

## Normal Iraqi values of overjet and overbite

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### ABSTRACT

**Background:** Knowing the normal range of values helps us define the abnormal range.

**Material and Method:** This study involved six governorates (cities and environs) in Iraq selected to cover the whole country geographically (Baghdad the capital, Ninevah, Basrah, Diyala, Anbar and Najaf). The sample consisted of 6957 intermediate school students aged 13 years with no previous history of orthodontic treatment. An intra-oral clinical examination was used to assess their overjet and overbite.

**Results:** More than two thirds of the sample (67.8%) had an overjet of 2mm to 4mm and three quarters of the sample (75.3%) had an overbite of 1mm to 3mm and when overjet and overbite values were cross-tabulated, 54.7% of the sample had an overjet of 2-4mm and an overbite of 1-3mm suggesting their normal values.

**Conclusion:** For Iraqi 13 early teen-agers the normal overjet is 2-4mm and overbite is 1-3mm

**Key words:** Overjet, overbite, Iraq (J Bagh Coll Dentistry 2006; 18(1): 80-83).

### INTRODUCTION

The importance of overjet and overbite arise from their role in esthetics, function and stability of orthodontic treatment. However, overjet and overbite values have a very wide range ranging between two extremes, <sup>(1-2)</sup> therefore it is important to determine their normal range.

#### Normal overjet value

Some researchers <sup>(3-5)</sup> considered normal overjet as the positive value extending to 3mm. Others, <sup>(6-11)</sup> reported the normal value to be between 2-4mm. Proffit and Fields <sup>(12)</sup> considered normal overjet to be 2-3mm.

Al-Alousi et al. <sup>(13)</sup> defined excessive overjet subjectively as the maxillary incisors positioned so anterior that they do not contact the mandibular incisors and defined deficient overjet as the situation where incisors contact each other prematurely.

Whereas different objective definitions for increased overjet were adopted by several researchers e.g. 3mm, <sup>(3)</sup> over 3mm, <sup>(4,5,14)</sup> 5mm or more, <sup>(6,8,9)</sup> 6mm or more <sup>(15-18)</sup> and over 6mm. <sup>(19)</sup>

#### Normal overbite value

The degree of overbite varies greatly from anterior open bite at one extreme to the complete deep traumatic overbite at the other. Normal overbite was considered to be 0-4mm. <sup>(18,20,21)</sup> Others <sup>(7,11,22)</sup> considered normal range value to be 2-4mm, while Farah <sup>(10)</sup> found the normal range to be within 1-3mm. Others as Proffit and Fields <sup>(12)</sup> considered normal overbite to be 1-2mm.

Considerable variations in the definition of increased overbite are seen in the previous studies, e.g.  $\frac{1}{3}$  overlap, <sup>(23,24)</sup> over  $\frac{1}{2}$  overlap, <sup>(25,26)</sup> over  $\frac{2}{3}$  overlap, <sup>(6,27,28)</sup> over 3mm, <sup>(29)</sup> 5mm or more, <sup>(15,30; 31)</sup> and over 5mm. <sup>(19)</sup> Salonen et al. <sup>(32)</sup> recorded deep bite only when gingival contact was found.

### MATERIALS AND METHODS

The sample included a total of 7176 intermediate school students 13 years of age. These students were taken from 6 governorates (cities and environs) in Iraq selected to cover the whole country geographically (Baghdad the capital, Ninevah, Basrah, Diyala, Anbar and Najaf) according to a multi-stage stratified sampling technique. Details of the geographic distribution and sampling technique are given in Al-Huwaizi. <sup>(33)</sup>

After excluding the invalid case sheets and isolating the students with some sort of orthodontic treatment, the number of casesheets which entered the statistical analysis dropped to 6957 <sup>(34,35)</sup> as shown in table 1.

Overjet was measured as the horizontal distance from the most prominent point on the incisal edge of the maxillary central incisor to the most prominent point on the labial surface of the corresponding mandibular incisors, measured parallel to the occlusal plane with the student in centric occlusion and his/ her occlusal plane horizontal. It was measured by a metric ruler or vernier to the nearest millimeter. In case of asymmetry the larger overjet measurement was recorded. <sup>(6)</sup>

Measurement of overbite was made with the aid of a metric ruler or vernier with the student in centric occlusion and his/ her occlusal plane horizontal. The amount of vertical overlap of the maxillary incisors on the mandibular

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incisors was marked with an indelible pencil on the labial surface of the mandibular incisors, using the incisal edge of the maxillary incisor to guide the pencil. The upper conical plane of the sharpened part of the pencil and not the shaft of the pencil itself was placed parallel to the student's occlusal plane. The measurement from the incisal edge of the mandibular central incisor to the pencil mark was made to the nearest millimeter.<sup>(36,37)</sup>

In case of anterior open bite, the amount of lack of overlap was measured directly with the metric ruler or vernier from edge to edge, and the largest measurement was recorded to the nearest (negative) whole millimeter.<sup>(36,37)</sup>

**RESULTS AND DISCUSSION**

More than two thirds of the sample (67.8%)

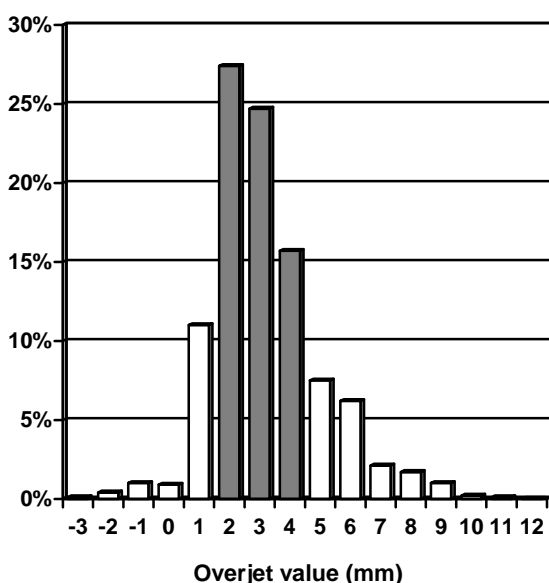
had an overjet of 2mm to 4mm (Figure 1). This finding is in agreement with Kinaan<sup>(22)</sup> who found that 66% of Iraqi and 69% of English 12 year olds had an overjet of 2-4mm.

On the other hand, three quarters of the sample (75.3%) had an overbite of 1mm to 3mm (Figure 2). This agrees with Farah<sup>(10)</sup> but disagrees with Kinaan<sup>(22)</sup> who found that the majority of his English and Iraqi sample had an overbite of 2-4mm.

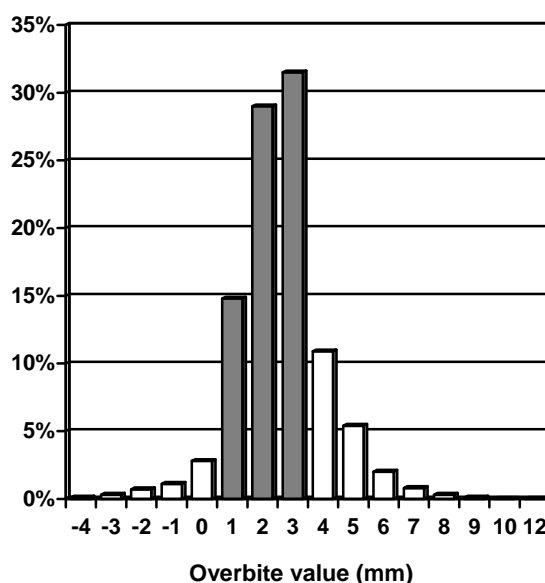
From the cross-tabulation of overjet and overbite values of the whole sample (Table 2), 54.7% had an overjet of 2-4mm and an overbite of 1-3mm. However, Kinaan<sup>(22)</sup> found 48% of Iraqi and 47% of English children had an overjet and overbite of 2-4mm. In this study, also a very large proportion of the sample (54.8%) had an overjet and overbite of 2-4mm.

**Table 1: Number and distribution of casesheets included in the statistical analysis.**

Residency	Gender	Baghdad		Ninevah	Basrah	Diyala	Anbar	Najaf	Total
		Karkh	Rusafa						
Urban	Males	249	250	247	248	249	249	247	1739
	Females	250	250	249	247	250	249	249	1744
	Total	499	500	496	495	499	498	496	3483
Rural	Males	250	248	248	248	247	248	249	1738
	Females	249	249	247	246	248	249	248	1736
	Total	499	497	495	494	495	497	497	3474
Total	Males	499	498	495	496	496	497	496	3477
	Females	499	499	496	493	498	498	497	3480
	Total	998	997	991	989	994	995	993	6957



**Figure 1: Distribution of the total sample according to their overjet values.**



**Figure 2: Distribution of the total sample according to their overbite values.**

**Table 2: Distribution of the total sample according to their overjet and overbite values (in mm).**

		Overjet															Total		
		-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	n	%
Overbite	-4	0	0	0	1	1	0	1	1	0	1	0	0	0	0	0	5	0.1	
	-3	1	0	1	2	3	7	3	1	1	2	1	0	0	0	0	22	0.3	
	-2	1	1	5	9	8	6	3	7	5	4	0	0	0	0	0	49	0.7	
	-1	0	3	4	13	12	11	9	6	9	7	3	3	0	0	0	80	1.1	
	0	0	2	13	56	58	13	25	13	2	7	4	2	1	0	0	196	2.8	
	1	1	16	25	0	442	263	113	81	35	26	13	9	3	3	0	1030	14.8	
	2	0	8	13	0	146	797	604	266	106	35	24	18	2	1	1	2021	29.0	
	3	1	1	4	0	45	515	689	479	191	164	44	40	9	4	3	2190	31.5	
	4	0	0	0	0	21	181	142	137	114	80	31	26	23	3	2	760	10.9	
	5	0	0	0	0	4	67	94	57	40	65	17	8	21	1	3	378	5.4	
	6	0	0	0	0	6	31	28	33	8	22	3	6	0	1	0	138	2.0	
7	0	0	0	0	1	7	8	7	4	14	3	7	7	0	0	58	0.8		
8	0	0	0	0	3	6	1	2	4	3	2	1	0	0	0	23	0.3		
9	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0	4	0.1		
10	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	3	0.0		
Total	n	4	31	65	81	751	1904	1722	1091	520	431	145	120	67	13	9	3	6957	100
Total	%	0.1	0.4	1.0	0.9	11.0	27.4	24.7	15.7	7.5	6.2	2.1	1.7	1.0	0.2	0.1	0.0	100	

**REFERENCE**

- Al-Huwaizi AF, Al-Mulla AA, Al-Alousi WS. The overjet of Iraqi 13 year olds (a national survey). *J Oral Dent Sc* 2004; 3(1): 40-6.
- Al-Huwaizi AF, Al-Alousi WS, Al-Mulla AA. The overbite of Iraqi teenagers (a national survey). *Iraqi Orthod J* 2005; 1(1): 36-41.
- Walther DP. Some of the causes and effects of malocclusion. *Dent Practit* 1960; X: 139-53.
- Foster TD, Day AJW. A survey of malocclusion and the need for orthodontic treatment in Shropshire school population. *Brit J Orthod* 1974; 1(3): 73-8.
- Isiekwe MC. Malocclusion in Lagos, Nigeria. *Comm Dent Oral Epi* 1983; 11: 59-62.
- Haynes S. The distribution of overjet and overbite in English children aged 11-12 years. *Dent Pract* 1972; 22(10): 380-3.
- Kinaan BK. A quantitative assessment of occlusal features and a simple orthodontic treatment need index. Master Thesis, College of Dentistry, University of Sheffield, England 1977.
- Corruccini RS, Kaul SS, Chopra SRK, Karosas J, Larsen D, Marrow C. Epidemiological survey of occlusion in North India. *Brit J Orthod* 1983; 10: 44-7.
- Tavares M, Soparker PM, Paola PF, Moorrees CFA. Rapid index for detecting severe malocclusion in population. *IADR* 1982 (Abs 1066); 297.
- Farah ME. The orthodontic examination of children aged 9 and 10 years from Baghdad, Iraq: a clinical and radiographic study. Master Thesis, College of Dentistry, University of Baghdad, Iraq 1988.
- Hassan AJ. Anterior tooth relations in Kenyan Africans. *Arch Oral Biol* 1993; 38(4): 337-92.
- Proffit WR, Field HW. *Contemporary orthodontics*. 2nd ed. Mosby Year Book, St. Louis 1993.
- Al-Alousi W, Jamison HH, Legler DD. A survey of oral health in Iraq. Population characteristics, occlusion and enamel mottling of senior secondary school students. *Iraqi Dent J* 1982; 9: 8-16.
- Tulley WH. Prevention of malocclusion and dentofacial anomalies. *Int Dent J* 1973; 23: 481-8.
- Björk A, Krebs ÅA, Solow B. A method for epidemiological registration of malocclusion. *Acta Odontol Scand* 1964; 22: 27-41.
- Ingervall B, Hedegård B. Awareness of malocclusion and desire for orthodontic treatment in 18-year-old Swedish men. *Acta Odontol Scand* 1974; 32: 93-101.
- Magnusson TE. An epidemiologic study of occlusal anomalies in relation to development of the dentition in Icelandic children. *Community Dent Oral Epidemiol* 1976; 4: 121-8.
- Oreland A, Heubel J, Jagell S. Malocclusions in handicapped children. *Swed Dent J* 1987; 11(3) 106-7.
- Lavelle CLB. A study of multiracial malocclusion. *Community Dent Oral Epidemiol* 1976; 4: 38-41.
- Björk A. Variability and age changes in overjet and overbite. *Am J Orthod* 1953; 39: 779-801.
- Ingervall B, Mohlin B, Thilander B. Prevalence and awareness of malocclusion in Swedish men. *Community Dent Oral Epidemiol* 1978; 6: 308-14.
- Kinaan BK. Overjet and overbite distribution and correlation: a comparative epidemiological English-Iraqi study. *Brit J Orthod* 1986; 13: 79-86.
- Gardiner JH. A survey of malocclusion and some etiological factors in 1000 Sheffield school children. *Dental practitioner* 1956; 6: 187.
- Poulton DR, Aaronson SA. The relationship between occlusion and periodontal status. *Am J Orthod* 1961; 47(9): 690-9.
- Miller J, Hobson P. The relationship between malocclusion, oral cleanliness, gingival conditions and dental caries in schoolchildren. *Br Dent J* 1961; 111: 43-52.
- Houston WJB. *Walther's Orthodontics notes*. 3rd ed. John Write and Sons Ltd 1976.
- Jackson D. Lip positions and incisor relation. *Brit Dent J* 1962; 112(4): 147.
- Haynes S. An epidemiologic study of the relationship between overbite in English children aged 11-12

- years. *Comm Dent Oral Epidemiol* 1974; 2: 193-5.
- 29- Johnson JS, Soetamat A, Wimoto MS. A comparison of some occlusal features of the Indonesian occlusion with those of two other ethnic groups. *Brit J Orthod* 1978; 5: 183-8.
- 30- Helm S. Malocclusion in Danish children with adolescent dentition: an epidemiologic study. *Am J Orthod* 1968; 54: 356-66.
- 31- Pederson J, Stensgaard K, Melsen B. Prevalence of malocclusion in relation to premature loss of primary teeth. *Comm Dent Oral Epidemiol* 1978; 6: 204-9.
- 32- Salonen L, Mohlin B, Götzlinger B, Helldén L. Need and demand for orthodontic treatment in an adult Swedish population. *Eur J Orthod* 1992; 14(5): 359-68.
- 33- Al-Huwaizi AF. Occlusal features, perception of occlusion, orthodontic treatment need and demand among 13 year old Iraqi students (A national cross-sectional epidemiological study). Ph.D. Thesis, College of Dentistry, University of Baghdad, Iraq 2002.
- 34- Al-Huwaizi AF, Al-Alousi WS, Al-Mulla AA. Orthodontic treatment demand in Iraqi 13 year olds - A national survey. *J Coll Dentistry* 2002; 13:134-9.
- 35- Al-Huwaizi AF, Al-Mulla AA, Al-Alousi WS. Method of a national survey on malocclusion. *J Coll Dentistry* 2002; 13: 12-23.
- 36- Draker HL. Handicapping labio-lingual deviations proposed for public health purposes. *Am J Orthod* 1960; 46(4): 295-305.
- 37- Baume LJ, Horowitz HS, Summers CJ, Backer Dirks O, Carlos JP, Cohen LK. A method for measuring occlusal traits developed by the FDI commission on classification and statistics for oral conditions. *Int Dent J* 1973; 23: 530-7.