



COMPARISON OF TOOTH DIMENSIONS OF AN ORTHODONTIC PATIENT POPULATION AND A NORMAL POPULATION OF NIGERIANS

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ABSTRACT

Objectives: The aim of this study was to compare the tooth dimensions of an orthodontic patient population with a normal population of Nigerians.

Materials and Methods: Participants were orthodontic and control populations selected from Obafemi Awolowo Teaching Hospitals Complex Ile-Ife. Selected participants had full eruption of first six permanent teeth in all quadrants, intact dentition and no conservative treatment other than class 1 restorations. The mesio-distal and bucco-lingual widths of teeth were measured with an electronic digital caliper from dental casts. Independent sample t test was used for group comparisons. Statistical significance was inferred at $p < 0.05$.

Results: Mean maxillary and mandibular mesio-distal tooth dimensions were generally larger in the orthodontic than the control population, however, only the dimensions of maxillary central incisors, left lateral incisor and mandibular left second premolar differed significantly ($p < 0.05$). Mean maxillary bucco-lingual tooth dimensions were significantly larger among the orthodontic than the control population. Mandibular bucco-lingual dimensions differed significantly for the right canine, left first and second premolars, and right and left first molars ($p < 0.05$). Tooth dimensions were generally larger in male than female participants, however only a few differences reached statistical significance ($p < 0.05$).

Conclusions: Some differences were observed in the mesio-distal tooth dimensions of the orthodontic patients and control patients who participated in this study, especially in relation to the maxillary incisors. Bucco-lingual tooth dimensions differed significantly between the groups which were more pronounced with the maxillary teeth. Gender differences were observed with some tooth dimensions.

KEYWORDS: Mesio-distal, Bucco-lingual, Tooth dimensions.

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INTRODUCTION

Individual tooth dimensions are of importance in orthodontics for accurate diagnosis, correct treatment prescriptions, and excellent finishing of

cases if the goals of orthodontic treatment which include aesthetics, function and stability are to be achieved. Crowding is reported to be the most common single contributor to

malocclusion and the most common cause of dental crowding is the presence of an arch-length--tooth-size discrepancy¹⁻². Crowding arises when the cumulative sizes of teeth on the dental

arch exceed the space available on the arch leading to a space discrepancy; the line of occlusion which is a smooth catenary curve becomes incorrect.³ Different forms of malocclusions are common in modern populations,⁴ but individuals with dental crowding are the most frequent patients in the orthodontic practice.⁵

Many factors contribute to crowding which include tooth crown size, dental arch length loss, poor periodontal status, primary tooth loss, presence of third molar, as well as general patient factors such as age and gender.⁵⁻⁶ Crowding may also result from an evolutionary trend towards reduced facial volume, without a proportional reduction in tooth sizes. Asynchronous dentofacial development could, at least partially, explain the frequency of dental crowding in modern populations.⁷ Crowding has been linked with civilisation or urbanisation,⁸⁻⁹ a shift from hunter-gatherers lifestyles towards sedentism and agricultural subsistence practices has resulted in a decrease in dental arch size over the years.¹⁰ Findings of the other studies however suggest that jaw-teeth size discrepancy is not a recent phenomenon; it is opined that malocclusion of developmental origin was already present in early anatomically modern humans.⁴

Tooth size has crucial implications in the clinical practice of orthodontists. This is because the presence or absence of crowding which is related to tooth size often leads to a decision for or against tooth extraction to create space for proper alignment of teeth.¹¹ Beyond alignment and symmetry within individual arches, tooth size is also of importance during the finishing phase of orthodontic treatment if stability of treatment results will be

achieved. Difficulties may arise during the finishing phase on account of discrepancy between mandibular and maxillary tooth size.¹²

Various factors are known to determine tooth size which include, race, gender, hereditary and environmental factors. Tooth size, eruption disturbances and specific malocclusions are thought to be genetically influenced.¹³ Several studies have been carried out to determine tooth dimensions in various population groups including the Nigerian population.¹⁴⁻¹⁶ Otuyemi and Noar¹⁴ compared crown size dimensions of permanent teeth in Nigerian and British populations, Adeyemi and Isiekwe¹⁵ compared permanent tooth sizes of Nigerians and American Negroes. Ajayi et al.¹⁶ also evaluated the mesio-distal crown widths of a group of final year Dental students in Benin-city Nigeria.

In a cross-sectional study to test the relationship between mesio-distal crown diameter of maxillary and mandibular central and lateral incisors, the prevalence of various classes of incisor relationships and other malocclusion traits, it was found that subjects with mandibular canine impaction had wider incisors with shorter lower dental arch forms and greater arch-length--tooth-size discrepancy when compared with a control sample.^{13, 17} Zerouaoui et al.¹² however found no significant difference between various classes of malocclusion as determined by Angle. The aim of this study was to determine the mesio-distal and bucco-lingual dimensions of teeth in a population of orthodontic patient at Obafemi Awolowo Teaching Hospital Ile Ife and compare the results with a control group of non-orthodontic patients.

MATERIALS AND METHODS

The study population consisted of a group of consecutive orthodontic patients that presented at the Orthodontic Unit, Department of Child Dental Health, Obafemi Awolowo University Ile-Ife, and a control population who were also selected from consecutive patients visiting the Oral Diagnosis and Paediatric Dentistry Units of the same hospital.

Participants were selected if they met the inclusion criteria; this included full eruption of all first six permanent teeth in all quadrants, no missing teeth in any of the quadrants, intact dentition with no caries or fractures, no conservative treatment other than class I occlusal restoration. Individuals with fractures, evidences of tooth wear, class II restorations were excluded from the study.

Sociodemographic data was collected for all participants, after which impressions of the upper and lower arches were made with alginate impression material, using appropriate sized trays to include all present teeth, the lingual and buccal sulci. Impressions were cast immediately in dental stone to prevent dimensional changes. Special attention was paid to casting to avoid air bubbles or defective models. Care was also taken to avoid breakages during removal of the cast from the impressions. All casting was carried out by an experienced technologist (O.G.A.).

The study models were numbered and measurements were carried out using an electronic digital caliper. The mesio-distal and bucco-lingual widths of the central incisors (I1),

Table 1: Descriptive Statistics for Maxillary and Mandibular Mesio-distal Tooth Diameters.

MAXILLARY MESIO-DISTAL TOOTH DIMENSIONS (mm)							
		PATIENTS		CONTROL			
TOOTH	SIDE	MEAN	SD	MEAN	SD	t	p value
I1	R	9.20	0.78	8.77	0.72	3.64	0.000*
	L	9.10	0.79	8.68	0.89	3.17	0.002*
I2	R	7.41	0.76	7.19	0.85	1.17	0.089
	L	7.36	0.74	7.09	0.76	2.27	0.025*
C	R	7.77	0.71	7.84	0.61	0.67	0.501
	L	7.77	0.76	7.68	0.62	0.83	0.408
PM1	R	7.56	0.80	7.44	0.87	0.90	0.369
	L	7.47	0.92	7.41	0.98	0.40	0.690
PM2	R	7.11	1.02	7.11	1.10	0.00	1.000
	L	7.11	1.07	7.23	1.17	0.68	0.498
M1	R	10.43	0.92	10.20	1.15	1.41	0.159
	L	10.60	0.88	10.36	1.06	1.57	0.117
MANDIBULAR MESIO-DISTAL TOOTH DIMENSIONS (mm)							
		PATIENTS		CONTROL			
TOOTH	SIDE	MEAN	SD	MEAN	SD	t	p value
I1	R	5.78	0.92	5.91	1.00	0.86	0.389
	L	5.71	0.85	5.76	0.70	0.40	0.689
I2	R	6.19	0.78	6.05	0.47	1.33	0.184
	L	6.17	0.58	6.16	0.46	0.12	0.905
C	R	6.98	0.64	7.10	0.63	1.19	0.235
	L	6.98	0.64	7.17	0.63	1.92	0.056
PM1	R	7.50	0.61	7.42	0.55	0.86	0.389
	L	7.57	0.64	7.50	0.64	0.69	0.491
PM2	R	7.53	0.77	7.30	0.76	1.90	0.060
	L	7.63	0.83	7.31	0.72	3.01	0.003*
M1	R	11.27	0.77	11.24	0.80	0.24	0.809
	L	11.31	0.66	11.28	0.74	0.27	0.786

I = Incisor; C=Canine; PM=Premolar; M=Molar SD= Standard deviation *Significant

Table 2: Descriptive Statistics for Maxillary and Mandibular Bucco-lingual Tooth Diameters.

MAXILLARY BUCCO-LINGUAL TOOTH DIMENSIONS (mm)							
		PATIENTS		CONTROL			
TOOTH	SIDE	MEAN	SD	MEAN	SD	t	p value
I1	R	7.84	0.54	7.45	0.56	4.26	0.000*
	L	7.72	0.54	7.49	0.56	2.65	0.009*
I2	R	7.27	0.58	6.96	0.58	3.38	0.001*
	L	7.31	0.48	6.97	0.58	4.08	0.000*
C	R	8.54	0.69	8.08	0.76	4.03	0.000*
	L	8.44	0.60	8.21	0.76	2.26	0.025*
PM1	R	9.87	0.93	9.33	0.85	3.81	0.000*
	L	9.89	0.95	9.41	0.85	3.34	0.001*
PM2	R	10.14	0.91	9.49	1.00	4.32	0.000*
	L	10.02	1.00	9.48	1.05	3.34	0.001*
M1	R	11.77	0.92	11.16	0.88	4.27	0.000*
	L	11.60	1.37	11.20	0.71	2.24	0.027*
MANDIBULAR BUCCO-LINGUAL TOOTH DIMENSIONS (mm)							
		PATIENTS		CONTROL			
TOOTH	SIDE	MEAN	SD	MEAN	SD	t	p value
I1	R	6.14	0.96	6.19	1.18	0.30	0.768
	L	6.13	1.12	6.07	0.87	0.37	0.710
I2	R	6.33	0.53	6.28	0.60	0.56	0.575
	L	6.34	0.53	6.26	0.49	0.99	0.326
C	R	7.59	0.66	7.33	0.65	2.50	0.013*
	L	7.63	0.60	7.42	0.76	1.97	0.051
PM1	R	8.36	0.77	8.16	0.68	1.73	0.086
	L	8.51	0.78	8.27	0.65	2.09	0.038*
PM2	R	8.66	0.99	8.40	0.81	1.79	0.075
	L	8.96	1.10	8.56	0.80	2.58	0.011*
M1	R	11.43	0.47	10.86	0.71	6.13	0.000*
	L	11.29	1.00	10.98	0.50	2.77	0.006*

I = Incisor; C=Canine; PM=Premolar; M=Molar; SD= Standard deviation; *Significant

lateral incisors (I2) canines (C), first premolars (PM1), second premolars (PM2) and first molars (M1) were obtained by measuring the distance between the anatomical correct points of each tooth, with the caliper positioned buccal to the teeth, however, the measuring device was positioned occlusally for rotated teeth.¹⁸ Measurements were made to the nearest 0.01mm. Measurements were repeated for each tooth twice and any major discrepancy resolved by taking a third measurement. Statistical analysis was carried out using SPSS version 20. Descriptive statistics (mean, SD) were computed for all participants, Independent sample t test was used for group comparisons. Statistical significance was inferred at $p < 0.05$.

RESULTS

A total of 162 pairs of study models belonging to 91 orthodontic patients and 71 control patients that presented at the dental hospital, Obafemi Awolowo University Teaching Hospital, Ile Ife, Osun State, Nigeria were evaluated. The orthodontic population consisted of 36 males and 55 females, while the control population had 40 males and 31 females. The mean ages of participants in the orthodontic and control groups were 20.48 ± 6.18 and 21.62 ± 6.82 respectively. Participant's ages were not significantly different ($p = 0.269$).

The mean maxillary mesio-distal tooth dimensions were generally larger in the orthodontic patient population than the control population, with the exception of the right canine and the left second premolar. However,

only the mesio-distal dimensions of the right and left central and left lateral incisors were significantly different between the groups (Table 1). The mean mandibular mesio-distal dimensions were also larger in the orthodontic than the control population, except for the right and left central incisors, and the right and left canines. Only the mesio-distal width of the mandibular left second premolar was significantly different between the orthodontic and the control groups (Table 1).

The mean maxillary bucco-lingual tooth dimensions for the orthodontic patient population were larger than those of the control group. All the differences in maxillary bucco-lingual dimensions between the two groups were statistically significant (Table 2). The mean mandibular bucco-lingual dimensions were also larger in the orthodontic patients except for the

Table 3: Gender Comparisons of Maxillary and Mandibular Mesio-distal Tooth Dimensions among the Orthodontic Patient Population

MAXILLARY MESIODISTAL TOOTH DIMENSIONS (mm)							
		MALE		FEMALE			
TOOTH	SIDE	MEAN	SD	MEAN	SD	t	p value
I1	R	9.38	0.87	9.08	0.69	1.83	0.071
	L	9.35	0.79	8.94	0.75	2.50	0.014*
12	R	7.34	0.84	7.45	0.71	0.67	0.503
	L	7.44	0.83	7.30	0.68	0.88	0.382
C	R	7.97	0.76	7.64	0.65	2.21	0.029*
	L	8.05	0.68	7.58	0.77	2.92	0.004*
PM1	R	7.54	0.67	7.57	0.88	0.17	0.862
	L	7.51	0.66	7.44	1.07	0.35	0.727
PM2	R	7.09	0.86	7.12	1.12	0.14	0.892
	L	7.10	0.77	7.12	1.23	0.09	0.931
M1	R	10.50	1.11	10.38	0.78	0.61	0.546
	L	10.70	1.01	10.53	0.79	0.90	0.372
MANDIBULAR MESIODISTAL TOOTH DIMENSIONS (mm)							
		MALE		FEMALE			
TOOTH	SIDE	MEAN	SD	MEAN	SD	t	p value
I1	R	5.85	0.70	5.74	1.05	0.55	0.582
	L	5.73	0.50	5.69	1.02	0.22	0.828
12	R	6.20	0.57	6.14	1.40	0.08	0.934
	L	6.26	0.55	6.11	0.59	1.22	0.227
C	R	7.13	0.57	6.89	0.67	1.77	0.080
	L	7.15	0.61	6.88	0.61	2.06	0.042*
PM1	R	7.63	0.59	7.43	0.62	1.53	0.129
	L	7.62	0.69	7.54	0.61	0.58	0.563
PM2	R	7.58	0.73	7.50	0.80	0.48	0.631
	L	7.64	0.86	7.62	0.82	0.11	0.911
M1	R	11.37	0.96	11.21	0.61	0.97	0.333
	L	11.50	0.76	11.19	0.56	2.24	0.028*

I = Incisor; C=Canine; PM=Premolar; M=Molar; SD= Standard deviation; *Significant

right central incisors. Mandibular bucco-lingual tooth dimensions were significantly larger in the orthodontic patient population only for the right canine, left first and second premolars and right and left first molars (Table 2).

Gender comparisons in the orthodontic population showed that the mean maxillary and mandibular mesio-distal tooth dimensions were larger in the male than female participants except for the maxillary right lateral incisors, right first premolar, right and left second premolars. The mesio-distal tooth dimensions were however only significantly different across gender for the upper left central incisor, upper right and left canines, lower left canine and lower left first molar (Table 3).

Maxillary and mandibular bucco-lingual tooth dimensions in the orthodontic population were larger in males compared with females except for the

upper left first molar, lower left central incisor and right first molar, gender differences were however significant for the upper right and left central incisors, upper right and left first premolars, upper right second premolar, lower left canine and lower right second premolar (Table 4).

Gender comparisons among the control population showed that the maxillary and mandibular mesio-distal dimensions were generally larger in the male than female participants, only the differences in upper right lateral incisor, lower left lateral incisors, lower right and left canines, lower right and left first molars dimensions reached significance (Table 5).

The mean bucco-lingual tooth dimensions in the control population were larger in males than females in both the maxillary and mandibular arches except for the upper left central incisors,

Table 4: Gender Comparisons of Maxillary And Mandibular Bucco-lingual Tooth Dimensions Among The Orthodontic Patient Population.

MAXILLARY BUCCO-LINGUAL TOOTH DIMENSIONS (mm)							
		MALE		FEMALE			
TOOTH	SIDE	MEAN	SD	MEAN	SD	t	p value
I1	R	8.00	0.54	7.69	0.52	2.74	0.007*
	L	7.88	0.57	7.61	0.50	2.38	0.019*
12	R	7.31	0.67	7.25	0.51	0.48	0.630
	L	7.37	0.50	7.27	0.47	0.97	0.336
C	R	8.68	0.75	8.46	0.64	1.50	0.138
	L	8.46	0.69	8.42	0.55	0.31	0.760
PM1	R	10.11	0.94	9.70	0.90	2.09	0.040*
	L	10.24	0.74	9.64	1.00	3.09	0.003*
PM2	R	10.40	0.78	9.97	0.96	2.24	0.027*
	L	10.22	1.07	9.89	0.94	1.55	0.125
M1	R	11.99	0.63	11.63	1.06	1.83	0.070
	L	11.59	1.59	11.62	1.22	0.17	0.866
MANDIBULAR BUCCO-LINGUAL TOOTH DIMENSIONS (mm)							
		MALE		FEMALE			
TOOTH	SIDE	MEAN	SD	MEAN	SD	t	p value
I1	R	6.21	1.12	6.09	0.85	0.58	0.563
	L	6.12	0.44	6.14	1.40	0.08	0.934
12	R	6.45	0.52	6.25	0.53	1.77	0.080
	L	6.41	0.54	6.29	0.53	1.05	0.297
C	R	7.73	0.83	7.49	0.50	1.72	0.089
	L	7.79	0.79	7.52	0.41	2.14	0.035*
PM1	R	8.48	0.74	8.28	0.79	1.21	0.229
	L	8.59	0.67	8.45	0.84	0.84	0.403
PM2	R	8.92	0.97	8.49	0.98	2.05	0.043*
	L	9.06	1.03	8.89	1.15	0.72	0.475
M1	R	11.38	0.61	11.46	0.35	0.79	0.429
	L	11.44	0.55	11.19	1.21	1.16	0.248

I = Incisor; C=Canine; PM=Premolar; M=Molar; SD= Standard deviation; *Significant

upper right first premolar and second premolars. All mandibular bucco-lingual dimensions were larger in males than females within the control group. Significant gender differences were observed for upper left first molar, lower right lateral incisors, lower left canine and left first premolar and lower left first molar (Table 6).

DISCUSSION

This study investigated the mesio-distal and bucco-lingual crown dimensions of a referred orthodontic population and a control population and found that although the mesio-distal tooth dimensions were generally larger in the orthodontic patient population compared with the control group, only the mean mesio-distal widths of the maxillary central incisors, left lateral incisors and the mandibular left second

Table 5: Gender Comparisons of Maxillary and Mandibular Mesio-distal Tooth Dimensions among the Control Population

MAXILLARY MESIO-DISTAL TOOTH DIMENSIONS (mm)							
		MALE		FEMALE			
TOOTH	SIDE	MEAN	SD	MEAN	SD	t	p value
I1	R	8.80	0.70	8.73	0.76	0.40	0.689
	L	8.67	0.76	8.70	1.04	0.14	0.889
12	R	7.00	0.91	7.44	0.71	2.20	0.031*
	L	7.00	0.81	7.20	0.69	1.09	0.278
C	R	7.90	0.71	7.75	0.45	1.02	0.313
	L	7.73	0.70	7.62	0.49	0.74	0.463
PM1	R	7.52	0.96	7.32	0.71	0.96	0.339
	L	7.49	1.17	7.30	0.63	0.83	0.422
PM2	R	7.22	1.27	6.97	0.80	0.95	0.346
	L	7.44	1.38	6.94	0.71	1.81	0.074
M1	R	10.41	1.11	9.92	1.16	1.80	0.075
	L	10.56	1.04	10.09	1.04	1.88	0.064
MANDIBULAR MESIO-DISTAL TOOTH DIMENSIONS (mm)							
		MALE		FEMALE			
TOOTH	SIDE	MEAN	SD	MEAN	SD	t	p value
I1	R	5.60	1.03	5.97	0.97	0.79	0.434
	L	5.70	0.39	5.83	0.97	0.78	0.439
12	R	6.13	0.50	5.94	0.41	1.70	0.093
	L	6.33	0.40	5.92	0.44	4.09	0.000*
C	R	7.25	0.63	6.90	0.58	2.39	0.020*
	L	7.34	0.70	6.95	0.45	2.67	0.009*
PM1	R	7.46	0.60	7.36	0.48	0.75	0.454
	L	7.57	0.76	7.40	0.44	1.10	0.277
PM2	R	7.37	0.88	7.20	0.57	0.92	0.358
	L	7.38	0.82	7.22	0.56	0.92	0.360
M1	R	11.44	0.55	10.96	1.03	2.60	0.011*
	L	11.46	0.50	11.02	0.93	2.57	0.012*

I = Incisor; C=Canine; PM=Premolar; M=Molar; SD= Standard deviation; *Significant

premolar were significantly larger in the orthodontic population. Maxillary bucco-lingual dimensions were all significantly greater among orthodontic patients. Mandibular bucco-lingual tooth dimensions were only significantly larger in the orthodontic patient population for the lower right canine, lower left first and second premolar, as well as right and left first molar.

The few significant differences in mesio-distal tooth dimension found in this study may indicate that crowding, which is the most common type of malocclusion observed in orthodontic patients, cannot be solely explained by tooth size. Yan-Vergnes et al.⁷ opined that crowding may result from an evolutionary trend towards reduced facial volume, without a proportional reduction in tooth sizes. There is a possibility of that crowding may also result from decrease in arch length.

Normando et al. (1) suggested from their study findings that the aetiology of dental crowding among Amazonian indigenous villagers is predominantly associated with the dimensions of the dental arches which are strongly related to genetic influences.

Interestingly, more differences were observed in bucco-lingual than mesio-distal tooth dimensions between participants in this study, this was particularly so in the maxillary arch. Otuyemi and Noar¹⁴ found only few differences in the bucco-lingual tooth dimensions between Nigerian and British populations. Participants in the orthodontic population in this study had significantly greater bucco-lingual tooth dimensions than the control population especially in the maxilla.

Among the orthodontic population gender comparisons showed that mesio-distal tooth widths were

Table 6: Gender Comparisons of Maxillary and Mandibular Bucco-lingual Tooth Dimensions among the Control Population

MAXILLARY BUCCO-LINGUAL TOOTH DIMENSIONS (mm)							
		MALE		FEMALE			
TOOTH	SIDE	MEAN	SD	MEAN	SD	t	p value
I1	R	7.53	0.56	7.33	0.53	1.52	0.133
	L	7.47	0.52	7.52	0.62	0.37	0.713
12	R	7.01	0.63	6.90	0.52	0.78	0.438
	L	6.99	0.62	6.96	0.52	0.22	0.830
C	R	8.10	0.85	8.05	0.62	0.27	0.786
	L	8.34	0.68	8.04	0.83	1.67	0.091
PM1	R	9.28	0.87	9.40	0.83	0.59	0.560
	L	9.44	0.86	9.37	0.85	0.34	0.735
PM2	R	9.45	1.07	9.53	0.92	0.33	0.743
	L	9.51	1.12	9.43	0.96	0.32	0.753
M1	R	11.26	0.66	11.02	1.11	1.14	0.253
	L	11.34	0.54	11.00	0.88	2.01	0.048*
MANDIBULAR BUCCO-LINGUAL TOOTH DIMENSIONS (mm)							
		PATIENTS		CONTROL			
TOOTH	SIDE	MEAN	SD	MEAN	SD	t	p value
I1	R	6.33	1.27	6.00	1.05	1.27	0.210
	L	6.10	0.45	6.02	1.24	0.38	0.704
12	R	6.42	0.59	6.08	0.56	2.45	0.017*
	L	6.35	0.41	6.12	0.56	2.00	0.050
C	R	7.46	0.66	7.16	0.60	1.96	0.053
	L	7.58	0.75	7.22	0.74	2.01	0.048*
PM1	R	8.24	0.75	8.05	0.57	1.16	0.249
	L	8.40	0.64	8.09	0.63	2.03	0.046*
PM2	R	8.53	0.88	8.24	0.70	1.49	0.140
	L	8.67	0.87	8.42	0.67	1.31	0.193
M1	R	10.98	0.64	10.68	0.78	1.78	0.080
	L	11.05	0.52	10.78	0.44	2.30	0.024*

I = Incisor; C=Canine; PM=Premolar; M=Molar; SD= Standard deviation; *Significant

generally greater in male than female participants, this observation is similar to previous reports.¹⁹ Although only a few significant differences were identified, gender differences were marked with the maxillary canines. Al-khateeb and Abu Alhajja¹⁹ noted that sexual dimorphism in the size of canines had been observed in Jordanian populations. This finding of larger canines in males was surprising as maxillary canine ectopia is a more common occurrence in females. Maxillary canine ectopia often occurs as a result of space deficiency which results in the ectopic location of the last tooth which has a predecessor to erupt and is reported to be more than twice as common in females than males.²⁰ In the control population, the mesio-distal tooth dimensions were also generally larger among males compared with females. This was similar to the findings of Adeyemi and Isiekwe¹⁵

among a group of Nigerian school children, Dominican American²¹ and Indian populations.²² However, Ajayi et al.¹⁶ observed no significant gender difference in the mesio-distal tooth dimensions of the Nigerian university undergraduates they studied. The significant gender difference in the mesio-distal width of maxillary canines observed in the orthodontic patients' population wasn't noted in the control population.

With regards to the mandibular incisors, a significant gender difference in the mesio-distal tooth dimension was only observed for a lower left lateral incisor in both the orthodontic and control groups. Significant gender differences may have been expected in the mesio-distal dimensions of lower incisors since females have a greater liability to incisor crowding, especially mandibular incisor crowding.³ An interesting observation was that whilst the majority of the significant gender differences in tooth dimensions were identified in the maxilla in the orthodontic population, most of the significant gender differences were noted in the mandible in the control population, a reason for this observation is not immediately apparent.

CONCLUSION

Some significant differences were observed in the mesio-distal tooth dimensions of the orthodontic patients and control patients who participated in this study, especially in relation to the maxillary incisors. Bucco-lingual tooth dimensions differed significantly between the groups, which were more pronounced with the maxillary teeth. Male participants generally had a tendency to wider tooth dimensions

than females, with significant gender differences in some tooth dimensions. Further studies examining the relationship between tooth size and jaw size in the study environment would be beneficial.

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