JOURNAL OF INTERNATIONAL CRISIS AND RISK COMMUNICATION RESEARCH
ISSN: 2576-0017
2024, VOL 7, NO S3

The Role of Nurses in Managing Patients with Asthma: A Comprehensive Review

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Abstract
Asthma is a chronic and common disease among communities and all age groups. Although it is not considered a critical infectious disease, it poses a threat to the health and life of patients. Therefore, asthma patients must manage to reduce acute complications and provide support to patients to improve their health outcomes through asthma management. Here, the role of nurses emerges as the first line of defense in health care and directly linked to patients in managing asthma patients, educating them, and multidisciplinary collaboration to ensure achieving the best health outcomes for patients. Nursing interventions are likely to lead to effective management outcomes through patient-centeredness and a holistic approach to health care. The purpose of this review was to explore the role of nurses in the management of asthma patients. In addition, to highlight the importance of technology in enhancing the ability of nurses to manage and follow up asthma patients.
Keywords: Nurses, Asthma, Chronic Disease, Holistic Approach, Managing Patients

Introduction

Asthma is a common disease and a major global issue, affecting more than 339 million people worldwide. All age groups are at risk of developing asthma [1]. However, this chronic disease is a critical non-communicable disease, which causes more than 80% of annual deaths attributed to the disease in older adults [2]. According to the World Health Organization Asthma is a lung condition characterized by difficulty breathing due to swelling and narrowing of the inflamed tubes that carry air to and from the lungs [3]. It usually begins in childhood and is an incurable disease; people living with asthma often have restricted life-related activities, but good management can control symptoms and enable them to have a good quality of life [3,4].
The risk of developing asthma increases with several environmental and social determinants from birth to 20 years of age, affecting recurrent lower respiratory tract infections during childhood, causing recurrent respiratory infections, and often in this age group, children from birth to 20 years of age cannot avoid being in environments that include these determinants [5]. Exposure to air pollution, whether indoors (e.g., dust, medications, animal dander, carpets, tobacco smoke, smoke) or outdoors (e.g., weather conditions such as low temperatures, pollution, cold air, very high humidity) or occupational exposure [6]. Causing long-term complications .such as insomnia, psychological problems, pneumonia (lung infection) or collapse of part or all of the lung. Severe asthma exacerbations can be life-threatening and are often preventable with timely management and education [6,7].
Nurses, as integral members of the healthcare team, play a pivotal role in asthma management across primary, secondary and tertiary care settings, providing assessment, education and

monitoring [8,9]. In addition, modern technology plays an important role in enhancing the ability of nurses to manage chronic conditions and asthma patients [10].

This review highlights the critical contributions of nurses in asthma management, with a particular focus on severe asthma.

Understanding Asthma and the Role of Nursing

Asthma, as defined by the World Health Organization, is a chronic respiratory condition that involves inflammation and narrowing of the airways, making breathing difficult. It is characterized by an over-response to various triggers such as allergens (dust mites and pollen), environmental pollutants, tobacco smoke, and respiratory infections [11]. This response often results in bronchial narrowing, airway inflammation, and excessive mucus production, causing characteristic symptoms such as wheezing, coughing, shortness of breath, and chest tightness [11,12]. These symptoms vary in severity and can significantly impact an individual's quality of life.

Severe asthma represents a subset of the disease where symptoms remain poorly controlled despite adherence to optimal drug therapies. Patients with severe asthma may experience persistent symptoms, frequent exacerbations requiring emergency care, or sudden attacks that can be fatal. This form of asthma requires a multidisciplinary and personalized management approach to optimize patient outcomes [13].

The Role of Nurses in Understanding and Managing Asthma

Nurses play an important role in the multidisciplinary approach to managing asthma, including severe asthma. Given the direct link between nursing and patients and the fact that nurses are the first line of defense in health care [14]. In addition, to clinical nursing interventions, nurses are required to educate patients about disease mechanisms, identify triggers, and promote adherence to treatment plans [14,15].

- Monitor and evaluate asthma control using tools such as peak flow meters and symptom diaries.
- Educate patients on appropriate inhaler techniques and action plans for managing exacerbations.
- Coordinate care across multidisciplinary teams to ensure a comprehensive, patient-centered approach.
- Provide psychosocial support to help patients cope with the emotional burden of living with a chronic condition.

Stepwise management of asthma and the pivotal role of nurses

1. The stepwise approach to asthma management

Asthma management is most effectively implemented using a stepwise approach, which is in line with international guidelines such as those provided by the British Thoracic Society (BTS). This strategy involves escalating or tapering treatment based on symptom severity and patient response to treatment [16].

- **Steps 1-3:** These initial steps primarily involve the use of inhaled corticosteroids (ICS) as a preventative measure and short-acting beta-2 agonists (SABAs) for symptom relief [17]. This combination is effective for most patients with mild to moderate asthma.
- **Steps 4-5:** For patients with poor disease control despite optimal inhaled treatments, advanced therapies are considered. These may include long-acting beta-2 antagonists (LABAs), leukotriene receptor antagonists, and biological therapies such as omalizumab for severe allergic asthma [18]. Patients at these stages are usually referred to specialist services for personalized management.

2. Role of Nurses in the Stepwise Approach

Nurses play a critical role in implementing and supporting the stepwise management of asthma, ensuring adherence to treatment protocols, and providing patient-centered care.

Primary Care Nurses

- **Assessment and Monitoring:** Nurses assess patient adherence to prescribed medications and proper use of inhalers. They also identify issues such as poor inhaler techniques or misconceptions about treatments [19].
- **Addressing Psychosocial Barriers:** They help patients overcome factors such as anxiety, stress, or social determinants that may affect asthma control [9].
- **Education and Self-Management:** Nurses provide guidance on avoiding triggers, developing asthma action plans tailored to the patient's lifestyle, and encouraging active participation in self-management practices [9,19].

Respiratory Nurse Specialists

- **Advanced Assessment:** Specialists conduct in-depth assessments, including asthma phenotyping, to identify the specific asthma subtype and recommend individualized treatment plans [20].
- **Advanced Therapeutics Management:** These nurses are trained to administer new treatments, such as biologics or bronchothermal therapy, and monitor their effectiveness [20].
- **Patient Advocacy and Continuity of Care:** Respiratory nurses ensure smooth coordination within multidisciplinary teams and serve as a vital link between patients and healthcare providers [8].

Nurses in Severe Asthma Management

Nurses play a pivotal role in the management of severe asthma by ensuring comprehensive care, from early assessment to advanced treatment management. Including assessment, education and care coordination, they ensure that patients receive effective interventions in a timely manner. Their role extends beyond clinical care, providing emotional and practical support that enables patients to manage their condition, improve quality of life and reduce the impact of asthma on daily life [8,20].

Assessment and Monitoring

Nurses are at the forefront of systematically assessing patients with severe asthma [21]:

- **Assess symptom control:** Using tools such as peak flow meters and asthma diaries, nurses track airway function and identify patterns in symptoms.
- **Monitor exacerbation risk:** Nurse help patients recognize early warning signs of exacerbation and provide guidance on when to seek medical care.
- **Reduced health burden:** Nurse empowering patients with knowledge and proactive measures, nurses reduce emergency room visits and hospitalizations, improve patient outcomes and reduce health care costs.

Patient education and self-management

Education is a cornerstone of effective asthma management. The role of nurses is to:

- **Correct inhalation techniques:** Ensure proper use of inhalers to maximize medication delivery and effectiveness [8].
- **Recognize and avoid triggers:** Guide patients to identify and avoid asthma triggers such as allergens, smoke and stress [22].
- **Action plans:** Help patients implement personalized asthma action plans during exacerbations, reducing severity and recovery time [8,21].

Nurses leverage a variety of educational resources, including videos, brochures and digital platforms, to enhance learning and adapt to different patient needs.

Referral to specialized care and coordination with medical teams

For patients with severe uncontrolled asthma, timely referral to specialized services is critical. Nurses [19,23]:

- **Facilitate specialized referrals:** Identify patients who need advanced care and ensure they access multidisciplinary teams promptly.
- **Simplify care pathways:** nurse coordinating between primary care and specialized centers, nurses reduce treatment delays and optimize care plans.

Specialized services provide access to advanced interventions such as biologics and bronchial heat, which are essential for patients with severe resistant asthma [23].

Advanced Therapies and Comprehensive Care

Respiratory nurses play a key role in the management of advanced therapies. Their responsibilities include [24,25]:

- **Biological management:** Providing treatments such as omalizumab to patients with severe allergic asthma and monitoring treatment outcomes.
- **Co-morbidity management:** Collaborating with nutritionists, physical therapists and psychologists to manage co-morbidities and improve overall health.
- **Holistic management:** Ensuring a patient-centered approach by incorporating the physical, emotional and social aspects of care into treatment plans.

Psychosocial Support and Quality of Life in Asthma Management

Asthma and severe asthma are generally associated with psychological and behavioral disorders that affect the patient's mental health and quality of life. Psychosocial burdens include anxiety, depression, and fear of exacerbation, which can reduce quality of life and impede effective disease management.

The Role of Nurses in Psychosocial Support

Nurses have the ability to address these challenges through:

- **Emotional Support:** Nurse providing empathy and understanding, nurses help patients cope with the psychological stresses associated with chronic disease [26].
- **Empowerment and Confidence Building:** Nurses encourage patients to regain control of their asthma by teaching them self-management strategies and promoting a sense of independence [26].
- **Effective Communication:** Through clear and compassionate communication, nurses build confidence and motivate patients to adhere to their treatment plans, reducing feelings of helplessness and improving engagement [27].
- **Comprehensive Care:** Addressing not only physical symptoms but also mental and social health, nurses ensure a comprehensive approach to asthma management [26,27].

Impact of nurse-led interventions

Evidence confirms the transformative impact of nurse-led interventions on asthma outcomes [28]:

- **Reducing exacerbations:** Proactive monitoring and timely adjustments to treatment plans reduce the frequency and severity of asthma attacks.
- **Reducing the burden on health systems:** Education and empowerment reduce reliance on emergency services and hospitalizations.
- **Improving adherence to treatment:** Nurse-patient engagement enhances treatment plans and mutual trust, encouraging patients to adhere to prescribed medications and lifestyle modifications, which improves patient outcomes.
- **Improving quality of life:** Comprehensive nurse-led care helps patients experience fewer symptoms, greater psychological well-being, and better overall health satisfaction.

Reaching Vulnerable Populations

Nurses should ensure inclusiveness of nursing services for patients in rural areas or with mobility challenges who have limited access to healthcare facilities [29].

- Providing education tailored to specific community needs.

- Using innovative approaches, such as telemedicine and group education sessions, to reach underserved populations.
- Ensuring continuity of care and regular follow-up to maintain disease control.

The Role of Modern Technology in Nursing and Management of Chronic Diseases

Recent years have witnessed a remarkable development in the use of technology to enhance nursing efficiency and improve the management of chronic diseases, such as asthma. These technologies contribute to monitoring patients, improving diagnosis, and enhancing communication between healthcare providers.

Modern Technologies in Nursing Chronic Diseases

- **Electronic Health Records (EHRs):** enable nurses to quickly access patient information, reducing errors and improving care coordination. This enhances the quality of healthcare and improves patient outcomes [30].
- **Mobile Health Applications (mHealth):** are used to monitor patients remotely, track vital signs, and remind patients of medication schedules, which enhances treatment adherence and improves chronic disease management [31].
- **Tele-nursing:** Enhances the ability of nursing to continuously monitor patients remotely, provide consultations to patients, follow up on treatment plans with patients, and continuous evaluation, which enhances patient confidence in nursing and improves patients' adherence to treatment plans and lifestyle, thus improving patient outcomes [32].
- **Smart inhalers:** Designed for asthma patients, they help improve medication use and avoid common errors, leading to improved disease control and reduced attacks [33].
- **Artificial Intelligence (AI):** Used to analyze patient data, predict exacerbations, and customize treatment plans, helping nurses provide more effective care [32].

The impact of technology on the role of nurses

The integration of technology into nursing has improved work efficiency and reduced administrative burden, allowing nurses to focus more on patient care. These technologies have also contributed to enhancing communication with patients, providing psychological support, and providing continuous health education, which improves the quality of life for patients [32,33].

Conclusion

Nurses are essential to the continuum of asthma care, particularly in the management of severe asthma. Through timely assessment, education, referrals, and administration of advanced therapies, they ensure personalized and effective care. Expanding the role of nurses in asthma management can further improve patient outcomes, reduce healthcare costs, and improve patient outcomes and quality of life. Continued investment in nurse-led training and resources is critical to advancing asthma care globally. In addition, the adoption of digital and emerging technologies is enhancing nurses' ability to effectively monitor chronic conditions and asthma and improve treatment outcomes. This reinforces the need for nurses to adopt emerging technologies in nursing practice.

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