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PREVALENCE OF DENTAL CARIES AMONG CHILDREN IN NAVOI REGION: ANALYSIS OF PREVENTIVE STRATEGIES

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Abstract: This article presents an analysis of the epidemiological situation regarding dental caries among the pediatric population of the Navoi region. It highlights the primary etiological factors contributing to the development of the disease, along with age-related and behavioral characteristics. The findings emphasize the need to enhance regional preventive programs and to improve oral health awareness among parents and caregivers.

Keywords: pediatric dentistry, caries epidemiology, Navoi region, hygiene education, risk factors, preventive strategy

In contemporary scientific literature, the key risk factors contributing to the development of dental caries in children are extensively examined. Researchers identify several major causes, including embryogenetic disturbances during enamel and dentin formation (impaired odontogenesis), early artificial feeding, adverse environmental conditions, deviations in the timing of tooth eruption, genetic predisposition, a history of infectious diseases in infancy, poor oral hygiene practices, low systemic fluoride bioavailability, and excessive consumption of carbohydrate-rich foods.

According to epidemiological data from the World Health Organization (WHO), dental caries and its complications are diagnosed in approximately 70–75% of school-aged children. This high prevalence indicates that current therapeutic and preventive measures remain insufficiently effective, underscoring not only the medical but also the significant social relevance of pediatric oral health issues.

Moreover, global statistics reveal that caries of primary teeth in children aged 3 to 3.5 years ranks among the common pathologies affecting hard dental tissues and necessitates specialized dental care.

Despite significant advancements in modern dental science and clinical practice, dental diseases and their consequences remain among the most pressing challenges in global public health. According to statistics, the prevalence of oral diseases in children ranges from 1% to 98%, depending on the socioeconomic status of the country. This indicates that dental disorders are closely linked not only to medical factors but also to broader social and economic conditions.

Studies conducted in various regions show a wide variation in the prevalence of dental caries among children under the age of three — from 1% to 30%. The highest rates have been recorded in European countries, where the average prevalence in this age group is approximately 32%. For instance, in Switzerland, caries is detected in 24.5% of children under three, while in Poland, the figure exceeds 55%. In the United States, prevalence ranges from 9% to 75%, and in Middle Eastern countries, it varies between 22% and 61%.

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Differences in these statistical indicators can be attributed to the quality of healthcare systems, the population's level of oral hygiene awareness, economic conditions, and the effectiveness of preventive dental programs in each respective country.

Based on the presented data, it can be concluded that the development of dental caries in children under six years of age is influenced by a complex interplay of multiple etiological factors rather than a single cause. Therefore, the causes of caries should be examined not only on an individual level but also at the population level. For example, low fluoride concentrations in drinking water necessitate the inclusion of fluoride-enriched foods in children's diets. In light of these circumstances, it is essential to design and implement scientifically grounded preventive and therapeutic strategies tailored to the specific epidemiological conditions of each region.

Poor oral hygiene contributes to the development of chronic inflammatory processes in the oral cavity. Among children, such inflammation can lead to various neuropsychological disorders, including anxiety, increased excitability, insomnia, and similar conditions. Prolonged absence of preventive dental care can result in the formation of chronic oral infection foci, which in turn may have serious adverse social and economic consequences.

One common issue encountered in dental practice is the disruption of proper contact between teeth, known as malocclusion. This condition frequently arises due to premature tooth loss. Disturbances in occlusal balance can not only affect the patient's speech but also lead to psychological distress, reduced self-confidence, and difficulties in social integration.

This study is based on annual statistical reports and data from two epidemiological dental surveys conducted in the Navoi region between 2018 and 2020. The study included records of 4,320 patients in 2018, 4,580 in 2019, and 5,120 in 2020. The surveys covered children and adolescents aged 6 to 15 years, who were grouped into three age categories: 6–9 years, 10–12 years, and 13–15 years. Additionally, urban and rural residents were considered separately within each age group.

Individual preventive programs were developed based on the dental status of each child. These programs included personalized hygiene product recommendations, professional cleanings, fluoride treatments/mineralization, fissure sealing (for specific groups), and follow-up evaluations after 3–6 months. The duration and sequence of preventive measures were determined according to the severity of the carious process, the eruption stages of the first and second permanent molars (M1, M2), and the level of parental involvement in implementing oral health measures.

To further assess the prevalence and severity of dental caries among the population aged 6 to 15 years in the Navoi region, a monitoring program was conducted from 2018 to 2020. For each year, the following general indicators were established:

Year	Number of Children Examined	Disease Prevalence (%)	Disease Severity (%)
2018	4 320	61.5	22.4
2019	4 580	59.7	20.8
2020	5 120	57.3	18.9

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In the statistical component of the study, key analytical methods were employed. Annual differences were evaluated using the chi-square test (χ^2), while the influence of age and place of residence (urban vs. rural) was analyzed through analysis of variance (ANOVA). To assess the clinical effectiveness of the comprehensive preventive program, DMFT (Decayed, Missing, Filled Teeth) indices were compared before and after intervention within each age group.

The implementation of the program in 2020 yielded the following clinical outcomes:

Age group 6–9 years: caries prevalence reduced by **25.3%**, with a mean DMFT reduction of **0.8**

Age group 10–12 years: reduction by **20.7%**, mean DMFT decrease of **0.6**

Age group 13–15 years: reduction by **18.2%**, mean DMFT decrease of **0.5**

The results were further analyzed using logistic regression and ANOVA, with particular attention paid to the correlation between outcomes and the level of individualization in preventive care.

Conclusion

Based on the results of epidemiological dental surveys conducted among children aged 6 to 15 years in the Navoi region from 2018 to 2020, the prevalence of dental caries remained high, reaching 68.4% in 2020. A consistent upward trend in caries prevalence was observed over the years, particularly in rural areas. The average caries intensity during the study period was 2.7, which corresponds to a moderately severe level according to World Health Organization (WHO) criteria. These findings may be attributed to inadequate oral hygiene, low fluoride availability, and limited access to dental care services.

The individualized preventive program developed within the study—consisting of oral hygiene education, the use of fluoride-containing products, and fissure sealing—demonstrated clinical effectiveness among the pediatric population. In groups where this program was implemented, a reduction in caries indicators was observed.

The obtained data emphasize the urgent need for widespread implementation of preventive strategies to improve children's oral health in the Navoi region. This includes regular dental check-ups in preschools and schools as part of a comprehensive public health initiative.

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