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Health prevention in the pediatric population - challenges and recommendations for the future

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ABSTRACT

Introduction and purpose: The aim of this work is to deepen the topic of health prevention and to draw attention to the need for early intervention, a holistic approach to health and cooperation between family, school and health care. Popularization of knowledge about a healthy lifestyle, including breastfeeding, physical activity and prevention of lifestyle diseases, is crucial for the proper development of children and adolescents.

State of knowledge: The contemporary approach to prevention in pediatrics is based on four levels of preventive measures. Primary prevention focuses on eliminating or reducing risk factors for diseases and shaping pro-health habits, such as a healthy diet, physical activity and vaccinations. Secondary prevention focuses on early detection of diseases in their subclinical stages, which allows for faster initiation of treatment and limiting further development of diseases. Tertiary prevention aims to prevent complications and further deterioration of health in people already affected by the disease. This includes rehabilitation, psychological support and control and treatment of chronic diseases. Quaternary prevention, which is gaining importance in recent studies, involves protecting patients from unnecessary medical interventions that may do more harm than good.

Conclusion: Effective prevention in pediatrics requires an integrated approach, including cooperation between parents, teachers, medical personnel and institutions responsible for public health. Adapting activities to local conditions and actively involving children and their caregivers increase the effectiveness of prevention programs. Comprehensive, yet individualized strategies are key to improving the health of the pediatric population and preventing diseases in later stages of life.

Keywords: prevention, primary prevention, secondary prevention, tertiary prevention, quaternary prevention, pediatrics, health, health promotion

INTRODUCTION

The most common categorization of prevention is its division into primary, secondary and tertiary. In pediatrics, these activities take on particular importance due to the intensive development of children, the need for early intervention and a holistic approach to the health of the child and their family.

Primary prevention aims to prevent the development of diseases, shape pro-health habits, and eliminate or reduce the impact of risk factors. Therefore, its target population is healthy people. The scope of primary prevention activities includes health education, promotion of physical activity, healthy nutrition and protective vaccinations. [33]

Secondary prevention emphasizes early detection of the disease and prevention of its further development and potential complications. Its target is people who do not present symptoms that would be noticeable by a doctor in a basic examination, but are characterized by subclinical manifestation of the disease. [30][33]

Tertiary prevention consists in preventing complications and preventing the effects of existing diseases or permanent damage to the body. The aim of this prevention is to improve the quality of life of patients affected by the disease, reduce its progression and their overall rehabilitation. The key actions of tertiary prevention are:

1. Medical rehabilitation

2. Psychological support

3. Monitoring and prevention of complications

4. Health education

Quaternary prevention, according to the authors of the research paper “Quaternary prevention: reviewing the concept”, has a new definition, which refers to taking action to protect patients from medical interventions that may cause more harm than good. This includes avoiding both unnecessary medical procedures and medications. This prevention should be a key element of good and ethical medical practice. [31]

Factors influencing health in pediatrics

Factors influencing health in the pediatric population can be divided into biological, environmental and social. According to Lalonde fields, the impact of factors on health is distributed as follows: 50% depends on the patient's lifestyle, 20% on social factors, 20% on genetic factors and 10% depends on the organization of medical care. [32] Health care for children begins in the prenatal period and is regulated by the Organizational Standard for Perinatal Care (2018), which specifies the scope of services for pregnant women and newborns. The impact of factors, especially biological factors, on the child begins at conception and depends, among other things, on the mother's health during pregnancy. According to the report, the number of women reporting to the doctor up to the 10th week of pregnancy has decreased. This is a dangerous situation, because the first trimester is crucial for the proper development of the child. During pregnancy and the postpartum period, various factors may come into play, most often resulting from women's ignorance, but they may also be neglect such as drinking alcohol during pregnancy, smoking tobacco or abusing drugs and psychoactive substances. The gold standard is considered to be breastfeeding a child until at least 6 months of age, and if the mother and child want it, it is recommended to continue breastfeeding until 2 years of age. [34] The benefits of breastfeeding are both short- and long-term. First of all, mother's milk provides the necessary nutrients for the proper development of the child, reduces the risk of obesity in later life, as well as type 1 and 2 diabetes. A proper diet and at least moderate physical activity

are also key factors thanks to which we are able to support the physical and mental health of the child, and as a result prevent the development of diseases in later life. Environmental factors concern the patient's environment in which he or she grew up, his or her access to clean drinking water, air pollution, constant access to green areas or housing conditions, which strongly affect the later occurrence of, among others, respiratory diseases or problems in the mental sphere. [35] The last group is social factors. The factors that are important here include the family's economic status, access to education, the parents' level of education, and providing the child with appropriate medical care. The role of the family is the most important environment that shapes health habits through the patterns that the child has contact with. The next and last mentioned strong foundation in the education and upbringing of a child is school. It promotes a healthy lifestyle through regular physical activity, preventive programs, and socialization among peers. [33]

DESCRIPTION OF THE STATE OF KNOWLEDGE

Modern health prevention strategies include a wide range of activities aimed at preventing diseases and promoting a healthy lifestyle. Their effectiveness depends on a comprehensive approach that combines elements of education, psychological support, physical prevention and modern technologies.

1. Preventive strategies in health education

Promoting a healthy lifestyle

Preventive activities focus on physical activity, a healthy diet and sleep hygiene. Regular physical activity has a beneficial effect on the physical and mental development of children and adolescents, improves immunity and reduces the risk of lifestyle diseases [1]. Proper eating habits, including eating vegetables, fruit and limiting sugar, affect the development of the body and the functioning of the nervous system. In turn, sleep deprivation can lead to problems with concentration, mood and metabolism [2].

Educational programs in schools

Schools are a key environment for implementing preventive programs. Programs such as "Health-Promoting School" or "Keep Fit!" teach children and adolescents the principles of a healthy lifestyle, developing social skills and taking care of mental well-being [3].

Collaboration with parents and teachers enables the long-term implementation of healthy habits [4].

2. Prevention of mental and emotional problems

In recent years, the importance of programs developing mental resilience and the ability to cope with stress has increased. Activities such as mindfulness training and programs to counteract depression in schools contribute to improving the mental well-being of students [5]. Developing emotional competences supports not only mental health, but also social relationships [6]. Early recognition of emotional problems and risky behaviors allows for the implementation of effective therapeutic activities. In Poland, more and more schools cooperate with psychologists and educators, implementing programs to counteract aggression, addictions and depression [7]. A systemic approach based on cooperation between the family, school and support institutions plays a special role [8].

3. Prevention in physical health

Vaccination programs

Vaccinations are one of the most effective ways to prevent infectious diseases. The National Vaccination Program in Poland includes both mandatory and recommended vaccinations, including against HPV, influenza and meningococci [9]. Vaccinations reduce the risk of epidemics and protect people who are particularly vulnerable to complications [10]

Oral hygiene activities

Dental prevention programs, including fluoridation of teeth in schools and education on proper brushing, help reduce caries and gum disease. Hygiene habits formed in childhood often last a lifetime [11].

Prevention and treatment of obesity

The growing problem of overweight and obesity among children and adolescents requires integrated preventive measures. Educational programs, access to dieticians and sports activities are aimed at improving lifestyle and preventing metabolic and cardiological complications [11]. Effective obesity prevention also requires limiting children's exposure to unhealthy food advertisements [12].

4. The role of new technologies in prevention

Mobile applications and educational games promoting health

Modern technologies enable the development of tools supporting a healthy lifestyle. Applications for monitoring physical activity, educational games or reminding to drink water

are becoming increasingly popular among children and adolescents [13]. Thanks to them, prevention becomes more attractive and accessible.

E-learning and social media in health education

Internet platforms enable conducting trainings, webinars and health campaigns. In turn, social media play an important role in promoting positive role models, spreading knowledge about health and creating support groups [14]. Digital education allows reaching a wide group of recipients, regardless of place of residence.

5. Effectiveness of preventive strategies – research results

The effectiveness of preventive strategies in public health has been the subject of numerous studies, both local and international. This chapter presents an overview of selected studies assessing the effectiveness of preventive actions, indicates key factors determining their success and discusses examples of good practices implemented in various social and cultural contexts.

A review of studies assessing the effectiveness of preventive strategies

In research on the effectiveness of health prevention, case studies, meta-analyses and systematic literature reviews play an important role. Case studies allow for an in-depth analysis of the context of strategy implementation, the course of the intervention and its results. For example, the analysis of the addiction prevention program "FreD goes net" implemented in Germany showed that an individual approach and an active role of participants significantly influenced the durability of the intervention effects [15].

Meta-analyses, on the other hand, provide evidence with greater statistical power, integrating the results of many independent studies. A systematic review conducted by Durlak et al. (2011) on programs promoting social and emotional competences in schools showed that interventions conducted in a structured manner and with the participation of teachers brought about significant, positive changes in student behaviors, including mental health [16].

Factors determining the success of prevention programs

The effectiveness of prevention strategies is strongly dependent on the method of their implementation. The most frequently indicated success factors include personalization of activities and cooperation of various stakeholder groups. Personalization, i.e. adapting activities to the age, gender, risk level or cultural context of the recipients, increases their engagement

and effectiveness of the intervention. Studies on obesity prevention among children and adolescents have shown that programs adapted to local realities and participants' preferences bring significantly better results than universal actions [17].

Cooperation between parents, teachers and health specialists is also important. The integrated prevention model emphasizes the need to create a coherent support system, in which each of the actors plays an important role in identifying threats, motivating change and monitoring progress. An example is the Finnish "Life Skills" program, the effectiveness of which was based on close cooperation between schools, local health facilities and students' families [18].

Selected examples of good practices

In practice, the effectiveness of preventive strategies is confirmed by numerous national and international initiatives. The World Health Organization (WHO) and UNICEF promote a number of programs focused on the prevention of non-communicable diseases, hygiene and mental health of children and adolescents. The "Health Promoting Schools" program implemented under the auspices of the WHO operates in many countries and is based on the assumption that schools can be a place to strengthen physical and mental health through education, environmental support and appropriate institutional policies [19].

At the regional level, preventive initiatives also bring measurable effects. An example is the Małopolska Program for Reducing the Health Consequences of Tobacco Smoking, which implemented educational activities in schools, workshops for parents and information campaigns. After three years of the program, a 12% decrease in the frequency of smoking among young people was noted [20]. To sum up, the effectiveness of preventive strategies depends on many factors – both structural and social. Their proper implementation, taking into account local conditions and active involvement of recipients, can lead to a lasting improvement in public health indicators.

SUMMARY

Despite the growing number of preventive programs and the growing social awareness of public health, effective implementation of preventive strategies still encounters numerous barriers. This chapter discusses the most important challenges related to the implementation of preventive actions, identifies unmet needs in this area, and formulates recommendations for future development directions.

1. Barriers to the implementation of effective strategies

The most common obstacles to the implementation of effective health prevention strategies include financial, cultural, educational, and organizational barriers. Limited financial resources are one of the basic barriers, especially in the case of long-term actions covering wide groups of recipients. Insufficient funding for programs often results in their low quality, lack of training for implementers, or insufficient duration of the intervention [21].

Equally important are cultural barriers that make it difficult to reach specific social groups with the preventive message. Cultural norms, traditional behavioral patterns, and stigmatization of certain health problems (e.g. mental disorders) can lead to rejection of preventive actions or lack of involvement in their implementation [22].

Educational barriers concern both the low level of health knowledge among program participants and the limited competences of people conducting preventive activities. Lack of effective communication skills, content not adapted to the age and abilities of recipients or too academic language - these are factors that significantly reduce the effectiveness of interventions [23].

In turn, organizational barriers result from, among others, the lack of coordination of activities, insufficient cooperation between institutions or too much workload of staff. In many cases, programs are implemented fragmentarily, without a long-term strategy and without taking into account local needs [24].

2. Unmet needs in health prevention

Despite progress in health promotion, many needs of children and adolescents still remain unmet. Children from families with a low socioeconomic status, with less access to health care, health education and a healthy lifestyle are particularly vulnerable to health exclusion. Studies indicate that socioeconomic factors significantly affect the level of health awareness and pro-health behaviors among young people [25].

Groups of children with disabilities, migrant children, and those growing up in environments with high levels of violence or addictions also belong to the population with special needs. For them, standard prevention programs often turn out to be inappropriate – both in terms of form and content. Therefore, interventions are needed that are targeted at the specific needs and limitations of these groups, based on a thorough diagnosis of the local social and health situation [26].

3. Recommendations for future actions

In response to the above challenges, it is recommended to implement coherent intersectoral strategies, combining the activities of education, health care, social policy and non-governmental organizations. Integration of activities of different sectors allows for a more comprehensive approach to the health problems of children and adolescents, increasing the effectiveness and reach of programs. An example is the "whole school approach" model, in which the school acts as a health support center, cooperating with parents, health care workers and the local community [27].

It is equally important to promote innovative research in the area of health prevention. New technologies, such as mobile applications or e-learning platforms, can support educational activities and increase the involvement of participants, especially among younger age groups. Studies on the effectiveness of such tools show that interactive and personalized approaches bring better results than traditional educational methods [28].

Finally, it is recommended to create nationwide mechanisms for monitoring the quality and effects of preventive programs. Currently, there is no uniform system for assessing the effectiveness of implemented activities, which makes it difficult to draw conclusions and improve them further. Regular evaluation of programs, based on measurable indicators, will not only improve the quality of activities, but also better manage resources and adapt programs to changing social needs [29]. In summary, effective health prevention requires not only appropriate resources, but also intersectoral cooperation, innovative tools and constant monitoring and evaluation. Only such an approach will allow for a real and lasting reduction in health inequalities among children and adolescents.

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