

# **Incisor overbite in Saudi Arabia**

Fadia M. Al-Hummayani, BDS, MS \*

## **Abstract**

Overbite values in one thousand five hundred (1500) female Saudi Arabian students aged 11-19 years had been measured using Jackson method of overbite classification. The percentage distribution were as follows, 1049 (69.9%) of the sample had normal overbite, 265 (17.7%) had moderate deep bite, and the least common were the extreme deep bite, 95 (6.3%) and open bite, 91 (6.1%). The conclusion that can be drawn from this study is that the majority of Female Saudis have normal overbite. This study also showed that Saudis have lesser over bite values than Caucasians and deeper overbite than black Africans.

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## INCISOR OVERBITE IN SAUDI ARABIA

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### ABSTRACT

Overbite values in one thousand five hundred (1500) female Saudi Arabian students aged 11-19 years had been measured using Jackson method of overbite classification. The percentage distribution were as follows, 1049 (69.9%) of the sample had normal overbite, 265 (17.7%) had moderate deep bite, and the least common were the extreme deep bite, 95 (6.3%) and open bite, 91 (6.1%). The conclusion that can be drawn from this study is that the majority of Female Saudis have normal overbite. This study also showed that Saudis have lesser over bite values than Caucasians and deeper overbite than black Africans.

### INTRODUCTION

Most dentists would classify incisal overbite either as complete or incomplete. The complete overbite is that in which the lower incisors, bite on the palatal surface of the upper incisor, when the teeth are in centric occlusion. The incomplete overbite is that in which the lower incisor, do not bite on the palatal surface of the upper incisors when the teeth are in centric occlusion.

These definitions are loose and of little value in epidemiology. In view of these inadequacies, a more precise method of classifying incisor overbite was described by Jackson 1962<sup>(1)</sup> and it was used to provide more relevant epidemiological data.

The prevalence of malocclusion varies from country to country and among races. Knowledge about the frequency of different types of malocclusion is essential in assessing the causes and resources required<sup>(2)</sup>.

In the United States (U.S.), two large scale surveys were carried out by Public health service covered children ages 6-11 between 1963 and 1965 and young ages 12 to 17 between 1969 and 1970<sup>(3, 4)</sup> and the same study was carried later in between

1989-1994<sup>(5, 6)</sup>. Both studies examined the over bite relationship in the U.S. population; the results showed that of the half the U.S. population have ideal vertical relationship of incisors. Deep bites were found in nearly 13% in adults, while open bites occurred in less than 1%.

In Nigeria, overbite values using Jackson overbite classification 1962<sup>(1)</sup> were reported by Richardson and Anna 1973<sup>(7)</sup> and Isiekwe in 1983 and 1989<sup>(8, 9)</sup>, these workers showed that normal incisal overbite in Nigerians was found in 75% and the least common over bite relation was the deep bite with prevalence of 1.5%.

In Saudi Arabia, the prevalence of malocclusion during mixed dentition period was reported by Nashashibi et al. 1983<sup>(10)</sup>. They found that the percentage of open bite was 5%, and it was more than the percentage of deep bite 2%.

Al-Emran et al. 1990<sup>(11)</sup> conducted a study on the prevalence of different malocclusion in 500 14-year-old male Saudi. They found 3.6 % had deep bite >5mm, and open bite (<-2mm) had prevalence of 3.6 % whereas, marked open bite (>-2mm) were found in 3 % of the total sample size.

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Both of the previous studies were done in the western region, (Riyadh city), and further studies in the eastern region are needed to confirm their findings

The purpose of this study is to determine the prevalence of incisors overbite values (as described by Jackson 1962 <sup>(1)</sup>) among Saudi school female students in the city of Jeddah and to compare the data with other similar studies.

## MATERIAL AND METHOD

A group of one thousand five hundred (1500) Saudi female school students, with age range (11-19 years) were randomly selected from governmental and private schools in different districts of Jeddah city. No socio-economic classification was attempted.

All students attending on the day of examination were examined. Inclusion criteria were:

1. No pervious orthodontic treatment.
2. All four (4) upper and lower incisors are present and fully erupted.
3. Saudi Arabian origin.

The method used for the study was the method described by Jackson 1962 <sup>(1)</sup>. The incisors were viewed horizontally when the posterior teeth were in occlusion, the overbite values were classified as shown in Figure 1 as follows:

Overbite = 0 If the incisal edges of the upper central incisors do not meet or overlap the lower central incisors (Open bite).

Overbite = 1 If the incisal edges of the upper central incisors meet edge to edge or overlap the incisal third of the lower central incisors (Normal bite).

Overbite = 2 If the overlap extends to the middle third of the lower central incisors (Moderate deep bite).

Overbite = 3 If the overlap extends to the cervical third or more of the lower central incisors (Extreme deep bite).

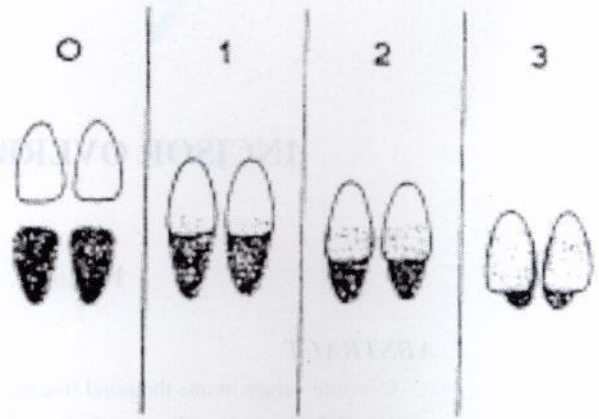


Figure 1 : Diagram representing grades of the incisal overbite

The clinical examination was carried out at the school in good daylight using disposable tongue depressors to retract the lips if needed during anterior segment examination.

Two orthodontic examiners examined all the participants; one of them is the author. Previous calibrations on the overbite indices were done before the field examination. Both inter and intra-examiner replicate examinations were done as a part of quality control analysis to assess examiner reliability utilizing interclass correlation coefficient (ICCs) and Kappa statistics <sup>(12)</sup>.

## RESULTS

The interclass correlation coefficient (ICCs) and Kappa statistics were high for all inter- and intra-examiner assessments, with ICCs ranging from 0.081 to 0.098 and Kappa statistic in the range of 0.079 to 1.00.

Figure 2 presents, the percentage distribution of overbite values among the 1500 Female students. 1049 (69.9%) of the sample had normal overbite, 265 (17.7%) had moderate deep bite, and the least common were the extreme deep bite, 95 (6.3%) and open bite, 91 (6.1%).

Cross tabulation between the overbite values and age ranges is presented in table 1. The normal bite 1 and open bite 0 were seen mostly in the age group (13-15 years), whereas moderate deep bite 2 and extreme deep bite 3, were seen in the age group (11-13 years).

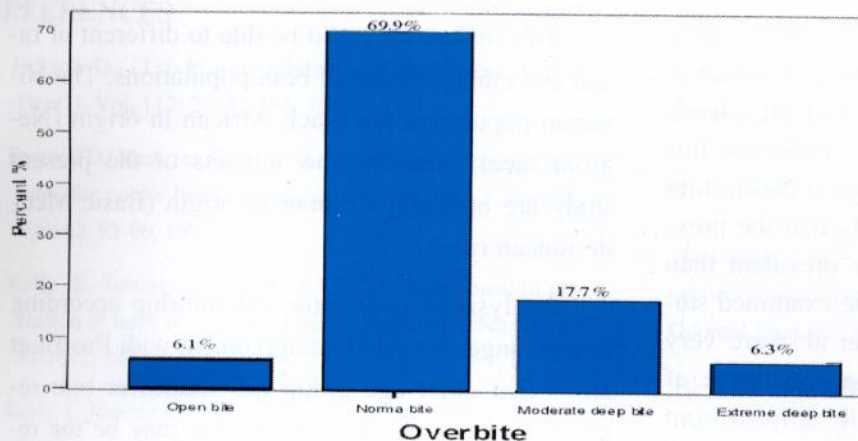


Figure 2 : Percentage distribution of overbite values in 1500 female students

Table 1 : Overbite distribution by age

Age range	Overbite relation							
	Open bite 0		Normal bite 1		Moderate deep bite 2		Extreme deep bite 3	
	n	%	n	%	n	%	n	%
11-13	26	1.7	312	20.8	104	7	35	2.3
13-15	31	2.1	346	23.1	81	5.4	29	1.9
15-17	19	1.3	245	16.3	50	3.3	19	1.3
17-19	15	1	146	9.7	30	2	12	0.8
Total	91	6.1	1049	69.9	256	17.7	95	6.3

## DISCUSSION

In the present study, analysis of a large sample of more mature permanent dentition is examined in order to obtain a clear and valid picture of the distribution of over bite patterns in the eastern region of Saudi Arabia.

Before conducting this study, both inter and intra-examiner replicate examinations were done utilizing interclass correlation coefficient (ICCs) and Kappa statistics that showed high scores indicating that reliability was very high between the two examiners.

The high incidence of normal overbite in this study is in agreement with all investigators that have done similar study (1,2,3,4,5,6,7,8,9,10,11,12)

The present study confirms the findings of Nashashibi et al. (10) and the study of Al-Emran et

al. (11) that the overbite relationship in the majority of Saudis is within the upper third of the crown of the mandibular central incisors.

Moderate and extreme deep bites were slightly more frequent in this study compared to the study of Nashashibi et al. (10) and the study of Al-Emran et al. (11). The most likely explanation is that the students in this study were older and that full eruption of front teeth had been accomplished.

The frequency of open bite in the present material was also more frequent in this study compared to the study of Nashashibi et al. (10) and the study of Al-Emran et al. (11), the most likely explanation is that the students in this study might have oral habits or genetic influences that contributed to this type of malocclusion. However, further exploration to help explain this apparent increase of open bite is needed.

In this study the prevalence of extreme deep bite (6.3%) is almost the same as the prevalence of open bite (6.1%). The same pattern of prevalence was reported by Al-Emran et al. (11). However, this observation differs from the findings of Nashashibi et al. (10) who showed in their study that the prevalence of open bite is much more prevalent than deep bite. This could be because the examined students in the study of Nashashibi et al. were very young and that the increase in the prevalence of open bite was mainly due to not fully erupted front teeth.

When comparing the results of this study with those of similar studies done in other populations, such as the United State population (3,4,5,6) and the Nigerian population (7,8,9), differences were also seen.

The over bite relationship in the U.S. population, showed that extreme deep bites is found in nearly 20% of children and 13% of adults, while open bite occurs less than 1%. This indicates that extreme deep bite is as twice as prevalent and open bite is much less prevalent, compared to the results of the present study.

This striking difference could be due to different racial and ethnic origins that forms most of the U.S. population, whereas, the subjects of the present study are of Saudi Arabians in origin (homogeneous ethnic background). Other reason that can be attributed is that some of the subjects that were examined for overbite relationship in the United State population, had orthodontic treatment, whereas in the present study all the subjects examined for the overbite relation had no pervious orthodontic treatment, which shows more relevant results of the actual overbite prevalence.

The results of over bite relationship in the Nigerian population, showed that extreme deep bites were found in nearly 1.5%, while open bites occurs in more prevalent distribution 7.4%. This indicates that open bite is more prevalent and extreme deep bite is much less prevalent, compared to the results of the present study.

This difference could be due to different of racial and ethnic origins of both populations. The Nigerian population are black African in origin (Negroid race), whereas, the subjects of the present study are of Saudi Arabian in origin (Basic Mediterranean race).

Analysis of over bite relationship according to age ranges revealed an agreement with Proffit et al. (6) that older age group has shallower bite relation than younger age group; this may be the reflection of the mixed dentition stage in the younger age subjects, where the posterior teeth are in the erupting stage. However, all subjects in the older age ranges are in permanent dentition stage and have all their posterior teeth fully erupted including the upper and the lower 2nd molars that produce a more stabilized occlusion with lesser overbite relation.

## CONCLUSION

The conclusion that can be drawn from this study is that the commonest overbite relationship in the female Saudi Arabian sample is the normal overbite. Extreme deep bite and open bite malocclusion are less prevalent but nearly of the same percentage distribution.

The present study also shows that Saudis have lesser over bite values than Caucasians and deeper overbite than black Africans.

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