PREVALENCE OF INCISORS CROWDING IN SAUDI ARABIAN FEMALE STUDENTS.

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This study was carried out to determine the prevalence of incisors crowding in Saudi Arabian female students. A group of one thousand sixty four (1064) Saudi female school students, with an age range (13-19 years) were randomly selected from governmental and private schools in different districts at Jeddah city. Clinical examinations were performed to evaluate the maxillary and mandibular incisors crowding using the method described by (little, 1975). The findings indicated that 18.6% of the students have well-aligned incisors. Incisors crowding decreases by age in the upper and the lower arches. (81.4%) of the examined sample had different degrees of incisors crowding. Mandibular incisors crowding was more prevalent than that of the maxillary.

A smalocclusion is considered to be a public health problem (*Draker, H.L., 1960 (1)*), the prevalence of occlusal anomalies, the need and demand for orthodontic treatment should be ascertained within a given community as reported by several authors (*Stephens et al., 1985 (2); Peter A. Hill., 1992 (3)*)

The prevalence of incisors crowding in class I malocclusion of 596 English children aged 11-12 years was estimated by *Haynes S., 1970 (4)*.who found that crowding was the most prevalent malocclusal defect with (80.23%).

Brunelle et al. 1996 (5), conducted a study as part of oral health survey in United States (U.S.) carried out by Public health service on the prevalence of occlusal characteristics for 7000 persons from 8 to 50 years of years between 1988 and 1991.they reported that 22%&25%of the examined in dividuals had no incisor displacement in the mandibular and maxillary arch respectively

Hill P. Al. 1992 (3), did an epidemiological investigation on 765 Glasgow schoolchildren aged 9-15 years to assess the prevalence and severity of malocclusion. He reported crowding in 68.8% however 10% needed treatment.

In Nigeria, the prevalence of incisors crowding in 617 schoolchildren (age range 10-19 years,) was reported by *Isiekwe 1983 (6)*. He found a very low prevalence of incisors crowding in Nigerians (12.9%).

In adeveloping country like Saudi Arabia, where the practice of orthodontics is limited ,studies on the prevalence of orthodontic problems and comparing it with other similar studies is essential to estimate the need for conducting practical orthodontic courses

Bryan Jones W. 1987 (7), conducted a study on 132 Saudi Arabian patients attending the orthodontic clinic at the Riyadh Armed Forces Hospital. He reported that incisors crowding was present in 67.4% of the examined sample.

Al-Emran et al. 1990 (8), conducted a study on 500 Saudi Arabian male students within the age range 13-14 years. He reported that incisors crowding was seen in 42.8%, (19.4%maxillary and 23.4% mandibular) 23.4% and Maxillary mandibular respectively

The pattern of different malocclusal features in 641 Saudi patients with age range 5-22 years, attending orthodontic treatment at the college of dentistry, King Saud University, Riyadh was examined by *Al-Balkhi and Al-Zahrani, 1994 (9)*. They found that crowding was the most common finding (49.5%) distributed mainly as anterior crowding

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

The purpose of this investigation is to determine the prevalence of incisors crowding in the maxillary and mandibular dental arches among Saudi school female students in the city of Jeddah (the Eastern Region of Saudi Arabia) and to compare the data with other similar studies.

Material and method

This investigation comprised one thousand sixty four (1064) Saudi female school students, within an age range (13-19 years). They were randomly selected from governmental and private schools in different districts of Jeddah city. Socio-economic differentiation of the sample was not attempted.

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

1. Age ranged from 13 to 19 years
2. No pervious orthodontic treatment.
3. Presence and complete eruption of all permanent teeth excluding third molars.

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4. Absence of large fillings, fractured or malformed anterior teeth.
5. No pervious history of permanent teeth extraction.
6. Saudi Arabian origin

The clinical examination was carried out at school in good daylight using disposable tongue depressors. The students were questioned about possible earlier extractions of permanent teeth and those with positive history were excluded from the study.

The scoring method of incisors crowding involves clinical examination of liner displacement (labio-lingually) of anatomic contact points of each maxillary and mandibular incisor from the adjacent tooth. Five displacements from the mesial aspect of the right canine to the mesial aspect of left canine were examined. (*Little, 1975(10)*) Figure (1).
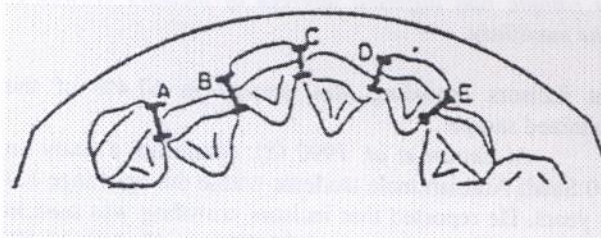

Figure 1: Measurement of incisors crowding

In the present study, the incisors were viewed occlusally, while the mouth is opened and the five labio-lingual displacements were examined to asses the presence or absence of incisors crowding (slipping of one contact is considered crowding; the degree of crowding is not included in this study).

Incisors crowding was scored as follows:

Incisors crowding in both arches = 0 labio-lingual displacements between the upper incisors and lower incisors (crowding existed in both arches)

Upper incisors crowding = 1 labio-lingual displacements between the upper incisors only, whereas the lower incisors shows no crowding

Lower incisors crowding = 2 labio-lingual displacements between the lower incisors only, whereas the upper incisors shows no crowding.

No incisors crowding = 3 No labio-lingual displacements of incisors in both arches. Any mesio-distal separation between the teeth is ignored and the score was 3 (no crowding).

Two orthodontic examiners examined all the participants; one of them is the author. Previous calibrations on the slipping of the labio-lingual contact between the incisors were done, before the field examination as a part of quality control analysis.

Results

Table (1) represents the overall percentage (%) distribution of incisors crowding among the 1064 Female students. (81.4%) of the sample had different degrees of incisors crowding. Whereas, (18.6%) of the total sample size have well aligned incisors in both arches.

Table 1. Overall frequency (n) and percentage (%) distribution of incisors crowding in 1064 Saudi Arabian female students.

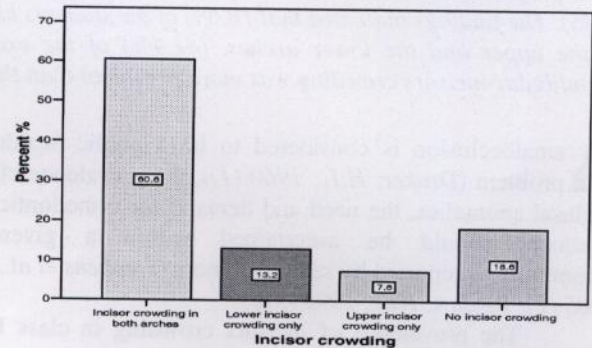| Incisors crowding	Frequency (n)	Percent (%)
Incisors crowding	866	81.4
No incisors crowding	198	18.6
Total	1064	100.0

Figure 2.presents, the Percentage (%) distribution bar chart of incisors crowding pattern in the 1064 female students.

(60.6%) of the examined students shows crowding in both arches (Bimaxillary crowding). Whereas lower incisors crowding alone was seen in (13.2%) and upper incisors crowding alone was seen in (7.6%).

Cross-tabulation in table (2) shows the incisors crowding frequency of the 1064 female Saudi Arabian students distributed according to the age ranges. The age range 17-19 years exhibits the highest frequency of well aligned incisor.

Table 2. Cross-tabulation between the overall incisors crowding frequency (n) and the age ranges in 1064 Saudi Arabian female students.

Age range (years)	Incisor crowding (n)		Total
	Incisor crowding	No incisor crowding	
13-15	339	61	400
15-17	274	53	327
17-19	253	84	337
Total	866	198	1064

Comparison clustered bar chart in figure (3) shows incisors crowding in 1064 female Saudi Arabian distributed according to their age ranges. Age range 13-15 years shows the highest frequency of incisors crowding among all of the age groups.
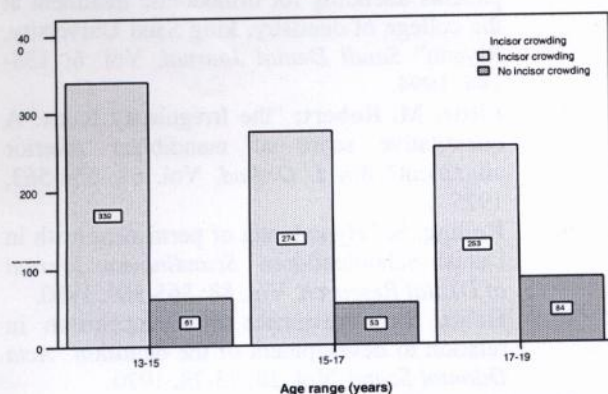

Figure 3. Comparison clustered bar chart of the incisors crowding frequency with the age ranges in 1064 Saudi Arabian female students.

Discussion

Studies concerning the prevalence and incidence of occlusal trait such as incisors crowding in young adults provided essential epidemiological data, The information obtained may be used to assess the state of dental health and form a baseline for planning future dental care programs in the society, *Rolling, 1980(11)*.

The number of patients seeking orthodontic treatment in Saudi Arabia has increased markedly during recent years. Therefore it is important to have relevant epidemiological data on different types of malocclusion in order to estimate the total need for treatment.

The method described by (*little, 1975(10)*) was used to determine the presence or absence of incisor crowding. Little, 1975, described the degree of incisor crowding using the irregularity index expressed as the total of millimeter distance from the contact point on each tooth to the contact point it should touch.

In the present study due to the large number of the examined sample, no attempts were made to measure the degree of incisors crowding (irregularity index), slipping of any of the incisor contact indicated the presence or absence of incisor crowding.

Most clinical studies investigating crowding prevalence had used slipping of the contact point between teeth as indication for crowding, *(4, 5, 6, 7, 8, 9, and 10)*.

The age range of the examined sample was (13-19 years) because at this age range all the permanent incisors are fully erupted to the level of occlusion and this was necessary in order to obtain a clear and valid picture of the prevalence and distribution pattern of incisors crowding in the presence of all of the permanent teeth.

This study shows a low incidence of well aligned incisors (18.6.4%) and high incidence of incisors crowding (80.4%), which was in agreement with other the investigators that have reported similar incidence (*Haynes S., 1970 (4) and Hill P. Al. 1992 (3) in UK, Brunelle et al. 1996 (5) in U.S. and Bryan Jones W. 1987 (7) in Saudi Arabia*).

The present study confirms the findings of *Al-Emran et al. 1990 (8)* and *Al-Balkhi & Al-Zahrani, 1994 (9)*, that the majority of Saudis have high incidence of incisors crowding in both arches. However, this study shows a higher percent (80.4%).

The explanation of this anomaly could be that in *Al-Emran et al. and Al-Balkhi et al.* studies, the crowding was considered present if there was 2mm or more dental arch insufficiency, neglecting the minor crowding that was accounted in this study. another explanation was due to the difference between the age groups in *Al-Balkhi et al.* study, they included younger Saudi Children.

The prevalence of incisors crowding in the Nigerian population done by *Isiekwe 1983 (6)*, was much less prevalent (12.9%), compared to the results of the present study (80.4%). 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). *Isiekwe,* stated that the low prevalence of incisors crowding in black Africans may be attributed to the broad arches, and favorable dento-alveolar ratio.

Bimaxillary incisors crowding was the most common type in the present study and this occurred in 60.6% in contrast to mandibular incisors crowding alone (13%) and the least was the maxillary incisors crowding alone (7.6%). this finding was in agreement with (*Haynes S., 1970 (4) and Isiekwe 1983 (6)*). However, all the investigators in this study agreed that the mandibular incisors crowding alone have higher incidence than the maxillary *(4, 5, 6, 7, 8, 9, and10)*.

In the present study, the age range 17-19 years exhibits the highest frequency of well aligned incisor and age range 13-15 years shows the highest frequency incisors crowding among all of the age groups Figure (3). The significant reduction in the percentage of students presented with incisors crowding with age have been also noticed by others *(13-15)*.

Helm 1970 (12) noticed that crowding in the anterior segment increases during development especially in the mandible. *Foster et al.1970 (13)*, demonstrated that crowding tends to increase until 13 or 14 years of age then tends to decrease until late teens.

The results of this study don't, however indicate the orthodontic treatment demand by the Saudi Arabian population is large due to inability to asses the amount of incisors crowding for all the participants. Further attempts are needed to measure the irregularity index of this study sample to estimate the extent of incisor crowding that needs orthodontic treatment.

Conclusion

The conclusion that can be drawn from this study is that the prevalence of crowding of one or more incisors was a common feature in the Saudi Arabian female students at Jeddah city. It was more common in the mandibular arch than the maxillary one and incisors crowding tend to decrease with age.

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