Original Paper

Evaluation of the Incidence of Different Types of Malocclusions in Patients with Early Loss of Temporary Teeth

RALUCA ULEANU-BICIUȘCĂ[1], DORIANA AGOP FORNA[2], DANIEL CIOLOCA[3], ALINA ADUMITROAIE[4], VASILICA TOMA[5]

[1]PhD Student, Faculty of Dental Medicine, "Grigore T. Popa" University of Medicine and Pharmacy, Iasi, Romania

[2]Department of Oral and Maxillofacial Surgery, Faculty of Dental Medicine, "Grigore T. Popa", University of Medicine and Pharmacy, Iasi, Romania

[3]Department of Preventive Dentistry Faculty of Dental Medicine, "Grigore T. Popa" University of Medicine and Pharmacy, Iasi, Romania

[4,5]Department of Pedodontics, Faculty of Dental Medicine, "Grigore T. Popa" University of Medicine and Pharmacy, Iasi, Romania

ABSTRACT: The aim of the study is to identify the dental somato-facial anomalies in young patients with early loss of temporary teeth, with the identification of crowding and other present clinical entities. The study was carried out on a working batch of 635 subjects who referred to the Pediatric Dentistry Clinic in Iasi and the private dental practice for various dental treatments, without any obvious dysfunctional subjective symptomatology. Out of 635 subjects,254were female (40%) and 381 male patients (60%), distributed in the rural area (n=157; 24.7%) and urban area (n=478; 75.3%). By applying the selection criteria, the aim was to avoid issues of differential diagnosis with other disorders of the orofacial system. The mean age of the girls in the group was 8.26±1.840 years and the mean age of the boys was 8.77±1.856 years; the mean age of the rural children was 8.88±1.962 years, with an average of 8.46±1.823 years for the urban children. Dental malocclusions represent complex clinical entity, capable of producing functional, aesthetic and psychological disharmonies. Malocclusions can be caused by a combination of factors, in which the early loss of temporary teeth, the frequency of vicious habits, without excluding genetic determinism, are particularly important. The disorders that occur in the case of malocclusion may be aesthetic, masticatory, speech impairments, temporomandibular joint dysfunctions and social integration disorders.

KEYWORDS: *Malocclusion, prevalence, correlations, early loss of temporary teeth.*

Introduction

The health status regarding the dento-maxillary apparatus implies the morpho-functional integrity and the harmonious, proportional development of all its components, so that the ratios between the teeth, the arches and the jaws are within the limits of phylogenetic variables, and their functioning is coordinated and automated by an integral regulation system, which stimulates the consolidation of the structures [1,2].

Being aware of the normal status, one can detect a dento-maxillary anomaly, manifested by morphologic changes (dental, alveolar or maxillary disharmony) and by neuro-muscular, occlusal and bio-psycho-social functional disorders [3,4].

The steady-state of evolving dental occlusion is dependent on the time, sequence and mesial component of eruption of each dental type, the optimal ratio of tooth size to available space and facial growth pattern, and the balanced activity of functional matrices [5,6].

The occlusion characterized by at least one altered ratio will be defined as "malocclusion", listing the altered ratios in the three directional orders (sagittal, transversal and vertical) in which it was examined [7,8].

Signs of an evolution of the dental occlusion towards imbalance can be noticed at birth, during the temporary dentition and the development of mixed dentition [9,10].

It is important to note that genetic factors play a significant role in determining anomalies related to tooth number, agenesis, dental crown shape, cusp count, root shape, tooth size, taurodontism, and certain craniofacial features such as prognathism, mandibular and maxillary retrognathism, and dento-alveolar disharmony.

However, when it comes to the shape of the dental arch, proalveoly, tipping, or rotations, the influence of genetics is less defined.

One of the key complications of early loss of temporary teeth is the movement of neighboring teeth into the edentulous space, which can reduce the area available for the eruption of permanent teeth.

10.12865/CHSJ.51.01.13

Additionally, the migration of remaining teeth leads to a shortening of the dental arch, which may cause delayed or accelerated eruption of permanent teeth.

Other issues include the shifting of the inter-incisal line toward the edentulous side, over-eruption of antagonist teeth into the empty space, the development of abnormal habits such as tongue thrusting that may worsen future dental issues, as well as disturbances in chewing and speech.

These factors can also lead to aesthetic and emotional concerns [11,12].

Premature loss of temporary teeth can have important implications in the etiology of malocclusion, their absence triggering a series of cascade events with important effect on occlusal relations.

Premature loss of deciduous teeth can lead to premature eruption of permanent teeth, the first molar having a particular clinical importance, by their role in decisively influencing the final occlusion [13,14].

Early loss of temporary teeth occurs in 4.3-42.6% of patients, most frequently in temporary molars (11-60.36%).

Early loss of frontal teeth is relatively inconsequential. In first molars space reduction occurs in the first 4-6 months after extraction, with 1.5mm in the mandible and 1mm in the maxilla.

The loss of lateral teeth, canines and especially second molars, has significant consequences in terms of frequency and severity: deficits in the development of the arches and maxillary bones, disruption of the sequence and timing of permanent teeth eruption, the development of vicious habits, disturbance of the dento-maxillary functions and the psycho-somatic and psychological development [15,16].

The consequences of early loss of the first permanent molar are: displacement of the adjacent teeth in the sagittal plane (more marked in the maxilla, for teeth distal to the gap, translational type for early extractions and of inclination type for late extractions) and vertical (extrusion/egression), with the appearance of disorders in static and dynamic occlusion [17,18].

The predisposing factors involved in the development of dental maxillary anomalies are pathophysiologic, psychological, or structural processes capable of sufficiently altering the orofacial system in order to trigger a dysfunctional myogenic or arthrogenic entity of the orofacial system [19-21].

The **aim** of the study was to identify dental somato-facial anomalies in patients with early loss of temporary teeth and to identify the correlative association between them and other present clinical entities.

Materials and Method

The study was conducted on a sample of children who presented to the Pediatric Dentistry Clinic in Iași and a private dental office, between 15.01.2024 and 28.02.2025, for various treatments, without evident functional complaints.

The research protocol was approved by the Ethics Committee of the "Grigore T. Popa" University of Medicine and Pharmacy (approval no. 17/10.01.2024).

Informed consent was obtained from each child's parent or legal guardian prior to participation.

Inclusion criteria:

-Age between 6 and 12 years;

-Presence of primary or mixed dentition;

-Absence of acute oro-facial dysfunction symptoms;

-Informed consent obtained from parents/guardians;

-Availability for clinical examination and completion of socio-demographic data.

Exclusion criteria:

-Congenital craniofacial malformations;

-Associated genetic syndromes;

-Previous orthodontic treatment;

-History of maxillofacial trauma;

-Neurological disorders or severe developmental delay.

Assessed parameters:

-Demographic data: sex, age, living environment (rural/urban);

-Socio-economic background: parental education level, family type (two-parent/single-parent);

-Clinical examination: arch integrity, occlusal plane, dental migrations, Angle classification of anomalies, crowding/spacing, lateral deviation, premature loss of primary teeth;

-Oro-dento-facial dysfunctions (ODF): mastication, speech, breathing, tongue posture.

Each child underwent standardized clinical examination by qualified personnel.

Malocclusion classification followed the Angle system, and premature loss of primary teeth was recorded per arch.

 10.12865/CHSJ.51.01.13

Statistical analysis was performed using SPSS v29.0.

Qualitative variables (gender, environment, family type, parental education, Angle classes, ODF) were presented as frequencies and percentages; quantitative data (age) as mean±standard deviation.

The following statistical tests were used:

-Chi-square test for associations between qualitative variables;

-Mann-Whitney U test for comparing quantitative data between groups;

-Kolmogorov-Smirnov test for normality assessment.

A p-value ≤0.05 was considered statistically significant, and p≤0.01 was considered highly significant.

Results

Out of 635 subjects included in our study, 254 were female patients (40%) and 381 male patients (60%), 157 patients from rural area (24.7%) and 478 patients from urban area (75.3%), with age between 6-12 years.

The detailed demographic features of the studied sample are specified in Table 1.

By applying the selection criteria, we aimed to avoid problems of differential diagnosis with other disorders of the orofacial system.

Table 1. The group's general demographic features.

		Total n (%)
Gender	male	381 (60.0)
	female	254 (40.0)
Environment	rural	157 (24.7)
	urban	478 (75.3)
Age	6-8 years	219 (34.5)
	9-10 years	222 (35.0)
	11-12 years	194 (30.6)
Age: m±SD		8.57±1.865
Total		635 (100.0)

Statistically significant differences between genders in what concerns their distribution on environments have been registered: most of the boys are coming from urban areas (89.2%), while the girls are almost proportionally distributed among the two environments-45.7% of them come from rural areas and 54.3% of them from urban areas.

The boys included in our study group were slightly older than the girls (the difference being anyway statistically significant), with a higher percentage of boys aged between 9-10 years (38.3%) compared to the corresponding percentage of girls (29.9%), as well as a higher proportion of boys with age between 11-12 years (32.3%) compared to girls (28.0%) Table 2.

The chronological age limits are between 6-12 years old.

It must be noted that the age stages were not randomly chosen, on the contrary we focused on these age stages given their systemic integrative relevance:

-psycho-ontogenetic (6 years old representing the beginning of the third period of childhood, implicitly the continuation of the child's community socialization as well as the psycho-mental, emotional and intellectual particularization of this age stage)

-10-12 years characterized by psycho-emotional and behavioral particularization, implicitly the structuring in part of the child's personality with specific elements of the prepubertal period.

Table 2. Demographic features of the sample: comparative study on genders.

		Male n (%)	Female n (%)	p-value
Environment	rural	41 (10.8)	116 (45.7)	< 0.001†**
	urban	340 (89.2)	138 (54.3)	
Age	6-8 years	112 (29.4)	107 (42.1)	0.003†**
	9-10 years	146 (38.3)	76 (29.9)	
	11-12 years	123 (32.3)	71 (28.0)	
Age: m±SD		8.77±1.865	8.26±1.840	0.001‡**
Total		381 (100.0)	254 (100.0)	

† Pearson Chi-squared test; ‡ Mann-Whitney test;
p≤0.05* statistically significant;
p≤0.01** statistically highly significant

It is also to be noted that the patients' age presents statistically significant differences between the urban and rural areas as well (Table 3) the children from rural areas being significantly older than those from urban locations.

Table 3. Patients' age: comparative study on environments.

		Rural n (%)	Urban n (%)	p-value
Age	6-8 years	39 (24.8)	180 (37.7)	0.013†*
	9-10 years	62 (39.5)	160 (33.5)	
	11-12 years	56 (35.7)	138 (28.9)	
Age: m±SD		8.88±1.962	8.46±1.823	0.033‡*
Total		157 (100.0)	478 (100.0)	

† Pearson Chi-squared test; ‡ Mann-Whitney test;
p≤0.05* statistically significant;
p≤0.01** statistically highly significant

We recorded in our sample the presence of oro-dental-facial (ODF) dysfunction, globally and comparatively on genders, environments and ages (Table 4).

Out of the total number of subjects, the ODF dysfunctions were recorded in 473 cases (74.5%).

Among the patients without ODF dysfunctions, 63.0% are boys, compared to 59.0% boys among the patients with ODF impairment-difference which is not statistically significant.

Also, among the patients without ODF dysfunctions 85.2% live in urban areas, comparatively with 71.9% of the patients with ODF dysfunction, being thus statistically highly significant.

The average ages of the children with and without ODF dysfunctions are quite close and without statistically significant differences between them.

Among the children without ODF dysfunctions 59.3% have ages between 6-8 years, 20.4% have ages between 9-10 years and 11-12 years respectively, while among the children with ODF dysfunctions only 50.2% have ages between 6-8 years, 29.0% have ages between 9-10 years and 20.9% have ages between 11-12 years.

Therefore, even if we did not identify statistically significant differences, we can conclude that the ODF dysfunctions were met more frequently in case of children with young ages, between 6-8 or 9-10 years.

Table 4. ODF dysfunctions: comparative study on main demographic features.

		Absent n (%)	Present n (%)	p-value
Gender	Male	102 (63.0)	279 (59.0)	0.372†
	Female	60 (37.0)	194 (41.0)	
Environment	Rural	24 (14.8)	133 (28.1)	<0.001†**
	Urban	138 (85.2)	340 (71.9)	
Age: m±SD		8.50±1.849	8.59±1.872	0.555‡
6-8 ys group	6 years	21 (13.0)	78 (16.5)	0.082†
	7 years	36 (22.2)	84 (17.8)	
	8 years	39 (24.1)	75 (15.9)	
9-10 ys group	9 years	21 (13.0)	87 (18.4)	
	10 years	12 (7.4)	50 (10.6)	
11-12 ys group	11 years	18 (11.1)	64 (13.5)	
	12 years	15 (9.3)	35 (7.4)	
Total		162 (100.0)	473 (100.0)	

† Pearson Chi-squared test; ‡ Mann-Whitney test; p≤0.05* statistically significant; p≤0.01** statistically highly significant

It is also relevant to refine the study of ODF dysfunction incidence on environments as well as genders (Table 5).

As expected, we did not find statistically significant differences between the distribution on genders of children with and without ODF nor in the case of children from rural environment, nor in the case of children from urban environment, analyzed separately.

Table 5. ODF dysfunctions: comparative study on environments and genders.

		Absent n (%)	Present n (%)	p-value†
RURAL environment (n=157)				
Gender	Male	6 (25.0)	35 (26.3)	0.892
	Female	18 (75.0)	98 (73.7)	
	Total	24 (100.0)	133 (100.0)	
URBAN environment (n=478)				
Gender	Male	92 (66.7)	248 (72.9)	0.170
	Female	46 (33.3)	92 (27.1)	
	Total	138 (100.0)	340 (100.0)	

† Pearson Chi-squared test

When recording a few elements concerning the children's socio-economic and cultural background, we could notice a heterogeneous aspect with a predominance of two-parent families (78.4%-Figure 1), an average of parents' educational level (Figure 2), an average and sub-medium socio-economic level and an intra-familial communication of the child mainly with the mother or grandparents.

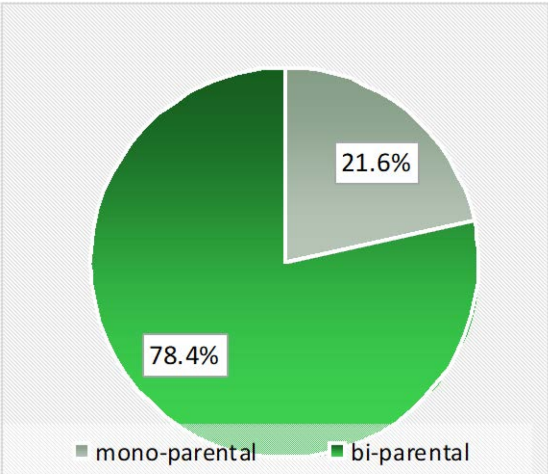

Figure 1. Sample's distribution on types of family.

10.12865/CHSJ.51.01.13

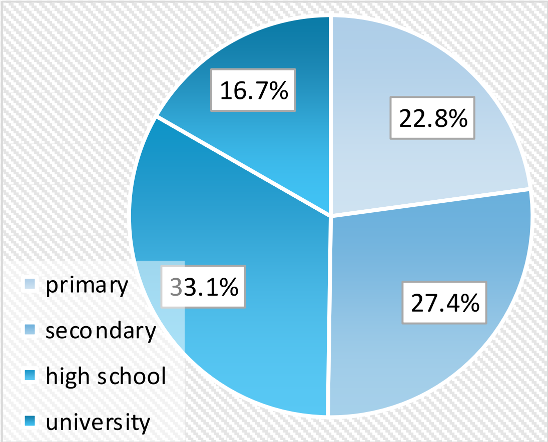

Figure 2. Sample's distribution on parents' study levels.

Regarding the anomaly types met in the study group, most cases belong to the Angle Class II (58.4%); the Angle Class III was only identified in isolated cases (4.7%), the rest of cases belonging to the Angle Class I (36.8%)-Figure 3.

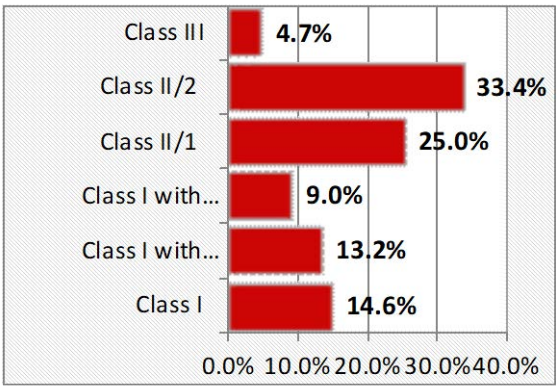

Figure 3. Sample's distribution on anomaly types(according to the Angle classification).

The average age of children with Angle Class I anomalies is 8.56±1.959 ys old; it grows slightly in case of Angle Class I anomalies with crowding (9.19±1.954 ys old), as well as in case of Angle Class I anomalies with spacing (8.74±1.598 ys old).

The children recording Class II/1 anomalies are the youngest (with an average age of 7.98±1.854 ys old), while the age grows slightly again for children with Angle Class II/2 anomalies (8.76±1.793 ys old) and Angle Class II anomalies (8.23±1.569 ys old).

We studied the distribution of reported anomalies comparatively by demographic features, the results being presented in tables VI-XI.

We did not find statistically significant differences between genders, even if we can notice that the Angle Class II/1 anomalies are somewhat more frequent among boys (27.6%) compared to girls (21.3%); in the case of girls the Angle Class I anomalies (16.5%) and the Angle Class I anomalies with crowding(14.2%) are slightly more frequent (Table 6).

Table 6. Types of anomalies (Angle classification): comparative study on genders.

	Male n (%)	Female n (%)	p-value†
Class I	51 (13.4)	42 (16.5)	0.569
Class I with crowding	48 (12.6)	36 (14.2)	
Class I with spacing	33 (8.7)	24 (9.4)	
Class II/1	105 (27.6)	54 (21.3)	
Class II/2	126 (33.1)	86 (33.9)	
Class III	18 (4.7)	12 (4.7)	
Total	381 (100.0)	254 (100.0)	

† Pearson Chi-squared test

The comparative study on environments also did not reveal statistically significant differences.

The facts to be noticed are that among the patients from rural environment, as the Class I anomalies with crowding are slightly more frequent (17.2%), as well as Class II/2 anomalies (35.0%); among the patients from urban environment the Class I anomalies are also somewhat more frequent (15.1%), as well as Class II/1 anomalies (25.7%) and Class III anomalies (5.6%) Table 7.

Table 7. Types of anomalies (Angle classification): comparative study on environments.

	Rural n (%)	Urban n (%)	p-value†
Class I	21 (13.4)	72 (15.1)	0.233
Class I with crowding	27 (17.2)	57 (11.9)	
Class I with spacing	15 (9.6)	42 (8.8)	
Class II/1	36 (22.9)	123 (25.7)	
Class II/2	55 (35.0)	157 (32.8)	
Class III	3 (1.9)	27 (5.6)	
Total	157 (100.0)	478 (100.0)	

† Pearson Chi-squared test

The comparative study on environments and genders also did not reveal statistically significant differences between the children's distribution on types of anomalies (Table 8).

We can notice, though, that in the case of children from rural areas, among girls a higher percentage of Class I anomalies with spacing is recorded (11.2%), compared to the similar percentage reported among boys (4.9%);

moreover, among girls there are no cases with Class III anomalies. In the case of children from urban areas, among girls a higher percentage of Class III anomalies is recorded (10.1%) compared to the similar percentage reported among boys (3.8%); another difference is noticed for the Class II/1 anomalies, which are more frequent among boys (27.1%) than among girls (22.5%).

Table 8. Types of anomalies(Angle classification): comparative study on environments and genders.

	Rural (n=157)		Urban (n=478)	
	Male (n=41)	Female (n=116)	Male (n=340)	Female (n=138)
	p=0.078†		p=0.080†	
Class I	5 (12.2)	1 (13.8)	51 (15.0)	21 (15.2)
Class I with crowding	7 (17.1)	20 (17.2)	38 (11.2)	19 (13.8)
Class I with spacing	2 (4.9)	13 (11.2)	33 (9.7)	9 (6.5)
Class II/1	10 (24.4)	26 (22.4)	92 (27.1)	31 (22.5)
Class II/2	14 (34.1)	41 (35.3)	115 (33.8)	42 (30.4)
Class III	3 (7.3)	-	13 (3.8)	14 (10.1)

† Pearson Chi-squared test

Nevertheless, the comparative study on family types reveals statistically significant differences.

In case of children from mono-parental families, Class I anomalies are more frequent (20.4%), while in the case of children from bi-parental families, Class II/1 (26.3%) and Class II/2 (35.7%) anomalies are more prevalent Table 9.

Table 9. Types of anomalies (Angle classification): comparative study on family types.

	Mono-parental n (%)	Bi-parental n (%)	p-value†
Class I	28 (20.4)	65 (13.1)	0.012*
Class I with crowding	21 (15.3)	63 (12.7)	
Class I with spacing	15 (10.9)	42 (8.4)	
Class II/1	28 (20.4)	131 (26.3)	
Class II/2	34 (24.8)	178 (35.7)	
Class III	11 (8.0)	19 (3.8)	
Total	137 (100.0)	498 (100.0)	

† Pearson Chi-squared test; p ≤ 0.05* statistically significant

Parents' educational attainment was also investigated through our research, the comparative study of their educational level revealing statistically significant differences.

Thus, the most prominent Class I anomalies are met among the children from parents with university studies (21.7%); similarly, the most frequent Class I anomalies with crowding are met among the children from parents with primary studies (20.0%); the Class I anomalies with spacing are met in close percentages regardless of the parents' educational level; the most frequent Class II/1 anomalies are seen among the children from parents with secondary studies (32.2%); the most frequent Class II/2 anomalies are also recorded among the children from parents with secondary studies (39.1%), as well as among children from parents with high school (40.0%), and the most frequent Class III anomalies are met again among the children from parents with higher educational level-university studies (12.3%) Table 10.

Table 10. Types of anomalies(Angle classification): comparative analysis on parents' study levels.

	Primary n (%)	Secondary n (%)	High school n (%)	University n (%)	p-value†
Class I	26 (17.9)	16 (9.2)	28 (13.3)	23 (21.7)	<0.001**
Class I with crowding	29 (20.0)	19 (10.9)	22 (10.5)	14 (13.2)	
Class I with spacing	17 (11.7)	10 (5.7)	17 (8.1)	13 (12.3)	
Class II/1	31 (21.4)	56 (32.2)	50 (23.8)	22 (20.8)	
Class II/2	39 (26.9)	68 (39.1)	84 (40.0)	21 (19.8)	
Class III	3 (2.1)	5 (2.9)	9 (4.3)	13 (12.3)	
Total	145 (100.0)	174 (100.0)	210 (100.0)	106 (100.0)	

† Pearson Chi-squared test; p ≤ 0.01* statistically highly significant

10.12865/CHSJ.51.01.13

In the case of children without ODF dysfunctions the most frequent anomalies are Class I (22.2%) and Class II/2 (37.0%), while in the case of children with ODF dysfunctions the most frequent anomalies are Class II/1 (30.4%) and Class II/2 (32.1%)-difference which is again statistically highly significant (Table 11).

Table 11. Types of anomalies (Angle classification): comparative study on ODF dysfunction's presence.

	ODF dysfunction		
	Absent n (%)	Present n (%)	p-value†
Class I	36 (22.2)	57 (12.1)	<0.001**
Class I with crowding	9 (5.6)	75 (15.9)	
Class I with spacing	27 (16.7)	30 (6.3)	
Class II/1	15 (9.3)	144 (30.4)	
Class II/2	60 (37.0)	152 (32.1)	
Class III	15 (9.3)	15 (3.2)	
Total	162 (100.0)	473 (100.0)	

† Pearson Chi-squared test;
p ≤ 0.01* statistically highly significant

Discussions

Dental malocclusions are complex clinical entities that may result in functional, aesthetic, and psychological disturbances.

They generally represent deviations from normal growth and development and are influenced by a variety of prenatal and postnatal factors.

While genetic predisposition significantly affects prenatal development, postnatal anomalies are heavily influenced by environmental and socio-economic conditions.

The primary objective of this study was to assess the prevalence of malocclusions in children with early loss of primary teeth and to analyze correlations with socio-demographic factors.

Our results revealed a high prevalence (74.5%) of oro-dento-facial (ODF) dysfunctions, with Class II/2 and Class II/1 anomalies being the most frequent.

Our findings are consistent with those reported by De Ridder et al. (2022), who observed a malocclusion prevalence of 71% in children and adolescents, highlighting a similar widespread nature of these anomalies [22].

Göranson et al. (2023) found that malocclusions were associated with a significant reduction in adolescents' quality of life, supporting our results that identified both psychological and social implications among children with ODF dysfunctions [23].

Wang et al. (2021) emphasized the role of bad oral habits in the development of malocclusions and caries, aligning with our data linking crowding and spacing issues with the presence of ODF dysfunctions [24].

Our study also found no statistically significant gender differences in malocclusion distribution, with a male-to-female ratio of 1.43.

This contrasts slightly with Komazaki et al. (2012), who reported that girls were more prone to anterior crossbite and crowding [25].

Thilander et al. (2001) similarly noted a higher prevalence of crowding among girls but found no major sex differences in malocclusion types overall [26].

In contrast, Thomaz and Valença (2005) observed a higher prevalence of malocclusions in females, particularly in relation to socio-economic determinants [27].

Tomita et al. (2000) reported strong associations between oral habits and socio-economic status, suggesting that lower parental education may contribute to poor oral behaviors [28].

Silva Filho et al. (2003) also confirmed the influence of early-life habits and environment on posterior crossbite development [29].

Importantly, our findings emphasize that malocclusions-especially Angle Class II anomalies-were significantly more frequent in children from urban areas and in those with less favorable familial and educational backgrounds.

This supports the notion that social environment, parental awareness, and access to dental care play key roles in oral health outcomes.

Furthermore, parental education level showed significant correlations with malocclusion types, indicating that higher awareness and health literacy may positively influence preventive behavior and treatment-seeking patterns.

Our study underlines the importance of maintaining primary teeth until their physiological exfoliation.

Early tooth loss often leads to space loss, dental arch shortening, delayed eruption, and altered inter-incisal line, as noted also by Bhujel et al. (2016), who identified tooth migration and subsequent malocclusion as major consequences of early extractions [30].

Similarly, Cenzato et al. (2024) observed molar tilting, space reduction, and arch length changes following early primary molar loss, which corroborates our clinical findings on the dental implications of such premature events [31].

In conclusion, our results support previous literature while highlighting specific socio-demographic correlations in a Romanian pediatric population.

More extensive longitudinal studies are necessary to further explore the multifactorial etiology of malocclusions and to implement targeted educational and preventive programs.

Conclusions

In conclusion, the data from the presented cross-sectional epidemiological study are of real value in elucidating the correlations between some of the factors contributing to the onset and progression of dental maxillary anomalies.

There are many significant interrelations between some secondary risk factors and cranio-mandibular dysfunction, with the credibility reaching values of more than 50.00%.

Early temporary tooth loss in the 635 study subjects had, as consequences, the instalment of a high prevalence of Angle class II/2anomalies, followed by Angle class I with crowding, a small proportion being addressed to patients with Angle class III.

The different findings regarding educational factors in relation to malocclusion in the studied population arise from an inconsistent assessment of socioeconomic status based solely on education levels.

In general, tutors with elevated socioeconomic status are more knowledgeable and have an improved access to resources, addressing their child's addiction to harmful oral habits.

Adopting good oral hygiene practices could be therefore vital in preventing conditions that could lead to tooth loss and, subsequently, malocclusion.

Additional studies with a larger sample size and a distribution that includes multiple co-variables should be conducted, in order to analyze the possible impact of various risk factors upon malocclusion.

Conflict of interests

None to declare

References

1. Bishara SE. Etiology and Classification of Malocclusion. In: Bishara SE (Ed): Textbook of Orthodontics, W.B. Saunders Company, 2001, Philadelphia, 95-120.
2. Proffit WR. Diagnosis and Treatment Planning I. In: Graber TM, Vanarsdall V (Eds): Orthodontics: Current principles and techniques, Elsevier Mosby, 2005, Philadelphia, 101-114.
3. Moyers RE. Analysis of Diagnostic Records. In: Moyers RE (Ed): Handbook of Orthodontics, Year Book Medical Publish. Inc., 1988, Chicago, 209-220.
4. Proffit WR, Fields HW. Orthodontic Diagnosis: The Problem-Oriented Approach. In: Proffit WR, Fields HW (Ed): Contemporary Orthodontics, Mosby Year Book, 1986, St. Louis, 113-127.
5. Vernescu VL. Dento-alveolar anomalies diagnosis. In: Vernescu VL (Ed): Dento-alveolar anomaly, Ed. Medicală, 1974, Bucureşti, 45-60.
6. Terlaje RD, Donly KJ. Treatment planning for space maintenance in the primary and mixed dentition. ASDC J Dent Child, 2001, 68(2):109-114.
7. Altug-Atac AT, Erdem D. Prevalence and distribution of dental anomalies in orthodontic patients. Am J Orthod Dentofacial Orthop, 2007, 131(4):510-514.
8. Uslu O, Akcam MO, Evirgen S, CebeciI. Prevalence of dental anomalies in various malocclusions. Am J Orthod Dentofacial Orthop, 2009, 135(3):328-335.
9. Guttal KS, Naikmasur VG, Bhargav P, Bathi RJ. Frequency of Developmental Dental Anomalies in the Indian Population. Eur J Dent, 2010, 4(3):263-269.
10. K Aitasalo, R Lehtinen, E Oksala. An orthopantomographic study of prevalence of impacted teeth. Int J Oral Surg, 1972, 1(3):117-120.
11. Udom TH, Terrence J. Prevalence of dental anomalies in orthodontic patients. Aust Dent J, 1998, 43(6):395-398.
12. Sogra Y, Mahdjoube GM, Elham K, Shohre TM. Prevalence of dental anomalies in Iranian orthodontic patients. Journal of Dentistry and Oral Hygiene, 2012, 4(2):16-20.
13. Gupta SK, Saxena P, Jain S, Jain D. Prevalence and distribution of selected developmental dental anomalies in an Indian population. J Oral Sci, 2011, 53(2):231-238.
14. Devi A, Narwal A, Bharti A, Kumar V. Premature loss of primary teeth with gingival erythema: An alert to dentist. J Oral Maxillofac Pathol, 2015, 19(2):271.
15. BrinI, Becker A, Shalhav M. Position of the maxillary permanent canine in relation to anomalous or missing lateral incisors: a population study. Eur J Orthod, 1986, 8(1):12-16.
16. Ooshima T, Ishida R, Mishima K, Sobue S. The prevalence of developmental anomalies of teeth and their association with tooth size in the primary and permanent dentitions of 1650 Japanese children. Int J Paediatr Dent, 1996, 6(2):87-94.
17. Neville DW, Damm DD, Allen CM, Bouquot JE. Abnormalities of teeth. In: Neville DW, Damm DD, Allen CM, Bouquot JE (Eds): Oral and Maxillofacial Pathology, 2nd ed, Elsevier, 2005, Philadelphia, 49-62.
18. Kositbowornchai S, Keinprasit C, Poomat N. Prevalence and distribution of dental anomalies in pretreatment orthodontic Thai patients. Khon Kaen Uni Dent J, 2010, 13:92-100.
19. Parry RR, Iyer VS. Supernumerary teeth amongst orthodontic patients in India. Br Dent J, 1961, 111:257-258.
20. Menczer LF. Anomalies of the primary dentition. J Dent Child, 1955, 22:57-62.

 10.12865/CHSJ.51.01.13

21. Castaldi CR, Bodnarchuk BA, MacRae PD, Zacherl WA. Incidence of congenital anomalies in permanent teeth of a group of Canadian children aged 6-9. J Can Dent Assoc, 1966, 32(3):154-159.
22. De Ridder L, Aleksieva A, Willems G, Declerck D, Cadenas de Llano-Pérula M. Prevalence of Orthodontic Malocclusions in Healthy Children and Adolescents: A Systematic Review. Int J Environ Res Public Health, 2022, 19(12):7446.
23. Göranson E, Sonesson M, Naimi-Akbar A, Dimberg L. Malocclusions and quality of life among adolescents: a systematic review and meta-analysis. Eur J Orthod, 2023, 45(3):295-307.
24. Wang Z, Feng J, Wang Q, Yang Y, Xiao J. Analysis of the correlation between malocclusion, bad oral habits, and the caries rate in adolescents. Transl Pediatr, 2021, 10(12):3291-3300.
25. Komazaki Y, Fujiwara T, Ogawa T. Sato M, Suzuki K, Yamagata Z, Moriyama K. Prevalence and gender comparison of malocclusion among Japanese adolescents: A population-based study. Journal of the World Federation of Orthodontists, 2012, 1(2):e67-e72.
26. Thilander B, Pena L, Infante C, Parada SS, de Mayorga C. Prevalence of malocclusion and orthodontic treatment need in children and adolescents in Bogota, Colombia. An epidemiological study related to different stages of dental development. Eur J Orthod, 2001, 23(2):153-167.
27. Thomaz EBAF, Valença AMG. Prevalência de má-oclusão e fatores relacionados à sua ocorrência em pré-escolares da cidade de São Luís-MA-Brasil. RPG Rev Pos-Grad, 2005, 12(2):212-221.
28. Tomita NE, Sheiham A, Bijella VT, Franco LJ. Relação entre determinantes socioeconômicos e hábitos bucais de risco para más-oclusões em pré-escolares. Pesqui Odontol Bras, 2000, 14(2):169-175.
29. Silva Filho OG, Silva PRB, Rego MVNN, Capelozza Filho L. Epidemiologia da mordida cruzada posterior na dentadura decídua. JBP, J Bras Odontopediatr Odontol Bebê, 2003, 6(29):61-68.
30. Bhujel N, Duggal MS, Saini P, Day PF. The effect of premature extraction of primary teeth on the subsequent need for orthodontic treatment. Eur Arch Paediatr Dent, 2016, 17(6):423-434.
31. Cenzato N, Crispino R, Galbiati G, Giannini L, Bolognesi L, Lanteri V, Maspero C, Premature loss of primary molars in children: space recovery through molar distalisation. A literature review. Eur J Paediatr Dent, 2024, 25(1):72-76.

Corresponding Authors: Daniel Cioloca, Department of Preventive Dentistry Faculty of Dental Medicine, "Grigore T. Popa" University of Medicine and Pharmacy, Iasi, Romania, e-mail: daniel-petru.cioloca@umfiasi.ro

Alina Adumitroaie, Department of Pedodontics, Faculty of Dental Medicine, "Grigore T. Popa" University of Medicine and Pharmacy, Iasi, Romania, e-mail: alinaelena.scutaru@yahoo.com