

PREVALENCE OF DIFFERENT CLASSES OF MALOCCLUSION AMONG DENTAL STUDENTS AT MOI UNIVERSITY IN KENYA

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ABSTRACT

INTRODUCTION: The single classification of malocclusion is difficult and of limited value in dentofacial assessment due to the multifactorial and multivariate nature of malocclusion. In order to plan a strategy for orthodontic treatment, the prevalence of malocclusion in a population must be estimated.

OBJECTIVE: The aim of the study was to determine the prevalence of different classes of malocclusion among dental students at Moi University in Kenya.

MATERIALS AND METHODS: The study was conducted at the Moi University Faculty of Dentistry in Kenya among 40 dental students aged 18-25 years. It was a cross-sectional descriptive survey. Study cast models of the subjects were prepared from alginate impressions and used to classify the malocclusions using Angle's method. Chi square and independent t test were used to test the effect of sex on prevalence of malocclusion.

RESULTS: The overall prevalence of malocclusion was 87.5%. Class I malocclusion was the most prevalent at 70% followed by Class II Division 1 at 7.5% and Class III and Class II Division 2 at 5% each. Normal occlusion was present in 12.5% of the respondents. There were gender differences in the prevalence of malocclusion but these were not statistically significant ($p > 0.05$).

CONCLUSION: The most prevalent class of malocclusion among the study sample was Class I Malocclusion while Class II Division 2 was the least prevalent.

KEY WORDS: Malocclusion, Prevalence, Angle Classification, Study Casts, Bolton Analysis

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INTRODUCTION

Malocclusion may be defined as a malalignment of teeth or an incorrect relationship between the dental arches that deviates from the normal. The single classification of malocclusion is difficult and of limited value in dentofacial assessment due to the multifactorial and multivariate nature of malocclusion. In spite of its wide use, Angle's Classification is still fraught with ambiguities (1).

Many studies have been conducted to investigate the prevalence of Malocclusion in various populations. A review of previous studies showed that the prevalence of malocclusions ranged from around 40 to 93 per cent and varied for different ethnic groups, different age groups, and different methods of registration (2). In Kenya, a number of epidemiological studies have provided data on the prevalence of malocclusion in the child population. One of the earliest investigations on the prevalence of malocclusion in Kenya compared the prevalence of malocclusion between school age Black American and Kenyan children. From the findings, Black Americans showed a greater prevalence of Class II malocclusion while Kenyans showed a stronger Class III tendency (3).

Another study that examined school children aged 13-15 years in the city of Nairobi found that 47% of the 251 children had some form of malocclusion with crowding being the most frequently encountered anomaly (4). A retrospective study of patients at the University of Nairobi's Orthodontic clinic reported no significant differences in the prevalence of malocclusion between the sexes (5). A 51% prevalence of malocclusion was reported from a study conducted on 221 children aged 3-6 years; 13% were found to have maxillary overjet, 13% had deep bite, 6% had a midline shift, and 12% had an

anterior open bite while 5% had an anterior cross bite (6). Financial constraints and shortage of orthodontists are still the major hindrances to the provision of specialized orthodontic services to the majority of Kenyans (7).

This study was done on University Students with the expected benefit of provision of orthodontic care in The University Student Hospital and the assignment of resources for such services.

MATERIALS AND METHODS

Ethical clearance was obtained from the Institutional Research and Ethics Committees from the Suez Canal University, Egypt; Moi University and Moi Teaching and Referral Hospital in Kenya. Permission was sought from the Moi University authorities and consent forms were circulated to the participants prior to examination and impression taking. The Study was carried out at the Moi University School of Dentistry in Eldoret, Kenya. It was a descriptive cross-sectional survey.

A total of 40 dental students in the different years of study took part in the study. Only those who consented to participate were included in the study and those who had previously had orthodontic treatment were excluded. Prior to taking upper and lower alginate impressions of the subjects, an intraoral clinical examination was carried out to record the Class of Malocclusion. This measurement would then be correlated with the Dental casts that were prepared in the dental lab from the alginate impressions. Each of the prepared dental casts was classified using Angle's Classification based on the intermaxillary relationship of the first permanent molars (8).

In the absence of the first permanent molar, the intermaxillary canine relationship was used. Asymmetric

malocclusions were classified based on the predominant Class or on the canine relationship. The other parameters that were assessed from the dental casts were arch form, midline shift, midline diastema, overjet, overbite and open bite. Tooth size and arch length discrepancies were assessed using Bolton analysis while spacing and crowding were assessed using Nance’s method (9). Statistical analysis was carried out using SPSS program Version 17.0. Cross-tabulation and Chi square test were used to compare classes of malocclusion between sexes while the independent sample t test was used for the other parameters.

RESULTS

A total of 40 respondents took part in this study with 18(45%) females and 22(55%) males. They were aged between 18-25 years with a mean age of 21.6 ± 3.2 years. The overall prevalence of malocclusion was 87.5%. Class I Malocclusion was found in 28 students which represented 70% of the total sample. This was followed by Normal Occlusion (12.5%), Class II Division 1 (7.5%), Class III (5%) and Class II Division 2 (5%) as seen from figure 1 below.

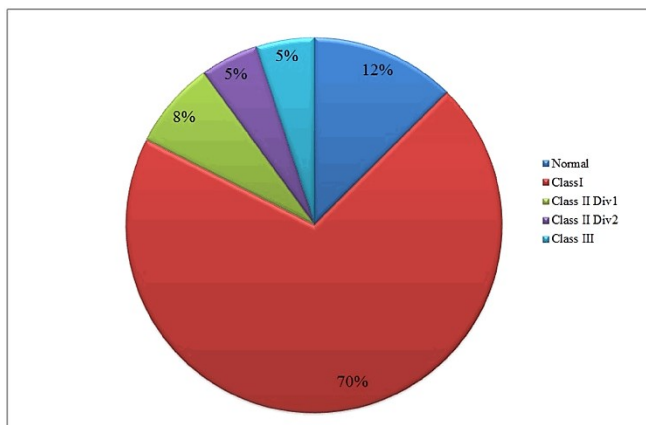


Figure 1:Prevalence of Classes of Malocclusion. There were more females (10%) with normal occlusion than males (2.5%) while more males (45%) had Class I malocclusion compared to females (25%) as shown in table 1 below.

Table 1: Distribution of Angle’s Classification According to Sex.

Angle Classification	Males		Females		Total	
	No.	%	No.	%	No.	%
Normal	1	2.5	4	10.0	5	12.5
Class I Malocclusion	18	45.0	10	25.0	28	70.0
Class II Division 1	2	5.0	1	2.5	3	7.5
Class II Division 2	1	2.5	1	2.5	2	5.0
Class III	0	0	2	5.0	2	5.0
Total	22	55.0	18	45.0	40	100.0

Class III malocclusion was found only in female students (5%). Chi square test showed no significant difference in distribution of the different classes of malocclusion between males and females. The association between sex and the different study cast parameters was tested using the independent samples t test. The male respondents had a higher mean for upper crowding (mean 3.30±1.52), open bite (mean 0.82±0.66) and lower spacing (mean 0.96±1.13) compared to the females but these differences were not statistically significant as revealed by independent t test. These findings are shown in table 2 below.

Table 2: Test of Significance between Males and Females.

Measurement	Male		Female		t value	p
	Mean	S.D.	Mean	S.D.		
Midline shift	0.682	0.894	0.722	0.826	-0.147	0.884 NS
Overbite	16.727	17.097	21.778	17.900	-0.910	0.369 NS
Open bite	0.818	1.736	0.167	0.707	1.492	0.144 NS
Crowding upper	3.295	3.747	1.861	2.319	1.416	0.165 NS
Crowding lower	2.659	2.151	3.194	3.561	-0.587	0.561 NS
Spacing upper	0.886	1.939	0.889	2.083	-0.004	0.997 NS
Spacing lower	0.955	2.236	0.000	0.000	1.807	0.079 NS

S.D. = Standard deviation.
 P = Probability level for the effect of sex (Student t test).
 NS = Insignificant (p>0.05).
 * Significant at p≤0.05

DISCUSSION

The determination of the incidence and treatment need of different malocclusions helps in planning for adequate manpower and resources. The present study was carried out to determine the prevalence of different classes of malocclusion among dental students at Moi University in Kenya using Angle’s Classification. The overall prevalence of malocclusion of 87.5% fell within the 40-93% range reported by many other studies (2). Class I malocclusion was the most prevalent type of malocclusion in this study at 70% while the least prevalent was Class II Division 2 at 2.5%. Several studies have reported Class I malocclusion to be the most prevalent type of malocclusion (3,5,10) while other studies have reported Class II Division 2 as being the least prevalent (11). The prevalence of normal occlusion of 12.5% was lower than that reported by other authors (12,13,14). The differences in the findings may be due to inadequate sample size or variations in sample selection and registration methods. The differences in the prevalence of different types of malocclusion among the sexes were not statistically significant which agree with other studies (5, 15). Some studies have reported significant sex differences in the prevalence of malocclusion (16, 17). The mean and standard deviation of the overall and anterior ratios in this study were 90.82±4.19% and 78.42±4.23% respectively. These findings compare to those of one study (18) that reported means of 77.04 and 91.30 among Egyptian orthodontic patients. More males reported excess maxillary tooth material for both the Anterior and Overall ratios of Bolton in this study. These findings were however not statistically significant similar to what was reported by Thilander (19).

CONCLUSIONS

1. Class I Malocclusion was the most prevalent type of malocclusion while Class II Division 2 was the least prevalent.
2. There were gender differences in the prevalence of malocclusion but these were not statistically significant.
3. Excess maxillary tooth material was reported in more males than females for both the anterior and overall ratios of Bolton.

CONFLICT OF INTEREST:

The authors declare that they have no conflict of interest.

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