

Malocclusion Traits of Yemeni Female School Children

Dr Nabil Muhsen Al-Zubair,¹ Dr Aussama Almulla²

¹Assistant Professor, Department of Orthodontics, Faculty of Dentistry, Sana'a University, Yemen

²Professor of Orthodontics, Faculty of Dentistry, Baghdad University, Iraq

Correspondence: Dr Nabil Al-Zubair; email: dr.nabilzubair7@gmail.com

ABSTRACT

Objective: To provide detailed information concerning clinically relevant occlusal traits and prevalence of occlusal anomalies in orthodontically relevant period of dental development.

Materials & Method: 1501 Yemeni female school children aged 12 years were clinically examined. Overjet was measured to the nearest of 0.5 mm, and sagittal molar relationship were measured. In addition, missing permanent teeth, crowding, spacing, anterior maxillary and mandibular irregularities and anterior open bite were evaluated. Descriptive analysis was carried out to assess the frequency.

Result: 9.1% female presented with at least one missing permanent tooth. The mean overjet was 2.8 mm, an increased overjet greater than 6 mm was affecting around 4 per cent of the children. Similarly, spacing and crowding were present in 25.8% and 30.4% respectively. Anterior open bite was affected in every tenth child. Molar relations other than Class I were reported in 29.5% of the sample.

Conclusion: Wide range of orthodontically relevant occlusal traits found in the present study underlines the need for orthodontic screening of children at the age of 12 years or earlier.

Key words: occlusal anomalies, malocclusion, Yemeni female

INTRODUCTION

Gender equity is a major concern in Yemen. History shows that women have contributed major roles in Yemen. The Queen of Sheba, for instance, is a source of pride for the Yemeni nation. Present-day females however are subject to humanity that reflects mostly agricultural, tribal, and patriarchal traditions. This combined with illiteracy and economic issues have led women to be continuously deprived of their rights as the citizens. Fewer girls are registered in school compared to boys, numerous tend to be over-aged and most drop out before completing basic education. In a similar way, females are also devoid in health facilities including the orthodontic service.

Study and determination of criterion for different ethnic groups is essential to promote accurate diagnosis and treatment planning in orthodontics. Individual with malocclusion could feel problem in social contacts, may lose vocation opportunities and might feel embarrassment about their dental appearance.¹

Many studies have been conducted to determine the prevalence of malocclusion in different populations. The malocclusion can be defined as an occlusion in which there

is a malrelationship between the arches in any of the planes or in which there are anomalies in tooth position beyond the normal limits.²

The prevalence of malocclusion has been reported to vary from 11 to 93%. These variations are difficult to explain. It may depend on differences in recording approaches, ethnic origin, social class, or age of the examined subjects.³ However, diagnostic criteria are the key factors determining the prevalence of malocclusion.⁴

Numerous indices such as IOTN, DAI, and ICON have been developed to rank or score the deviation of malocclusion from the normal.^{5,6} An alternative method to the use of indices is a registration of measurable occlusal characteristics such as crowding, overjet, overbite, crossbite, and others.⁷

Yemen is a country on the Arabian Peninsula in Southwest Asia and is a part of Middle East. Currently, oral health and in particular the treatment of malocclusion is not a high priority in Yemen. However for planning purposes, valid and reliable information regarding treatment needs of oral conditions and diseases are needed. There are no previous research data on the prevalence of malocclusion of the Yemeni population. The lack of data on prevalence and severity of malocclusion in

Yemen is likely to affect the effective planning for orthodontic services. Thus the aim of this study was to determine the prevalence of individual malocclusion traits in a sample of Yemeni female school children.

MATERIALS AND METHOD

A random sample of 1501 female children aged 12-year-old was selected from schools in six randomly selected governorates in Yemen. In each governorate the same multi-stage stratified sampling technique was implemented. Permission was obtained from the general directorate of education and the regional directorate of education in the governorates. All school authorities were contacted and the aim of the study was explained to them to ensure full cooperation.

Children were examined seated in a chair with their head supported in an upright position and the examiner standing in front of the chair. Portable light was used to supplement natural daylight during examination when needed. At the end case sheets were reviewed to ensure accuracy of the recording.

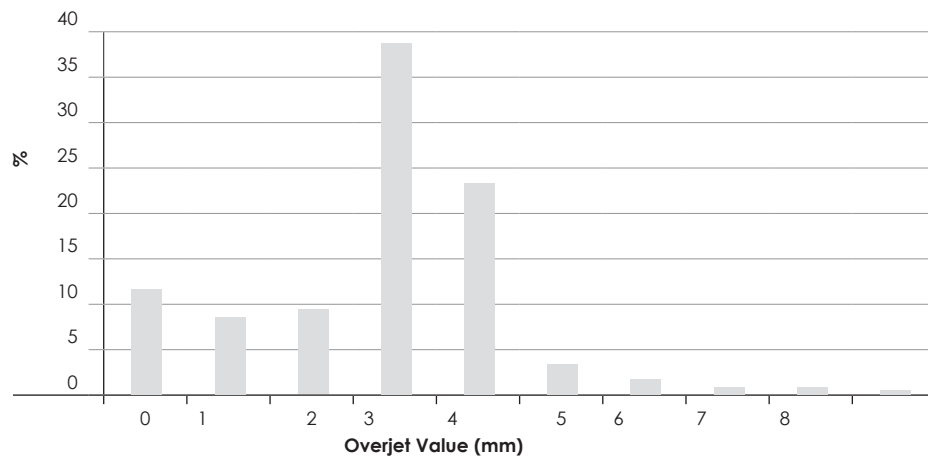
Ten malocclusion traits were recorded which included; missing permanent teeth, crowding and spacing of upper and lower arches, maxillary midline diastema, anterior maxillary and mandibular irregularities, overjet, anterior open bite and sagittal molar relationship. Data were entered to SPSS 13.0. Descriptive analysis was carried out to assess the frequency.

RESULT

The distribution of missing teeth shows about 9.1% of total sample had at least one tooth missing. The malocclusion traits recorded by this study are shown in Table 1; crowding was present in 30.4%, while spacing was recorded in 25.8% of the sample. Anterior mandibular irregularities were noticed in 42.2% sample as compared to anterior maxillary irregularities which was recorded in 37.2%; among them 7% had anterior mandibular and maxillary irregularities more than 2 mm. Increased overjet more than 3 mm was present in 30.7% of the investigated sample. Out of the total sample, 28.5% demonstrated abnormal molar relationship. The mean overjet was 2.8 mm; the distribution of total sample according to their overjet values is shown in Figure 1.

Table 1: Malocclusion traits of Yemeni female school children

Parameters		n	%
Missing teeth	>1	137	9.1
Crowding (incisal segments)	0	1045	69.2
	1	296	19.7
	2	160	10.7
Spacing (incisal segments)	0	1114	74.2
	1	278	18.5
	2	109	7.3
Midline diastema (mm)	>1	224	14.9
	>2	39	2.6
Anterior maxillary irregularity (mm)	0	938	62.5
	1-2	455	30.3
	≥3	108	7.2
Anterior mandibular irregularity (mm)	0	853	56.8
	1-2	538	35.8
	≥3	110	7.4
Maxillary overjet (mm)	0	181	12.1
	1-3	859	57.2
	>3	461	30.7
	>6	57	3.8
Open bite (mm)	>0	138	9.2
Molar relationship	Normal	1073	71.5
	One half cusp	261	17.4
	One full cusp	167	11.1

Figure 1: Distribution of total sample according to overjet values

DISCUSSION

There is no previous study regarding malocclusion in Yemeni population; thus we cannot make any comparison. However, this study will be the first data on the prevalence of malocclusion to form a database for Yemeni studies. Compared to investigations of other countries, the present subjects represent a different population in terms of geographic, social and cultural variations. Comparison with other studies is not always possible because of the differences in descriptions of the examined features, varying examination techniques and different indices. Thus comparison shall be made with the studies carried out on a similar age group using similar methodology emphasizing on the samples of Arabic populations.

The present study suggests that malocclusion in Yemeni school children can be characterized by significant dental crowding and relatively high frequency of missing teeth. In the current study, 9.1% of had one or more missing anterior teeth in either arch. Similar prevalence was observed by Shivakumar *et al.*⁸ Only one previous study reporting similar methodology could be found in the Arab literature. In the Iraqi population,⁹ the frequency of individuals presenting at least one missing tooth was lower compared to the present report. The higher frequency of missing teeth in the Yemeni school children could be a reflection of the limited access to dental care. The economic constrains could compel the people for least expensive treatment of tooth extraction to solve their dental problems. Dental crowding in at least one dental arch was reported in 19.6% of Iraqi compared to 30.4% in the present study. The slight increase in anterior arch dimension during normal development is not sufficient to overcome moderate to severe discrepancies. Crowding is therefore likely to persist in the permanent dentition, particularly if it was initially severe.¹¹

The present study reports one out of four children presented with spacing in the incisal segment. One of the characteristic

features of normal occlusion is arch continuity as expressed by proximal contact between the teeth. The prevalence of spacing in the present study was much higher than that of Al-Huwaizi⁹ among 13-year-old Iraqi sample. The reason for this difference is the criteria used for the study; as he recorded space discrepancies ≥ 2 mm. However, it was lower than that of Steigman and Weissberg¹¹ in 12-14 years old Palestinian sample and of Drummond¹² in 12-year-old South African sample.

When the diastema larger than 2 mm is taken into account, the result shows 2.6% Yemeni females presented with diastema. In the developing dentition of the age 12 years, the presence of diastema is regarded as a normal phenomenon. In the absence of a deep overbite these spaces normally close spontaneously.¹³ If the space between the maxillary central incisors is greater than 2 mm; spontaneous closure is unlikely.^{14,15}

Brunelle *et al.*¹⁶ reported that mandibular incisors possess more alignment irregularities than maxillary incisors, which coincide with the present finding, while it contradicts with other studies.^{8,9,12}

It is remarkable that, Cons *et al.*¹⁷ found no irregularities in 92% of the sample recorded, which may be because they included only irregularities of 2 mm or more as suggested by Baume *et al.*¹⁸ Using the same criteria the present study showed that, 93% had no maxillary anterior irregularities and 92% had no mandibular anterior irregularities. This finding supports the previously mentioned finding that slight increase in the anterior arch dimension during normal development is not sufficient to overcome moderate to severe discrepancies. Crowding and anterior irregularities is therefore likely to persist in the permanent dentition.¹⁵

The mean maxillary overjet of the sample was 2.8 mm, which was smaller than those found in other studies^{17,19-21} but was near to the finding of others.^{8,22} Anterior maxillary overjet

indicates an antero-posterior deviation in Class II direction.¹⁰ It was encouraging that, the increased overjet ≥ 6 mm was found only in 3.8% of the sample and it was less than the findings of other studies.^{17,21,23}

In the present study, 9.2% children presented with anterior open bite which was four-fold compared to other studies.^{8,9} This difference may be attributed to varying prevalence of oral habits like digit sucking, which have a major role in anterior open bite. In a malocclusion study of 12-13 years old Nigerian children, Otuyemi *et al*²⁴ reported 10.2% occurrence of anterior open bite in rural and urban communities.

The antero-posterior jaw relation is most often based on upper and lower permanent first molar relation. The right and the left sides were assessed with the teeth in occlusion and the

deviation from the normal relation was recorded.²⁵ When posterior occlusal relationships were compared between the two populations, molar relations other than Class I were similar in Yemeni and Iraqi school children.⁸

CONCLUSION

Among the population of Yemeni female school children; malocclusion was characterized by a relatively high frequency of missing teeth, appreciable dental crowding and a relatively high frequency of anterior open bite. The wide range of relevant occlusal traits found in the present study underlines the need for orthodontic screening of children at the age of 12 years or earlier.



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