Prevalence of Malocclusion in Adolescence (12-17 Years) in Najaf area.

Selma Merza Hasan
College of Dentistry , Kufa University
drsmerza@gmail.com

Abstract

Background: The aim of present study is to detect the prevalence of malocclusion in specific group aged between 12-17 years school children in Al-Najaf city of Iraq.

Patient and methods: Cross sectional study composed of two groups that classified according to the gender into male and female groups, the study was done in randomly selected secondary school for male and others for female in Al-Najaf city, in the period between October, 2015 and May, 2016. Ten schools were randomly selected 788 females and 584 males were clinicaly examined aged between 12-17 years old.

Results: The result shows Class I malocclusion was 88.04% according to Angle's classification, whereas 8.03% show Class II Div.1, 1.31 % exhibit Class II Div. 2 and Class III malocclusion were present in 2.3%. Crowding was present in about 57%, While Excessive overjet, Negative overjet, anterior crossbites, Posterior crossbites show 16.1%, 3.4%, 10.34%, 12.68% respectively, Deep overbite were in 6.4%, Open bite in 2.9%, Median diastema were in 2.7%.

Conclusion: Angle's Class I malocclusion show maximum prevalence, followed by Angle's Class II/1 and Class III, while Angle's Class II/2 malocclusion shows the lowest percent of prevalence in secondary school of Al-Najaf.

Keywords: malocclusion, prevalence, al-najaf.

الخلاصة

الهدف من هذه الدراسه هو تحديد وجود وشيوع عدم الاطباق الصحيح في مجموعة معينه من طلاب المدارس تتراوح اعمارهم مابين 12–17 سنه في مدينة النجف في العراق .

المرضى وطريقة البحث: دراسه عرضيه تتكون من مجموعتين صنفت حسب الجنس الى مجوعة ذكور ومجموعة اناث ,الدراسه اجريت عشوائيا على مجموعه معينه من المدارس الثانويه للذكور والاناث في مدينة النجف في الفتره بين شهر تشرين الاول 2015 الى شهر الخامس 2016. عشرة مدارس اختيريت عشوائيا 788 من الاناث و584 من الذكور تتراوح اعمارهم مابين 12–17 سنه.

النتائج: اظهرت النتائج ان الصنف الاول من الاطباق كانت نسبتهم 88.04% بينما الصنف الثاني كانت نسبتهم 8.03% و 1.13 للقسمين الاول والثاني على التوالي اما الصف الثالث فكانت نسبتهم 2.3%.

مجموعة الاسنان المتركبه كانت نسبتهم 57% بينما زيادة بروز الاسنان الايجابي والسلبي 16,1% و6,3% على التوالي ومجموعة الاطباق المتعاكس كانت نسبتهم 10,34و 12.68% على التوالي. وكانت نسبة زيادة الاباق والاطباق المفتوح وفتحة بين الاسنان الاماميه كالتالي 6.4%و 2.9%و2,7%.

الاستنتاجات:نسبة الشيوع الاعلى كانت للصنف الاول من الاطباق ومن ثم الصنف الثاني القسم الاول يتبعه الصنف الثالث ومن ثم القسم الثاني من الصنف الثاني الذي كان اقل نسبه.

الكلمات المفاتحية: عدم الاطباق الصحيح , الشيوع , النجف.

Introduction

A malocclusion is a misalignment or incorrect relation between the teeth of the two dental arches beyond the range of what is accepted as normal when they approach each other as the jaws close, (Mtaya *et al.,* 2009). Due to the high presence of

malocclusion and the presence of high treatment possibilities, it can be regarded as a public health problem and not life threating condition. Malocclusion considered as a common finding. The people who have more severe malocclusions, may need only orthodontic treatment or in sever skeletal problems surgical treatment needed to correct the condition. Correction of malocclusion may reduce risk of tooth decay and other periodontal disease and TMJ disorders. Orthodontic treatment is also used to align for aesthetic reasons, (Karaiskos, 2005; Marques, 2009) .

Malocclusions may be associated with skeletal disharmony of the face, the concerning of the most people is on the oral-facial region because it represents the most attention from other people in our communities and is the important source of physical, and emotional communication. So people who seeking orthodontic treatment are concerned with improving their body image and social acceptance. Regardless of age, patients and their families thinking about improvements in oral function, esthetics, social acceptance, and body image are important for orthodontists to consider when explaining the plane of treatment for the patient (Mridula *et al.,* 2013).

Recently, the need for orthodontic treatment elevated, so it is important to detect the prevalence of malocclusions. Many Epidemiological studies were necessary in order to get more accurate data on the presence of malocclusions and the social need for orthodontic treatment (Giuseppina *et al.,* 2013).

The collected data provided information can be used in different countries to plane a health programs for orthodontic prevention and screening (Borzabadi- *et al.,* 2009; Perillo *et al.,* 2010). In the last two decades there were many studies were published on the prevalence of malocclusions and on the demand for orthodontic therapy in different ethnic groups. These studies reported different data which exhibit a great variability with respect to the manner of the survey like the developmental status, the method of clinical examination, the number of sample involved in the study and to the characteristic of the different ethnic groups. It is important to do survey on the prevalence of malocclusion and the need for orthodontic treatment in every country in order to improve public oral health (Lew *et al.,* 1993; Ngom *et al.,* 2007).

Despite the amount of literature on the subject there are few studies investigating the distribution of malocclusion in this city so the aim of this epidemiological study was to detect the prevalence of malocclusions, to show the expected demand for orthodontic treatment in schoolchildren in Al-Najaf city of Iraq. By using the Index of Orthodontic Treatment Need (IOTN).

Patients and Methods

Cross sectional study composed of two groups classified according the gender into male and female group, the study were done in randomly selected secondary school for male and others for female in Al-Najaf city, in the period between October, 2015 and May, 2016.

Ten schools were randomly selected and 788 females and 584 males were clinical examined aged between 12-17 years old. The examinations were done after the acceptance of the patient themselves and after the explanation of the aim of the study for the school authorities and parents of sampled groups.

The data was collected by the same examiner. The examiner visited the schools on predetermined dates according to schedule.

The specific criteria of sample:
1- The age of the samples is 12-17 years old.
2- No previous orthodontic treatment.
3- They don't have any congenital craniofacial anomalies.
4- They are not subjected to trauma which may affect the normal growth pattern of the patient.
5- Good general health (no systemic disease).

The school children were examined in the specific isolated room of the schools to preserve specificity of the patients. The examination lasted 20 min per child, according to the WHO guidelines (WHO; 1985). The malocclusion were determined using latex gloves, mouth mirrors, specific head light, and vernea and millimeter rulers.

The clinical examination was done without radiograms and the result recorded according to Angle classification of orthodontic: canine and molar sagittal relationships and coincidence of incisor midlines. Findings were classified in the following categories: class I, class II divisions 1 and 2 and class III malocclusions, also other types of malocclusion were determined according to specific criteria mentioned in the table below. For each subject, the presence or absence of malocclusion were registered on designed chart.

⬦ The presence of the following types of malocclusion was also determined according to specific criteria which include:

Increased overjet		≥ 3mm
Reversed overjet		All upper incisors in lingual position in relation to lower incisors.
Crowding		Drift ≥ 1mm between the contact points of permanent teeth shifted away from the arch line
crossbites	Anterior and posterior	Teeth with abnormal bucco-lingual relationship
	Unilateral or bilateral	one or both arches
Anterior diastemas		Space ≥ 1mm between the contact points of permanent incisors
Completely un erupted teeth		There are no enough space in the arch
Excessive overbite		≥ 3mm
Deep bite		>3mm
Median diastema		>2mm

Results

Distribution of the subjects:

A total of 1372 subjects, 584 males and 788 females, were examined to participate in the survey.

Among 1372 secondary schoolchildren, 1208 subject were show Class I malocclusion according to Angle's classification, whereas (114) show Class II Div. 1, (18) subject exhibit Class II Div. 2 and Class III malocclusion were present in (32).

Table (1): Samples distribution according to the gender.

Age in years	Male	Female	Total
12-17	584	788	1372

Table (2): Distribution of sample according to angle's classification.

Gender	Total	Class I	Class II Div1	Class II Div2	Class III
Male	584	490	54	7	19
Female	788	718	60	11	13
Total	1372	1208	114	18	32

Table (3): Malocclusions percent according to each type.

Gender	Class I %	Class II Div1 %	Class II Div2 %	Class III %
Male	(83.9)	(9.24)	(1.19)	(2.4)
Female	(91.11)	(7.61)	(1.39)	(2.2)
Total	(88.04)	(8.03)	(1.31)	(2.3)

The result shows that males have more prevalence of CLII and CLIII than female which have more prevalence in CLI malocclusion.

Class I malocclusion represent the highest percentage among other types of malocclusion in contrast to Class II division 2 which represent the lowest percentage of malocclusion. Class II division 1 and Class III show the second and third more common types of malocclusion (Table: 3).

Table (4): Prevalence of other types of malocclusions and their distribution according to the gender.

Type of malocclusion	Male	Female	Total
Crowding	380 (27.69)	403 (29.3)	(783)57%
Excessive overjet	103 (7.5)	118 (8.6)	(221)16.1%
Negative overjet	25 (1.8)	23 (1.67)	(48) 3.4%
Anterior crossbites	73 (5.3)	69 (5)	(142) 10.34%
Posterior crossbites	83 (6)	91(6.6)	(174)12.68%
Unilateral crossbites	39 (2.8)	46 (3.3)	(85) 6.1%
Bilateral crossbites	17 (1.3)	12 (0.8)	(29)2.1%
Un erupted teeth (missing or impacted)	41 (3)	60 (4.3)	(101)7.3%
Deep overbite	39 (2.9)	49 (3.5)	88 (6.4%)
Open bite	22 (1.6)	19 (1.3)	41 (2.9%)
Median diastema	20 (1.45)	18 (1.31)	38 (2.7)%

According to Table (4) our result shows the prevalence of malocclusion in boys increased in reversed overjet (1.8), anterior and bilateral crossbite (5.3) and (1.3) respectively, in open bite (1.6) and median diastema (1.45).

The prevalence of malocclusion in female was increased in the following types of malocclusion: crowding (29.3), increased overjet (8.6), posterior and unilateral crossbite (6.6) and (3.3) respectively, unerupted teeth (4.3) and deep overbite (3.5).

Discussion

Literatures show no studies that were published on the prevalence of malocclusion among schoolchildren of this city, Hence the comparisons are made with other populations.

This study represented the first epidemiological survey carried out in Al-Najaf city of Iraq. This cross sectional descriptive study was performed to assess the prevalence of malocclusion among 12–17 year old schoolchildren. Presence of crowding, excessive or reversed overjet, overbite, crossbite (anterior or posterior/unilateral or bilateral), median diastema and the presence of un erupted teeth (regardless whether it is impacted or missing) were assessed. We choose this age group because in which the patient gives specific care to their facial and general appearance due to their mental and emotional changes. And also due to the clinical condition that involve alterations in the arches and faces.

The present study fulfills a specific criteria (mentioned in the introduction). Well-defined sample, subjects with no prior history of orthodontic treatment should always choose for objective data collection (Shaikh & Desai, 1966; Tewari 1966).

The present study population shows significant percent of malocclusion. It may be due to the high level of extensive untreated caries lesions which lead to premature tooth extractions in children, no concern being shown for the maintenance of space in schoolchildren. This in turn may be as a result of the general social status of the country which suffering from the war in this period and the lower socioeconomic status of the families.

The study declares that highest percent of malocclusion were to Class I malocclusion, while the lowest percent were for Class II div 2, Class II div 1 and Class III show the second and third order of prevalence. This result was agree with (Singh S, 2015, Jacob PP, Mathew CT, 1969). Various authors have reported prevalence of 68%, 50.97%, 36%, 23% and 40.4% Class I malocclusion, up to 62.9% among Latino adolescents (Silva & Kang, 2001).

The distribution of Class II/1 malocclusion in this study was (8.03), other studies have reported very high prevalence of Class II/1 malocclusion, when compared with the result of present study (Singh *et al.,*2015; Jacob & Mathew, 1969; Silva & Kang, 2001 and . Dimberg *et al.,* 2015).

The prevalence of Class III malocclusion (2.3%) , it was agree with Shaikh & Desai, 1966; Jacob & Mathew,1969; Dimberg *et al.,*2015 And Tak *et al.,* 2013 and it disagree with Tiwari A 1966 ; Silva and kang, 2001 and Lew *et al.,*1993 who reported high prevalence of 26.1%, 9% and 12.6% respectively.

Several studies have been performed to show the prevalence and types of malocclusions in different populations. Different methods and indices were used in different age and race of populations so Comparisons of these findings must be done carefully. In our study, males represent high number of class II and class III malocclusion which was in agree to the results of Onyeaso et al, 2004 who reported that boys were found to have significantly more of classes II and III molar relationships than girls. The differences in methodology in recording the traits of malocclusion were single factor that

has extreme   influenced of variation in prevalence of malocclusion, (Onyeaso *et al.,* 2004, Roopa & Rani, 2014).

The presence of dentoalveolar discrepancies, tooth size and jaw size discrepancies may result in crowding and spacing in the dental arches. Also the presence of caries and molar extraction may be responsible on high prevalence of crowding which explained by the migration of the first permanent molar, inclinations and rotations. Prevalence of crowding in females was lower than males, it was in agreement with studies by Rwakatema *et al.,*2007 and Gass *et al.,* 2003).

The prevalence of midline diastema agree with the previous studies Like Brito DI *et al.,* 2009; Shivakumar *et al.,*,2010; Baca-Garcia,2004) was observed in while studying familial correlations and the hereditability of maxillary midline diastema, suggested a possible genetic basis for it. In our study, females showed a lower prevalence of diastema, which is inconsistent with other previous studies.

Unilateral posterior crossbite show more prevalence in female while bilateral posterior crossbite were more in male. Anterior crossbite which were more prevalent in male need early interceptive treatment to enhance favorable growth and development of not only the occlusion, but also the entire craniofacial complex. Anterior mandibular overjet or reverse overjet, Like most communities, exhibit a very rare occurance of 2.1% among the study population coinciding with other studies Shivakumar *et al.,* 2010; Baca-Garcia, 2004. Early loss of upper primary canines, as a part from the growth discrepancies, resulting in palatal tipping and/or distal migration of upper permanent anterior teeth may also be considered as a causative factor of mandibular overjet (Esa , 2001).

In the present study, vertical anterior open bite presented in (2.9) % of population while deep bite were (6.4) %. Regarding open bite, similar results were observed by Hill in 1992 among Glasgow children, Esa et al in 2001. Among Malaysians and Shivakumar et al, 2010. Among Davangere children. Onyeaso, 2006 showed that anterior open bite was founded in subjects with finger sucking and/or tongue thrusting habits. Open bite occurrence may be genetically determined because he found that an anterior open bite is more prevalent in black than in white American adolescents (Thilander *et al*, 2001).

Refrences

Baca-Garcia A, Bravo M, Baca P, Baca A, Junco P. Malocclusions and orthodontic treatment needs in a group of Spanish adolescents using the dental aesthetic index. Int Dent J. 2004;54:138–42

Borzabadi-Farahani A, Borzabadi-Farahani A, Eslamipuor F. Malocclusion and occlusal traits in an urban Iranian population: an epidemiological study of 11- to 14-year-old children. Eur J Orthod. 2009; 31:477–84.

Brito DI, Dias PF, Gleiser R. Prevalence of malocclusion in children aged 9-12 years old in the city of Nova Friburgo, Rio de Janeiro state, Brazil. Rev Dent Press Ortod Ortop Facial. 2009;14:118–24.

Brook PH, Shaw WC. The development of an index of orthodontic treatment priority. Eur J Orthod. 1989; 11:309–20.

Dimberg L, Lennartsson B, Arnrup K, Bondemark L (2015) Prevalence and change of malocclusions from primary to early permanent dentition: a longitudinal study. Angle Orthod 85: 728-734.

Esa R, Razak IA, Allister JH. Epidemiology of malocclusion and orthodontic treatment need of 12-13-year-old Malaysian school children. Community Dent Health. 2001;18:31–6.

Gass JR, Valiathan M, Tiwari HK, Hans MG, Elston RC. Familial correlations and heritability of maxillary midline diastema. Am J Orthod Dentofacial Orthop. 2003;123:35–9

Giuseppina L, Caterina M, Francesco F, Patrizio B and Paola. Prevalence of malocclusions, oral habits and orthodontic treatment need in a 7- to 15-year-old schoolchildren population in Tirana. 2013, 14:12

Hill PA. The prevalence and severity of malocclusion and the need for orthodontic treatment in 9-, 12-, and 15-year-old Glasgow school children. Br J Orthod. 1992;19:87–96

Jacob PP, Mathew CT. Occlusal pattern study of school children (12-15 years) of Trivandrum City. 1969; J Indian Dent Assoc 41: 271-274.

Karaiskos N, Wiltshire WA, Odlum O, Brothwell D, Hassard TH. Preventive and interceptive orthodontic treatment needs of an inner‑city group of 6 and 9 year old Canadian children. J Can Dent Assoc 2005;71:649.

Lew KK, Foong WC, Loh E (1993) Malocclusion prevalence in an ethnic Chinese population. Aust Dent J 38: 442-449.

Marques LS, Pordeus IA, Ramos‑Jorge ML, Filogônio CA, Filogônio CB, Pereira LJ, *et al*. Factors associated with the desire for orthodontic treatment among Brazilian adolescents and their parents. BMC Oral Health 2009;9:34.

Mridula T, Ramesh N, Archana JS, Kailash A, Aniruddh T, Sagar J, Gauri K. Prevalence of malocclusion and orthodontic treatment needs among 12‑15 years old school children of Udaipur, India.2013;37.236.

Mtaya M, Brudvik P, Astrom AN. Prevalence of malocclusion and its relationship with socio‑demographic factors, dental caries, and oral hygiene in 12‑ to 14‑year‑old Tanzanian school children. Eur J Orthod 2009;31:467‑76.

Ngom PI, Diagne F, Dieye F, Diop-Ba K, Thiam F. Orthodontic treatment need and demand in Senegalese school children aged 12–13 years: an appraisal using IOTN and ICON. Angle Orthod. 2007; 77:323–30.

Onyeaso CO, Oneyeaso AO. Occlusal/dental anomalies found in a random sample of Nigerian school children. Oral Health Prev Dent. 2006;4:181–6.

Onyeaso CO. Orthodontic treatment need of Nigerian outpatients assessed with the dental aesthetic index. AustOrthod J. 2004;20:19–23.

Perillo L, Masucci C, Ferro F, Apicella D, Baccetti T. Prevalence of malocclusion and orthodontic treatment need in children and adolescents in Bogota, Colombia. An

epidemiological study related to different stages of dental development. Eur J Orthod 2001;23:153‑67.

Roopa Siddegowda, Rani M Satish. The prevalence of malocclusion and its gender distribution among Indian school children: An epidemiological survey. 2014;5:4, Page : 224-229

Rwakatema DS, Ng'ang'a PM, Kemoli AM. Orthodontic treatment needs among 12-15 year-olds in Moshi, Tanzania. East Afr Med J. 2007;84:226–32

Shaikh HS, Desai DH. Varieties of malocclusion amongst orthodontic patients. 1966; J Indian Dent Assoc 38: 201-203.

Shivakumar K, Chandu G, Shafiulla M. Severity of malocclusion and orthodontic treatment needs among 12- to 15-Year-Old school children of Davangere district, Karnataka, India. Eur J Dent. 2010;4:298–307.

Silva RG, Kang DS (2001) Prevalence of malocclusion among Latino adolescents. Am J Orthod Dentofacial Orthop 119: 313-315.

Singh S, Kumar V, Narboo P. Prevalence of Malocclusion among Children and Adolescents in Various School of Leh Region. 2015;1: 2-15.

Singh SP, Utreja A, Chawla HS (1993) A study of distribution of malocclusion among North Indians seeking orthodontic treatment. 1993; J Ind Orthod Soc 24: 47-53.

Tak M, Nagarajappa R, Sharda AJ, Asawa K, Tak A, et al. (2013) Prevalence of malocclusion and orthodontic treatment needs among 12-15 years old school children of Udaipur, India. Eur J Dent 7: S45-53.

Tewari A. Relationship of the incidence of malocclusion with the socio-economic status of people. (An epidemiological study). 1966; J Indian Dent Assoc 38: 192-200 passim.

Thilander B, Pena L, Infante C, Parada SS, de Mayorga C. Prevalence of malocclusion and orthodontic treatment need in children and adolescents in Bogota, Colombia. An epidemiological study related to different stages of dental development. Eur J Orthod. 2001;23:153–67.

World Health Organization. Oral health care systems: an International collaborative study. Geneva: WHO; 1985.