

Keywords: Mesiodistal width, interpupillary distance, maxillary, innovative technology, facial harmony, anthropometric measurements.

Running title: inter pupillary distance and mesiodistal width of central incisors

INTRODUCTION

For a successful rehabilitation of missing teeth, selection of teeth is of paramount importance. This population with esthetic teeth has an aesthetic arrangement with facial harmony, matching shape, colour and anthropometric measurements. The interpupillary width will not get modified after the age of 14. Moreover, variations in teeth occurring in permanent detention varies demographically (1). Pre-extraction records are valuable guides for the teeth selection and the clues taken from the participants of their own natural detention are dependable aids to accomplish a successful, eye-catching restoration of a patient (2). Eruption disturbances of teeth are not unusual; many variations are encountered and eruption disturbances can negatively influence the development of the tooth and jaw system. (3).

Facial esthetics is a great concern for everyone as it is a crucial part of self image. The tracking of beauty is based on various subjective factors, based on custom, education and civilisation (4). Calculating the Mesiodistal width of maxillary central incisors is a tedious process when selecting artificial teeth for edentulous people (5). The width of interpupillary distances varies widely within population groups predominantly based on sex and race (6).

The selection of maxillary anterior artificial teeth is one of the primary concerns in complete denture esthetics. In the absence of pre-extraction records, it becomes difficult to estimate the combined width of maxillary six anterior teeth (7). Documentation of this data over a large sample size can help in selection and in guiding proper size. Established morphometric criterions can serve as guides for the mesiodistal dimension in the population studied (8). Our team has extensive knowledge and research experience that has translate into high quality publications(9),(10),(11),(12),(13),(14),(15),(16),(17),(18),(19),(20),(21),(22),(23),(24),(25),(26),(27),(28) . The aim of the study is to compare the interpupillary distance and mesiodistal width of central incisors in different genders.

Materials and methods

General public visiting from a private dental college were selected for the study. Both male and female are at age 17-20 years having full compliments of natural teeth; acceptable alignments were selected. To minimise sampling bias, the selection of participants was random. The measurements were done by a digital vernier caliper. The two end points of the vernier caliper were placed on the two mid pupils and the distance was measured. The same procedure was followed to measure the width of the teeth on each participant. Anthropometric measurements of all samples were recorded and tabulated. Data, thus collected, was subjected to statistical analysis . The two end points were placed on the maximum convexity of the distal side of right and left maxillary central incisors.

Results:

A total of 102 participants, 74 females, 28 males of first year undergraduate (UG) students in Saveetha dental college were selected for the study. Statistical analysis of the collected data to ascertain the correlation of interpupillary distance and combined Mesiodistal width of maxillary central incisor teeth was done. The mean interpupillary distance of males (mean=66.91) was significantly more compared to that of females (mean=63.39). The P value was 0.051.

The mean Mesiodistal width of the maxillary central incisor for male (mean=8.56) was more than that of females (mean=8.43) although the statistical significance could not be achieved. The P value was 0.166.

Table-1:Group Statistics

	Gender	N	Mean	P
Interpupillary Distance	MALE	28	66.91 ± 2.0	0.051
	FEMALE	74	63.39 ± 2.9	
MD Width of Maxillary Central incisor	MALE	28	8.56 ± 0.2	0.166
	FEMALE	74	8.43 ± 0.2	

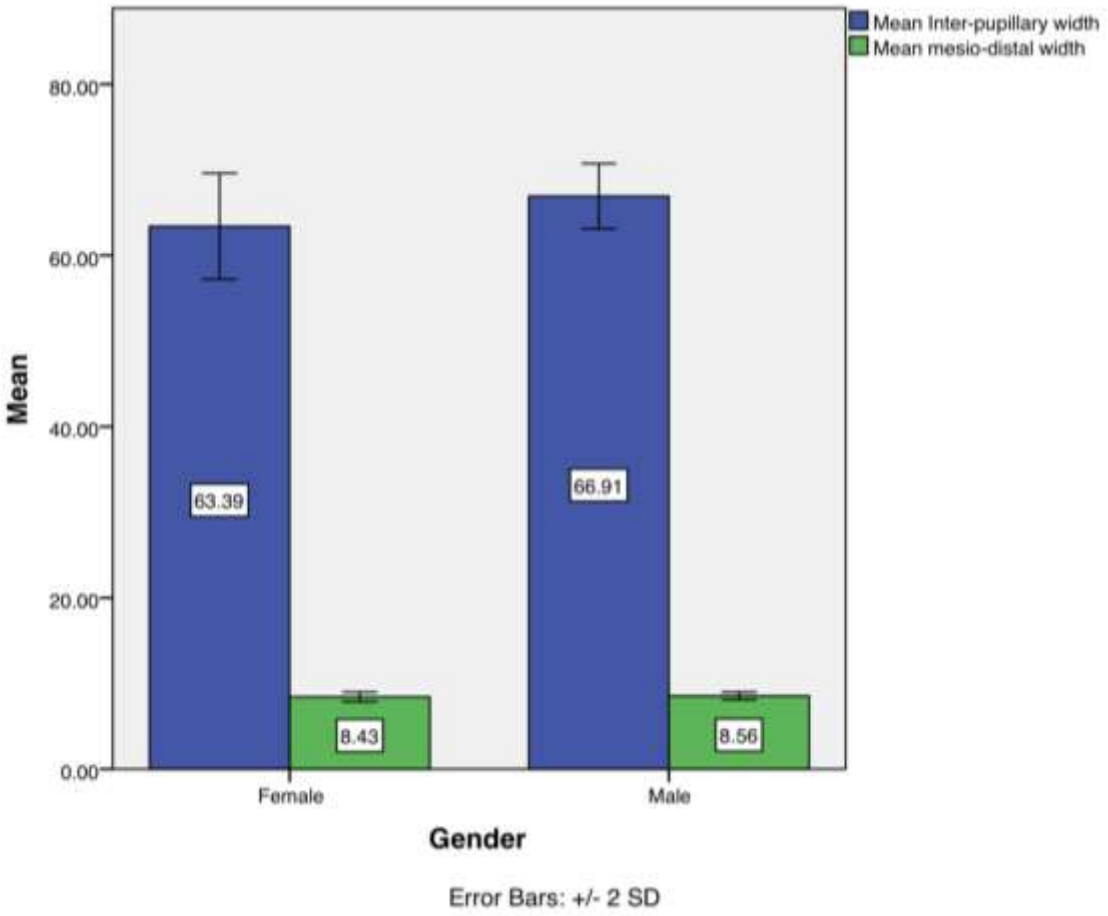

Figure 1 : Bar graph depicting the comparison of mean interpupillary distance and mean mesiodistal width of central incisors in different genders. X axis represents Gender and Y axis represents mean interpupillary distance and mean mesiodistal width of maxillary central incisors. Mean interpupillary distance of males (45.40%) were greater than females (43.07%). The difference was statistically significant (Independent t-test, The p value=0.051). Mean mesiodistal width of central incisors of males (5.81%) were greater than of females (5.72%). The difference was statistically insignificant (Independent t-test, The p value=0.166)

Discussion

In this study population, no significant correlation was found between inter pupillary distance and mesiodistal width of maxillary central incisors. The mean inter-pupillary distance in this study was found to be 66.91 ± 2.0 in males and 63.39 ± 2.9 in females, and the mean mesiodistal width of six maxillary anterior teeth was found to be 8.56 ± 0.2 and 8.43 ± 0.2 for males and females, respectively. Ideal teeth selection which is pleasing both esthetically and functionally is a critical step in the fabrication of prosthesis. Even though different anthropometric landmarks have been suggested for aiding teeth selection in the absence of any pre extraction records, it has been proven beyond doubt that these landmarks vary from different race and ethnic origin.

Analysis of the human face is a science and an art. It is a well established fact that the human face differs from one another on the basis of race and gender. Further, anthropometric measurements by previous investigators were either recorded directly on the anatomical landmarks

on the dental cast obtained from the impression by calipers like devices and various other techniques. In general, the Indian population is genetically diverse due to its geographical location and historical background, giving rise to many dental and facial variations. To eliminate human error, (29) used computers to accurately record the measurements. However, (30)used both computer and caliper methods and recorded the variation on both the methods. In this study, a statistically significant difference was found in interpupillary distance among UG first years done by the vernier method. Similarly, a statistically significant difference was found in the Mesiodistal width of the maxillary central incisor. This may be attributed to the fact that all the participants belong to a young age group where the gross wear and tear if the tooth is usually not visible. Since ethnic differences exist between different populations, universal application of the previous research is possible only studied in all populations (31). The present study was an attempt to analyze this relation among males and females only. Independent sample t tests in the present study did not reveal any statistically significant difference in the IPD among males and females done with the vernier method. Likewise, statistically no significant difference was seen in the combined mesiodistal width of maxillary central incisors among males and females done with the vernier method. The results of this study are not consistent with the studies previously done by other researchers on the basis of ethnic populations.

Limitation of the study:

The limitations of the present study included a relatively small sample of individuals from diverse backgrounds.

Scope of the study:

Further study must necessarily be carried out to determine if this correlation leads to different results.

Conclusion

The present study concluded that there was a significant difference in interpupillary distance and no significant difference in mesiodistal width of maxillary central incisors between males and females. Although various methods of tooth selections are used, the applicability can vary due to gender difference between populations. In future, studies should be carried out with greater sample size to authenticate the use of these parameters for selection and arrangement of anterior teeth.

AUTHOR CONTRIBUTIONS

Author 1: Deepasakthi J, carried out the study by collecting data and drafted the manuscript after performing the necessary statistical analysis and in the preparation of the manuscript.

Author 2: Dr.Gheena S, aided in conception of the topic, designing the study and supervision of the study, correction and final approval of the manuscript.

Author 3: Dr.Sandhya. S supervised the study, helped in correction and final approval of the manuscript.

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CONFLICTS OF INTEREST

The author declares no conflict of interest.

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