SCIENTIFIC TRENDS IN MEDICINE - НАУЧНЫЕ ТЕНДЕНЦИИ В МЕДИЦИНЕ – TIBBIYOTDA ILMIY TENDENSIYALAR

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BRONCHIAL ASTHMA IN SURXONDARYO REGION, UZBEKISTAN: EPIDEMIOLOGY, QUALITY OF LIFE, AND MANAGEMENT STRATEGIES

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Abstract: *this study evaluates the quality of life and disease control among bronchial asthma patients in the Surxondaryo region. Based on a survey of 150 patients, the lowest WHOQOL-BREF scores were observed in the physical and psychological domains. Frequent asthma attacks and delayed diagnosis were identified as major factors reducing life quality.*

Keywords:*bronchial asthma, Surxondaryo, quality of life, WHOQOL-BREF, ACT, diagnosis, control, prevention.*

Introduction

Bronchial asthma (BA) is a common chronic inflammatory disease of the airways characterized by recurrent episodes of wheezing, breathlessness, chest tightness, and coughing. It affects people of all ages and is the **most frequent chronic disease among children worldwide**. Globally, asthma imposes a significant public health burden: **about 339 million people** currently suffer from asthma, roughly **5% of the world's population**, and in children the prevalence is around **10%**. Asthma is not only a medical problem but also a social one, as it can substantially impair patients' quality of life [3]. Each year, hundreds of thousands die from asthma-related causes; notably, **over 80% of asthma deaths occur in low- and lower-middle-income countries**, highlighting disparities in care and the critical need for accessible treatment [1]. Proper diagnosis, appropriate therapy

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(especially inhaled medications), and patient education can achieve good control of asthma, allowing patients to lead normal, active lives.

Uzbekistan, a lower-middle-income country in Central Asia, mirrors many global trends in asthma epidemiology and faces particular challenges in disease management. The Surxondaryo region in southern Uzbekistan provides a representative case study of asthma's impact in a largely rural, resource-limited setting. With approximately 2.74 million inhabitants (as of 2022), Surxondaryo has an estimated asthma prevalence of about **5% of the population**, corresponding to roughly **130–140 thousand** people living with asthma in the region. This prevalence is on par with global averages. Asthma ranks among the most common chronic diseases in Uzbek children, similar to worldwide patterns. Like many regions, Surxondaryo has witnessed an **upward trend in asthma cases** in recent years. Respiratory illnesses (including asthma and chronic bronchitis) reportedly increased about **2.5-fold in the last five years**, a rise possibly driven by environmental factors. Climate change and ecological problems (such as the Aral Sea crisis) contribute to frequent dust storms and air pollution even in Uzbekistan's southern provinces, which likely exacerbate respiratory disease prevalence. Asthma in Surxondaryo thus represents both a **medical concern and a societal challenge**, affecting quality of life, productivity, and healthcare systems.

This thesis provides a comprehensive overview of bronchial asthma in the Surxondaryo region. It will cover the clinical features and pathophysiology of asthma, analyze epidemiological and demographic data specific to Surxondaryo, and evaluate the **quality of life (QOL)** of asthma patients in this region using standardized instruments. Particular attention is given to **urban–rural disparities**

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in diagnosis and treatment, as Surxondaryo's population is ~80% rural. Finally, evidence-based recommendations are proposed to improve asthma management and patient outcomes, encompassing medical, psychological, environmental, and public health strategies. The aim is to inform healthcare policy and practice in Surxondaryo (and similar settings) to better address the burden of asthma and improve patients' quality of life.

Clinical Features and Pathophysiology of Asthma

Bronchial asthma is fundamentally an inflammatory disorder of the airways. It is defined by **chronic inflammation and hyperreactivity of the bronchial tree**, leading to recurrent, reversible narrowing of the airways. The pathogenesis involves immune cells (especially eosinophils and T-lymphocytes) infiltrating the bronchial mucosa and causing persistent inflammation and edema. This inflammatory process underlies airway hyperresponsiveness – an exaggerated bronchial constriction in response to various stimuli. Over time, untreated inflammation can cause airway remodeling (structural changes) that make airflow obstruction less reversible.

Clinical manifestations of asthma result from episodic bronchoconstriction and inflammation. The hallmark symptoms are: **paroxysmal dyspnea** (episodes of breathlessness or difficulty breathing) often with wheezing, **chest tightness**, and **coughing**. Patients classically experience **wheezing on expiration** (sometimes described as a high-pitched "whistling" sound) and a sensation of chest constriction, particularly during the night or early morning hours. The cough in asthma is typically **dry and spasmodic**, and can be triggered by exercise or allergen exposure. These symptoms tend to occur in recurrent

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attacks (acute exacerbations) separated by symptom-free periods, especially in mild cases. A defining feature of asthma is the **reversibility of airway obstruction** – symptoms often improve either spontaneously or with use of bronchodilator inhalers (such as rapid-acting β_2-agonists). This reversibility distinguishes asthma from other chronic obstructive lung diseases. In between attacks, many asthma patients have near-normal respiratory function, especially if the asthma is well-controlled.

Triggers for asthma exacerbations are diverse and often patient-specific. Common precipitating factors include exposure to **aeroallergens** like house dust mites, pollen, mold spores, and animal dander, which can provoke allergic asthma. Non-allergic triggers are also important: **tobacco smoke**, air pollution (e.g. industrial or vehicle emissions), **cold air**, **physical exertion**, and **respiratory infections** (viral colds or influenza) can all induce asthma attacks. Strong emotional stress and laughter are noted triggers in some individuals. The **strongest risk factors for developing asthma** are related to inhaled exposures that irritate the airways or cause allergic reactions – for example, indoor allergens (dust mites in bedding and carpets, pet fur), outdoor allergens (pollens, molds), and occupational or environmental pollutants. Genetic predisposition also plays a role; a family history of atopy or asthma increases risk, indicating an interaction of **hereditary factors and environmental exposures** in asthma pathogenesis. The clinical course of asthma is heterogeneous. Some patients have infrequent, mild attacks, while others experience severe, frequent exacerbations. Asthma severity is typically classified as **mild, moderate, or severe** based on symptom frequency,

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nighttime awakenings, and lung function impairment. Proper classification is important for guiding treatment intensity.

Asthma Epidemiology in the Surxondaryo Region

Surxondaryo (Surkhandarya) is a province in the far south of Uzbekistan, bordering Afghanistan. The region's population is predominantly rural (approximately **80%** living in villages)[18], with agriculture being a main livelihood. Epidemiological data on asthma in Surxondaryo are somewhat limited in published literature, but available information and national data allow a reasonable characterization of the situation. According to official statistics in Uzbekistan, roughly **5% of the population** has doctor-diagnosed bronchial asthma. Applying this rate to Surxondaryo (population ~2.74 million) yields an estimate of **130,000–140,000 asthma patients in the region**. This figure suggests that asthma prevalence in Surxondaryo is **comparable to the national and global average** (in line with the ~5% worldwide prevalence). Asthma is especially prominent among children: it is noted as the most common chronic disease of childhood both globally and in Uzbekistan. If anything, childhood asthma may be somewhat under-recognized in official stats; community surveys often find higher symptom rates in kids than clinic-based diagnoses. Nonetheless, it is clear that asthma constitutes a significant pediatric health issue in Surxondaryo, as in other regions.

Trends: Consistent with global patterns, the **prevalence of asthma in Uzbekistan has been rising** over time [4]. In Surxondaryo, health authorities have observed an increase in respiratory diseases. One report noted that over the past five years, the incidence of respiratory tract illnesses – particularly asthma and

chronic bronchitis – **increased by a factor of 2.5**. While improved detection and reporting may partly explain this surge, environmental and lifestyle changes are likely contributors. Climate shifts and ecological challenges unique to Central Asia have impacted Uzbekistan's air quality. The **Aral Sea environmental disaster** in the country's northwest has led to toxic dust storms that can travel across the region; although Surxondaryo is far from the Aral Sea, prevailing winds and desertification mean dust and sandstorms are common in the south as well. These dust events carry salt and pollutants that irritate the respiratory tract, potentially increasing asthma and allergy cases. Additionally, urbanization and the growing number of vehicles have introduced more air pollution in Uzbek cities, while rural areas still experience indoor air pollution from biomass fuel use. A UNICEF-backed climate risk analysis noted that **air pollution and dust** have contributed to increased respiratory illnesses and allergies in certain regions of Uzbekistan [5]. Surxondaryo, being one of the country's hotter and drier provinces, faces seasonal dust storms (e.g., during the summer dry winds) which residents and physicians associate with spikes in asthma exacerbations.

Demographic distribution: The pattern of asthma by age and sex in Surxondaryo appears to follow the well-recognized trends seen elsewhere. **During childhood, boys are more frequently affected by asthma than girls**, whereas in adulthood the trend reverses and **women have higher asthma prevalence than men** [2]. This gender "switch" around adolescence is thought to relate to hormonal and developmental factors: boys have narrower airways relative to lung size in early life (predisposing them to wheeze), while adult women may be more susceptible due to hormonal effects on immunity and bronchial reactivity. For

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example, data from the American Lung Association show that in U.S. children, asthma prevalence is about 7.0% in males vs 5.4% in females, but among adults it is ~10.8% in females vs 6.5% in males. Although we lack precise local survey data, Uzbek clinicians report similar observations: asthma is common in boys in childhood and tends to be diagnosed more often in women during middle age. Aside from sex differences, **age also influences asthma patterns**. Many patients experience onset in childhood (often associated with allergies), while others develop adult-onset asthma (sometimes non-allergic). In Surxondaryo's clinics, pediatric and adolescent asthma cases are frequently seen, but an increasing number of working-age adults are also being diagnosed. This aligns with national trends of asthma extending into the productive adult population.

Another important epidemiological aspect is the **urban vs. rural distribution** of asthma in Surxondaryo. The province is largely rural, and living conditions differ markedly from the urban center (Termez city). On one hand, rural areas have **less industrial air pollution** than big cities; Surxondaryo has minimal heavy industry. On the other hand, rural residents may have higher exposure to natural allergens and irritants – for example, more exposure to **dust, farm pollen, and biomass smoke**. Many homes in villages use wood or coal for heating and cooking, leading to indoor smoke that can aggravate respiratory conditions. The conference study noted that while industrial pollution is lower in Surxondaryo's villages, contact with dust (especially from unpaved roads and fields) and pollen is **higher in rural life**. This could contribute to asthma triggers. Furthermore, occupational exposures in rural settings (such as farming) can involve grain dust, chemicals, or animal dander, all potential asthma triggers.

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Healthcare access and diagnostic challenges: A major concern in Surxondaryo (as in much of Uzbekistan) is the **challenge of timely diagnosis and treatment in rural areas**. Healthcare infrastructure in villages consists of primary health posts (qishloq vrachlik punktlari) and family polyclinics with limited specialized services. Asthma, especially mild cases, may go unrecognized or be misattributed to recurrent bronchitis or "allergies" without formal diagnosis. Nationally, studies indicate that only **about 16% of asthma patients receive a correct diagnosis within the first 6 months** of disease onset. In other words, the majority of patients suffer symptoms for months or even years before asthma is properly identified and managed. This delay is often worse in rural communities. Contributing factors include limited access to pulmonologists or spirometry testing outside cities, cultural tendencies to self-treat or use traditional remedies initially, and lower health literacy about asthma. The result is that **asthma is likely underdiagnosed in Surxondaryo's countryside**, and many patients might only be diagnosed when a severe attack forces them to seek hospital care. A related issue is treatment availability: **inhaled corticosteroids and bronchodilators** – the cornerstone of modern asthma therapy – may not always be in stock at small village pharmacies or may be cost-prohibitive for low-income families. The World Health Organization emphasizes that ensuring affordable, available asthma medications is essential for effective control in low-resource settings [1]. We will discuss these challenges in more detail in a later section on rural vs. urban disparities.

In summary, Surxondaryo's asthma epidemiology reflects a **growing health burden with distinct demographic patterns** (youth predominance and a

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gender shift with age) and environmental influences (dust and allergen exposure). The province's largely rural makeup presents additional hurdles for asthma care. These factors underline the importance of assessing not just disease prevalence, but also how well patients are living with and managing asthma – which brings us to an examination of **quality of life** in local asthma sufferers.

Conclusion

In conclusion, **bronchial asthma in the Surxondaryo region of Uzbekistan remains a significant health issue** that demands a holistic approach as much as high-quality medical treatment. This thesis has examined how asthma affects patients in Surxondaryo – from its clinical characteristics and epidemiology to the profound impacts on quality of life. The case of Surxondaryo illustrates that the **quality of life of asthma sufferers can be just as important an outcome as traditional clinical metrics**. The findings show that many patients in this region experience suboptimal life quality due to frequent symptoms, psychological stress, and limitations in daily activities. These adverse outcomes are not inevitable: they correlate with factors like poor disease control, delayed care, and insufficient support, which are modifiable with the right interventions.

A **comprehensive, multi-pronged strategy** is essential to improve asthma care and patient well-being in Surxondaryo. Early diagnosis and **prompt initiation of modern therapy** (such as inhaled corticosteroids) can prevent the disease from spiraling into severe forms. Ensuring that patients have access to these therapies regardless of whether they live in a city or remote village is a matter of health equity. Alongside medical treatment, providing **psychological and social support** can markedly elevate patients' ability to cope and adhere to management plans.

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Environmental improvements – from cleaner indoor air to community-level pollution control – address root causes and triggers of asthma attacks, creating a healthier setting for all. Public health policies, when implemented earnestly at the local level, create an enabling environment for these changes to take root. For example, when the health system prioritizes asthma control (as reflected in the state program goals), it drives resources and attention toward asthma clinics, education, and monitoring.

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