

PREVALENCE OF MALOCCLUSION USING ANGLE CLASSIFICATION WITHIN THE DENTAL STUDENTS OF FAYOUM UNIVERSITY, EGYPT (A SURVEY STUDY)

Adel Rashid* and Hanem El Feky*

ABSTRACT

Subjects : The sample of this study consisted of 1000 students (580 female and 420 male) studying in the Faculty of Dentistry, Fayoum University, Fayoum government , Egypt. The age ranged from 18 to 23 years old.

Methods : All students should fulfill the following criteria : Having full permanent dentition without any missing teeth nor previous orthodontic treatment was the main inclusion criteria. The occlusion was assessed when the patients were guided to occlude in centric occlusion. All students were examined clinically on the dental chairs by single orthodontist. The collected data was statistically analyzed. Statistical analysis was performed with IBM® SPSS® Statistics Version 20 for Windows.

Results : The results of the study revealed that 30.1% of the sample had normal occlusion and 69.9% had malocclusion. Class I malocclusion was found in 33.1% of the subjects , followed by Class II malocclusion in 20.2% and finally Class III malocclusion in 16.6% of .

Conclusion : Angle malocclusion was found to be in 69.9% of sample. Class I malocclusion was of highest percentage followed by Class II malocclusion and finally Class III malocclusion .

INTRODUCTION

Malocclusion is a misalignment or incorrect relation between the teeth of the two dental arches when they approach each other as the jaws close ⁽¹⁾ . Malocclusion is the most common oral health problem along with dental caries, gingivitis, and dental fluorosis and it varies from country to country and also among different races ⁽²⁾ .

Many etiological factors for malocclusion have been proposed. They are mainly categorized into: genetic, environmental, and ethnic ones. Certain types of malocclusion, such as Class III relationship, gives a strong relation between genetics and malocclusion as it runs in certain families. The bimaxillary protrusion, for example, affects the African origin more frequently than other ethnicities representing the ethnic factors ^(3,4) .

* Lecturer of Orthodontics, Faculty of Dentistry, Fayoum University, Egypt.

To know the prevalence of malocclusion and quantify the orthodontic need, a number of epidemiological studies on dentofacial anomalies and orthodontic treatment need have been performed world-wide in various countries during the last four decades. Different ethnic groups have been investigated, including Amerindian ⁽¹⁾, Caucasian ^(4,5), non-Hispanic black ^(6,7), and non-Hispanic white ⁽⁶⁾.

Generally, there are no accepted criteria to define normality or abnormality as regards occlusal status. Some studies have used several different indices for the same aim, including the Index of Orthodontic Treatment Need (IOTN) ⁽⁸⁾, the Dental Aesthetic Index (DAI) ⁽⁷⁾ and the Treatment Priority Index (TPI) ⁽⁹⁾.

The main aim of the present survey was to document the prevalence of individual traits of malocclusion, including molar relation, anterior alignment, posterior and anterior crossbites, overjet, overbite, open bite and the coincidence of the upper and lower midlines, in the selected sample of Egyptian students based on Angle's classification (Angle, 1907) ⁽¹⁰⁾.

MATERIALS AND METHODS

Subjects

The research was carried out as part of the Regional Dental Examination Survey promoted by the University of Fayoum, Fayoum government, Egypt. The examinations were conducted over 12 months between 1 December 2017 and 30 November 2018. The total number of students included in the study was 1200 representing the total number of students of Faculty of Dentistry, Fayoum university (The whole population). Applying the inclusion and exclusion criteria, 1000 students were in the study (Target population). Their ages ranges from 18-23 years (mean 20.5 years). No sample size was calculated because we had conducted the study on the whole target population.

The exclusion criteria included the presence of any systemic disease, craniofacial anomaly, previously orthodontic treatment, extracted teeth, congenitally missed teeth and retained deciduous teeth, fractured incisors and restoration of upper central incisors. Informed consent was obtained for each participant.

A separate sheet was used as a record for each individual including name of the student, age, sex, graduation level, identification number and the occlusion description.

Diagnosis and classification of malocclusion

Dental examinations were performed in the dental chairs, using, dental mirrors, masks and gloves in compliance with the infection control protocol of the Faculty of Dentistry, Fayoum University. The occlusion was assessed when the patients were guided to occlude in centric occlusion. A single orthodontic specialist performed all dental examinations in order to avoid inter-operator bias and to give high intra-observer calibration.

The normal occlusion group showed bilateral Angle Class I molar relationship with acceptable overjet and overbite and well-aligned arches. While, the malocclusion group fulfilled the criteria according to Angles classification of malocclusion i.e. Class I, Class II and Class III malocclusions.

Class I Malocclusion group showed bilateral Angle Class I molar relationship with one or more of these characteristics: Crowded anteriors, spacing, protruded maxillary incisors, unilateral or bilateral posterior cross bite, mesial drift of molars, anterior or posterior open bite, deep anterior overbite.

Class II Malocclusion group showed bilateral Angle Class II molar relationship with proclined maxillary incisors and increased overjet (Angle Class II div 1 malocclusion) or with retroclined maxillary central incisors and proclined lateral incisors (Angle Class II div 2 malocclusion).

Class III Malocclusion group showed bilateral Angle Class III molar relationship with end to end incisor relationship incisors or in cross bite relationship.

Statistical analysis

The data were collected and statistical analysis of the information obtained was performed using SPSS software (version 20) and the Chi-square test. The differences with $P < 0.05$ were considered statistically significant.

RESULTS

1- Distribution of the occlusion status in the sample

Normal occlusion was found in 30.1% of subjects followed by Class I malocclusion in 33.1%

TABLE (I) : Distribution of the occlusion status in the sample

Occlusion	Percentage	Number of students
Normal occlusion	30.1%	301
Class I malocclusion	33.1%	331
Class II malocclusion	20.2%	202
Class III malocclusion	16.6%	166

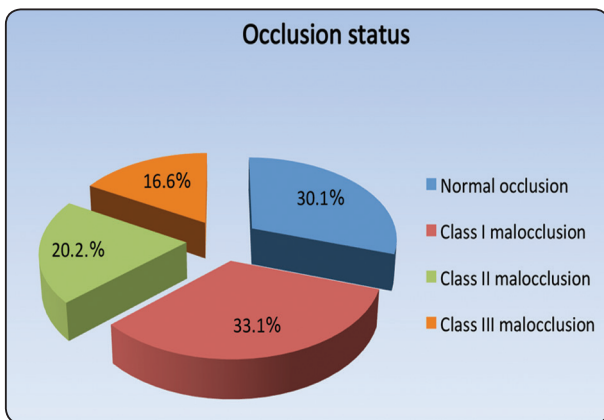


Fig. (1) : Distribution of the occlusion status in the sample

of subjects followed by Class II malocclusion in 20.2% and finally Class III malocclusion in 16.6% of subjects. As shown in Table (I) and figure (1).

2- Percentage of normal occlusion and malocclusion

The statistical analysis for this study revealed that 30.1% of the study sample with normal occlusion and 69.9% with malocclusion. As shown in figure (2).

3- Percentage of Class I, II and III in the malocclusion group

Class I malocclusion was found in 47.53% of subjects followed by Class II malocclusion in 28.90% and finally Class III malocclusion in 23.75% of subjects. As shown in figure (3).

TABLE (II) : Distribution of the Class II Malocclusion status in the sample :

Occlusion	Percentage	Number of students
Class II division 1	14.1%	141
Class II division 2	6.1%	61

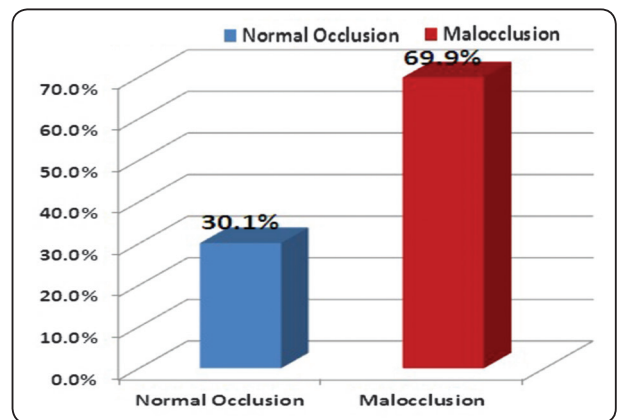


Fig. (2) : Percentage of normal occlusion versus malocclusion

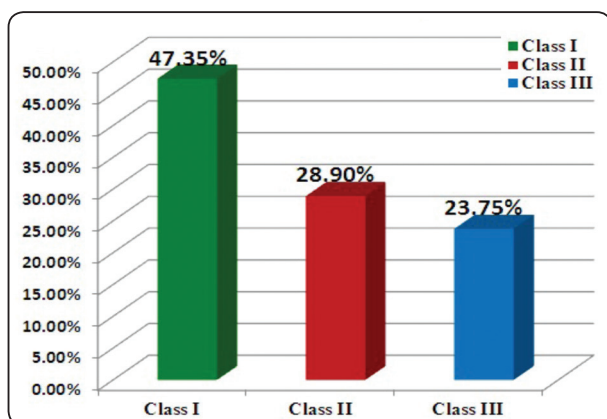


Fig. (3): Percentage of Class I,II and III in the malocclusion group

DISCUSSION

The wide spread orthodontic practices nowadays in Egypt highlights the importance of having data for planning the orthodontic treatment need. This study was conducted on 1200 students representing all the students at Faculty of Dentistry, Fayoum University (The whole population) .

After the application of inclusion and exclusion criteria, only 1000 student (580 femals and 420 mals) were included in the study (Target population). The number of excluded students was relatively small (16.6 per cent of the total).

One of the main exclusion criteria was those students who had previously had any type of orthodontic treatment (as malocclusion is no longer possible to determine). The study was conducted over one year period because only a single orthodontic specialist performed all dental examinations in order to avoid inter-operator bias and to have a high intra-observer calibration.

The mean average age was 20.5 years to assure full permanent dentition. The students examination were performed in the dental chairs, using, all the diagnostic sets such as : dental mirrors, probes, masks and gloves in compliance with the infection control protocol of the Faculty of Dentistry, Fayoum University.

Several studies have been published to describe the prevalence and types of malocclusions in different populations. The results of the present study revealed that 69.9 % of the sample had malocclusion which is not in agreement with **Sticco et al (1989)** ⁽¹¹⁾ and **Anelli and Montaruli (1998)** ⁽¹²⁾ who reported a higher prevalence of malocclusion in Italian population (79–84% and 73–75 %, respectively) . Also, **Silva and Kang (2001)** ⁽¹³⁾ reported that 93 % of Latin American adolescents were affected by some type of malocclusion and **Thilander et al. (2001)** ⁽¹⁾ observed similarly high rates for Colombians (88 per cent).

On the other hand, the results of this study were higher when compared with that obtained by **Souames et al** ⁽¹⁴⁾ who found that 21.1% of French populations sample were in need for orthodontic treatment and **N'agom et al** ⁽¹⁵⁾ who found that 42.6 % in Senegalese population sample were in need for orthodontic treatment.

The results of the current study were nearly in agreement with those obtained by **Elsayed et al** ⁽¹⁶⁾ who found that 25.7% had normal occlusion while, 73.3% had malocclusion (51.5 % Class I , 16.4 % Class II , 5.9 % Class III and 0.5 % Class IV).

CONCLUSION

Angle malocclusion was found to be in 69.9% of the sample. Class I malocclusion was of highest percentage followed by Class II malocclusion and finally Class III malocclusion .

REFERENCES

1. Brook P.H and Shaw W.C. The development of an index of orthodontic treatment priority. *Eur J Orthod.* 1989; 11:309–320.
2. Thilander B, Pena L, Infante C, Parada S S and de Mayorga C . Prevalence of malocclusion and orthodontic treatment need in children and adolescents in Bogotá, Colombia. An epidemiologic study related to different stages of dental development. *Eur J Orthod.* 2001; 23: 153–167 .

3. Alhammadi M, Halboub E, Fayed M S, Labib A and El-Saaidi C. Global distribution of malocclusion traits: A systematic review. *Dent Pres J Orthod*. 2018 Nov-Dec;23(6):40.e1-10 .
4. Kerosuo H . Occlusion in the primary early mixed dentitions in a group of Tanzanian and Finnish children. *J Dent Child* . 1990 ; 57: 293–298.
5. Tschill P, Bacon W and Sonko A. Malocclusion in the deciduous dentition of Caucasian children. *Eur J Orthod*. 1997; 19: 361–367.
6. Brunelle J A, Bhat M and Lipton J A. Prevalence and distribution of Selected occlusal characteristics in the US population, 1988–1991. *J Dent Researh*. 1996 ; 75: 706–713.
7. Otuyemi O D, Ogunynka A, Dosumu O, Cons N C and Davis J J. Malocclusion and orthodontic treatment need of secondary school students in Nigeria according to the Dental Aesthetic Index (DAI). *Int Dent J* . 1999; 49: 203–210.
8. Burden D J and Holmes A . The need for orthodontic treatment in the child population of the United Kingdom. *Eur J Orthod*. 1994; 16: 395–399.
9. Uğur T, Ciğer S, Aksoy A and Telli A. An epidemiologic survey using the Treatment Priority Index (TPI). *Eur J Orthod*. 1998; 20: 189–193.
10. Angle E.H. Classification of malocclusion. *Dental Cosmos*. 1899;41:248–264.
11. Sticco E, Clarich G, Casseler F and Bonivento A. Prevalence of malocclusion in the school population of the province of Trieste. *Minerva Stomatologica*. 1989; 38: 1025 –1028.
12. Anelli G and Montaruli G . Caries and malocclusion . A statistical–epidemiological study performed on 5399 children between 3 and 10 years old in the schools of Bari. *Minerva Stomatologica* . 1998 ; 47: 489–497.
13. R G and Kang D S. Prevalence of malocclusion among Latino adolescents. *Am J Orthod Dentof Orthop*. 2001 ; 119: 313–315.
14. Souames M., Bassigny F., Zenati N., Riordan PJ and Boy-Lefevre M.L. Orthodontic treatment need in French school-children: an epidemiological study using the index of orthodontic treatment need. *Eur J Orthod*. 2006;28:605–609.
15. N’agom P.I., Diagnea F., Dieyeb F., Diop-Baa K and Thiame F. Orthodontic treatment need and demand in Senegalese school children aged 12–13 years – an appraisal using IOTN and ICON. *Angle Orthod* . 2007; 77 (2):323–330.
16. Elsayed FA, Fsifis MS and Munir H. Prevalence of malocclusion in primary school children of Cairo , Egypt (A survey study). *Egy Dent Jo*. 2016; 62 (Januray): 225 .