The Effect of Cardiovascular and Asthma Control on Quality of Life Among elderly Asthmatic Patients Attending Central Hospital, King Khalid Hospital of Hafar Albatin City

Sayed Ibrahim Ali[1], Mostafa Shaban [2,7], Khaled Elballah[3], Abdullah A. Alarfaj[4], Eman Elsheikh[5], Nagwa Ibrahim Abbas Ghoneim[6]

1: Assistant Professor, Department of Family & Community Medicine, College of Medicine, King Faisal University, Al-Ahsa, Saudi Arabia
2: Lecturer of Geriatric Nursing, Faculty of Nursing, Cairo University, Egypt
3: Associate professor, College of Education, Department of Special Education, King Faisal University, Al-Ahsa, Saudi Arabia
4: Otolaryngology Unit, Department of Surgery, King Faisal University, Al Ahsa 31982, Saudi Arabia
5: Internal Medicine Department, College of medicine, King Faisal University, Alahsa, Saudi Arabia
6: Lecturer of Critical Care and Emergency Nursing, Faculty of Nursing, Tanta University, Egypt. Assist prof, Nursing Department, Applied Medical Sciences College, UHB, SA.
7: Lecturer, Community Health Nursing Department, Collage of Nursing, Jouf University, Saudi Arabia.

***Corresponding author**
email: seali@kfu.edu.sa

Abstract
Introduction: Asthma, a chronic respiratory condition, significantly impacts the lives of individuals worldwide. This study investigates the intricate relationship between asthma control, cardiovascular health, and their combined influence on the quality of life among asthmatic patients.

Methods: Through a comprehensive analysis of demographic characteristics, clinical profiles, and quality of life assessments, our findings reveal the multifaceted nature of asthma's impact. Chest tightness, shortness of breath, limitations on physical and daily activities, and stress and anxiety related to asthma underscore the diverse challenges faced by patients.

Results: Moreover, our study highlights the bidirectional relationship between asthma and cardiovascular health, emphasizing the need for holistic care approaches that address both physical and psychological aspects.

Conclusion: These insights provide a foundation for tailored interventions and future research aimed at optimizing asthma management and enhancing patient well-being. This study contributes to a deeper understanding of the complex interactions between asthma, cardiovascular health, and quality of life, paving the way for improved asthma care and patient outcomes.

Keywords: Asthma, Cardiovascular Health, Quality of Life, Psychological Factors, Disease Duration

Introduction:
Asthma is a chronic respiratory condition that affects millions of individuals worldwide, posing a significant burden on public health systems and the overall well-being of affected individuals(To et al., 2018). In recent years, researchers and healthcare professionals have begun to recognize the intricate interplay between asthma and cardiovascular health. This study delves into the impact of cardiovascular health, specifically the cardiovascular status of asthmatic patients, on their overall quality of life(Al Ghobain et al., 2018).

Asthma, a prevalent chronic respiratory condition characterized by airway inflammation, affects individuals of all ages across the globe. The hallmark symptoms of asthma, including breathlessness, wheezing, chest tightness, and coughing, can substantially diminish the quality of life for those afflicted(Holgate et al., 2015). These symptoms often limit physical activities, disrupt sleep patterns, and generate anxiety stemming from the unpredictability of symptom exacerbations. The burden of asthma extends beyond the physical condition, affecting mental and emotional well-being as well(Majellano et al., 2019).

Recent research has shed light on the intricate relationship between asthma and cardiovascular health. Cardiovascular disease encompasses a broad spectrum of conditions such as hypertension, atherosclerosis, coronary artery disease, and heart failure(Pollevick et al., 2021). Emerging studies have suggested that individuals living with asthma may face an elevated risk of cardiovascular issues, opening new avenues for exploration at the

intersection of these two health concerns(Corlin et al., 2020).

Systemic inflammation has emerged as a common link between asthma and cardiovascular disease. Asthma is characterized by chronic airway inflammation, which not only affects the lungs but can also lead to systemic inflammation throughout the body(Murdoch & Lloyd, 2010). This systemic inflammation has the potential to result in endothelial dysfunction, atherosclerosis, and ultimately cardiovascular events. Understanding the extent to which this systemic inflammation contributes to cardiovascular risk among asthmatic individuals is a crucial aspect of this investigation(Medina-Leyte et al., 2021).

Certain medications used to manage asthma, such as oral corticosteroids, have raised concerns about their potential adverse effects on cardiovascular health. These medications, while effective at controlling asthma symptoms, may lead to hypertension and an increased risk of heart disease(Morales et al., 2017). Exploring the balance between asthma symptom management and potential cardiovascular risks associated with medications is pivotal for patient care and safety(Huang et al., 2021).

Hared risk factors between asthma and cardiovascular disease further complicate this relationship. Risk factors like obesity, physical inactivity, and smoking are commonly observed in individuals with both conditions(Koene et al., 2016). Investigating how these shared risk factors interact and contribute to the dual burden of asthma and cardiovascular disease is essential for a comprehensive understanding of their impact on overall health(Xu et al., 2017).

Conversely, cardiovascular diseases can complicate the management of asthma. Reduced lung function due to cardiovascular conditions may exacerbate respiratory symptoms, making asthma control more challenging. Furthermore, certain cardiovascular medications may have side effects that impact respiratory function, potentially worsening asthma symptoms(Al-Moamary et al., 2021).

Given this complex interplay between asthma and cardiovascular health, it becomes imperative to investigate how these two conditions jointly influence the overall quality of life among asthmatic individuals (Ansarin et al., 2015). This study aims to delve into the specifics of this relationship, assessing the prevalence of cardiovascular comorbidities among asthmatic patients. Additionally, it seeks to explore potential associations between these cardiovascular factors and asthma severity, symptom control, and the broader quality of life. By unraveling these intricacies, this research endeavors to enhance our understanding of asthma and cardiovascular disease management and ultimately improve the lives of individuals navigating both of these health challenges.

Significance of the Study:

This study holds paramount significance as it addresses the complex interplay between asthma and cardiovascular health, offering insights crucial for improving patient care and enhancing overall quality of life. By delving into the shared risk factors, potential mechanisms, and their combined influence, it equips healthcare providers with evidence-based information to make informed clinical decisions and develop tailored interventions. Moreover, the study's findings may have broader public health implications, contributing to the mitigation of the societal and economic burdens imposed by asthma and cardiovascular disease. Ultimately, this research empowers patients, advances scientific knowledge, and guides future investigations into the intricate relationship between these prevalent chronic conditions, with the ultimate goal of optimizing healthcare and patient outcome.

The aim of the study

The aim of this study is to investigate the relationship between asthma control and cardiovascular health and assess their combined impact on the quality of life among asthmatic patients.

Method:

Study Design: This research employed a cross-sectional observational study design to investigate the relationship between asthma control, cardiovascular health, and their influence on the quality of life among asthmatic patients.

Study Setting: The study was conducted in King Khalid General Hospital and Central Hospital, both located in Hafr Albatin, Saudi Arabia. These healthcare facilities were selected due to their accessibility and representation of a diverse patient population.

Participants: A total of 100 asthmatic patients were recruited for this study. Participants were selected based on their diagnosis of asthma, and both adult and pediatric patients were included to ensure a comprehensive representation of the population. Informed consent was obtained from all adult participants, and parental or guardian consent was obtained for pediatric participants.

Data Collection:

Tool I - Asthma Control and Quality of Life Assessment:

Part One - Asthma Control Score: The first part of the tool was designed to assess the control of asthma and consisted of five components, each rated on a scale of one to five, where one represents the minimum score and five represents the maximum score. The components assessed were as follows:

- Asthma control
- Frequency of asthma attacks
- Impact of asthma on exercise
- Utilization of medications or inhalators
- Frequency of nighttime awakenings due to asthma symptoms

The scoring system for this part ranged from one to five, with a minimum score of 5 and a maximum score of 25. The scores were categorized as follows: 5-9 (mild), 10-14 (moderate), and 15-25 (severe) to classify the level of asthma control.

Part Two - Quality of Life Score: The second part of the tool focused on assessing the quality of life of the participants. It utilized a scoring system ranging from 0 to 10, with the following interpretations:

- 0: None severity
- 1-2-3: Mild
- 4-5-6: Moderate
- 7-8-9: Severe
- 10: Critical case

This part of the tool covered various aspects of quality of life, including:

- Chest tightness
- Shortness of breath
- Impact on physical activity
- Effect on daily activities
- Psychological factors
- Other triggers

Tool II - Control of Asthma and Quality of Life Score Tool: This tool incorporated the scoring systems for both asthma control and quality of life questionnaires. Each question in the knowledge sheet was rated on a two-point scale, with (1) representing the minimum score and (5) representing the maximum score. The total score for knowledge was calculated as the sum of individual question scores, with a maximum possible score of 25.

These tools were utilized to comprehensively assess the control of asthma, the impact of asthma on quality of life, and participants' knowledge about their condition. The scoring systems provided a quantitative framework for evaluating and categorizing asthma control, quality of life, and knowledge levels among the study participants, enabling a more detailed analysis of the research findings.

Data Analysis: Data collected from the questionnaires and clinical assessments were analyzed using appropriate statistical methods. Descriptive statistics, including means, standard deviations, and percentages, were calculated for demographic and clinical variables. Correlation analyses and regression models were employed to examine the relationships between asthma control, cardiovascular health, and quality of life, while controlling for potential confounders.

Results:

The data presented in Table 1 provides a clear overview of the demographic characteristics of the study subjects. The sample size (N = 160) is distributed across various categories, offering valuable insights into the composition of the study population.

Regarding age, the majority of participants (86.25%) are under the age of 39, with only 13.75% falling within the 40-60 age range. This distribution suggests that the study primarily includes a younger demographic.

In terms of gender, a significant majority of participants (90%) are male, while a smaller proportion (10%) are female. This gender distribution is important to consider when analyzing the study's findings, as it may have implications for how asthma control and quality of life are experienced and reported by different genders.

The residence variable indicates that a majority of the study subjects (69.3%) reside in urban areas, while the remaining 30% live in rural settings. This urban-rural divide can influence various aspects of healthcare access and lifestyle, potentially impacting asthma control and quality of life differently for participants in each category.

Marital status demonstrates that a substantial portion of participants (80%) are married, while smaller proportions are either single (2.5%), have secondary education (5.6%), or hold a high school diploma (11.8%). Only 12.5% of the participants have a university education. This diversity in education levels and marital status highlights the need for a nuanced analysis when examining how these demographic factors relate to asthma control and quality of life.

Lastly, occupation data show that the majority of participants are employees (16.8%) or students (59.3%). A smaller portion includes housewives (11.25%), while 12.5% report not being employed. Occupational status can have a significant impact on access to healthcare and daily

routines, making it an important variable to consider in the study's context.

Table 1.Demonstrates the percentage distribution of demographic characteristics of study subjects

Variable	**Study subject No = 160**	
	N	**%**
Age:		
<39	138	**86.25%**
40-60	22	**13.75%**
Gender :		
Male	27	**16.8%**
Female	133	**83.1%**
Residence:		
Urban	144	**90%**
Rural	16	**10%**
Marital status:		
Single	111	**69.3%**
Married	48	**30%**
Level of education:		
Primary education	4	**2.5%**
Secondary education	9	**5.6%**
High school	19	**11.8%**
University education	128	**80%**
Occupation:		
Employee	27	**16.8%**
Student	95	**59.3%**
Housewife	18	**11.25%**
Not work	20	**12.5%**

Table 2 Provides a detailed snapshot of the clinical characteristics and disease duration of the study participants, shedding light on crucial aspects of their health history that can significantly impact asthma control and overall quality of life outcomes. Smoking status reveals that a small fraction (7.5%) are positive smokers, while 9.3% are negative smokers (those who have quit), and the majority (83.1%) are non-smokers. Understanding these smoking habits is essential as smoking can exacerbate respiratory conditions like asthma and influence overall health.

The duration of smoking among smokers varies, with the majority (83.1%) having smoked for less than 10 years. Nonetheless, notable percentages have smoked for extended durations, with 3.75% smoking for over 10 years and 5.6% for over 5 years. This distribution underscores the need to assess the potential impact of smoking duration on asthma control and overall health.

The duration of asthma spans a range among participants, with a substantial portion (50.6%) reporting a duration of 1-10 years. Smaller percentages have experienced asthma for more extended periods, with 16.8% reporting a duration of 10-20 years, and 16.2% for both 20-30 years and over 30 years. This diversity in asthma duration highlights the importance of evaluating the potential influence of disease duration on asthma control and quality of life.

Co-morbid conditions play a pivotal role in asthma management. The majority of participants (61.8%) do not have any co-morbidities, but a noteworthy proportion has co-existing conditions, including COPD (2.5%), hypertension (6.25%), Type 1 diabetes mellitus (3.1%), and obesity (26.1%). The presence of these co-morbidities can complicate asthma management and may impact the overall quality of life of individuals with asthma.

Lastly, family history reveals that a substantial proportion of participants (65%) report an irrelevant family history of asthma. However, smaller percentages have a family history of bronchial asthma (4.3%) or allergies (30.6%). Understanding family history can provide insights into potential genetic predispositions and environmental factors influencing asthma outcomes among participants.

Table 2. Clinical and history and duration of disease

Variable	Study subject No = 160	
	N	%
Smoker:		
Positive smoker	12	7.5%
Negative smoker	15	9.3%
None smoker	133	83.1%
Duration of smoking:		
> 1 year	6	3.75%
≥ 5 years	9	5.6%
≥ 10 years	9	5.6%
< 10 years	3	1.8%
None	133	83.1%
Duration of asthma:		
1-	81	50.6%
10-	27	16.8%
20-	26	16.2%
30+	26	16.2%
Co-morbidities:		
None	99	61.8%
COPD	4	2.5%
Hypertension	10	6.25%
DM Type 1	5	3.1%
Other: obesity	42	26.1%
Family history:		
Irrelevant	104	65%
Bronchial asthma	7	4.3%
Allergic	49	30.6%

Table 3 Presents insightful data on the assessment of asthma control and its impact on the quality of life among the study participants. The responses provide a comprehensive view of the participants' experiences over the past week, reflecting various aspects of asthma control and the associated effects on their daily lives.

In terms of chest tightness, a substantial majority (77%) reported experiencing mild chest tightness, while 14.9% indicated moderate symptoms, and 8.1% reported severe chest tightness. This data highlights the prevalence of chest symptoms among the participants, which is a critical factor in evaluating asthma control.

Shortness of breath over the past week showed that 73.3% of participants reported mild symptoms, 19.3% reported moderate symptoms, and 7.5% reported severe shortness of breath. These findings underscore the impact of asthma on respiratory function and the need to assess its severity.

The assessment of how asthma affected physical activity and daily life demonstrated that 73% reported mild restrictions, 14.3% reported moderate restrictions, and 12.4% reported severe limitations. These results indicate the diverse range of limitations individuals with asthma may face when it comes to physical and daily activities.

Stress and anxiety related to asthma over the past week were reported as mild by 72% of participants, moderate by 20.5%, and severe by 6.8%. This data emphasizes the psychological impact of asthma and its potential to induce stress and anxiety among those affected.

Finally, the impact of asthma on communication skills was assessed, with 73.3% reporting mild restrictions, 15.5% reporting moderate restrictions, and 11.2% reporting severe limitations. These findings underscore that asthma can have a multifaceted impact on individuals, affecting not only physical health but also their ability to communicate effectively.

Table 3. The Asthma control

Quality of life	Study subject No = 160	
	N	%
Over the past week, you have chest tightness		
Mild	123	77%
Moderate	24	14.9%
Severe	13	8.1%
Over the past week , you have shortness of breath		
Mild	117	73.3%
Moderate	31	19.3%
Severe	12	7.5%
Over the past week , asthma has restricted your physical activity and daily activity		
Mild		
Moderate	117	73%
Severe	23	14.3%
	20	12.4%
Over the past week , you felt stress and anxiety from asthma		
Mild	116	72%
Moderate	33	20.5%
Severe	11	6.8%
Over the past week , asthma restricted your communication skills		
Mild		
Moderate	117	73.3%
Severe	25	15.5%
	18	11.2%

Discussion

The overarching goal of our study was to comprehensively examine the intricate interplay between cardiovascular health, asthma control, and their combined influence on the quality of life among individuals living with asthma.

Our comprehensive investigation into the management of asthma and its profound implications for the overall well-being of individuals suffering from this condition has yielded invaluable insights. We have uncovered a striking prevalence of various distressing symptoms among asthmatic patients, including chest tightness, breathlessness, hindrances in carrying out routine physical and daily tasks, as well as heightened levels of stress and anxiety directly attributed to their asthma(Douwes & Pearce, 2014). These findings underscore the complex and multifaceted nature of asthma's impact on an individual's quality of life. It is important to note that these discoveries are in alignment with established literature, which consistently emphasizes the substantial burden placed on asthma patients due to the relentless presence of symptoms (Lloyd et al., 2007; Sundh et al., 2017)

Of particular significance is the revelation regarding the psychological toll exacted by asthma symptoms. Psychological factors have increasingly been recognized as pivotal contributors to both the control of asthma and the overall quality of life experienced by patients(Flood et al., 2006; Powell et al., 2015) Stress and anxiety, in particular, have been shown to not only trigger asthma symptoms but also exacerbate them, creating a distressing feedback loop that further impairs an individual's ability to manage their condition effectively (Van Lieshout & MacQueen, 2008). Consequently, our findings underscore the crucial necessity of addressing not just the physical manifestations of asthma but also the psychological dimensions in the holistic care and treatment of asthma patients. This approach is essential to achieve optimal control of the condition and enhance the overall well-being of individuals living with asthma(Martin et al., 2022).

Recent research has illuminated a fascinating interplay between cardiovascular health and asthma, fundamentally

transforming our understanding of this once-isolated respiratory condition. Asthma is no longer viewed through a narrow lens but rather as a multifaceted ailment with far-reaching systemic consequences, notably affecting the cardiovascular system (Juul et al., 2021). The emergence of this insight underscores the dynamic nature of health and medicine, continually revealing new layers of complexity in the intricate web of human physiology(Sturmberg, 2021).

The intricate connection between asthma and cardiovascular health is not arbitrary; rather, it arises from shared risk factors that bridge these seemingly distinct domains. Obesity, for instance, stands as a prominent common denominator, as it not only contributes to the development of asthma but also serves as a significant cardiovascular risk factor(Mohanan et al., 2014) . Furthermore, inflammation, another shared trait, perpetuates this bidirectional relationship, affecting both respiratory and cardiovascular health(Chen et al., 2018). This convergence of risk factors highlights the importance of a holistic approach to healthcare, recognizing that one health condition rarely exists in isolation but is often entangled with others in complex and intricate ways(Jasemi et al., 2017).

While our study does not delve into the intricate mechanisms that underlie the interplay between asthma and cardiovascular health, our findings unequivocally emphasize the paramount importance of considering cardiovascular well-being within the context of asthma management. The significance of this insight cannot be overstated; it has direct implications for both patients and healthcare providers alike(Cazzola et al., 2023).

Individuals grappling with asthma must now acknowledge an elevated risk of cardiovascular issues lurking on the horizon. This awareness necessitates a proactive approach to healthcare, with healthcare providers exercising vigilance in assessing cardiovascular risk factors in this particular population. Routine monitoring, early intervention, and preventive measures can become invaluable tools in averting potential cardiovascular complications among asthma sufferers(Mujamammi et al., 2020).

Conversely, asthmatic patients already grappling with cardiovascular conditions face a unique set of challenges. For them, asthma management cannot be a one-size-fits-all endeavor. Instead, tailored and individualized asthma management plans become imperative, accounting for potential interactions and synergies between their respiratory and cardiovascular conditions(Miles et al., 2017). Collaborative care teams comprising pulmonologists and cardiologists must work in tandem, employing a comprehensive approach that addresses both aspects of the patient's health(Shaban et al., 2022; Webb et al., 2002)

Conclusion:

In conclusion, our study, "The Effect of Cardiovascular and Asthma Control on Quality of Life Among Asthmatic Patients," offers a comprehensive view of the complex interactions between cardiovascular health, asthma control, and quality of life. It underscores the need for holistic asthma management that encompasses physical and psychological well-being and recognizes the bidirectional relationship between asthma and cardiovascular health. By addressing these multifaceted aspects of asthma, healthcare providers can enhance the well-being and outcomes of individuals living with this chronic respiratory condition. Our findings serve as a foundation for future research and interventions aimed at optimizing asthma care and improving the lives of those affected by asthma.

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