RESEARCH ARTICLE

Tooth Width among Qatari with Different Malocclusion

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Abstract

Aims: The aims of this study were to establish the mesiodistal tooth width in a sample of Qatari population. Further, to be able to compare tooth width between genders and Angle classification groups as well as with previous studies.

Material and methods: Sixty pairs of pretreatment orthodontic study models with different malocclusion (Class I, Class II, Division 1, Class III malocclusion) were selected from orthodontic records of subjects (30 males and 30 females) seeking orthodontic treatment. Descriptive statistics was done. T-test for comparison between males and females and the ANOVA test was undertaken to explore significant differences between the three groups.

Result: Tooth width in upper and lower jaw was presented. Comparison between the right and left side in the upper and lower arch revealed no statistical significant difference. The mesodistal teeth width in males was greater than females in both jaws. Comparison between the three classes of Angle classification show that Class III malocclusion demonstrated statistical significant differences in the lower right and left central incisors, right lateral incisor and left canine (P<0.05). On the other hand, very significant difference was exhibited in the lower right and left first molars (P<0.01) whereas in the upper arch only the upper right canine showed statistical significant difference (P<0.05).

Conclusions: The results of the mesiodistal tooth width obtained in the present investigation could be of great help to the clinical Orthodontist for space assessment and to Anthropologists as well as to the Prosthodontist.

Keywords: Tooth width; Angle Classification; Malocclusion

Introduction and Review of Literature

Measurements of teeth width is needed in several branches of dentistry. However, these measurements are usually done in dental casts or sometimes directly from the teeth. Such measurements are used for research and clinical purposes, particularly in orthodontics. Several instruments of devices were used in measurement. Previously, researchers have used the contact method using dividers with a millimeter ruler [1-3] or sliding calibrated calipers [4,5]. Whereas others used the non-contact methods, which include standard photographs [6] photocopies [7], sophisticated occlusograms [8] and laser holograms of the occlusal aspects of the teeth [9]. Recently, electronic digital caliper and computerized methods for collecting information from photographs and photocopies have also been described, saving considerable time and effort [10,11]. Tooth width or mesiodistal dimension of a tooth, i.e. the distance between its mesial and distal surfaces, which is the commonly used measure of the occlusal size of the tooth [12]. There is a general consensus with regard to the use of landmarks for this dimension (mesiodistal tooth diameter or width), researcher have used different landmarks for the purpose. The anatomic contact points between individual teeth are agreed upon in defining mesiodistal limits of a tooth. However, most clinical studies, particularly those investigating crowding or dental irregularities have used contact points to define mesiodistal tooth width.

Several studies investigated the correlation between tooth size discrepancies and different malocclusion groups. Some reported significant differences [13-15], whereas other reported no significant differences [16-19].

At the beginning of this century, G.V. Black [1] conducted one of the most classical investigations on the subject of tooth size. Although a large number of human teeth were measured, and tables of mean figures were established for each tooth in the dental arch, Black's study was based upon a sample of unknown size and racial origin.

Review of the literature reveals variations in tooth size exist between different racial groups [11]. Therefore, different diagnostic standards should be established for each racial group in order to provide an effective diagnostic standard [20].

Hashim and Murshid [21-23] conducted a study on a Saudi sample with different types of malocclusion and found the first molars exhibited the least coefficient of variation in size, while the central and lateral incisors showed the most variation in size. They also indicated there was no significant statistical difference between the right and left sides. Thus, measurement of one side could be representative when the corresponding measurement on the other side was unobtainable. Furthermore, the canines in both jaws exhibited significant differences between the sexes while the other teeth did not.

Several studies have reported the existence of significant differences between males and females tooth size, with a tendency for males have larger mesiodistal width.

Gorjizadeh, et al. [24] performed study among 200 Iranian patients to find the relationship of the teeth size to be used when needed in treatments planning. They found that the measurement difference varied from 0 to 0.04 mm. the average value of difference was 0.016 mm with SD of 0.02 mm. All teeth in male are bigger than those in female and this different is most evident in canine teeth, especially the lower jaw canine teeth. The same finding was reported by Gran, et al. [25] who found the canine tooth with greatest difference in males and females. The minimum difference in terms of teeth size between females and males was found in the first upper molar teeth; whereas Gran, et al. believe that incisors have the lowest difference in males and females Further the same finding was observed by Sanin and Savara [26] who believe that the mesiodistal size of crown in males in all teeth, except for the central incisors, are bigger than those in females Fernandes, et al. [27] did study to observe the presence of sexual dimorphism and compare the mesiodistal width of the teeth in Caucasian, African and Japanese individuals with Brazilian ancestry not orthodontically treated and with normal occlusion. The result revealed that sexual dimorphism occurred on the three evaluated groups, and the highest mesiodistal widths were found in males. There was statistically significant difference between racial groups in all evaluated teeth in males. However, in females, this same difference was found only on upper lateral incisor and first molar; and lower lateral incisor, canine, first premolar and first molar. They concluded that most of mesiodistal measures present particular characteristics in relation to gender, with higher values for males, and to race, with a tendency for African to present greater mesiodistal distance of the teeth, followed by Japanese and Caucasians, respectively. These finding were important for the correct diagnosis and orthodontic treatment planning.

Bugaighisand Elorf [28] assesses the mesio-distal tooth width in normal, crowded, or spaced dentitions in Libyan sample. The sample was divided into normal, crowded, and spaced groups according to tooth size/arch length discrepancy. Their result show that MD tooth width, TTM, I, and CPP were significantly wider in the crowded compared to normal and spaced dentitions (P<0.001), except for the width of the upper left lateral incisors in both normal and crowded groups. They stated "Although there was a trend for smaller tooth widths in spaced dentitions compared to normal ones, this was only significant in the maxillary left central incisor, maxillary right and left lateral incisors, maxillary right first premolar, mandibular right lateral incisor, and mandibular right canine (P<0.05). However, the maxillary TTM, I, and CPP in the normal group were significantly greater than in the spaced group (P<0.05). Significant positive correlations existed between the mean values of I and CPP in both the maxillary and mandibular dentitions of all groups (P<0.01)."

Otuyemi and Noar [29] investigated and compared the mesio-distal and bucca-lingual crown dimensions of the permanent teeth in Nigerian and British populations. Their sample consisted of 30 pairs of study models of children from each of the two populations. Their results indicate that no left-right side differences were observed (P> 0.05). Further, the mesio-distal crown diameters were consistently large in the Nigerian sample. With the exception of mandibular central incisors and maxillary canines, there were no statistically significant differences in bucco-lingual crown diameters in the two populations.

AL-Junaid, et al. [30] conducted study among Yamenis and reported that male subjects had larger tooth size width than female. He stated "This difference was also observed in the cumulative tooth size widths, where males exceeded those of the females by 2.04 mm in the maxilla and 2.22 mm in the mandible".

Since there was no recorded values reported in the literature for Qatari, the aims of this study were to establish the mesiodistal tooth width in a sample of Qatari population. Further, to be able to compare tooth width between genders and Angle classification groups as well as with previous studies.

Materials and Methods

Sixty pairs of pretreatment orthodontic study models with different malocclusion(Class I, Class II, Division 1, Class III malocclusion) were selected from orthodontic records of subjects with age range 15 to 20 years old (30 males and 30 females) seeking orthodontic treatment.

Material

Criteria of sample selection:

- All subjects were Qatari.

- Age ranged 15 to 20 years.

- Good quality study models.

- No restorative treatments other than Class I restorations.

- Presence of fully erupted permanent teeth from the right first molar to the left first molar of the maxillary and mandibular arch.

- Minimal crowding and absence of severely rotated tooth.

- No previous orthodontic treatment.

Methods

The measurements were made directly on the un-soaped dental casts. One operator took all measurements under natural neon light. Electronic digital caliper was used in the measurements. The procedure for measuring the mesiodistal tooth width was performed as described by Hunter and Priest [4].

The caliper beaks were inserted from the buccal (labial) and held occlusally parallel to the long axis of the tooth. The beaks were then closed until gentle contact with the contact points of the tooth was made.

The measurements included the mesiodistal of 12 maxillary and mandibular teeth from the right first permanent molar to left permanent first molar.

The measurements were made as carefully as possible to avoid any damage on instrumental contact.

Statistical Analysis

Descriptive Statistics: The following descriptive statistics were calculated for each variable:

- Mean
- Standard deviation

Statistical Comparison between Groups:

- An independent t-test was used for comparison between the groups.
- The ANOVA test was undertaken to explore significant differences between the three groups.

The Level of Significance:

A level of significance of 5% was used for the rejection of the null hypothesis. One asterisk (*) represents p<0.05, (**) represent p<0.01, while (***) represent p<0.001.

Assessment of measurement errors:

10 study models were randomly selected and re-measured by the same examiner with one week interval and compared with the first measurements. Statistical t-test was used for analyzing the error.

Results

Table 1 demonstrated the error of the method. No statistical significant difference was observed between the two readings for all teeth.

Table 2 showed the mean mesiodistal tooth width values for all teeth in both upper and lower arches for both sexes combined. The result showed that some of the mean values in the right side in the upper and in the lower arch were relatively greater than those in the left side and the same was observed in the left side.

Table 3 exhibited the comparison of tooth width between the right and left side in upper and lower arch. No statistical significant difference was observed in both arches.

Table 4 revealed the descriptive statistical mean values of the teeth width in upper and lower arch in males and females. The mesodistal teeth width in males was greater than females in both jaws.

Table 5 demonstrated the comparison of tooth width between males and females. In upper jaw the males showed extremely significant difference for the right and left canines while in the lower jaw extremely significant difference was observed in the right canine. On other hand, very significant difference was noted in left canine and left first premolar and right first molar.

Table 6 showed the comparison between the three classes of Angle classification (Class I, Class II, and Class III).

In upper jaw, Class III malocclusion demonstrated statistical significant mean difference only in the right canine.

In the lower jaw, Class III malocclusion showed statistical significant difference in the right and left central incisors, right lateral incisor and left canine (P<0.05). On the other hand, very significant difference was exhibited in the right and left first molars (P<0.01).

Discussion and Conclusion

Most investigators used plaster casts for tooth measurements while few of them did measurements on natural teeth. This could give rise to errors due to distortion in the impression material during making of the impression, due to dimensional

Table 1: Error of the method of the individual teeth in the upper and lower jaw.

Teeth	16	15	14	13	12	11	21	22	23	24	25	26
Upper jaw												
Mean reading first week	9.7	6.577	6.786	7.64	6.847	8.491	8.453	6.853	7.638	6.752	6.488	9.666
Mean reading second week	9.75	6.574	6.886	7.667	6.811	8.611	8.6	6.875	7.648	6.715	6.502	9.796
P- value	0.816	0.982	0.682	0.908	0.863	0.647	0.580	0.891	0.969	0.868	0.941	0.584
Comment	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S
Lower jaw												
Mean reading first week	10.166	6.904	6.942	6.659	5.855	5.316	5.333	5.881	6.55	6.999	6.897	10.087
Mean reading second week	10.275	7.042	7.076	6.775	5.87	5.381	5.579	5.867	6.695	7.005	6.98	10.357
P- value	0.748	0.437	0.566	0.554	0.921	0.707	0.294	0.926	0.330	0.968	0.654	0.412
comment	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S

NS: Not Significant

Table 2: Mean, standard deviation (SD), confidence interval (95% CI) and range of teeth width (N60).

Tooth		Right side			Left side		
		Mean (SD)	CI 95%	Range	Mean (SD)	CI 95%	Range
Upper Jaw	CI	8.62 (0.65)	8.45-8.78	7.32-10.43	8.52 (0.90)	8.29-8.74	5.48-10.83
	LI	6.74 (0.68)	6.56-6.91	5.35-8.53	6.82 (0.69)	6.64-6.99	4.61-8.58
	C	7.82 (0.48)	7.69-7.94	6.65-8.9	7.75 (0.55)	7.61-7.88	6.06-8.89
	1P	6.87 (0.56)	6.72-7.01	5.57-7.92	6.88 (0.49)	6.75-7.00	6.06-7.94
	2P	6.56 (0.41)	6.45- 6.66	5.79-7.64	6.57 (0.42)	6.46-6.67	5.82-7.84
	M	10.07 (0.66)	9.90-10.23	9.01-11.77	9.98 (0.69)	9.80-10.15	8.84-11.77
Lower Jaw	M	10.54 (0.74)	10.35-10.72	9.33-13.08	10.47 (0.70)	10.29-10.64	9.02-11.91
	2P	6.99 (0.58)	6.84-7.13	6.12-8.86	6.97 (0.62)	6.81-7.12	5.2-8.8
	1P	7.05 (0.48)	6.92-7.17	6.29-8.2	7.06 (0.60)	6.90-7.21	6.14-8.88
	C	6.86 (0.52)	6.72-6.99	5.49-8.14	6.80 (0.49)	6.67-6.92	5.85-7.97
	LI	5.97 (0.47)	5.85-6.08	4.89-6.96	5.98 (0.44)	5.86-6.09	4.92-6.91
	CI	5.36 (0.45)	5.24-5.47	4.16-6.2	5.38 (0.41)	5.27-5.48	4.64-6.24

Table 3: Comparison between right and Left side teeth width (N60).

Tooth		Right side	Left side		
		Mean (SD)	Mean (SD)	P- value	comment
Upper Jaw	CI	8.62 (0.65)	8.52 (0.90)	0.501	NS
	LI	6.74 (0.68)	6.82 (0.69)	0.519	NS
	C	7.82 (0.48)	7.75 (0.55)	0.491	NS
	1P	6.87 (0.56)	6.88 (0.49)	0.916	NS
	2P	6.56 (0.41)	6.57 (0.42)	0.989	NS
	M	10.07 (0.66)	9.98 (0.69)	0.488	NS
Lower Jaw	M	10.54 (0.45)	10.47 (0.41)	0.598	NS
	2P	6.99 (0.47)	6.97 (0.44)	0.859	NS
	1P	7.05 (0.52)	7.06 (0.49)	0.969	NS
	C	6.86 (0.48)	6.80 (0.60)	0.555	NS
	LI	5.97 (0.58)	5.98 (0.62)	0.905	NS
	CI	5.36 (0.74)	5.38 (0.70)	0.857	NS

Table 4: Mean Standard deviation, Confidence interval and Range of teeth width in males (N30) and females (N30).

Tooth		Male			Female		
		Mean (SD)	CI 95%	Range	Mean (SD)	CI 95%	Range
Upper Jaw	Right CI	8.67 (0.66)	8.43-8.90	7.36-10.43	8.57 (0.65)	8.33-8.80	7.32-9.69
	Left CI	8.46 (1.12)	8.05-8.86	5.48-10.83	8.58 (0.63)	8.35-8.80	7.36-9.79
	Right LI	6.84 (0.83)	6.54-7.13	5.35-8.53	6.65 (0.50)	6.47-6.82	5.35-7.94
	Left LI	6.94 (0.78)	6.66-7.21	5.44-8.58	6.71 (0.58)	6.50- 6.91	4.61-7.75
	Right C	8.04 (0.45)	7.87-8.20	7.01-8.9	7.60 (0.42)	7.45-7.75	6.65-8.33
	Left C	8.00 (0.47)	7.8-8.17	6.96-8.89	7.51 (0.53)	7.32-7.69	6.06-8.69
	Right 1P	7.01 (0.58)	6.80-7.21	5.76-7.92	6.74 (0.52)	6.55-6.92	5.57-7.63
	Left 1P	6.95 (0.55)	6.75-7.14	6.10-7.94	6.81 (0.42)	6.65-6.96	6.06-7.58
	Right 2P	6.62 (0.48)	6.44-6.79	5.79-7.64	6.51 (0.33)	6.39-6.62	6.02-7.46
	Left 2P	6.62 (0.52)	6.43-6.80	5.82-7.84	6.51 (0.29)	6.40-6.61	5.85-7.03
	Right M	10.21 (0.69)	9.96-10.45	9.16-11.77	9.93 (0.61)	9.71-10.14	9.01-11.5
	Left M	10.14 (0.77)	9.86-10.41	8.84-11.77	9.83 (0.57)	9.62-10.03	9.2-11.51
Lower Jaw	Right M	10.81 (0.72)	10.55-11.06	9.4-13.08	10.27 (0.68)	10.02-10.51	9.33-11.5
	Left M	10.70 (0.64)	10.47-10.92	9.02-11.91	10.24 (0.69)	9.99-10.48	9.09-11.8
	Right 2P	7.10 (0.67)	6.87-7.32	6.21-8.86	6.87 (0.46)	6.70-7.03	6.12-7.78
	Left 2P	7.13 (0.67)	6.89-7.36	5.2-8.8	6.80 (0.53)	6.61-6.99	5.4-7.64
	Right 1P	7.16 (0.57)	6.95-7.36	6.29-8.2	6.95 (0.35)	6.82-7.07	6.39-7.66
	Left 1P	7.27 (0.70)	7.01-7.52	6.14-8.88	6.85 (0.38)	6.71-6.98	6.21-7.75
	Right C	7.10 (0.51)	6.91-7.28	6.27-8.14	6.62 (0.41)	6.47-6.76	5.49-7.47
	Left C	7.00 (0.54)	6.81-7.19	6.1-7.97	6.61 (0.35)	6.48-6.73	5.85-7.41
	Right LI	6.09 (0.47)	5.92-6.25	4.89-6.96	5.84 (0.44)	5.68-5.99	5.03-6.91
	Left LI	6.07 (0.44)	5.91-6.22	5.08-6.91	5.89 (0.44)	5.73-6.04	4.92-6.64
	Right CI	5.41 (0.43)	5.25-5.56	4.43-6.11	5.32 (0.46)	5.15-5.48	4.16-6.2
	Left CI	5.42 (0.39)	5.28-5.55	4.64-6.24	5.34 (0.42)	5.18-5.18	4.65-6.14

Table 5: Comparison between males (N30) and females (N30) teeth width.

Tooth		Male Mean (SD)	Female Mean (SD)	P value	comment
Upper Jaw	Right CI	8.67 (0.66)	8.57 (0.65)	0.525	NS
	Left CI	8.46 (1.12)	8.58 (0.63)	0.622	NS
	Right LI	6.84 (0.83)	6.65 (0.50)	0.306	NS
	Left LI	6.94 (0.78)	6.71 (0.58)	0.208	NS
	Right C	8.04 (0.45)	7.60 (0.42)	0.0002	Extremely significant ***
	Left C	8.00 (0.47)	7.51 (0.53)	0.0005	Extremely significant ***
	Right 1P	7.01 (0.58)	6.74 (0.52)	0.064	NS
	Left 1P	6.95 (0.55)	6.81 (0.42)	0.278	NS
	Right 2P	6.62 (0.48)	6.51 (0.33)	0.343	NS
	Left 2P	6.62 (0.52)	6.51 (0.29)	0.338	NS
	Right M	10.21 (0.69)	9.93 (0.61)	0.097	NS
	Left M	10.14 (0.77)	9.83 (0.57)	0.084	NS
Lower Jaw	Right M	10.81 (0.72)	10.27 (0.68)	0.004	Very significant **
	Left M	10.70 (0.64)	10.24 (0.69)	0.010	NS
	Right 2P	7.10 (0.67)	6.87 (0.46)	0.143	NS
	Left 2P	7.13 (0.67)	6.80 (0.53)	0.043	NS
	Right 1P	7.16 (0.57)	6.95 (0.35)	0.096	NS
	Left 1P	7.27 (0.70)	6.85 (0.38)	0.006	Very significant **
	Right C	7.10 (0.51)	6.62 (0.41)	0.0002	Extremely significant***
	Left C	7.00 (0.54)	6.61 (0.35)	0.001	Very significant **
	Right LI	6.09 (0.47)	5.84 (0.44)	0.041	NS
	Left LI	6.07 (0.44)	5.89 (0.44)	0.125	NS
	Right CI	5.41 (0.43)	5.32 (0.46)	0.473	NS
	Left CI	5.42 (0.39)	5.34 (0.42)	0.439	NS

Table 6: Teeth width comparison in class I (N27), class II (N21) and class III (N10).

Tooth		Class I Mean (SD)	Class II Mean (SD)	Class III Mean (SD)	P value	comment
Upper Jaw	Right CI	8.52 (0.78)	8.73 (0.50)	8.78 (0.45)	0.409	NS
	LEFT CI	8.37 (1.02)	8.82 (0.57)	8.44 (1.10)	0.222	NS
	Right LI	6.89 (1.17)	6.82 (0.62)	6.80 (0.99)	0.842	NS
	LEFT LI	6.80 (0.58)	6.96 (0.66)	6.87 (0.76)	0.697	NS
	Right C	7.64 (0.48)	7.95 (0.48)	8.05 (0.24)	0.021	Significant *
	LEFT C	7.65 (0.49)	7.82 (0.66)	7.93 (0.45)	0.342	NS
	Right 1P	6.89 (0.55)	6.74 (0.57)	7.12 (0.53)	0.210	NS
	Left 1P	6.83 (0.48)	6.89 (0.48)	7.11 (0.53)	0.291	NS
	Right 2P	6.48 (0.32)	6.66 (0.53)	6.58 (0.33)	0.343	NS
	Left 2P	6.50 (0.41)	6.68 (0.46)	6.58 (0.37)	0.360	NS
	Right M	9.93 (0.70)	10.17 (0.60)	10.33 (0.66)	0.212	NS
	Left M	9.89 (0.75)	10.01 (0.55)	10.29 (0.78)	0.313	NS
Lower Jaw	Right M	10.55 (0.70)	10.31 (0.56)	11.22 (0.81)	0.003	VERY Significant **
	Left M	10.32 (0.68)	10.46 (0.65)	11.09 (0.53)	0.009	VERY Significant **
	Right 2P	6.93 (0.46)	6.94 (0.70)	7.29 (0.62)	0.234	NS
	Left 2P	6.93 (0.56)	6.94 (0.80)	7.20 (0.33)	0.487	NS
	Right 1P	6.95 (0.40)	7.15 (0.53)	7.14 (0.54)	0.300	NS
	Left 1P	6.99 (0.43)	7.06 (0.74)	7.29 (0.69)	0.405	NS
	Right C	6.76 (0.48)	6.85 (0.53)	7.16 (0.49)	0.119	NS
	Left C	6.73 (0.41)	6.74 (0.55)	7.17 (0.45)	0.041	Significant *
	Right LI	5.86 (0.39)	5.96 (0.53)	6.33 (0.37)	0.024	Significant *
	Left LI	5.90 (0.46)	6.02 (0.40)	6.25 (0.34)	0.096	NS
	Right CI	5.27 (0.47)	5.41 (0.34)	5.67 (0.37)	0.040	Significant *
	Left CI	5.30 (0.45)	5.37 (0.32)	5.67 (0.36)	0.045	Significant *

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changes in the impression material during setting, and due to changes during setting of the cast material [1-3].

Hunter and Priest [4] found that measurements on casts were on an average of 0.1mm larger than those of the actual teeth. They explained that due to the difficulty encountered in establishing the greatest mesiodistal diameter, particularly in the maxilla, they did not mention whether this difference is significant or not. However, Lundstrom [31] recorded measurements of six anterior teeth by a direct method. He claimed that no significant differences were observed between the direct and indirect methods. This could be explained by the fact that Lundstrom [31] did not measure the posterior teeth which are difficult to measure due to inaccessibility.

The result of the present study showed that some of the mean mesodistal tooth width in the right side in the upper arch was relatively greater than that in the left side. However, the same was observed in the lower arch. These differences did not show significant statistical differences between the right side and left sides which in agreement with study conducted among Saudis [21-23]. The same result was also observed in study carried out among Yamenis [30] and among Jordanian by ALkhateebb, et al. [16] However, the result of the present investigation also supported other studies carried out on other racial groups [32,33,2] On the other hand, this finding is not in line with the results of other investigators [34-36]. They reported that there was significant difference between left and right tooth width measurements. According to the result of the present study and several pervious investigations, it can be recommended that either right or left side measurements could be representative to the other side in case of missing or unerupted tooth.

The result of the present study between males and females tooth width revealed that there was no statistical significant difference between both genders. This was in agreement with The results of AL-Junaid, et al. among Yamenis [30] and other Arabian groups of Iraqis [37] Jordanians [16,34,38], and Saudis [21] and also in other racial groups [38,39].

The differences in mesiodistal tooth widths between the different malocclusion groups in the present investigation were shown in table 5. In the present study it was found that significantly larger mesiodistal dimensions of mandibular teeth in Class III malocclusion subjects when compared with Class I and Class II subjects. The result of the present investigation was in line with study conducted among Bangladesh population by Hyder, et al. [40] and also in agreement with the study done by levelle [41] and Sperry, et al. [42]. They recommended that further studies are needed to clarify whether a correlation exists between increased growth of the jaws and increased mesiodistal dimension of anterior teeth.

Further, Al-Khateeb, et al. [16] reported that tooth width in Class III malocclusion were mostly significantly larger than tooth width in Class II division 1 and division 2 except for the maxillary second premolar where it was significantly larger than

that in Class I malocclusions (P < 0.05). Furthermore, in the lower jaw tooth width in class III was significantly larger than that in Class II division 1 and Class II division 2 malocclusions [16]. However, in the present study only the maxillary right canine demonstrated significant difference at 5% level whereas in the lower jaw four of the teeth in class III were significantly greater than those in class II and class I at 5% level and two at 1% level (Table 6). This disagreement could be attributed to the different methods and criteria of collecting the data and the devices used in the measurements as well as the sample size.

Mesiodistal tooth size is an important factor in orthodontic diagnosis and treatment planning [38,43]. To achieve optimal occlusion, the maxillary and mandibular teeth must be proportional in size. However, if there is mismatch, optimal occlusion will not be achieved [44]. This mismatch is known as tooth size discrepancy.

Nevertheless, the result of the mesiodistal tooth width obtained in the present investigation could be of great help to the clinical orthodontist for space assessment and also of importance to anthropologists as well as to the prosthodontist. Further, the present study may be used as a basis for future studies where a larger sample is considered.

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