DENTAL CROWDING IN RELATION TO BODY MASS INDEX AND DIETARY STATUS IN SCHOOL AGED CHILDREN (A CROSS-SECTIONAL STUDY)

Ahmad S. Abo Elwafa [1*] BDS, Amani M. Khalil [2] PhD, Dalia M. Talaat [3] PhD

1.   Instructor at Pediatric Dentistry Department, Faculty of Dentistry, Kafr El-Sheikh University, Egypt.1
2.   Professor of Pediatric Dentistry Department of pediatric Dentistry and dental Public Health, Faculty of Dentistry, Alexandria University, Egypt 2
3.   Professor of Pediatric Dentistry Department of pediatric Dentistry and dental Public Health, Faculty of Dentistry, Alexandria University, Egypt 3

*Ahmad S. Abo Elwafa

INTRODUCTION

There is lack of evidence about the possible etiological factors of dental crowding in school aged children. However, it is clearly understood that those factors are divided into environmental and genetic (1). Body Mass Index (BMI) and dietary habits are among those environmental factors contributing to crowding occurrence (2). This study aimed to assess the relation between BMI, dietary status, gender, and dental crowding in school aged children.

METHODOLOGY

A cross-sectional study was conducted on 74 patients attending the Department of Pediatric Dentistry and Dental Public Health Clinic. The subjects selected for the study were from Egyptian parents, from 7 to 11 years of age. They had first permanent molar in occlusion and erupted four mandibular permanent incisors in crowding. Children included in the study were free from systemic diseases, oral habits, arch asymmetry, cross bites, intellectual or physical disability and, had no premature extractions. Impressions for study casts were taken for arch length analysis by means of Moyers chart. Body Mass Index were obtained for each child from Centers for Disease Control and Prevention's online BMI calculating tool by entering each participant's age, gender, weight in Kilograms and height in centimeters (3). The daily dietary intake was estimated using 5-days diet analysis (including weekend). The collected data was compared to caloric needs and recommended daily amounts of different food groups obtained from Dietary Reference Intake (DRI) calculator for healthcare professionals (4).

RESULTS AND DISCUSSION

The results of this study showed that median maxillary arch discrepancy measurement in males was -1.75 (1.80) while in females was -2.30 (2.95) with no statistically significant difference between them (P = 0.408). While median mandibular arch measurements were -1.10 (3.25) in males and -1.20 (3.80) in females without statistically significant difference too (P = 0.812). In relation to BMI the highest median maxillary arch discrepancy was found in underweight cases even though there was no statistically significant difference between healthy, underweight, overweight, and obese children. (P = 0.401) (Table 1). Similar results were obtained by relating the BMI to the mandibular arch. (P = 0.486) (Table 2). This finding was similar to Al-Refeidi et al.(5), who found a weak correlation between BMI and spaced, closed, and crowded dentition. On the other hand, Jasim et al. (2) found a significant relation between BMI and dental crowding. Moreover, the current study's findings showed no statistically significant association between total calorie consumption and dental crowding in either the maxillary or mandibular arches (P = 0.355),(P = 0.200) respectively. While the low protein diet group had greater arch discrepancy values, it was not significantly different from the adequate protein diet group. Similarly, Thomaz et al. (6) stated that energy-protein

deficiency may hinder the growth and development of bones' face; however their results were not statistically significant.

		Mean (SD)	Median (IQR)	P value
Gender	Male	-1.82 (2.10)	-1.75 (1.80)	0.828
	Females	-1.89 (2.33)	-2.30 (2.95)	(0.408)
BMI	Healthy	-1.90 (2.19)	-2.20 (2.90)	2.942
	Underweight	-3.45 (2.45)	-2.85 (4.50)	(0.401)
	Overweight	-0.81 (2.34)	-1.25 (3.90)	
	Obese	-1.56 (0.60)	-1.50 (0.0)	
Calories	Not adequate	-1.62 (2.38)	-2.00 (2.60)	0.925
	Adequate	-2.09 (2.01)	-2.30 (2.35)	(0.355)
Proteins	Not adequate	-1.95 (.24)	-2.25 (2.92)	1.042
	Adequate	-1.59 (2.12)	-1.85 (1.35)	(0.297)
Activity	Sedentary	-1.85 (2.20)	-2.20 (2.40)	0.848
	Active	-1.85 (2.41)	-2.50 (4.35)	(0.863)

Table (1): Maxillary arch discrepancy in relation to gender, BMI, Diet and Activity

		Mean (SD)	Median (IQR)	P value
Gender	Male	-0.56 (2.60)	-1.10 (3.25)	0.238
	Females	-0.81 (2.66)	-1.20 (3.80)	(0.812)
BMI	Healthy	-0.61 (2.70)	-1.10 (3.10)	2.441
	Underweight	-2.40 (1.47)	-2.25 (2.70)	(0.486)
	Overweight	-0.58 (2.57)	-1.10 (4.82)	
	Obese	0.00 (2.31)	0.80 (0.0)	
Calories	Not adequate	-0.37 (2.61)	-0.80 (3.40)	1.282
	Adequate	-0.99 (2.62)	-1.30 (3.40)	(0.200)
Proteins	Not adequate	-0.66 (2.64)	-1.15 (3.25)	0.256
	Adequate	-0.74 (.59)	-1.20 (3.32)	(0.798)
Activity	Sedentary	-0.68 (2.65)	-1.15 (3.42)	0.811
	Active	-0.70 (2.26)	-0.15 (4.20)	(0.827)

Table (2): Mandibular arch discrepancy in relation to gender, BMI, Diet and Activity

CONCLUSION

Maxillary and mandibular arch discrepancies were more common in children who were underweight with no significant association. Additionally, people eat habits may affect these differences.

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