

## PREVENTION OF DENTAL DISEASES (LITERATURE REVIEW)

Baratova Sh.N. (Republic of Uzbekistan)

Email: Baratova521@scientifictext.ru

*Baratova Shoiri Norjigitovna - Master's Student,  
DEPARTMENT OF PEDIATRIC THERAPEUTIC DENTISTRY, SAMARKAND  
STATE MEDICAL INSTITUTE,  
SAMARKAND, REPUBLIC OF UZBEKISTAN*

**Abstract:** *the review is devoted to the program for the prevention of dental diseases in a school dental office. The article analyzes the effectiveness of the methods used to prevent dental diseases. The following methods are most often used: hygienic education, professional hygiene, sealing fissures, covering teeth with fluoride varnish. The lack of measures for dental clinical examination and preventive work with children and adolescents is a serious negative factor that leads to a sharp increase in the incidence of all types of dental pathology and, above all, caries and its complications. Low level of sanitary and hygienic knowledge and skills, lack of motivation to participate in preventive programs, determine the increase in the prevalence and intensity of dental diseases, primarily in children and adolescents. The introduced programs for the prevention of dental diseases in school dental offices have been effective and have improved the quality of dental care for children. Currently, the literature contains only a few data on the features of prevention programs and their effectiveness in adolescents.*

**Keywords:** *prevention of dental diseases, school dental office, fissure sealing, oral hygiene training, professional hygiene.*

## ПРОФИЛАКТИКА СТОМАТОЛОГИЧЕСКИХ ЗАБОЛЕВАНИЙ (ОБЗОР ЛИТЕРАТУРЫ)

Баратова Ш.Н. (Республика Узбекистан)

*Баратова Шоира Норжигитовна – студент магистратуры,  
кафедра детской терапевтической стоматологии,  
Самаркандский государственный медицинский институт,  
г. Самарканд, Республика Узбекистан*

**Аннотация:** *обзор посвящен программе профилактики стоматологических заболеваний в школьном стоматологическом кабинете. В статье анализируется эффективность применяемых методов профилактики стоматологических заболеваний. Чаще всего используются следующие методы: гигиеническое воспитание, профессиональная гигиена, заделка фиссур, покрытие зубов фторидным лаком. Отсутствие мер по стоматологическому диспансерию и*

*профилактической работе с детьми и подростками является серьезным негативным фактором, который приводит к резкому увеличению заболеваемости всеми видами стоматологической патологии и, прежде всего, кариесом и его осложнениями. Низкий уровень санитарно-гигиенических знаний и навыков, отсутствие мотивации к участию в профилактических программах определяют рост распространенности и интенсивности стоматологических заболеваний, прежде всего, у детей и подростков. Внедренные программы профилактики стоматологических заболеваний в школьных стоматологических кабинетах оказались эффективными и улучшили качество стоматологической помощи детям. В настоящее время в литературе имеется лишь немного данных об особенностях профилактических программ и их эффективности у подростков.*

**Ключевые слова:** профилактика стоматологических заболеваний, школьный стоматологический кабинет, герметизация фиссур, обучение гигиене полости рта, профессиональная гигиена.

UDC 613.6(616.31:615)

The relevance of the prevention of dental diseases lies in the fact that there is a high level of their prevalence in the population associated with exogenous (water composition, nutrition, level of social and economic living conditions) and endogenous factors (individual characteristics of anatomy, physiology, immunity, heredity, age, general somatic status) [2, 25, 27, 36].

The main goal of prevention is to eliminate the causes of the onset and development of diseases, as well as to create conditions for increasing the body's resistance to adverse environmental factors [35]. Hygienic education in dentistry plays a very important role, since the etiology and pathogenesis of dental caries, periodontal diseases are largely due to the negative habits of adolescents: eating a large amount of carbohydrate foods and sugars, unwillingness to brush your teeth. In modern dentistry, the problem of treatment and prevention of caries and its complications in children and adolescents is one of the most difficult and attracts the attention of many researchers [3, 5, 12, 13]. The lack of measures for dental clinical examination and preventive work with children and adolescents is a serious negative factor that leads to a sharp increase in the incidence of all types of dental pathology and, above all, caries and its complications [14]. Low level of sanitary and hygienic knowledge and skills, lack of motivation to participate in preventive programs, determine the increase in the prevalence and intensity of dental diseases, primarily in children and adolescents [23, 36].

The socio-hygienic studies conducted in our country show a low level of sanitary knowledge of the population, as 79% of children have an unsatisfactory oral hygienic state, which depends on irregular care and inability to brush their teeth correctly [38]. In children with poor hygiene, the carious process is more

active, they often have subcompensated and decompensated forms of caries. More than 50% of all requests for outpatient care are associated with dental diseases and mainly with dental caries and its complications [7, 8, 38]

The prevalence of caries on average in Moscow was 65% in persons aged 12 years and 80.2% in adolescents aged 15 years. The intensity of caries according to the KPU index ranged from 1.42 to 5.31 teeth [13]. The prevalence of inflammatory periodontal diseases among children and adolescents remains quite high and reaches in different age periods from 30 to 90% [33, 37].

In most European countries in the last two decades there has been a significant decrease in the prevalence of caries among children and adolescents [14, 33]. The reasons for this phenomenon are manifold, but the most significant are: a decrease in sugar intake, an improvement in the quality of dental and oral cavity care, the use of fluoride-containing toothpastes, an improvement in the organization of dental services and the deployment of school preventive programs [10, 39]. The most important and weak link in the prevention of major dental diseases is hygienic education of adolescents, dental educational work and teaching the rules of oral hygiene [28, 29, 32, 36].

In Russia, there is a positive experience in the implementation of dental prevention programs for children and adolescents [18, 37]. However, at present, in general, dental prevention programs do not have a clear organizational, legal and financial basis, and at the state level their regulation is insufficient [13, 14, 19, 23]. In a market economy, the implementation of preventive programs is limited to the maximum regional level, in the absence of a state organization and targeted funding for such programs [12]. In the Soviet Union, there was extensive experience in providing dental care to children in school dental offices, but now there is a real threat of death of school dentistry [19, 37]. The crisis of school dentistry is the widespread closure of school dental offices, which leads to a sharp decrease in the coverage of planned rehabilitation and medical examination of the child population, an increase in dental morbidity. The main reasons for this phenomenon are the lack of an appropriate legislative framework, the complexity of licensing these offices, often the lack of motivation of school administration to operate on their basis of school dental offices [9, 10, 19, 24]. Thus, at present, the development and implementation of school dental programs, as the most adapted to modern conditions and having the ability to use the available resources of school dental offices, is acquiring particular relevance. There is a need to develop a clear scheme and procedure for work, planning the volume and range of care provided, as well as a qualified assessment of the effectiveness of the program for the prevention of dental diseases in adolescents in a school dental office. Today, the work of school dental offices is carried out on the basis of the principles proposed in the 70s, and modified in practice due to changes in working conditions and funding.

Dental hygienists are practically not involved in work in schools, the functional responsibilities of these specialists in the implementation of school

medical and preventive programs are not defined. In existing school dental offices, the work of a dentist is still carried out on the principle of oral cavity sanitation without an emphasis on the prevention of major dental diseases, which increases the cost and reduces the efficiency of such offices. The main emphasis is placed on the treatment of the already existing pathology, and much attention is paid to the treatment of complicated forms of caries, which reduces the number of schoolchildren receiving dental care, and due to the lack of X-ray control and special equipment leads to a decrease in the quality of care. There is a widespread lack of personnel, which is caused by a decrease in the prestige of work in a school dental office for a dentist due to a weak level of equipment in offices, a decrease in professional interest in work due to the specifics of admission, and a lack of career opportunities. The activities of the school dental office are not integrated into the school health care system, which results in a lack of interaction between education, health care and local government systems. The listed reasons for the crisis in school dentistry cannot be eliminated by the efforts of clinicians or by the administration of dental clinics that run school dental offices. However, even in today's conditions, it is possible to highlight the directions for improving the provision of dental care to adolescents in a school dental office, which were identified in the course of this study on the development and implementation of a program for the prevention of dental diseases. The main stages of the school dental office work include the following [9, 19, 37]: 1) development of an organizational scheme for the functioning of the school dental office (basic principles of the school office); 2) drawing up and implementing a plan of epidemiological measures in order to study the state of dental health of adolescents; 3) drawing up a treatment and prevention program; 4) training of personnel and the necessary documentation for the implementation of medical and preventive measures.

The principles of the school dental office: priority of preventive measures; wide involvement of mid-level specialists - dental hygienists, which can significantly reduce the cost of implementing treatment and prophylactic programs; reduction of the volume of medical measures provided - treatment of caries of permanent teeth (elimination of permanent teeth from the treatment of pulpitis and periodontitis as the most highly qualified type of activity) [11, 14, 21, 22, 35]. The main goals of the school treatment and prevention program: 1) increasing the level of health literacy among adolescents; 2) a decrease in the intensity and prevalence of caries and its complications; 3) an increase in the number of adolescents who do not have caries; 4) decrease in the prevalence and severity of periodontal diseases; 5) a decrease in the prevalence of dentoalveolar anomalies [4, 5, 11, 23].

The first visit assesses the quality of oral hygiene, the condition of the dentition, personality traits of a teenager and other factors affecting the effectiveness of preventive measures. Plaque staining is carried out, the hygienic index according to Green-Vermillion, PMA is determined. Then they talk with

the teenager about the rules of individual oral hygiene, give recommendations on brushing teeth, choosing a toothbrush and toothpaste, and teach them how to use floss. Individual oral hygiene is a thorough and regular removal of deposits from the surface of teeth and gums by an individual using various hygiene products and items [15, 30, 32, 34].

One of the main oral hygiene products is toothpaste. Currently, toothpastes are the most common oral care products. Toothpastes are a suspension of powder particles in a continuous liquid phase. The dispersed phase in them are abrasives, structure-forming agents and other fillers that are insoluble in a dispersed medium - a gel containing surfactants, biologically active additives, flavorings, preservatives and other components. The dispersed phase is intended for mechanical and chemical treatment of the tooth surface: the dispersed medium ensures the transport of active additives into the hard tissues of the teeth and the oral mucosa [1, 33, 38]. The ratio of the components of a toothpaste determine its properties, purpose, mechanism of action and effectiveness. Toothpastes come in the form of a cream, gel or paste, or liquid paste. In addition to known components, therapeutic and prophylactic toothpastes contain biologically active additives: vitamins, extracts, infusions of medicinal plants, salts, trace elements, enzymes. Therapeutic and prophylactic toothpastes are intended both for daily oral care for preventive and hygienic purposes, and for targeted prevention of dental caries, periodontal disease, non-cariou lesions, diseases of the oral mucosa [8, 30].

Anti-caries toothpastes strengthen the mineral tissues of the tooth and prevent the formation of plaque. This is achieved by introducing fluoride, phosphorus and calcium compounds into toothpastes. Of the fluorine compounds in toothpastes, sodium monofluorophosphate, sodium fluoride, stannous fluoride, organic fluorine-containing compounds (for example, "Blend-a-med", "Colgate" contain sodium fluoride) are used. When creating fluoride toothpastes, great attention is paid to the concentration of fluoride in them. A number of authors believe that in order to saturate the hard tissues of the tooth with fluoride ions, it is necessary to use weak concentrations of fluorine, not exceeding 2% in a tube. Toothpastes containing 1-3 mg of fluoride in 1 g of paste are effective. Studies of the caries prophylactic effect of fluoride toothpastes have shown that their use reduces the growth of caries in children by 15-35% [1]. The anti-cariou effect of toothpastes is explained, first of all, by the fact that topically applied fluorides increase the enamel's resistance to adverse effects. The penetration of fluoride into the enamel structure creates a more durable system of fluorapatite, promotes the fixation of phosphorus-calcium compounds in the hard tissues of the tooth, in addition, fluoride preparations inhibit the growth of microflora of soft dental plaque. The most active anti-cariou action of fluoride and pastes containing it is manifested during the maturation of tooth enamel in childhood.

A mouthwash is a necessary addition to your daily brushing and flossing. 0.05% cetylpyridine chloride significantly reduces plaque formation. Sodium

fluoride (0.05%) provides protection against caries formation, it has been found that the sodium fluoride content in a mouthwash reduces the risk of caries by 40% more than just brushing your teeth, even with a paste containing fluoride [1, 5, 33]. Elixir "Sensitive", which contains stannous fluoride, has a good anti-cariogenic effect. Rinse "Forest Balsam" contains herbal extracts and natural biooxidants, it is recommended for catarrhal gingivitis in adolescents.

Professional oral hygiene is a regular set of activities carried out by a dentist (or hygienist) aimed at preventing the development of caries and periodontal diseases and including professional teeth cleaning, as well as controlled individual oral hygiene (assessment of the hygienic state of the oral cavity, dental education with the creation of motivation for compliance preventive procedures, selection of individual methods and means of oral hygiene, control of the effectiveness of hygiene measures), the use of mineralizing compounds [15, 29]. Carrying out professional cleaning of teeth, to remove soft dental plaque, end circular brushes are used, which are made of natural or artificial bristles. Brushes of different shapes are used: round, cylindrical and conical, which are used in conjunction with a paste intended for professional use "Polydent" (Vladmiva) with a contra-angle handpiece for a micromotor; rubber polishing caps with a paste for professional hygiene "Clinpro Prophy Pasta". Rubber polishing caps and heads are designed for the treatment of flat surfaces and cusps. In the area of the interdental spaces, the removal of soft plaque is carried out using polishing polymer strips or flat floss. Removal of hard dental plaque in adolescents is carried out with hand instruments, followed by polishing of the tooth surface. A significant disadvantage of professional oral hygiene is the complete or partial removal of the surface layer of tooth tissues saturated with minerals and fluorine [15, 26, 29]; increased sensitivity of the teeth to all types of irritants may also appear, so the surface of the teeth should be treated with mineralizing compounds. The DRC company has developed a highly adhesive gel R.O.C.S. Medical Minerals containing calcium glycerophosphate, magnesium chloride and xylitol. The gel is prescribed in the form of applications (can be used at home). It is also effective to cover the surface of the teeth with fluoride preparations: Clinpro White Wamish (3M ESPE), Gluftored, Calcium-phosphoric gel Belagel.

O.A. Bagdasarova (2009) found that dental morbidity in the child population decreased due to the introduction of a comprehensive program for the prevention of major dental diseases [3]. Monitoring of dental morbidity, carried out in the city of Samara from 1986 to 2005, revealed: the intensity of caries of permanent teeth according to the KPU index of teeth decreased in 6-year-old children from  $0.67 \pm 0.06$  to  $0.3 \pm 0.06$  ( $p < 0.05$ ), in 12-year-olds - from  $3.86 \pm 0.18$  to  $2.3 \pm 0.16$  ( $p < 0.05$ ), in 15-year-olds - from  $5.3 \pm 0.15$  to  $2.9 \pm 0.13$  ( $p < 0.05$ ); reduction in the increase in the intensity of dental caries was, respectively, 60.1%, 40.4% and 45.3% with an increase in the number of children with healthy teeth at 6 years old from 33.7% to 81.2%; at 12 years old -

from 12.3% to 30.4% and in 15-year-olds from 10.4% to 22%. The prevalence of periodontal diseases at the age of 15 years decreased from 94.4% to 43.7% with an increase in the number of sextants with a healthy periodontium from  $1.23 \pm 0.6$  to  $3.8 \pm 0.2$  ( $p < 0.05$ ) [3].

S.V. Zapadaeva (2009) showed the high efficiency of the proposed model of the school dental office with a priority preventive direction. The prevalence of caries over 5 years of program implementation in 12-year-old students decreased from 90 to 48-53%, and the average caries intensity according to KPU decreased from 3.47 to 2.35-1.27 [9].

S.S. Shevchenko (2010) believes that as a result of the participation of a dental hygienist in the prevention program at school in the group of 12-year-old children after 5 years, the reduction in the increase in caries was 75%, the number of healthy children increased 5 times, the improvement in the level of hygiene was 2.4 times, the number of children with healthy periodontal disease increased by 44% within 2 years, the prevalence of dentophobia decreased from 60% to 0%, which indicates the high efficiency of the program [9].

Currently, the development and implementation of school dental programs for the prevention of major dental diseases is very important. It is necessary to develop a clear scheme for the sequence of events, planning the scope and criteria for assessing the effectiveness of school preventive programs, including a dental hygienist and a children's dentist and the introduction of innovative technologies and recommendations. New approaches to the provision of medical and preventive care to adolescents in a school dental office should be clinically tested. In our opinion, a new concept of school dentistry in our country should be created that meets modern realities.

Thus, according to most authors, the developed programs for the prevention of dental diseases in school dental offices were effective and made it possible to improve the quality of dental care for children, but currently there are only sporadic data in the literature on the effectiveness of similar programs in adolescents, and the problem needs further study.

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