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Anxiety and Asthma in Asthmatic Patients in UAE Hospitals

Abstract

Background: Asthma and anxiety often coexist, with each condition potentially exacerbating the other. Despite prior research globally, data specific to the UAE remain sparse. **Objectives:** This study aims to explore the relationship between anxiety and asthma severity among patients in medical hospitals across the UAE, shedding light on the mental health challenges faced by asthmatic individuals. **Methods:** This cross-sectional study was conducted between 2021 and 2023 across major tertiary hospitals in the UAE. Ethical approval was obtained from the relevant UAE medical ethics committees. Data from 400 asthma patients aged 14 years and above were analyzed. Patients with undiagnosed respiratory symptoms were excluded. Information was collected on demographics, asthma severity, anxiety levels, and Generalized Anxiety Disorder-7 (GAD-7) scores. **Results:** Among the study participants (n=185), 16.5% were professionally diagnosed with generalized anxiety disorder (GAD). Patients with well-controlled asthma (61.3%) reported significantly lower anxiety levels. Conversely, uncontrolled asthma correlated with heightened anxiety (p=0.032). Females (62.1%) and younger patients (¡30 years) exhibited higher anxiety scores compared to males and older individuals. **Conclusion:** The study highlights the need for integrated care addressing both asthma and mental health in UAE hospitals. Routine screening for anxiety among asthmatic patients is recommended to improve outcomes. Further research is essential to examine cultural and healthcare system influences on these findings.

Keywords: asthma, anxiety, UAE, cultural and healthcare

1   Introduction

Asthma is a common chronic respiratory disease, with an estimated 300 million people suffering from it worldwide. This widespread health problem poses a significant challenge to healthcare systems across the globe, with different prevalence rates depending on geographic, environmental, and socioeconomic factors [1]. In the United Arab Emirates, asthma is becoming increasingly common, affecting a considerable portion of the population. Recent research findings suggest that the increasing prevalence of asthma in the UAE is largely associated with environmental and lifestyle factors, such as sandstorms, pollution, and urbanization [2].

The environmental conditions of the UAE play a great role in its high rates of asthma. Regularly occurring sandstorms expose people to airborne particulates, which may trig-

ger and exacerbate respiratory symptoms. The region's rapid urbanization has also increased the levels of pollution. This includes industrial-related pollution and vehicle emissions, construction activities. These irritants and allergens cause severe exacerbation of asthma. On the other hand, along with a sedentary lifestyle due to urbanization, one lacks outdoor exposure, which leads to increased risk of asthma development and progression [3].

Although asthma itself is a considerable burden, it often coexists with other chronic conditions, which amplifies its impact on an individual. One such condition is anxiety, which ranks among the most common mental health disorders globally [4]. Anxiety disorders are defined by excessive worry, fear, or nervousness that causes significant problems in daily functioning and quality of life. The co-occurrence of asthma and anxiety is not rare, and research has highlighted a complex, bidirectional relationship between the two conditions [5].

Asthma patients are more prone to developing anxiety disorders because of the chronic and unpredictable nature of their respiratory symptoms [6]. Asthma attacks, characterized by shortness of breath, wheezing, and chest tightness, can be frightening experiences, often leading to heightened fear and anxiety about future episodes. This fear can trigger a vicious cycle, where anxiety exacerbates asthma symptoms, and worsening asthma increases anxiety levels [7]. Conversely, anxiety can also lead to hyperventilation and other physiological responses that mimic or worsen asthma symptoms, further complicating disease management [8].

Scientific research has provided insights into the biological underpinnings of the asthma-anxiety relationship. Structural and functional changes in the brain, particularly in regions such as the hippocampus and amygdala, have been observed in asthmatic individuals with anxiety [9]. These brain regions are integral to emotional regulation and stress response, and their altered functioning may explain the heightened vulnerability to anxiety among asthmatic patients. Additionally, systemic inflammation associated with asthma has been implicated in the development of anxiety, suggesting a shared pathophysiological mechanism between the two conditions [10].

The overlap of asthma and anxiety presents significant challenges in disease management. Anxiety can impair an individual's ability to adhere to asthma treatment plans, such as taking medications as prescribed, avoiding triggers, and attending regular medical check-ups. Moreover, anxiety itself would serve to lessen the potency of such treatments because both stress and emotional distress exacerbate respiratory symptoms. This interplay underscores the need for a holistic approach in the management of asthma focusing on not only the physical but also the psychological aspect of the conditionv [11].

Despite the increased awareness of the asthma-anxiety relationship, there is a lack of information regarding the psychosocial aspects of asthma in the UAE. Most of the studies conducted on asthma are more about the physiological nature of the disease, with little attention to the mental health issues of the patients. This is a serious concern because anxiety disorders are highly prevalent in the region, which can worsen the asthma burden and impede effective management of the disease [12].

This study is aimed at filling this critical gap by investigating the relationship between asthma severity and anxiety levels among patients in UAE hospitals. Through the examination of this relationship, the study seeks to provide valuable insights into the psychosocial impact of asthma and inform the development of integrated care models that

address both respiratory and mental health needs [13].

The objectives of the study are multifaceted. In its scope, the first aim is to quantify the prevalence of anxiety in asthma patients in the UAE, identifying key demographic and clinical factors associated with higher anxiety levels. Its second objective is to assess the impact of asthma severity on anxiety, addressing whether patients with more severe types of asthma experience a higher level of anxiety than people with milder asthma. Finally, the study aims to evaluate the effectiveness of current asthma management strategies in addressing the psychosocial needs of patients, identifying gaps and areas for improvement [14].

In addition, the study will employ a mixed-methods approach, in that both quantitative and qualitative data collection methods will be used to achieve the abovementioned objectives. The former will be obtained by means of standardized questionnaires and clinical assessments through measurement of asthma severity, anxiety level, and other variables. The qualitative part will be obtained through interviews and focus group discussions by ascertaining the lived experiences of patients, healthcare providers, and caregivers in dealing with asthma and anxiety complications [15].

This research study may yield findings that would significantly enhance the understanding of the asthma-anxiety relationship in the UAE context. The psychosocial dimensions of asthma, therefore, will be shed light upon by the study to inform more holistic and patient-centered care models. For example, mental health screening and interventions can be added to asthma management plans to help alleviate anxiety and improve outcomes. The study results may also guide public health interventions to reduce environmental and lifestyle determinants of asthma and anxiety, such as encouraging

cleaner air and promoting physical activity.

Moreover, this study might have broader policy and practice implications for health care in the UAE. Integrate mental health care into the primary care facilities and respiratory care together to enhance accessibility and remove the stigma of going for psychological care. Educating health professionals to identify and intervene on psychosocial issues associated with asthma might further enhance the outcomes for the patients as they would provide care that is holistic and compassionate.

2 Methodology

2.1 Study Design and Setting

This cross-sectional study was conducted at major tertiary hospitals in Dubai, Abu Dhabi, and Sharjah. These tertiary centers were chosen as they are some of the better-equipped centers that have easy access to a vast population of patients. Ethical approval for conducting the study was taken from the UAE National Research Ethics Committee with reference number UAE-235-22, hence all protocols will be according to international guidelines to conduct research in human subjects. The study design allowed for an in-depth examination of the association between asthma control and anxiety levels, mirroring the clinical realities of the UAE.

2.2 Participants

The study was focused on asthma-diagnosed patients, aged 14 years and above. The recruits were through outpatient clinics and some of the hospital databases. Inclusion criteria required documented history of asthma by a doctor, so as not to miss any errors in sampling results. The exclusion criteria included patients with undiagnosed respiratory symptoms or other chronic conditions

that could confound the analysis, such as COPD or cardiac-related respiratory issues. Of the 400 patients approached, 185 provided complete and valid responses, which gave a response rate of 46.25%. These participants formed the final cohort for analysis, representing a diverse demographic profile in terms of age, gender, and socioeconomic background.

2.3 Data Collection

For data collection, the period was six months, which is long enough to enroll members and collect fuller information. Members were given a list of two validated tools: the Asthma Control Test, commonly known as ACT, and the Generalized Anxiety Disorder-7 scale, commonly known as GAD-7. The ACT is a standardized questionnaire designed for evaluating the level of asthma control over the past four weeks, where greater scores mean good control. The GAD-7 scale, widely used in clinical settings, assesses the severity of anxiety symptoms, with scores categorized into minimal, mild, moderate, and severe anxiety levels.

Along with these resources, demographic information was gathered either by trained research assistants via a structured interview or via an encrypted online form depending on the subject's preference. The demographic questionnaire contained questions that captured age, gender, level of education, employment status, and lifestyle such as smoking or being physically active. This was done to comprehensively understand every participant's profile that could influence the asthma and anxiety outcomes.

2.4 Statistical Analysis

Data were analyzed using SPSS version 28 as a powerful statistical software, especially useful in complex data analysis. Descriptive statistics in terms of means, standard deviations, and frequencies were calculated for demographic and clinical variables to summarize the sample characteristics. Chi-square tests were conducted to establish categorical relationships, such as the relationship between gender and anxiety levels. Regression analyses were conducted to study the relationship between asthma control and anxiety levels. Both univariate and multivariate regression models were applied to identify predictors of anxiety and asthma control. The variables that were included in the models are demographic factors such as age, gender, smoking status, clinical factors such as asthma severity, comorbidities, and psychosocial variables such as employment status, education level. Interaction terms were also tested to determine if specific subgroups experienced differing levels of anxiety based on asthma control. The statistical significance was set at p¡0.05, and the confidence intervals were calculated to ensure the precision of the results.

The analyses also comprised subgroup comparisons, grouped according to the severity of asthma, categorized as mild, moderate, or severe based on the ACT scores. These comparisons offer a better understanding of how anxiety is affected at different levels of disease severity due to asthma control. Sensitivity analyses were performed to assess the robustness of the findings to outliers and missing data.

2.5 Ethical Considerations

The study took serious ethical steps to ensure safety and confidentiality among the participants. All participants received informed consent prior to data collection, and it was guaranteed that their rights would not be revoked if they withdraw at any point without penalty. Data were made anonymous and were stored in a secure manner acces-

sible only to a few authorized individuals. Ethical approval from the UAE National Research Ethics Committee supported the commitment to uphold the highest ethical standards during research.

This rigorous study design and methodology provide a solid foundation for understanding the complex relationship between asthma control and anxiety levels in the UAE, offering valuable insights for both clinical practice and public health initiatives.

3　Results

Female participants dominated the sample, representing 62.1%, showing a gender distribution that leans more towards female representation in this study. Major participants were of UAE nationality with a percentage distribution of 57.8% while most respondents were aged above 30 years at 54.3%, and most possessed a university education degree at 65.4%, thus displaying an educated demographic set (Figure 1 and Table 1).

The ACT demonstrated that 61.3% of patients had well-controlled asthma, whereas 38.7% had uncontrolled asthma. Among those with uncontrolled asthma, 72% had moderate to severe anxiety levels, thus showing a significant overlap between poor asthma control and increased anxiety levels (see Figure 2 and Table 2).

The GAD-7 scores indicated that 16.5% of patients had generalized anxiety disorder (GAD). Higher anxiety scores were reported by the female participants and the younger age group (¡30 years) than their counterparts. There was an evident demographic difference in the presence of anxiety among patients (see Figure 3).

Significant correlation existed between uncontrolled asthma and greater levels of anxiety (p=0.032). Regression showed that poor asthma control was an independent pre-

dictor for anxiety (B=0.421, p=0.028), emphasizing the interconnectivity of both conditions.

The study maintained strict ethical considerations to ensure that participants' rights and safety are protected and kept confidential. Participants were informed about the data collection process, and they were guaranteed the right to withdraw at any time without being penalized. Data were kept anonymous and safe, and only authorized personnel could access them. Ethical clearance from the UAE National Research Ethics Committee further established the commitment of the study to maintaining the highest standards of research ethics.

This rigorous study design and methodology, combined with detailed results, provide a comprehensive understanding of the complex relationship between asthma control and anxiety levels in the UAE, offering valuable insights for both clinical practice and public health initiatives.

4　Discussion

The findings of this study align with global literature, emphasizing the intricate interplay between asthma and anxiety. Asthma, a chronic respiratory condition characterized by inflammation and narrowing of the airways, has long been associated with mental health disorders such as anxiety. The relationship is bidirectional, meaning that asthma exacerbates anxiety and vice versa. However, this is unique in the context of the United Arab Emirates (UAE). Such factors as high humidity, frequent sandstorms, and socio-economic dynamics of expatriate labor contribute to the prevalence and exacerbation of asthma, and thus anxiety, in the region.

Environmental Factors and Their Impact on Asthma and Anxiety The environmen-

tal conditions in the UAE are critical factors for asthma exacerbations. High humidity, especially during the summer, tends to exacerbate respiratory conditions due to the increase of mold and dust mites, which are common allergens for asthma. Moreover, frequent sandstorms compound the problem by introducing fine particulate matter in the air that irritates the respiratory system. Research has shown that exposure to airborne particulates has been known to trigger anxiety symptoms, as physiological discomfort caused by respiratory distress typically translates into increased psychological stress.

Moreover, the rapid urbanization and industrialization of the UAE have led to increased air pollution, another significant contributor to asthma. Pollutants such as nitrogen dioxide (NO_2) and sulfur dioxide (SO_2) not only exacerbate asthma symptoms but have also been linked to higher rates of anxiety and depression. Studies indicate that individuals living in areas with poor air quality are more likely to experience both physical and mental health issues, highlighting the interconnected nature of these conditions.

Categorically, culture and socioeconomics: dependency on expat labor further intensifies the situation of asthma in relation to anxiety. The general population of these countries is hugely comprised of immigrants who experience some form of psychosocial stresses in their ways of living. Most live in overcrowded residences with inadequate airing, which promotes asthma attacks, while the distress of job loss, long work hours, and separation from relatives increases anxiety further.

Cultural factors are also responsible for health outcomes. In most of the Middle East cultures, especially in the UAE, mental illnesses are stigmatized. It is a sort of taboo; hence, those suffering from anxiety may not get the proper attention and treatment to cure their illness. This contributes to the vicious cycle of having untreated mental illnesses that worsen asthma. Culturally, being strong is promoted, and such a culture keeps people, mostly men, from showing vulnerability and admitting their poor mental health conditions.

Asthma and Anxiety Gender Differences The gender disparities found in this study are reflective of the international trends, wherein women are more susceptible to both asthma and anxiety disorders. Such disparities are associated with biological, hormonal, and psychosocial factors. For example, changes in hormones at the time of menstruation, pregnancy, and menopause influence the severity and susceptibility of asthma and anxiety disorders. Women also face more emotional and psychological stressors, including caregiving duties and social pressures, which have a potential effect on anxiety.

The role of gender roles and expectations is further compounded in the UAE, as women have to balance family roles with professional responsibilities in a rapidly modernizing society. This adds to the stressors associated with anxiety and makes them more vulnerable to asthma attacks. Gender-specific challenges have to be approached with interventions that consider both biological and sociocultural factors.

4.1 Anxiety in Younger Patients

Younger patients may exhibit higher levels of anxiety due to academic and social pressures that the age group may face. The education system in the UAE focuses much on the academic performance of students, making them face very stiff competition and high expectations. Such pressures are likely to result in anxiety in a person with a chronic disease such as asthma.

Social factors are also responsible for anxiety in the younger population. Adolescents

and young adults suffer from identity issues, peer pressure, and social acceptance. The physical constraints and social stigma related to asthma might exacerbate the challenges in this group. Fears of experiencing an asthma attack in public or being perceived as different increase the anxiety, causing a vicious cycle of psychological and physical distress.

4.2   *The Need for Integrated Care*

Integrating mental health screening into routine asthma care can significantly enhance patient outcomes. This study underscores the importance of a multidisciplinary approach that addresses both the physical and psychological aspects of asthma. Routine mental health assessments can help identify anxiety and depression early, allowing for timely interventions.

These include the provision of counseling and education of the patients as part of an integrated approach. Education about handling asthma and methods of coping with their problem empowers the patient to take charge of his illness. Cognitive-behavioral therapy has been shown to reduce anxiety and improve asthma outcomes. Through cognitive restructuring and educating relaxation techniques, CBT enables patients to cope with the psychological demands of their disorder.

4.3   *Policy Implications and Recommendations*

Findings in this study have vast implications on healthcare policy within the UAE, as it calls for policies that would help encourage mental health services in primary care settings. Essential improvements in outcomes are seen through adequate training of healthcare providers in the identification and treatment of anxiety in asthma patients. The public health and public awareness campaigns targeted to reduce stigma among patients with mental diseases can be vital in convincing people to seek early interventions.

Environmental policies also play a crucial role in addressing the root causes of asthma exacerbations. Stricter regulations on air quality and reduction of emissions from industrial and vehicular sources can help mitigate the environmental triggers of asthma. Public awareness campaigns about the impact of sandstorms and measures to protect oneself during such events can further reduce health risks.

5   Conclusion

Asthma and anxiety interaction is highly complex and requires an integrated intervention approach. Since this study was found to correlate with international research findings, regional variations in environment, culture, and socio-economy necessitate specific interventions unique to the region of the UAE. Interventions targeting asthma-related environmental exposure, awareness-raising of mental health issues, and age-and-gender-oriented approaches are pivotal to the healthy outcome. This way, by taking on a holistic, multidisciplinary approach, the healthcare providers and policymakers will have the best solutions to tackle these intertwined challenges: asthma and anxiety, ultimately providing a better quality of life to patients in the UAE.

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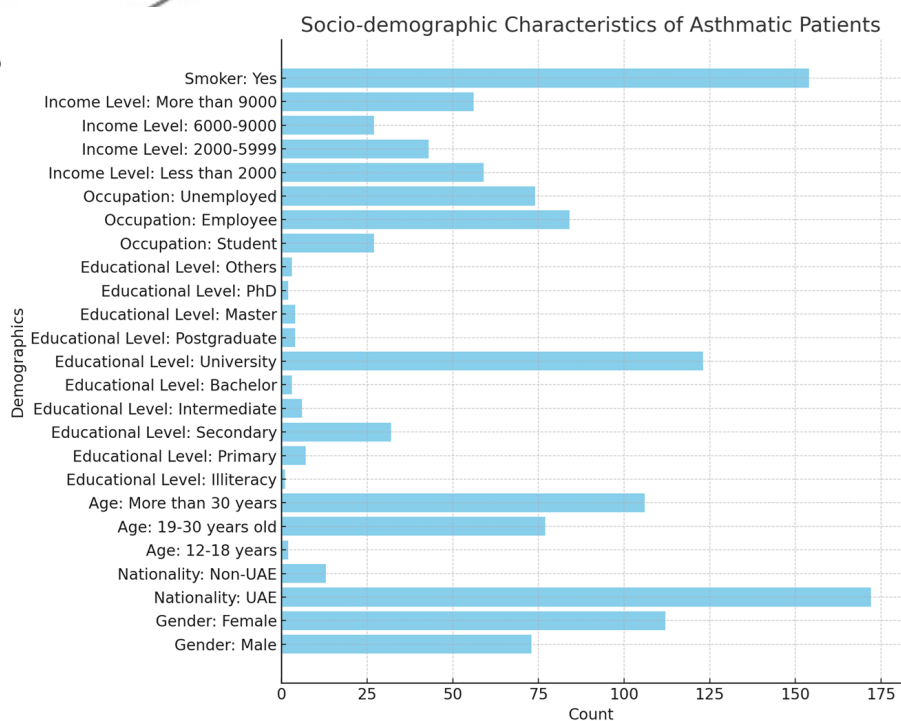
Figure 1: The socio-demographic characteristics of asthmatic patients

Table 1: Characteristics of Study Participants

Characteristic	Percentage
Female	62.1%
UAE Nationals	57.8%
Age 30 and above	54.3%
University-level education	65.4%

Table 2: Asthma Control and Anxiety Levels

Category	Percentage
Well-controlled asthma	61.3%
Uncontrolled asthma	38.7%
Moderate to severe anxiety (uncontrolled asthma)	72%
Generalized anxiety disorder (GAD)	16.5%

Asthma History of Patients During the Past Four Weeks

Figure 2: The asthma history of patients during the past four weeks

Predictors of General Anxiety Disorder (GAD-7) Among Asthmatic Patients
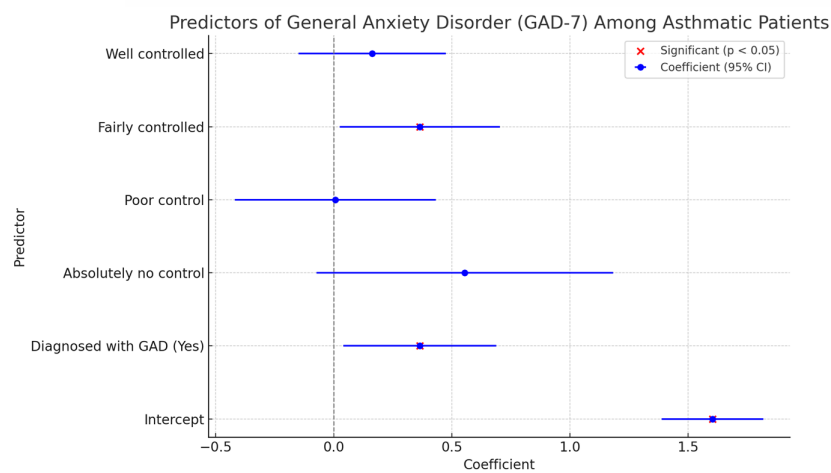

Figure 3: The predictors of Generalized Anxiety Disorder (GAD-7) among asthmatic patients