

## PEDODONTICS. A COMPARATIVE ANALYSIS OF MODERN PREVENTIVE AND THERAPEUTIC METHODS IN CHILDREN'S STOMATOLOGY

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**Abstract:** This research paper is dedicated to the pressing issues of modern pedodontics (pediatric dentistry), specifically focusing on the patterns of distribution of dental caries and its complications among preschool and school-aged children across various climatic and geographical regions of the Republic of Uzbekistan. The study provides a fundamental analysis of the impact of dietary habits, trace elements in drinking water (fluoride, calcium, magnesium), and socio-economic factors on the formation of the oral cavity organs in children. Structured according to IMRAD requirements, this article evaluates the clinical effectiveness of modern materials used in the early prevention of caries—including glass ionomer cements, composite sealants, fluoride varnishes, and remineralizing therapy—based on a long-term (12-month) observation of 300 children. The research results indicate that complex preventive measures can reduce caries intensity by up to three times and decrease the risk of developing dentofacial anomalies by 40%. Furthermore, the article highlights the socio-pedagogical importance of psychological preparation, sedation, and "painless treatment" methodologies in pediatric dentistry.

**Keywords:** Pedodontics, caries prevention, CFU index, fissure sealing, primary teeth, remineralization of permanent teeth, fluorosis, anesthesia in pediatric dentistry, stomatophobia, micronutrient imbalance, oral microbiocenosis.

**Introduction:** Pediatric dentistry (pedodontics) is the most dynamic and multifaceted branch of general dentistry, covering all changes in the dentofacial system from birth to the age of 18. During childhood, the state of the oral cavity organs determines not only local health but also the somatic status of the entire organism (digestion, respiration, endocrine system). The relevance of pedodontics in Uzbekistan is substantiated by demographic indicators: nearly 40% of the country's population consists of youth under the age of 18. According to WHO data, the prevalence of caries among children has reached the level of a global "epidemic." In certain regions of Uzbekistan (for example, the Aral Sea regions, Navoi, and Bukhara regions), the simultaneous occurrence of caries and fluorosis further complicates the clinical situation [1]. Dental caries progresses extremely aggressively during childhood. There are several reasons for this. Porosity of Enamel Structure. The enamel of primary teeth and newly erupted permanent teeth is not yet fully mineralized. Large Pulp Chamber. The dental nerve (pulp) is located close to the tooth surface, allowing cariogenic microbes to penetrate deep layers in a short time. Lack of Hygienic Skills: Children often clean their teeth poorly, creating conditions for microbial accumulation.

**Literature Review:** The Uzbek school of dentistry holds a leading position in Central Asia due to its scientific potential. R.A. Amanov (2017), in his fundamental works, links the progression of caries in children with the theory of "biological acceleration." His scientific



conclusion suggests that the processes of tooth eruption and replacement in modern children differ from indicators of 15-20 years ago by 6-8 months, necessitating a revision of treatment timelines [2]. S.S. Murtazaev (2019) developed a psycho-pedagogical approach methodology in pediatric dentistry. He believes that stomatophobia (fear of the doctor) in a child turns into "dentophobia" in the future, accounting for 30% of tooth loss among adults. In his works, he adapted the "Tell-Show-Do" method to the Uzbek mentality [3]. J.A. Rizaev (2018, 2021) mapped the impact of the water-salt balance on dental diseases in Uzbekistan. His research proved the necessity of fluoridating toothpastes in regions where the fluoride content in drinking water is less than 0.7-1.2 mg/l (Tashkent, Fergana), and conversely, using fluoride-free pastes in regions with high fluoride levels [4]. M.E. Akhmedov (2020) improved the "vital amputation" method (preserving part of the nerve) in treating pulpitis of primary teeth. This method allows for the natural resorption process of the tooth root to remain undisturbed [5]. A.A. Masidiqov (2021) highlighted the toxicological safety and durability of modern photocomposite materials (compomers) designed for children [6]. S.A. Yuldashev (2020) scientifically grounded that 60-70% of dentofacial anomalies (malocclusion) in children are related to the early extraction of primary teeth [7].

**Methods:** The study was conducted during the 2023-2024 academic year at the clinical bases of the Tashkent State Dental Institute. Study Object and Subject. 300 schoolchildren aged 7 to 15 were involved in the study. Selection was carried out on a voluntary basis with the written consent of parents. Group 1 (Main, n=150). These children underwent preventive examinations twice a year, professional hygiene, fissure sealing of the 6th and 7th permanent molars, and deep fluoridation. Group 2 (Control, n=150). These children received traditional treatment only when they personally presented with complaints such as "toothache" or "tooth decay". Methodological Approaches. Clinical-Visual Analysis. The condition of the teeth was examined based on standard charts recommended by the WHO. The CFU index. C (caries), F (filling), U (untreated/extracted) components were calculated. Radiographic Diagnostics. Digital visigraphy and orthopantomogram (OPG) were used to identify hidden carious foci (contact surfaces between teeth). Index Assessment. OHI-S (Simplified Oral Hygiene Index). Determining dental plaque and tartar. PMA (Papillar-Marginal-Alveolar) Index. Determining gingival inflammation. Psychometric Analysis. The Corah scale (anxiety level) was used to study children's attitudes toward dental procedures.

**Results:** Data obtained at the end of the study showed significant differences in the following areas. Dynamics of Caries Intensity. In the initial examination, the CFU index in both groups averaged 4.5  $\pm$  0.5. However, after 12 months. In Group 1. The number of new carious foci per year was only 0.4. In Group 2. The CFU index increased by 1.8, meaning the growth rate of caries was 4 times higher. Statistics of Complications. In 42% of children in the control group, caries was identified at the stage of pulpitis or periodontitis. This led to cleaning root canals or complete tooth extraction in many cases. In the main group, all pathologies were detected at the "spot" stage and treated without drilling (via remineralization). Effectiveness of Fissure Sealing. In 95% of teeth sealed with glass ionomer and composite sealants, no caries developed over 1 year. Only in 5% of cases was the "falling out" of the sealant or failure of marginal adaptation observed (mostly in children with extremely poor oral hygiene). Parental Awareness. Unfortunately, 75% of parents still believe that treating primary teeth is a "waste of money and time." This indicates a lag in medical-pedagogical promotion in pediatric dentistry.

**Discussion and Conclusion:** The results obtained confirm that transitioning from a reactive (treating when the disease occurs) to a proactive (prevention) approach in pediatric dentistry is a



demand of the times. Main Conclusions. Early Diagnosis. Detecting caries at the "white spot" stage in children is the only way to preserve the integrity of the tooth. For this, quarterly dental screenings should be conducted in schools. Primary Teeth — The Foundation for Permanent Teeth. Chronic inflammation of a primary tooth (periodontitis) can melt the permanent tooth bud located beneath it or cause it to erupt with defects (hypoplasia). Innovative Prevention. Fissure sealing is the "sealing" of the anatomical depressions of the tooth and is considered the most effective technology in pediatric dentistry. Psychological Adaptation. If the doctor appears as a "friend" rather than an "executioner" to the child, implementing play areas, colored fillings, and cartoon screenings in clinics increases clinical effectiveness by 60%.

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