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PREVALENCE AND PREVENTIVE APPROACHES FOR DENTOFACIAL ANOMALIES IN SCHOOL-AGED CHILDREN

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ABSTRACT

Dentofacial anomalies represent one of the most prevalent oral pathologies among school-aged children, ranking second only to dental caries in frequency. This scientific thesis examines the prevalence patterns and preventive approaches for dentofacial anomalies in paediatric populations based on contemporary epidemiological evidence. The research synthesises data demonstrating that malocclusion prevalence varies significantly across populations, ranging from 47.1% to 88.2% depending on geographic region, environmental conditions, and age group [Melnyk et al., 2023, p. 20; Shamshetdinova, 2025, p. 24]. Studies utilising the Index of Orthodontic Treatment Need reveal that 45.8% of children aged 12-15 years exhibit a definite need for orthodontic treatment, with increased overjet, crossbites, and severe crowding being the most common occlusal traits requiring intervention [Shamshetdinova, 2025, p. 24]. Age-related dynamics demonstrate a progressive increase in anomaly prevalence from 57.1% in children aged 6-9 years to 68.0% in those aged 13-16 years [Chukhray et al., 2024, p. 46]. The most frequently diagnosed anomalies include dental arch abnormalities (64.9%), occlusal malrelationships (51.3%), and individual tooth anomalies (8.6%) [Chukhray et al., 2024, p. 48]. Effective preventive approaches encompass early risk factor identification, deleterious habit modification, breastfeeding promotion, and systematic orthodontic screening programmes integrated with school health services. The findings underscore the necessity for regionally tailored preventive strategies and early interceptive interventions to reduce the burden of dentofacial anomalies.

Keywords: dentofacial anomalies, prevalence, school-aged children, prevention, orthodontic screening, malocclusion

INTRODUCTION

Dentofacial anomalies rank among the most common oral diseases affecting the paediatric population, representing a significant public health challenge due to their functional, aesthetic, and psychosocial implications. According to contemporary research, malocclusion is the third most common oral pathology after dental caries and periodontal disease [Chukhray et al., 2024, p. 44]. The high level of dental morbidity in the children's population remains one of the urgent problems of modern dentistry, with dentofacial pathology affecting not only the state of health but also the quality of life, emotional and social well-being of patients [Byala, 2024, p. 70].

The prevalence of dentofacial anomalies among school-aged children varies considerably across populations and geographic regions. Studies report prevalence rates ranging from 41% to 87.3%, with the highest figures observed in environmentally challenged regions [Byala, 2024, p. 70; Shamshetdinova, 2025, p. 24]. A comprehensive examination of 1,167 children aged 6-16 years revealed an average malocclusion prevalence of 63.7%, with a notable age-related increase from 57.1% in younger children to 68.0% in adolescents [Chukhray et al., 2024, p. 46]. Research conducted

in the Aral Sea region, an area affected by severe environmental degradation, demonstrated an exceptionally high prevalence of 88.2%, significantly exceeding the 46.5% observed in control regions [Shamshetdinova, 2025, p. 25].

Untreated dentofacial anomalies tend to worsen with age, as dento-maxillofacial anomalies not detected and eliminated in childhood acquire more severe forms during facial skeleton growth, becoming more pronounced and less amenable to treatment [Byala, 2024, p. 70]. This underscores the critical importance of early detection and preventive intervention. The development of malocclusion is a gradual process starting at an early age, and effective orthodontic prevention programmes should therefore include preschool children, with paediatricians playing a key role in early detection [Luzzi et al., 2017, p. 995].

MAIN PART

Prevalence of Dentofacial Anomalies in School-Aged Children

The global prevalence of malocclusion in school-aged children demonstrates considerable variation, reflecting differences in genetic predisposition, environmental conditions, and methodological approaches. Data from the Ukrainian population reveal that 57.5-87.3% of children are diagnosed with dentofacial anomalies, with prevalence increasing significantly in recent years [Chukhray et al., 2024, p. 44]. A study of 946 children aged 6-18 years in Uzhhorod reported an overall prevalence of 47.1%, with the highest treatment need observed in the 16-18 year age group [Melnyk et al., 2023, p. 21]. The most common pathologies identified were diastema (15.1%), mandibular crowding (14.9%), tooth dystopia (12.7%), and deep bite (11.4%) [Melnyk et al., 2023, p. 21].

Age-related dynamics of malocclusion prevalence reveal a progressive increase throughout childhood. Among children aged 6-9 years (early mixed dentition), prevalence was 57.1%, rising to 66.2% in 10-12 year olds (late mixed dentition) and reaching 68.0% in 13-16 year olds with permanent dentition [Chukhray et al., 2024, p. 46]. The increase in prevalence from 6 to 8 years may be attributed to the untimely detection of risk factors and the lack of measures to eliminate them [Chukhray et al., 2024, p. 46].

Environmental and socio-economic factors significantly influence malocclusion prevalence. A comparative study of the Aral Sea region, characterised by chronic exposure to toxic dust storms and heavy metal contamination, found that 88.2% of children presented with at least one form of dentoalveolar anomaly, compared to 46.5% in control areas [Shamshetdinova, 2025, p. 25]. The structure of anomalies in this population demonstrated significantly higher rates of Class II malocclusion (31.6%), increased overjet (37.3%), deep bite (33.6%), and crowding (46.7%) compared to control groups [Shamshetdinova, 2025, p. 25].

Assessment of Orthodontic Treatment Need

The Index of Orthodontic Treatment Need provides a standardised framework for assessing the severity and treatment requirements of malocclusion. Studies conducted in the Republic of Karakalpakstan involving 1,200 children aged 12-15 years revealed that 45.8% of examined children were classified as having a definite need for treatment (IOTN grades 4 and 5), 35.2% had borderline need (grade 3), and only 19.0% demonstrated little to no need (grades 1 and 2) [Shamshetdinova, 2025, p. 24]. The most common occlusal traits leading to high treatment need scores were increased overjet, crossbites, and severe crowding [Shamshetdinova, 2025, p. 24].

The aesthetic component of the IOTN revealed that 38.5% of children were dissatisfied with their dental appearance, indicating a substantial subjective need for orthodontic care alongside objective clinical requirements [Shamshetdinova, 2025, p. 24]. This finding highlights the psychosocial impact of dentofacial anomalies and the importance of addressing aesthetic concerns in comprehensive care.

Structure of Dentofacial Anomalies

Analysis of the structure of dentofacial anomalies reveals that dental arch abnormalities are the most prevalent category, affecting 64.9% of children with malocclusion. Occlusal malrelationships are diagnosed in 51.3% of cases, while individual tooth anomalies are found in only 8.6% of examined children [Chukhray et al., 2024, p. 48]. Among occlusal anomalies, deep bite and increased overjet are particularly common, with studies reporting increased overjet prevalence ranging from 37.3% in environmentally challenged regions to lower rates in other populations [Shamshetdinova, 2025, p. 25].

Sagittal anomalies demonstrate varying patterns across populations. Angle Class I malocclusion remains the most common type, followed by Class II Division 2, Class II Division 1, and Class III malocclusions [NIH, 2025, p. 2]. The prevalence of Class III malocclusion is generally lower, affecting approximately 7.4% of school-aged children [NIH, 2025, p. 2].

Preventive Approaches for Dentofacial Anomalies

The multifactorial aetiology of dentofacial anomalies necessitates a comprehensive preventive approach addressing genetic, environmental, and behavioural risk factors. Early identification of risk factors during primary dentition is crucial for preventing the development of pathological conditions during the mixed dentition period.

Habit Modification: Deleterious oral habits including digit sucking, mouth breathing, and tongue thrusting are major modifiable risk factors for malocclusion. Studies demonstrate that the prevalence of abnormal habits is significantly higher in females (31.5%) compared to males (25.0%), with nail-biting being the most common (41%), followed by mouth breathing (23%) and tongue thrusting (16%) [NIH, 2025, p. 2]. Early intervention to eliminate these habits can prevent the development of associated malocclusions.

Breastfeeding Promotion: Longitudinal birth cohort studies have highlighted the protective role of breastfeeding against increased overjet in adolescence, mediated largely through reduced pacifier use. These findings support integrated oral-general health counselling in early life to discourage prolonged non-nutritive sucking and promote breastfeeding in line with public health guidelines [Nature, 2025, p. 1].

Orthodontic Screening Programmes: Systematic screening programmes integrated with school health services are essential for early detection and referral. The high prevalence of dento-mandibular anomalies indicates the need for timely diagnosis at early stages of orthodontic pathology development, which will contribute to timely treatment and ensure normal development of the child's dento-maxillofacial system [Byala, 2024, p. 70].

Health Education: Health education initiatives for parents and school-aged children are crucial, as preventing dental disorders remains a challenging task [Sami, 2024, p. 73]. Comprehensive prevention programmes should include not only the integration of related specialists and different methods of prophylactic and hygienic education but also clinical observation and specialised treatment techniques implemented at multiple levels (children's clinics, families, schools, and kindergartens) [Chernomorchenko, 2024, p. 15].

REFERENCES

1. Byala O-KhA. Prevalence and structure of dento-maxillofacial anomalies in children. Ukrainian Dental Almanac. 2024;(1):70-77. [Byala, 2024, p. 70]
2. Shamshetdinova Y. Assessment of the need for orthodontic care among children and adolescents of the Republic of Karakalpakstan. International Journal of Medical Sciences. 2025;5:24-30. [Shamshetdinova, 2025, p. 24-25]
3. Chernomorchenko NS. Clinical diagnostic fundamentals of dental care and its role in complex prophylaxis of maxillofacial anomaly in children [dissertation]. Saint Petersburg University; 2024. [Chernomorchenko, 2024, p. 15]

4. Chukhray NL, Smoliar NI, Mirchuk BM, Lesytskiy MJ. Dynamics of the structure of malocclusion in schoolchildren. Via Stomatologiae. 2024;1(3):44-53. [Chukhray et al., 2024, p. 44-48]
5. Melnyk VS, Zombor KV, Melnyk SV. Prevalence of maxillofacial abnormalities among children and adolescents in Uzhhorod. Ukrainian Dental Almanac. 2023;(2):20-23. [Melnyk et al., 2023, p. 20-21]
6. Sami WA. The incidence of dental anomalies among school children at age 7-14 years old. Journal of Life Science and Applied Research. 2024;5(2):70-75. [Sami, 2024, p. 73]
7. Luzzi V, Ierardo G, Corridore D, et al. Evaluation of the orthodontic treatment need in a paediatric sample from Southern Italy. Journal of Clinical and Experimental Dentistry. 2017;9(8):995-1001. [Luzzi et al., 2017, p. 995]