Quality of Life of Older Adult with Bronchial Asthma Related to Climate Change

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Abstract

Background: Bronchial asthma is one of the most common chronic inflammatory airway diseases, so climate change threatens patients with bronchial asthma. **The study aimed to** assess the quality of life of patients with bronchial asthma related to climate change. **Research design**: A descriptive research design was utilized to conduct this study. **Setting**: the study was conducted at Outpatient Clinics of Chest Hospital in Benha City. **The sample:** Simple random sample was used in this study; it included 100 patients with bronchial asthma. **Tools: Three tools were used** in this study, it included **I:** A structured interviewing questionnaire to assess first part); socio-demographic characteristics of the studied patients. The second part); medical history of the studied patients. The third part, knowledge of the studied patients regarding bronchial asthma and climate change **Tool II:** Patients practices regarding bronchial asthma and climate change. **Tool III:** Quality of life scale to assess domains of quality of life. **Results**: 65% of the studied patients with bronchial asthma were male and 35% of them were female. 45% of the studied patients had poor total knowledge score.43% of the studied patients had satisfactory total practices and 12% of the studied patients had high level of total quality of life score. **Conclusion**: Revealed that more than two fifths of the studied patients had good of total knowledge score. Approximately two fifths of the studied patients had satisfactory of total practices level toward bronchial asthma. **Recommendations**: Provide health educational and training programs are recommended to improve patients' knowledge, practices and quality of life about bronchial asthma related to climate change.

Keywords: Bronchial Asthma, Climate Change, Patients, Quality of Life.

Introduction:

Climate changes is defined by United Nations (UN) as significant long-term alterations in the statistical distribution of weather patterns over periods ranging from decades to millions of years. This phenomenon contributes to seven million deaths annually worldwide due to factors such as air pollution, extreme weather and communicable diseases. This is estimated that climate change could contribute to an additional 250,000 deaths annually by 2030. One significant aspect of climate change included fluctuations in temperature, a relative humidity and the increase in extreme weather events **(Tran et al., 2023).**

Bronchial asthma is a heterogeneous disease usually characterized by chronic airway inflammation. Bronchial asthma characterized by wheezing, shortness of breath, chest tightness and cough. Bronchial asthma is a serious global health problem and patients worldwide are affected by this chronic respiratory disease. Bronchial asthma was the second leading cause of death among chronic respiratory diseases. In Egypt, asthma is estimated to be 6.7% among patients being

more predominant in males than females **(Omar et al., 2024 & Cao et al., 2023).**

Climate change significantly impact chronic medical disorders including asthma. Respiratory health is patently affected by climate change which can promote the development of asthma and allergic diseases. Asthma is among the most common chronic lung diseases affecting adult patients worldwide. Weather can affect airway hyperresponsiveness directly or indirectly by augmenting aeroallergen production and worsening air pollution. Climate change is associated with greater frequency and intensity of extreme weather events which are associated with increased risk of asthma morbidity and mortality **(Arceneaux & Gregory, 2024).**

World Health Organization (WHO) defines quality of life as an individual's perception of life in the context of culture and value system in which or lives and in relation to the goals, expectations, standards and concerns. This covers the individual's mental health, physical health, degree of independence, attachment to surroundings, individual beliefs and connection with the environment. The health of the patient is very important to maintain not only for own sakes but also for the wellbeing of the society as a whole **(Parsuraman et al., 2021).**

Patients with bronchial asthma have a higher rate of allergic sensitization, decreased lung function and significantly worse QoL when compared to controls. Some of the stimuli or triggers may generally be subdivided into allergic as allergens such as pollen, molds and fungi, dust mites, pet dander, and insects or nonallergic such as cold air, infections, diesel exhaust, indoor or outdoor air pollution, perfume, tobacco smoke, and other irritants. Bronchial asthma is a significant chronic problem in the patients. There is a need to pay more attention to prevent the worse of QoL **(Liu et al., 2023).**

Community Health Nursing educated patients to identify risks and create safety plans for disasters that include consideration of food, water, medications, and healthcare. CHN educating and reinforcing patients decrease impacts of climate change through use proper waste disposal, purchasing green cleaning products, modeling walking, biking and electric vehicle use. Promoting healthy and green eating. CHN help patients to examine chronic illnesses and the adverse impacts of global warming, food insecurity and health disparities related to climate change **(Arceneaux, Gregory, 2024).**

Significance of the study:

Patients with bronchial asthma are more sensitive to environmental changes, have increased exposure to climate stressors and have a decreased adaptive capacity rendering them more vulnerable to the effects of climate change. This is estimated that climate change could contribute to an additional 250,000 deaths annually by 2030. One significant aspect of climate change included fluctuations in temperature, a relative humidity and the increase in extreme weather events **(Anu et al., 2023; Tran et al., 2023).**

According to WHO, climate change is responsible for a minimum of 150,000 deaths every year worldwide a number that is expected to double by 2030. In Egypt the heat wave of 2018 has killed about 65 people within 3 days when the temperature reached about 47°c **(Ibrahim et al., 2023).**

Aim of the study:

The study aimed to assess the quality of life of the studied patients with bronchial asthma related climate change.

Research questions:

1- What is knowledge of patients regarding bronchial asthma disease and climate change?

2 – What are practices of patients with bronchial asthma regarding bronchial asthma disease and climate change?
3- What is quality of life level of patients with asthma during climate change?

Subjects and method:

Research design:

Descriptive research design was used for this study.

Research Setting:

This study was conducted at Outpatient Clinic at Chest Hospital in Benha City. This setting is chosen because high flow rate of patients with bronchial asthma.

Sampling:

Simple random sample was used in this study. The total number of patients diagnosed with bronchial asthma that attended at Outpatient Clinics of Chest Hospital in Benha City during 2023 were 600 and were chosen according to inclusion criteria; both sexes, free from chronic disease and accepted to be involved in the study. according the equation:

$$n = \frac{N}{1 + N(e)^2}$$

n=sample size,
N= Total older adults 100
(e) efficient factor =0.05

Tools for Data Collection:

Three tools were used to collect the data:

Tool I: A structured Interviewing Questionnaire: It was designed by the researchers based on reviewing related literature and experts, opinion and written in the simple clear Arabic language consisted of the following three parts: -

Part I: A-Concerned with socio demographic characteristics of the studied patients which consisted of age, sex, marital status, level of education and occupation).

Part II: Included medical history of the studied patients which consisted of the season of the year in which asthma attacks occur most frequently, the average occurrence of an asthma attack during a month, the average persistence of a severe attack, there are people in the family or relatives suffering from bronchial asthma).

Part III: Concerned with patients' knowledge about bronchial asthma and climate change. It was developed by researchers which included two parts.

A- Patients' knowledge about bronchial asthma (multiple choice type) as meaning, risk factors, types, signs & symptoms, diagnosis, preventive measures, treatment and complications.

B- Patients' knowledge about climate change (multiple choice type) meaning of climate changes, causes, effects on human health, meaning of extreme temperatures.

Knowledge scoring system: It was calculated as follows 2 score for correct and complete answer, while 1 score for correct and in complete answer and 0 score for don't know. Total knowledge score = 44 points Good if the total score was 75% to 100% (≥33 points). Average if the total score was 50 to less than 75% (22;33 points). Poor if the total score was less than 50% (<22points).

Tool II: The studied patients' practices which cover the following reported practices.

Practices it was developed by the researchers and consisted of 8 main categories included 61 items divided into 10 items about extreme high temperatures measurement, 8 items about extreme cold weather measurement, 5 items about practices during asthma attack,7 items about difficulty breathing, 10 items about practices during high levels of air pollution, 8 items about practices during cold and runny nose, 7 items about nutrition and 6 items about physical exercise.

Practice scoring system:

It was calculated as follows 1 score for done and 0 score for not done. These scores

of the items were summed-up and the total divided by the number of the items, giving a mean score for the part. = 61 points. satisfactory when the total score was ≥ 80% (≥48points). unsatisfactory when the total score was <80% (<48 points).

Tool III: Concerned with quality-of-life scale adopted from Marks et al., 1999; Juniper et al., 1999). It used to assess QoL of patients with bronchial asthma. It was translated into Arabic by the researchers and divided into 4 main categories which contained 34 items: physical domain which consisted of 10 items, psychological domain which consisted of 11 items, social domain which consisted of 8 items and environment domain which consisted of 5 items.

Scoring system:

Each response had three levels of answers: always, sometimes and never. These were respectively scored 2, 1 and 0. The scores of the items were summed-up and the total divided by the number of the items, giving a mean score. These scores were converted into a percent score and means and standard deviations. Total scores of qualities of life = 68 points. Good if the total quality of life > 80% (> 54 points). Moderate if total quality of life 60 - 80% (40 – 54 points). Poor if it equals < 60% (< 40 points).

Content validity and reliability:

Tools of the study were given to a group of 5 staff members of Faculties Staff Nursing experts from the Community Health Nursing Specialists who reviewed the tools for clarity, relevance, comprehensiveness, applicability and easiness for implementation. The reliability of the developed tools was estimated using Cronbach's α test to measure the internal consistency of the tools. It was found that the reliability of knowledge was 0.651, reliability of practices was 0.764 and the reliability of quality of life was 0.711.

Ethical Considerations:

Ethical approval of Research Ethics Committee Faculty of Nursing Benha University was obtained. All ethical issues were assured; an oral consent was obtained from each patient to participate in the study and withdraw at any time when needed during the study. The aim of the study was explained to the studied patients with bronchial asthma applying the tools to gain their confidence and trust. The study had no any physical, social or psychological risks. Privacy and confidentiality were assured. Ethics, values and cultures were respected.

Pilot study:

Before starting data collection, a pilot study was conducted on 10% of the total sample 100 patients with bronchial asthma to test the tools clarity, simplicity and applicability and time needed to fill tools as well as to identify any possible obstacles that may hinder the data collection. The pilot study wasn't excluded as no modifications were done and excluded from study sample.

Preparatory phase:

It was included reviewing of current and past available national and international related literatures, and the theoretical knowledge of various aspects of the study using textbooks, articles, magazines and internet search. This use necessary for the researchers to be acquainted with and oriented about aspects of the research problem as well as assist in the development of the data collection tools.

Field work:

The data was collected from patients at Out-patient Clinics, Chest Hospital in Benha City. Data was collected over a period of six months from the beginning of October 2023 to the end of March 2024. Approvals were obtained orally after the researchers introduced themselves to each patient with bronchial asthma and after explaining the

purpose of the study. The researchers visited Chest Hospital Out-patient Clinics 3 days/week (Saturdays, Mondays and Wednesdays) from 10.00 a.m. to 1.00 p.m. to collect the data, taking into consideration the use of simple language to suit the understanding level of studied patients with bronchial asthma. The average time needed for the sheet was around 30-45 minutes; the average number of interviewed patients with bronchial asthma was 1-2patients each time depending on the understanding and response of interviewers, as well as distribution the questionnaire respondents were assured for anonymity of answers and that information used for scientific research only and will be confidential, the respondents filled the questionnaire in the presence of the researchers all the time to clarify any ambiguities and answer any queries and collect the questionnaire.

Statistical analysis:

All data collected were organized, tabulated and analyzed using appropriate statistical test. The data were analyzed by using the Statistical Package for Social Science (SPSS) version 22, which was applied to calculate frequencies and percentages as well as test statistical significance and associations by using chi-square test and person correlation test to detect the relation between the variables for (p value).

Results:

Figure (1): Reveals that, 65% of the studied patients with bronchial asthma were male and 35% of them were female.

Figure (2): Shows that, 63% of the studied patients from urban and 37% of them were from rural.

Table (1): Indicates that, 76% of the studied patients with bronchial asthma had repeated asthma attacks most frequently during winter, 37% of them had an asthma attacks occurred twice time per month and 75% of them had family or relatives suffering from bronchial asthma.

Figure (3): Shows that, 45% of the studied patients with bronchial asthma had poor total knowledge score regarding bronchial asthma disease and climate change.

Figure (4): Reveals that,44% of the studied patients with bronchial asthma had satisfactory practices regarding total practices score. While 56% of them had unsatisfactory regarding total practices score.

Figure (5): Indicates that, 12% of the studied patients with bronchial asthma had high level of total quality of life score. While 35% of them had low level of total quality of life score.

Table (2): Shows that; there was statistically significant a positive correlation between total knowledge and total practices score of the studied patients pre and post program implementation ($p<0.05$). Also, there was statistically significant a positive correlation between total knowledge and total quality of life score of the studied patients post program implementation ($p<0.05$).

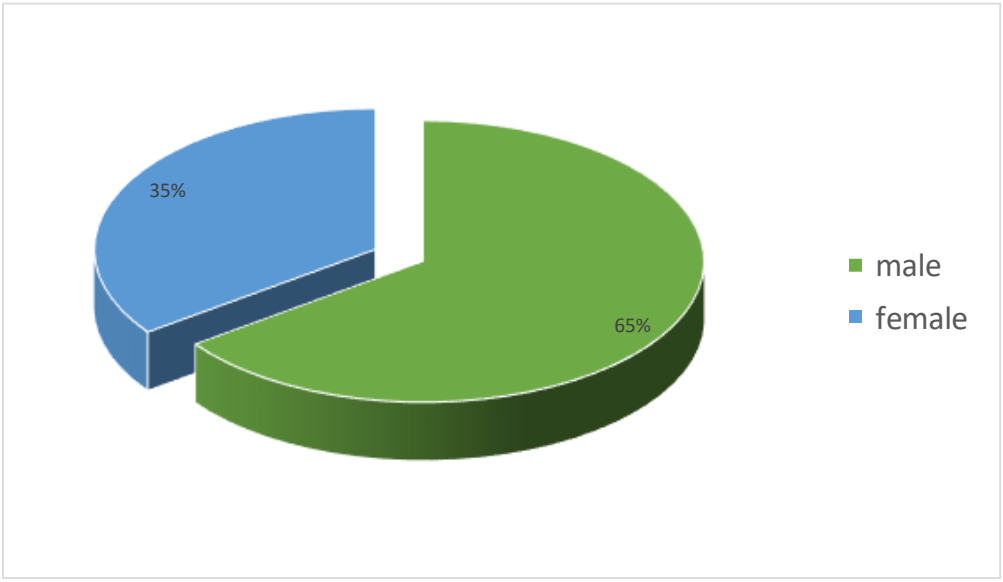

Figure (1): Frequency distribution of the studied patients with bronchial asthma regarding their sex characteristic (n=100).

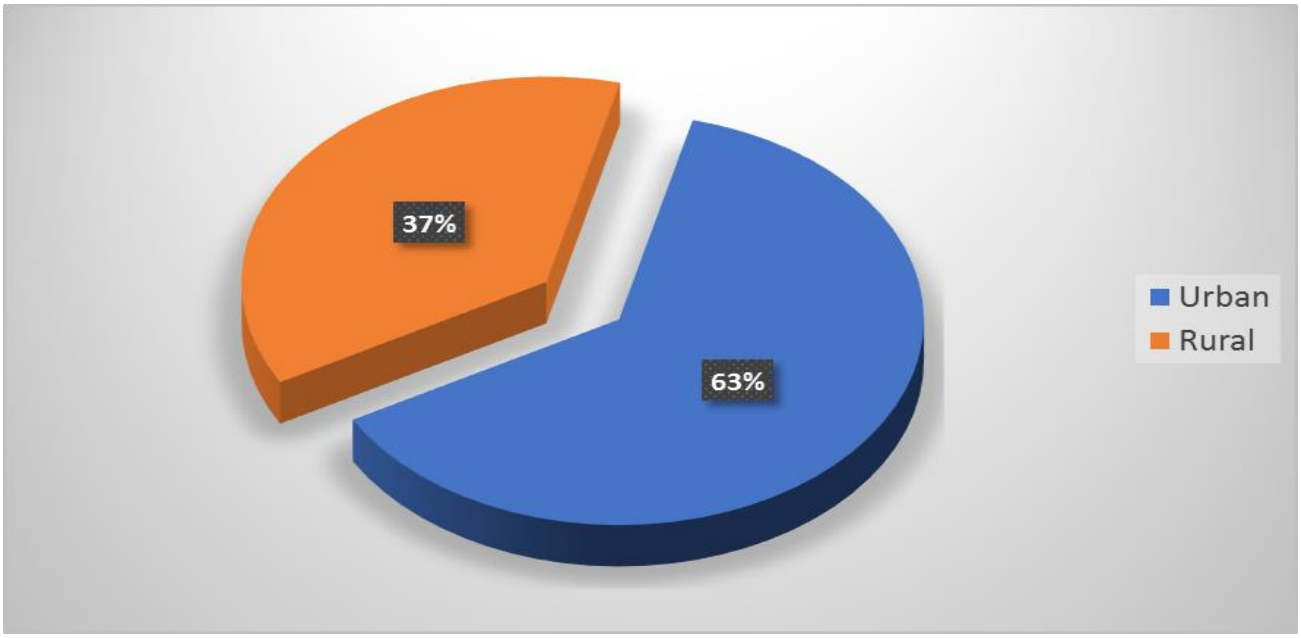

Figure (2): Frequency distribution of the studied patients with bronchial asthma regarding their residence (n=100).

Table (1): Distribution of the studied patients regarding their medical history (n=100).

Medical history		
The season of the year in which asthma attacks occur most frequently#		
During summer	37	37.0
During winter	**76**	**76.0**
During spring	73	73.0
During autumn	68	68.0
The average occurrence of an asthma attack during a month.		
Once	29	29.0
Twice	**37**	**37.0**
Three times	34	34.0
The average persistence of a severe attack		
Less than 15 minutes	12	12.0
15>30 minute	**56**	**56.0**
30> 45 minute	32	32.0
There are people in the family or relatives suffering from bronchial asthma		
Yes	**75**	**75.0**
No	25	25.0
IF Yes (n=75) The degree of kind ship is		
First class kinship	49	**65.3**
Second class kinship	23	30.7
Third class kind ship	3	4.0
Time of follow- up		
Every two weeks	6	6.0
Every three weeks	13	13.0
Every month	**52**	**52.0**
More than a month	29	29.0

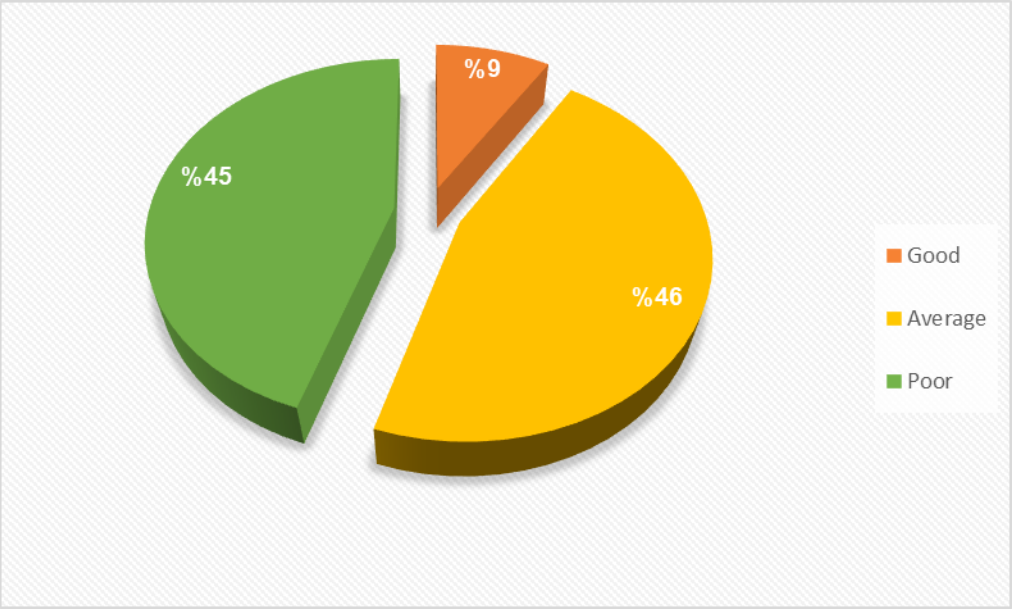

Figure (3): Percentage distribution of the studied patients regarding their total knowledge score about bronchial asthma and climate change (n=100).

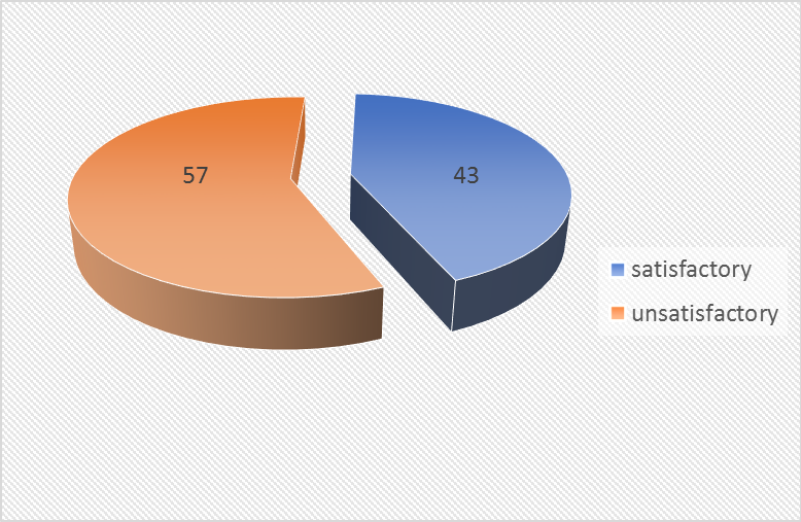

Figure (4): Percentage distribution of the studied patients regarding their total practices score about bronchial asthma and climate change (n=100).

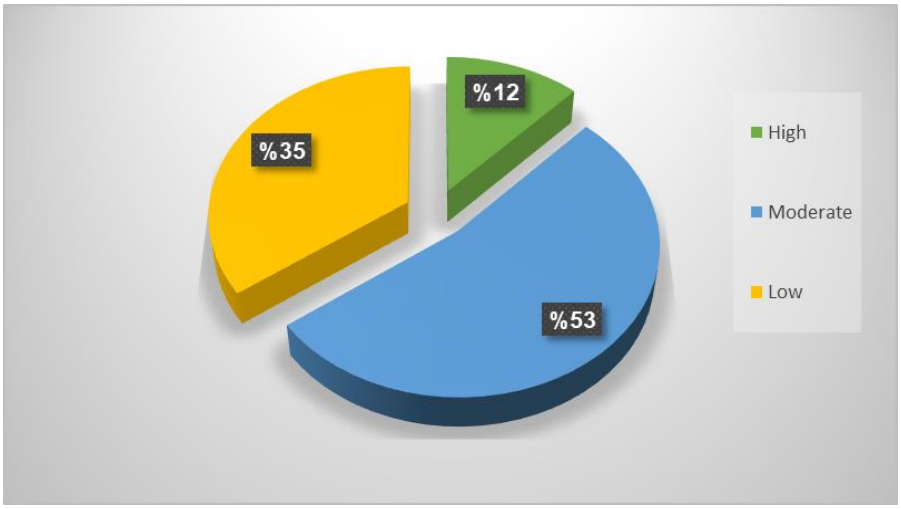

Figure (5): Percentage distribution of the studied patients regarding their total quality of life score (n=100).

Table (2): Correlation between total knowledge, practices and quality of life score among the studied patients regarding climate change pre and post program implementation (n=100).

Items	Total Knowledge Score.			
	Pre- program		Post- program	
	R	p-value	R	p-value
Total practices score	.281	.005*	.212	.034*
Total quality of life score	.068	.502	.641	.041*

*Statistically significant difference P<0.05. Insignificant p>0.05.

Discussion:

According to socio demographic characteristic of the studied patients. The present study showed that; almost two thirds of the studied patients were male. This finding agreed with **Elsayed et al., (2024),** who conducted a study of "Health Risks Related to Extreme Temperature Resulting from Climate Changes among Older Adults with Respiratory Diseases in Egypt", (n=297), reported that; 59.3% of patients with bronchial asthma were male. This might be due to the male patients more exposed to predisposing risk factors of bronchial asthma as smoking.

The current study revealed that; more than three fifths of the studied patients were from rural areas. This finding supported by **Aheto et al., (2020),** who conducted a study of "Prevalence, Socio-Demographic and Environmental Determinants of Asthma in 4621 Ghanaian Adults: Evidence from Wave 2 of the World Health Organization Study on Global Ageing and Adult Health in Ghanaian", (n=4621), reported that 53% of adult with bronchial asthma were from rural areas. This might be due to lack of health care centers in rural areas and medical health team not provide and neglect the health education.

Regarding medical history, the present study revealed that; three quarters of the studied patients had family or relatives suffering from bronchial asthma. This finding agreed with **Pullerits et al., (2021),** who conducted a study of "The Triad of Current Asthma, Rhinitis and Eczema is Uncommon among Adults: Prevalence, Sensitization Profiles and Risk Factors in West Sweden",(n=1103), reported that 83% of the studied adult were had positive relationship of family history about bronchial asthma disease. This might be due to bronchial asthma was considered hereditary.

Regarding total knowledge score of the studied patients. The present study revealed that; approximately two fifths of the studied patients had poor total knowledge score. This finding disagreed by **Mohamed & Mohamed (2023),** who conducted a study of "Effect of Training Program Regarding Knowledge and Self Care Practices on Patients with Bronchial Asthma in Egypt", (n=70), who reported that 4.3% of the studied patients with bronchial asthma had unsatisfactory total knowledge. This might be due to educational level helped and increased the patients with bronchial asthma knowledge.

Regarding total practices score of the studied patients about bronchial asthma and climate change. The present study revealed that; approximately two fifths of the studied patients had satisfactory total practices score. This finding agreed with **Hassan et al., (2020),** who reported that 42.1% of the study older adult with bronchial asthma had satisfactory practices regarding total practices.

Concerning total quality of life score of the studied patients. The present study revealed that; more than tenth of the studied patients had high total quality of life score. This finding disagreed by **Belachew et al., (2023),** who conducted a study of "Health-Related Quality of Life and its Associated Factors Among Patients with Asthma in Addis Ababa", (n=85), who reported that 53% of the studied patients with bronchial asthma had average level of quality of life. This finding might be due to effect of disease and climate changes that cause more complications and lead to prevent patients from practice daily living activities.

Regarding the correlation between total knowledge score and total practices score of the studied patients. The present study revealed that there was statistically significant correlation between total knowledge score and total practices score. This finding was

supported by **Ibrahim et al., (2023),** and reported that there was statistically significant relation between total knowledge score and their total practices score of the studied older adult.

Conclusion:

The study revealed that approximately two fifths of the studied patients had poor total knowledge scores regarding bronchial asthma and climate change. Approximately two fifths of the studied patients had satisfactory practices regarding bronchial asthma and climate change. More than tenth of the studied patients had high level of total quality of life scores regarding bronchial asthma and climate change

Recommendations:

- Provide health educational and training programs are recommended to improve patients' knowledge, practices and quality of life about bronchial asthma related to climate change.

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جودة حياة كبار السن المصابين بالربو الشعبي المرتبط بتغير المناخ

نورا احمد عبدة - هناء عبدالجواد عبدالمجيد- امينة عبدالرازق محمود- شيماء جمال الدين ابراهيم

الربو الشعبي هو أحد أكثر أمراض الجهاز التنفسي شيوعًا حيث يسبب التهاب مزمن في مجري الممرات الهوائية، لذا فإن تغير المناخ يهدد مرضى كبار السن المصابين بالربو الشعبي . لذلك هدفت الدراسة إلى تقييم جودة حياة كبار السن المصابين بالربو الشعبي المرتبط بتغير المناخ وقد أجريت هذة الدراسة على ١٠٠ عينة عشوائية من كبار السن المصابين بالربو الشعبي المترددين على عيادات مستشفي الصدربمدينة بنها. حيث كشفت النتائج عن ٦٥٪ من مرضي كبار السن المصابين بالربو الشعبي ذكور بينما ٣٥٪ منهم أناث.٤٥ % منهم لديهم معرفة غيرجيدة فيما يتعلق بمرض الربوالشعبي وتغير المناخ. ٤٣٪ من مرضي كبار السن لديهم مستوى مرضى من الممارسات. ١٢٪ من مرضي كبار السن لديهم جودة حياة جيدة ، وقد لخصت النتائج على أن هناك أكثر من خُمسي المرضى المدروسين حصلوا على درجة معرفة إجمالية جيدة. كما حصل حوالي خُمسي المرضى المدروسين على مستوى مرضي من ممارستهم ، وأوصت الدراسة بتوفير برامج تثقيفية وتدريبية صحية لتحسين معرفة المرضى وممارساتهم وجودة حياتهم فيما يتعلق بالربو الشعبي المرتبط بتغير المناخ.