

## Nursing Care for Children With Bronchial Asthma

*Tillabayeva Akida Aripovna*

*Teacher, PhD candidate and assistant, Department of Family Medicine No. 1, Physical Education, Civil Defense of TSMU (Tashkent State Medical University, mail: aqidatillaboyeva@gmail.com)*

**Annotation:** Bronchial asthma remains one of the most common chronic pathologies of childhood, requiring a comprehensive interdisciplinary approach to management. In recent years, more and more attention has been paid to the role of a nurse as a key link in the organization of care, training and prevention of exacerbations of the disease. This review summarizes current data on nursing strategies for managing children with asthma, including clinical, school-based, and community-based care models. The results of studies published in international scientific journals and open databases — such as PubMed Central, DOAJ, PLOS, Europe PMC, and BioMed Central — are analyzed, with a focus on nurse-led programs, the effectiveness of educational interventions, and the use of telemedicine technologies.

It is noted that the introduction of protocol nursing models helps to reduce the number of hospitalizations and emergency calls, improves the control of symptoms and the quality of life of patients. Nurses play a leading role in teaching inhalation techniques, developing self-management skills, and organizing prevention activities in schools and families. Additional attention is paid to the nutritional, behavioral and psychological aspects of care, as well as the role of digital technologies and artificial intelligence in personalizing surveillance.

The review highlights the need to standardize nursing protocols, train staff in international programs, and develop multidisciplinary teams. Integration of innovative technologies and educational approaches is considered as a key vector of future nursing care in children with bronchial asthma, ensuring the transition from episodic observation to continuous, individualized patient support.

**Keywords:** Bronchial asthma, children, nursing, school programs, prevention, inhalation therapy, telemedicine.

### Review purpose

The purpose of this review is to systematize current data on the role of nurses in the management of children with asthma, including prevention of exacerbations, self-control training, condition monitoring, and interdisciplinary interaction. Special attention is paid to the analysis of the effectiveness of nursing interventions — both in clinical, school and family settings - as well as the prospects for the introduction of digital technologies and remote support programs in the practice of nursing care.

### Materials and methods

The review is based on an analysis of publications devoted to the nursing care of children with bronchial asthma, including clinical, school and family-oriented models of management. The search for sources was carried out among peer-reviewed articles published in international scientific journals indexed in the databases PubMed Central, Europe PMC, BioMed Central, DOAJ, PLOS, Semantic Scholar and WHO Global Index Medicus. Priority was given to systematic reviews, meta-analyses, randomized controlled trials, and cohort studies evaluating the effectiveness of nursing interventions, educational programs, and self-management technologies in children with asthma. The selected publications were subjected to thematic analysis in order to summarize the data, identify key areas of nursing practice and determine the prospects for its improvement in the context of a modern approach to chronic diseases of childhood.

## Introduction

Bronchial asthma (BA) is one of the most common chronic diseases in children and is a serious medical and social problem that requires a comprehensive and interdisciplinary approach. According to the World Health Organization, asthma affects millions of children worldwide, and it remains one of the leading causes of school absences and hospital admissions. Insufficient control of symptoms, improper use of inhalers, and failure to follow the doctor's recommendations significantly reduce the quality of life of the child and his family, increasing the risk of severe exacerbations and chronic respiratory failure[1].

The role of a nurse in the management of asthma in children goes far beyond the performance of medical appointments. The modern concept of nursing care includes educational, preventive and coordination functions. The nurse teaches children and their parents the correct inhalation technique, monitors compliance with the treatment regimen, monitors symptoms and risk factors, and provides psychoemotional support. Studies show that nurse-led programs in schools and communities significantly reduce the frequency of exacerbations, increase parents' knowledge of the disease, and promote better asthma control in children [2].

In addition, nursing becomes the most important link between the child, the family, the school and the medical system. Through school and community initiatives such as SHARP and Asthma Link, improved self-management, increased adherence to therapy, and reduced hospital admissions are being achieved. The introduction of digital technologies, including telemedicine consultations and mobile applications, opens up new opportunities for personalized support of children with asthma, making nursing care more flexible and efficient.

## Organization of nursing care

The organization of nursing care for children with bronchial asthma is based on the principles of a systematic approach, including early detection of symptoms, constant monitoring and training of patients. Current research shows that the introduction of nurse-led models for managing children with asthma in outpatient practice improves clinical outcomes and reduces treatment costs. Protocol-based nurses conduct regular consultations, evaluate inhalation techniques, the level of disease control, and adherence to therapy. Such models can not only reduce the frequency of exacerbations and hospitalizations, but also increase the satisfaction of parents and patients with the quality of care provided [3].

One of the key advantages of the nurse-led approach is close coordination between all participants in the care process — pediatrician, family, school and medical institutions. The nurse acts as an intermediary, ensuring continuity of observation and timely correction of therapy. As part of multidisciplinary teams, she collects data on the frequency of symptoms, medication use and compliance with preventive measures, informing the doctor about the dynamics of the child's condition. This model contributes to the formation of individualized management plans and strengthens the partnership between medical personnel and the family, which is especially important for chronic diseases of childhood [1].

The effectiveness of protocol-based nursing models is also supported by economic and organizational advantages. In countries with a developed primary health care system, where nurse-led clinics are actively implemented in practice, there is a decrease in the burden on pediatricians and a decrease in the number of emergency calls. At the same time, the level of disease control in children remains stable or even improves. These data point to the prospects of integrating such an approach into national health systems, including adaptation for the CIS countries, where a nurse can play a key role in long-term monitoring and training of families with children suffering from bronchial asthma [4,5].

## Training in inhalation techniques and self-management

One of the central tasks of nursing in children with bronchial asthma is to teach the correct inhalation technique, since it is mistakes in the use of inhalers that often lead to a decrease in the effectiveness of

treatment. The nurse plays a leading role in developing the child and parents' skills in the correct use of medicines: demonstrates the technique of using metered-dose and powder inhalers, teaches the sequence of actions, monitors respiratory movements and the tightness of the mouthpiece grip. Studies show that training provided by a nurse significantly increases the level of understanding of therapy by parents and children, improves control of symptoms, and reduces the frequency of hospitalizations [1].

Self-management of asthma, including daily monitoring of symptoms, keeping a diary, and assessing peak expiratory velocity, also requires the involvement of a nurse as a mentor and coordinator. Through individual and group classes, the nurse builds the responsibility of the child and his family to follow the treatment regimen and avoid triggers of the disease. Nurse-led self-management educational programs implemented in schools and outpatient settings have proven to be effective: according to controlled studies, participants in such programs have more stable asthma control, less need for emergency care, and a higher level of self-confidence in managing the disease [2].

Current trends in teaching patients with bronchial asthma include the use of remote technologies. Video instructions, mobile apps, and online platforms allow for repeated training and monitoring without the need for frequent visits to the clinic. Comparative studies show that the combination of face-to-face classes and digital forms of education increases the long-term effectiveness of nursing educational interventions. Such hybrid programs not only expand patient coverage, but also help to personalize the approach — children and parents can return to the materials at a convenient time, strengthening the correct skills of inhalation and symptom control [6,7].

### **School and community programs.**

School-based asthma and respiratory programs such as SHARP (School-based Asthma and Respiratory Program) and Asthma Link have proven highly effective in improving disease control in children and reducing the frequency of exacerbations. These programs are based on the active participation of school nurses, who regularly monitor children, monitor the use of inhalers, and teach school staff and parents the basics of seizure recognition and prevention. According to the results of systematic studies, the participation of nurses in school initiatives leads to a decrease in the number of missed school days, a decrease in emergency calls, and an increase in the level of family knowledge about the disease and self-control [2,7].

One of the key advantages of such programs is their integration into the school system and interaction with local medical institutions. School nurses become the central link between the child, family, doctor and teachers. They share information about the child's health status, organize individual treatment plans, and conduct educational seminars for parents and teachers. This cross-sectoral model increases the school's readiness to respond to asthma episodes and contributes to the creation of a safe and supportive environment for children with chronic diseases [2,7].

Community-based care programs implemented in outpatient and community centers complement school initiatives by ensuring continuous follow-up. Nurses in such projects conduct home visits, monitor medication use and adherence therapy, and organize training events for families. The experience of implementing community-based models shows that systematic coordination between the school and the community contributes to better disease control and reducing the social burden of asthma. These data confirm the need for active participation of nursing staff in the prevention and long-term support of children with asthma at the school and local community level [5,8].

### **Nutritional, behavioral and psychological aspects**

Nursing care for children with bronchial asthma covers not only medical and educational areas, but also important nutritional and behavioral aspects. A nurse plays a key role in advising families on nutrition issues, as the diet directly affects the immune system and inflammatory processes in the respiratory tract. Parents' training includes recommendations on avoiding foods that provoke allergic reactions (milk, nuts, chocolate, citrus fruits), as well as on increasing the intake of antioxidants, vitamins C and E, and polyunsaturated fatty acids that help reduce inflammation. Regular nursing

counseling helps parents develop healthy eating habits in their child and reduce the risk of asthma exacerbations[1, 5] .

An equally important task is to develop a safe level of physical activity in children. The nurse explains that moderate physical activity — such as breathing exercises, swimming, and walking in the fresh air— helps strengthen the respiratory muscles and improve the control of asthma symptoms. Together with parents and teachers, she helps to adapt physical exercises to suit individual tolerance, teaches how to recognize signs of hyperventilation and how to prevent it. Such behavioral interventions reduce the level of anxiety among parents and increase children's self-confidence, contributing to social adaptation [2,7].

Psychological support for the child and family is also the responsibility of the nursing staff. Frequent asthma attacks and limitations associated with the disease can cause fear, uncertainty, and social isolation in children. A nurse with communication and empathy skills helps reduce emotional stress, teaches parents stress management techniques, and creates an atmosphere of trust and support. Studies show that the inclusion of psychosocial elements in nursing care programs improves compliance, reduces the number of exacerbations, and improves the overall quality of life of children with asthma [6,8].

### **Problems and prospects**

Despite the proven effectiveness of nursing interventions in children with bronchial asthma, there are still a number of problems in practice that limit their widespread implementation. One of the key factors is the lack of qualified personnel and insufficient training of nurses according to international standards. In many countries, including the CIS countries, nursing education remains predominantly clinical and does not sufficiently include aspects of prevention, communication and patient education. As a result, nurses often do not have the necessary competencies to conduct educational and behavioral interventions, which reduces the potential of nurse-led programs. International experience shows that specialized training and certification of nurses in the areas of "Asthma Educator" and "School Nurse Specialist" significantly improve the quality of care and independence of nursing staff[1, 5].

An equally urgent problem is the lack of unified interdisciplinary protocols for the nursing care of children with bronchial asthma. Different countries and even regions of the same country have different approaches to training, monitoring, and interaction between doctors, nurses, and schools. This leads to fragmentation of the care system and reduces the effectiveness of preventive measures. The creation of unified standards of care based on evidence and adapted to local conditions will increase the continuity and coherence of specialists' actions. Special attention should be paid to the development of training programs for parents and educators, as well as the inclusion of nurses in the decision-making process on the management of chronic patients [7,8].

Prospects for the development of nursing care are linked to the integration of digital technologies and a multidisciplinary approach. Telemedicine platforms, mobile applications for monitoring symptoms, databases on the use of inhalers, and artificial intelligence can become tools to support nurses in controlling the disease and analyzing the dynamics of the child's condition. Such solutions have already been shown to be effective in increasing treatment adherence and early detection of exacerbations. The future of nursing care for bronchial asthma lies in the transition from episodic observation to continuous, personalized patient support, where the nurse acts not only as a performer, but also as a coordinator of the entire care system [2,6].

### **Conclusion**

Nursing care for children with bronchial asthma is a key component of the modern chronic disease control system and has proven effective in reducing the frequency of exacerbations, improving the quality of life and improving compliance. Implementing nurse-led models in schools and communities, teaching proper inhalation techniques, developing self-management skills, and working closely with families can achieve sustainable disease control at lower resource costs. However, further development of this practice requires systematic training of nurses in accordance

with international standards, the creation of unified nursing protocols and the integration of digital technologies into daily work. A promising direction is the transition to personalized, multidisciplinary models of care, in which the nurse acts not only as a performer, but also as an active coordinator of the treatment, training and prevention process, providing continuous support to a child with bronchial asthma at all stages of his life.

## Literature

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