

STATISTICAL STUDY OF DENTAL CROWDING

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ABSTRACT

Introduction : The evolution of the dento-maxillary apparatus in today's world is quantitatively regressive and should not be regarded as an involution, representing an adaptive development to the new conditions of life and environment, and especially to the feeding. The result is a discrepancy between the tooth size and the alveolar volume, which causes malocclusions, the most frequent being those with dental crowding.

Aims : The purpose of the study is to establish on a specific group of patients the frequency of dento-alveolar disharmony with crowding according to age, gender, environment, type of dentition, tooth-maxillary anomalies and orthodontic treatment.

Material and methods: The study was performed on a group of 223 patients, the age between 6 and 45 years. over a period of 2 years, in a dental office in Brăila, patients being informed and accepting to participate in the study .

Results and discussions : The results obtained on the studied group showed that the dental crowding have a close correlation with the age and type of dentition of the patient, with the malocclusions and the local factors.

Key words : dental crowding, dentition, malocclusions

INTRODUCTION

Dento-alveolar abnormalities with crowding are anomalies with alveolar base too small for the size of the teeth, resulting in dental malpositions (rotations, ectopias)(1,2).

Dental crowding can be classified into(3):

- primary or true – with macrodontic presence (interincisive sum greater than 36 mm)
- secondary - presented in: endalveolie, isolated dental abnormalities (meziodens, ectopias, impacted teeth, rotations), or early extraction of temporary teeth with mesial migration of the posterior teeth

- tertiary - presented after the eruption of the wisdom teeth, orthodontic treatments, residual growth

- transient –presented in early eruptions of the teeth on underdeveloped arches

- combined (primary with secondary)

The pathogenesis of dental crowding includes several factors that occurs throughout the period of prenatal morphogenesis and postnatal (4).

Genetic factors occur in the appearance of dento-maxillary abnormalities (by shape and volume of teeth, by number , by eruption, position and structure of the teeth), but also in some genetic syndromes.

Cross-inheritance, characterized by the heritage of maxillary characters from one parent and the dental structures from the other parent, is at the origin of dental crowding, deep bite or bimaxillary proalveolia(3,5).

Phylogenetic factors (phylogenetic evolution) is manifested by the tendency of faster reduction of the jaws and slower of the teeth, with morphofunctional disorders of the arches and malocclusion determining the dental crowding (atavistic form)(2,6).

General factors are endocrine and metabolic diseases that can disrupt the rhythm and rate of growth of the components of the dento-maxillary apparatus (the rate of exfoliation of the temporary teeth and eruption of the definitive teeth, the rate and the speed of growth of the jaws), with the occurrence of dental crowding and delays in the development of self-regulation phenomena between tooth size and arch length and occlusion(7,8).

Dysfunctions and vicious habits cause serious direct or indirect disturbances of the dimensional and directional growth of the jaws. Thus, oral breathing, finger sucking, infantile swallowing, interposition of objects between teeth can determine dental crowding, open bite and increased overjet(9).

The local factors involved in the etiopathogenesis of dental crowding are related to the integrity and functional function of the teeth, alveolus, jaws, neuromuscular system and adaptation of environment conditions. Untreated simple and complicated dental caries causes

occlusive dysfunction, dental malpositions, dental extrusions. Teeth supranumerated erupted or impacted, the persistence of the temporary teeth on the arch can cause dental crowding(4,10).

Dental crowding are common in technologically advanced countries due to diet and eating habits. Thus, if soft and processed foods are preferred, the masticatory forces are not strong enough for the harmonious development of the jaws, resulting in a discrepancy between tooth size and arch length, with the imbrications and rotation of teeth(3,9).

MATERIAL AND METHOD

The purpose of this study is to determine on a specific group of patients the frequency of dental crowding according to age, gender, environment, type of dentition, malocclusion and treatment.

The study was performed on a group of 223 patients, male and female, the age between 6 and 45 years. over a period of 2 years, in a dental office in Brăila, patients being informed and accepting to participate in the study.

RESULTS

Of the total number of patients presented at the orthodontic private practice (223), they are represented by: 10 male patients aged between 6 - 15 years from rural area (4.5%) and 55 from urban area (24.7%), 1 patients with age between 16 - 35 years of age in rural area (0.4%), and 10 in urban areas (4.5%) and no patients over 35

years old in rural or urban area. Female patients aged between 6 and 15 years from rural area 22 (9.9%), and from urban area 87 (39%), patients aged between 16 and 35

years from rural area 2 (0.9%), and from urban area 31 (13.9%), and patients aged over 35 from rural 1 (0.4%) and urban 4 (1.8%).(table 1)

Table I Distribution of the studied group according to gender, age and environment

Gender	Age	Environment			
		Rural		Urban	
Male	6 - 15 years	10	4.5%	55	24.7%
	16 - 35 years	1	0.4%	10	4.5%
	> 35 years	0	0.0%	0	0.0%
Female	6 - 15 years	22	9.9%	87	39.0%
	16 - 35 years	2	0.9%	31	13.9%
	> 35 years	1	0.4%	4	1.8%

The distribution of the studied group according to dentition shows that patients with mixed dentition have the highest share (54.7%). One patient (0.4%) had temporary dentition, 122 mixed dentition and 100 (44.9%) permanent dentition. (figure 1).

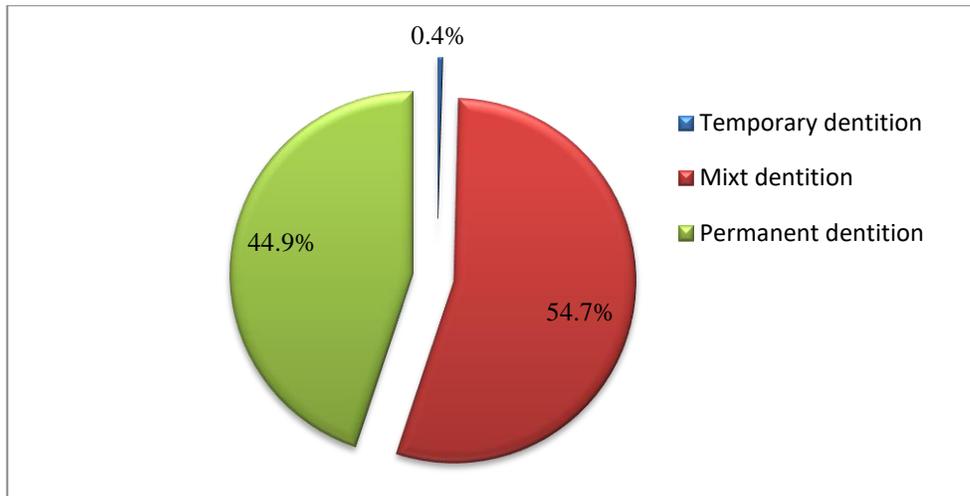


Figure 1 Distribution of the studied group according the type of dentition

Regarding the occlusal reports of the patients of the studied group it is observed that:
 - 136 with neutral occlusion; - 17 with open bite;
 - 21 with deep bite; - 15 with corss bite;

- 21 with overjet; - 13 with scissors bite (figure 2)

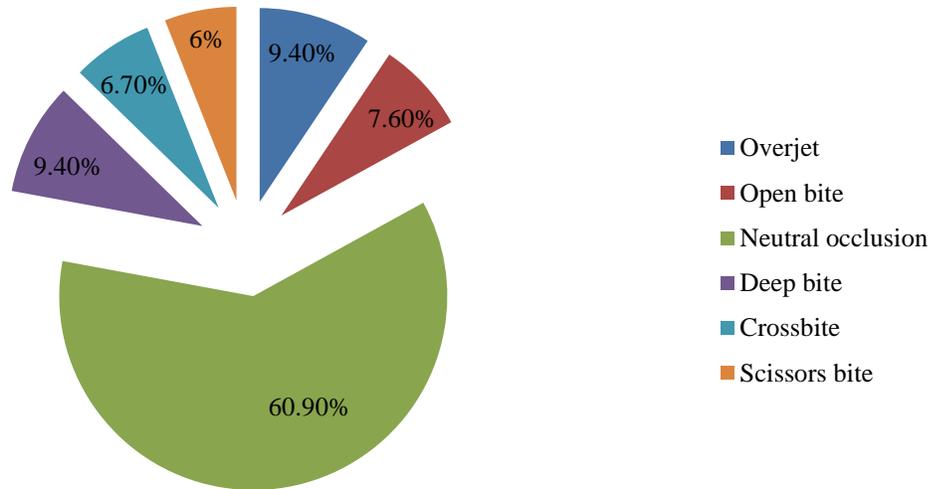


Figure 2 Distribution regarding occlusion

The study showed that 74% of the patients present dental crowding, of which 147 patients had anterior crowding and only 18 patients had posterior crowding. (figure 3 and 4).

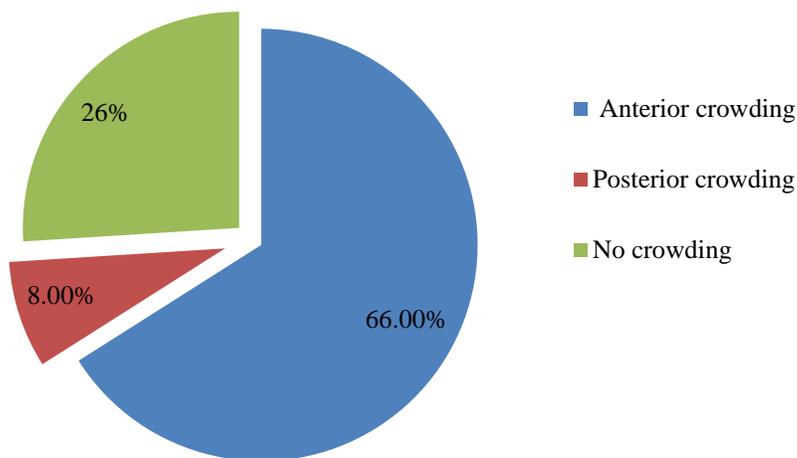


Figure 3 Distribution regarding the regions of dental crowding

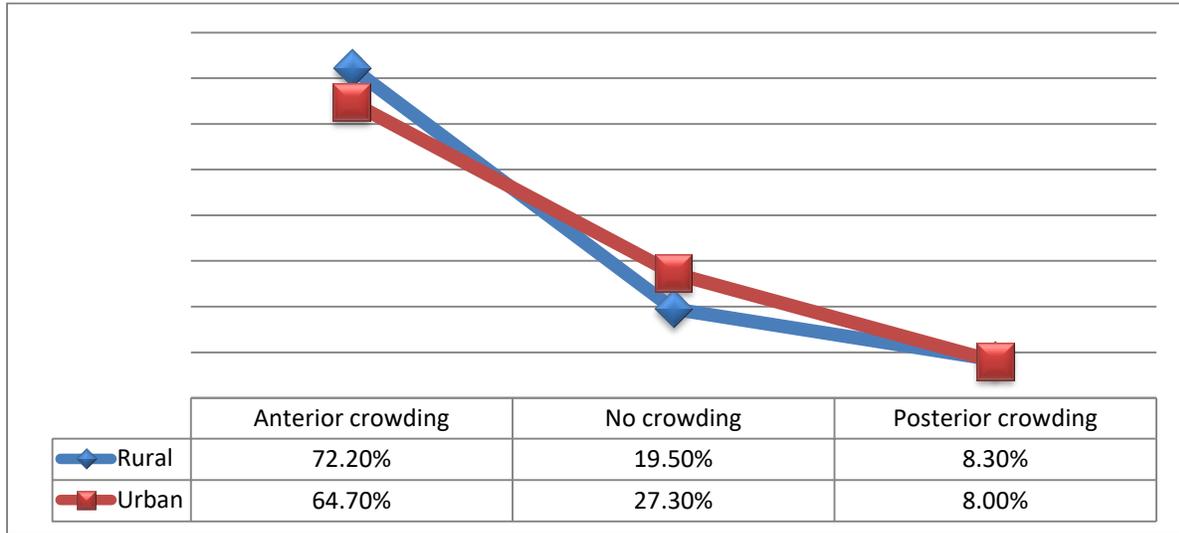


Figure 4 The correlation between the type of dental crowding and the environment

Table II and figure 5 shows the distribution of the study group according to gender, age and the areas of dental crowding : - 41 male patients, age 6 to 15 years with anterior crowding (18.4%), 5 male patients between 15 and 35 years of age with anterior crowding (2.2%) and 4 with posterior crowding (1.8%)

- 71 female patients between the ages of 6 and 15 years with anterior crowding (31.8%), and 11 with posterior crowding (4.9%), 26 female with the age between 16 and 35 years with anterior crowding (11.7%), 2 with posterior crowding (0.9%) and 4 female patients over 35 years old with anterior crowding (1.8%)

Table II Distribution of the studied group according to gender, age and dental crowding

Gender	Age	Crowding					
		Anterior crowding		No crowding		Posterior crowding	
Male	6 - 15 years	41	18.4%	23	10.3%	1	0.4%
	16 - 35 years	5	2.2%	2	0.9%	4	1.8%
	> 35 years	0	0.0%	0	0.0%	0	0.0%
Female	6 - 15 years	71	31.8%	27	12.1%	11	4.9%
	16 - 35 years	26	11.7%	5	2.2%	2	0.9%
	> 35 years	4	1.8%	1	0.4%	0	0.0%

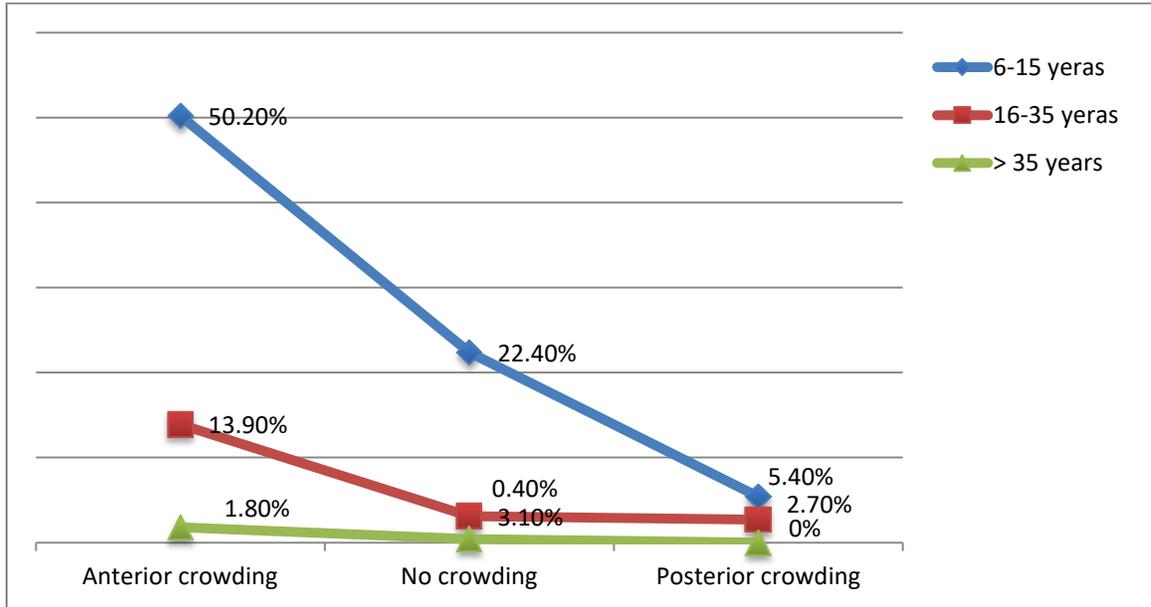


Figure 5 The correlation between dental crowding and age

On the studied group 11 patients had anterior crowding and overjet (4.9%), 10 patients with over bite (4.5%), 91 had normal occlusion (40.8%), 17 with deep bite (7.6%), 8 patients had cross bite (3.6%), 10 with scissors bite (4.5%), and 2

with posterior crowding and overjet(0.9%), 15 with neutral occlusion and posterior crowding (6.7%) and 1 patient with cross bite and posterior crowding (0.4%). (figure 6).

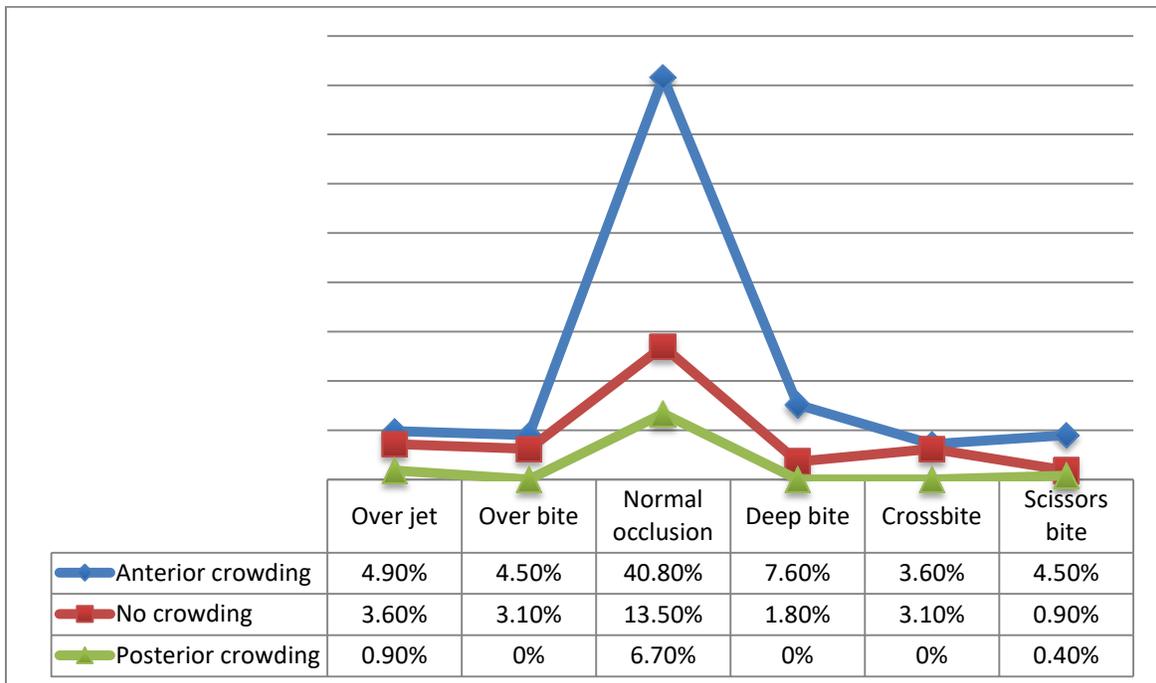


Figure 6 The correlation between dental crowding and occlusion

The study showed the prevalence of anterior dental crowding to the patients with mixed dentition - 79 patients (35,4%) and

68 patients with permanent dentition and anterior dental crowding (30,5%) (figure 7).

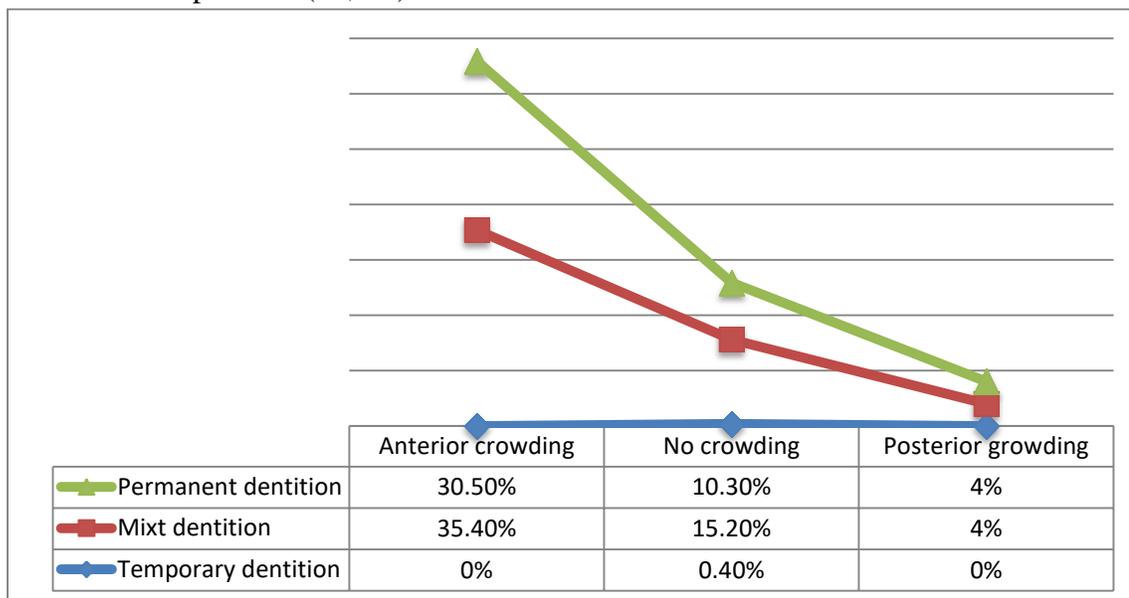


Figure 7 The distribution of the studied group according to dental crowding and type of dentition

The anterior dental crowding is found in a proportion of 46.2% in the patients with Class 1 Angle (31 male and 72 female) (table III).

Table III Distribution of the studied group by gender, Angle classification and dental crowding

Gender	Angle Classification	Crowding					
		Anterior crowding		No crowding		Posterior crowding	
Male	Class I Angle	31	13.9%	12	5.4%	2	0.9%
	Class II Angle	12	5.4%	9	4.0%	2	0.9%
	Class III Angle	3	1.3%	4	1.8%	1	0.4%
Female	Class I Angle	72	32.3%	24	10.8%	7	3.1%
	Class II Angle	26	11.7%	6	2.7%	6	2.7%
	Class III Angle	3	1.3%	3	1.3%	0	0.0%

Of the total number of patients who presented to the orthodontic private office 41 patients needed treatment with a fixed appliances and 41 also needed dental extraction for anterior dental crowding (18.4%) and 12 with posterior crowding (5.4%); 82 patients with anterior dental

crowding (36.8%) and 6 with posterior crowding (2.7%). Patients who had a removable orthodontic device and who needed extractions, with anterior crowding are 4 (1.8%) and patients who did not need dental extractions and had anterior dental crowding are 20 (9%). (Figure 8)

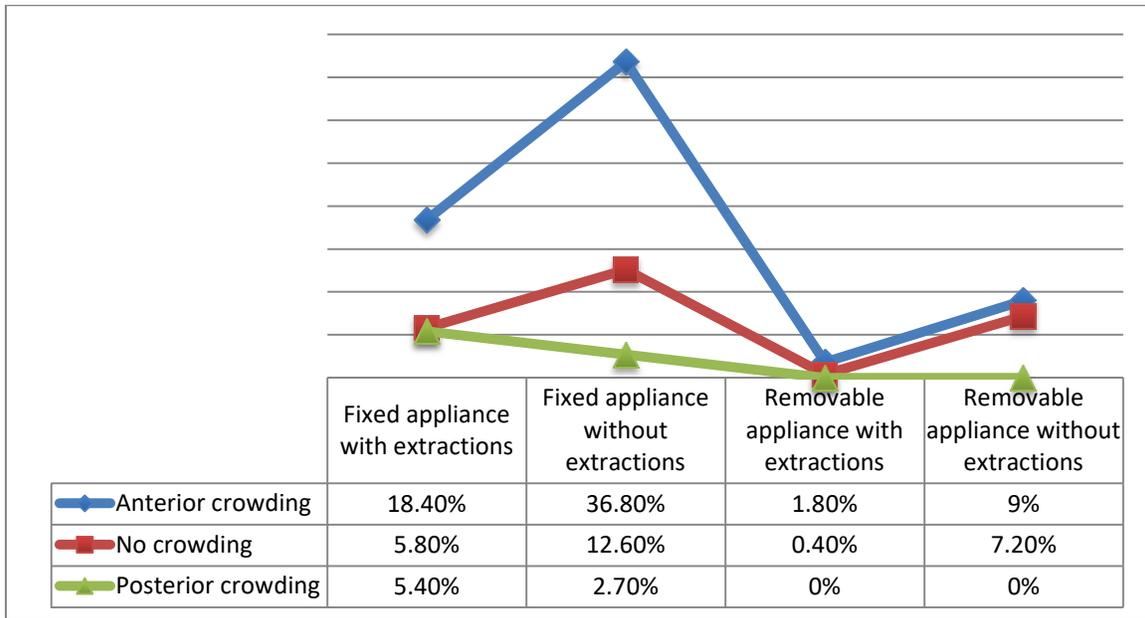


Figure 8 Distribution of the studied group according to the orthodontic treatment, the need for extraction of teeth and dental crowding

DISCUSSION

The results of this study suggest the increased addressability of patients to orthodontics due to dento-maxillary anomalies with crowding. The frequency of dental crowding according to parameters followed in the study are: female gender between 6-15 years, from urban environment, with mixed dentition and anterior dental crowding, neutral occlusion (class I Angle), treated with fixed appliances without dental extractions.

Dental crowding, especially in the frontal area, are a common cause which patients require consultation and orthodontic treatment. Dental crowding is evident both in the mixed dentition (when replacing the incisors with the permanent ones) and in the definitive one (the ectopic eruption of the definitive canines, the eruption of the third molars, which can cause the crowding of the incisors)(9).

Depending on the space required for dental alignment, the pattern of mandibular growth, and the dento-facial morphology of each patient, the treatment of dental

crowding can be with or without dental extraction(10).

CONCLUSIONS

The results of this study suggest further investigation regarding associated factors which contribute of dental crowding and the

clinical importance in the treatment planning of dental crowding. Dental crowding are sometimes a challenge for the orthodontist regarding the timely and correct diagnosis of this disharmony, the decision of the moment of the orthodontic intervention and the choice of the appropriate treatment in order to obtain good and stable results in time.

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