Educational Program regarding Effect of Climate Change on Quality of Life of Older Adult with Bronchial Asthma

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Abstract

Background: Climate change plays a significant role in global health threats for older adult with bronchial asthma. **The study aimed to** evaluate the effect of educational program regarding effect of climate change on quality of life of older adult. **Research design**: A quasi-experimental 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 older adults with bronchial asthma. **Tools: Three tools were used** in this study, it included **I:** A structured interviewing questionnaire to assess older adults, part I: **A-**socio-demographic characteristics B- home environment, part II**:** Medical history, part III: Knowledge of the studied older adults about bronchial asthma and climate change **Tool II:** Assess practices of the older adults regarding bronchial asthma and climate change. **Tool III:** Quality of life scale questionnaire. **Results**: 9% of the studied older adults had good total knowledge pre program which improved to 53% post program implementation.57% of the studied older adults had unsatisfactory regarding total practices preprogram which improved to 84% post program implementation. and 12% of studied older adults had high level of QoL preprogram which improved to 44% post program implementation. **Conclusion**: The program succeeded to improve QoL of older adult and decreased the harmful effect of climate change. **Recommendations**: Disseminated booklet with illustrated pictures about climate change and bronchial asthma disease to all older adult patients at outpatient clinic of chest hospital.

Keywords: Bronchial Asthma, Climate Change, Older Adults, Quality of Life

Introduction:

Older adult with bronchial asthma diseases experiencing worsening health conditions and the main causes of death worldwide. Bronchial asthma is a major global health concern and faces a major global health and socioeconomic burden **(Hassan et al., 2020).** Bronchial asthma is a heterogeneous disease usually is characterised 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 older adults worldwide are affected by this chronic respiratory disease. Bronchial asthma was the second leading cause of death among chronic respiratory diseases **(Omar et al., 2024 & Cao et al., 2023).**

The number of older adults suffering from bronchial asthma is increasing. Epidemiological data show that the prevalence of bronchial asthma in people aged 65 years or over is 4%−15%. The

burden of disease study revealed bronchial asthma to be the second most prevalent chronic respiratory disease and the second leading cause of death from chronic respiratory disease. Asthma poses a serious threat to the quality of life and health of older adults and increases the use and burden of healthcare resources on society **(Zeng et al., 2023).**

Older adults are more vulnerable to external factors such as climate changes. According to a report by the United Nation (UN) both ageing and climate change are current urgent global concerns. The consequences of climate change affect directly on the health and well-being of older adults. Older adults are especially at risk to mortality and morbidity related climate changes. Mortality among older adults aged 65 and over has increased by 53.7% in recent decades. Consequence of climate change is responsible for 6.7 million deaths worldwide each year. A quarter of these deaths occur in older adults over the age of 65 due to chronic diseases **(Figueiredo et al., 2024).** Multiple factors increase morbidity and mortality in older adults related climate changes including rising temperatures and heat waves, exposure to infectious diseases, increased risk of more intense hurricanes, and air pollution, all of which exacerbate preexisting respiratory diseases or pose challenges for new onset of acute illnesses **(Nicholas et al., 2020).**

Quality of Life (QoL) is a multi-dimensional term which reflects the impact of the disease from the patient's perception. Improper asthma management can have a substantial effect on the QoL including physical, emotional, occupational, social and environmental impacts, where the symptoms differ from one older adult patient to another. QoL is explained as the perception that older adult patients have of the position in life in relation to the aims, expectations, concerns and standards. The older adult patient's wellbeing is the standard clinical outcome to assess QoL and prevent morbidity from uncontrolled disease. Poor QoL in asthmatic older adult is associated with a high prevalence of behavioral and emotional difficulties, depression, and poor worked Moreover, avoiding triggers of asthma and enhancing older adult patient QoL, are effective measures to reduce morbidity and mortality **(Kharaba et al., 2022).**

Community Health Nurse (CHN) plays an important role regarding educating older adults about climate change and particularly about extreme temperature-related illnesses. CHN should raise awareness of older adults about the health risks of heat and cold waves through exhibitions as forms of health education for healthy ageing. CHN should implement appropriate public health programs such as heat warnings, heat-health action and adaptation plan and long-term communications strategies, such as heat education campaigns to help prepare older adults to self-manage and adapt to heat in order to lessen the burden of heat-related illnesses **(IElsayed et al., 2024).**

Significance of the study:

Older adults are more vulnerable to climate change for many reasons. One reason is normal changes in the body associated with aging. And older adult chronic health conditions such as respiratory disease. In Egypt the number of older adults is about 7 million representing 7.1% of the total population and this percentage is expected to rise to 17.9% in 2052 **(Mohamed et al., 2022).** In Egypt, asthma is estimated to be 6.7% among older adults that being more predominant in males than females **(Omar et al., 2024).**

According to World Health Organization (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).** By the 2050s, the proportion of deaths attributable to climate change in Egypt could rise to approximately 15.2%. Egypt's increasing temperatures and severe heat waves **(Ali et al., 2024).**

Aim of the study:

The study aimed to evaluate the effect of educational program regarding effect of climate change on quality of life of older adult with bronchial asthma.

Research Hypothesis:

Implementation of health educational program will improve quality of life of older adult with bronchial asthma and decrease the harmful effect of climate change.

Subjects and methods:

Research design:

A quasi-experimental research design was used for this study.

Research Setting:

The study was conducted at Outpatient Clinic of Chest Hospital in Benha City.

Sampling:

Simple random sample was used in this study. The total number of older adults diagnosed with bronchial asthma that attended to 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. The total number of older adult aged 60 - > 75 years and selected 100 older adults with bronchial asthma according to the equation: -

$$n = \frac{N}{1 + Ne^2}$$

n=sample size,

N= Total older adults

(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 which consisted of the following three parts:

Part I: A-Concerned with socio demographic characteristics of the studied older adult with bronchial asthma which consisted of 9 closed ended questions as (age, gender, marital status, level of education, occupation, residence and monthly income).

B-Concerned with home environment of the studied older adult with bronchial asthma as reported by older adult which consisted of 13 closed ended questions.

Part II: Included medical history of the studied older adult patients with bronchial asthma which consisted of 19 closed ended questions

Part III: Knowledge of the studied older adults about bronchial asthma disease and climate change which consisted of two parts:

A- Studied older adult' knowledge about bronchial asthma disease. which included 7 closed ended questions about bronchial asthma disease (multiple choice type) as meaning of bronchial asthma, causes, signs and symptoms, risk factors.

B- Studied older adult' knowledge about climate changes which included 15 closed ended questions about climate change (multiple choice type) included meaning of climate change, causes of climate change, effect of climate change, the effects of climate change on older adult with bronchial asthma.

Knowledge scoring system: Total knowledge score = 44 points

Good if the total score was 75% to100% (>33 points). **Average** if it was 50 to less than 75%

(22;33 points). **Poor** if it was less than 50% (<22points).

Tool II: Older adult' practices which cover the following two parts as an observational checklist and reported practices.

A-Observational checklist which consisted of 3 main categories divided in to 34 items where using inhaler device, using nebulizer devise and diaphragmatic breathing it consisted of:

1-Using inhaler device which adopted & modified from **Hiasat et al., (2023),** included 11 steps.

2- Using nebulizer device which adopted & modified from **Sockrider, (2020),** included 13 steps.

3-Diaphragmatic breathing devise which adopted & modified from **Mehandiratta, & Gugnani, 2020),** included 8 steps.

B-Reported practices consisted of 9 main categories 70 questions divided into (9 items about infection control, 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 in the atmosphere, 8 items about practices during cold and runny nose, 7 items about nutrition and 6 items about physical exercise.

Practices 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. These scores were converted into percent score. As well as older adult with bronchial asthma total observational and reported practices score was classified as the following: Total scores of practices for older adult with bronchial asthma= 102 points.

Satisfactory when the total score was ≥ 80% (≥81points).

Unsatisfactory when the total score was <80% (< 81 points).

Tool III: Concerned with quality of life scale adopted from Marks et al., 1999; Juniper et al., 1999). Which divided into 4 domains contained 34 statement:

Physical domain which consisted of 10 statement.

Psychological domain which consisted of 11 statement.

Social domain which consisted of 8 items.

Environment domain which consisted of 5 statement.

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 score was > 80% (> 54 points).

Moderate if it was 60 - 80% (40 – 54 points).

Poor if it was < 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 older adult to participate in the study and withdraw at any time when needed during the study. The aim of the study was explained to studied older adult with bronchial asthma applying the tools to gain their confidence and trust. The study had no any physical, social psychological or environment risks. Privacy and confidentiality were assured. Ethics, values and cultures were respected.

Pilot study:

Before starting data collection, a pilot study was carried out through the first two weeks of September 2023 on 10 patients with bronchial asthma. The 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 didn't exclude as no modifications were done.

Educational program regarding effect of climate change on quality of life of older adult with bronchial asthma include for phases:

I-Preparatory and assessment phase:

It included reviewing of current and past available national and international related literatures, using textbooks, articles, magazines and internet search. This was 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. Assessment phase in this phase the researchers assessed knowledge, practices and quality of life of the studied patients through collection analysis baseline data from the filled tools.

Field work:

The data was collected from older adult with bronchial asthma at Out-patient Clinics, Chest Hospital in Benha City. Data was collected over a period of six months from the beginning of November 2023 to the end of April 2024. Approvals were obtained orally after the researchers introduced themselves to each older adult 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 older adult with bronchial asthma. The average time needed to fill the tools was around 30-40 minutes; the average number of interviewed older adults was 1-2 patients each time depending on the understanding and response. The researchers implemented the health educational program through 4 phases as the following:

II-Planning phase: The researchers identified the important needs, set priorities of needs, goal and objectives goals and teaching methods and media were developed.

❖ **General objective:**

By the end of the health educational program sessions, patients will be able to acquire knowledge, practices and their quality of life will be improved regarding the effect of climate change on older adults with bronchial asthma.

❖ **Specific objectives**:

At the end of educational program, the studied patients would be able to

- Define bronchial asthma disease.
- Mention causes of bronchial asthma disease.

- Enumerate signs and symptoms of bronchial asthma disease.
- Enumerate etiology of an asthma attack.
- List complications of bronchial asthma disease.
- Mention method for prevention complication of bronchial asthma disease.
- Describe how dealing when an asthma attack occurs.
- Define climate change.
- Mention causes of climate change.

Teaching methods: All patients received the same educational content using the same teaching methods, there were:

- Lectures.
- Discussion.
- Demonstration and re-demonstration.

Teaching media: Suitable teaching media were specially prepared for educational, as: booklet & colored posters. Real objects (equipment) & Videos.

III-Implementation phase: in this phase the researchers implemented the program through 8 sessions (5 theoretical and 3 practical) at the beginning of the first session the researchers illustrated all aspects about bronchial asthma, meaning of bronchial asthma, causes, signs and symptoms, etiology of an asthma attack, complication, mention methods of prevention and describe how dealing when an asthma attack occurs. Reinforcement were used during the lecture to enhance learning. Each session took 30-40 min and started with a summary of what had been given through the previous session and objectives of new topics. At the end of each session, patients participated in a discussion to correct any misunderstanding. Also, they were informed about the time of the next session.

V- Evaluation phase:

Evaluation of program ware done by using tools the post test which was the same format of pre- test tools in order to compare the change of patient's knowledge, practices and quality of life immediately after the end of the program.

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:

Table (1): Reveals that, 80% of studied older adult with bronchial asthma their age ranged from 60 to 65 years old with mean ± SD 64.51+6011 and 65% of them were male. 49% of them were married and living as nuclear family. 31% of them were secondary level of education and 60% of them were worked. 63% of the studied older adult with bronchial asthma were from rural areas and 66% of them with adequate monthly income.

Table (2): Demonstrates that, all of the studied older adult with bronchial asthma had a carpet and rug cover in the house and 83% of them had good ventilation at home and had fans in the house. 64% of them had absent air conditioning in the house also, 38% and 43% of them there were not available number of window and the house was free of odors and perfumes respectively.

Table (3): Indicates that, 52% of the studied older adult with bronchial asthma suffer from the disease for 5 <10 years, 55% of them had recurrent hospitalized once time due to asthma and 68% of them daily occurred an asthma attack at night. Also,76% of them had repeated asthma attacks most frequently during winter and 37% of them had an asthma attacks occurred during a month

twice time.

Figure (1): Shows that, 9% of the studied older adult with bronchial asthma had good total knowledge regarding bronchial asthma disease and climate change pre program which improved to 53% post program implementation.

Figure (2): Describes that, 57% of studied older adult with bronchial asthma had unsatisfactory practice regarding total practices level pre program which improved to 84% post program implementation.

Figure (3): Indicates that, 12% of studied older adult with bronchial asthma had high level of quality of life pre program which improved to 44% post program implementation. While 35% of them had low level of quality of life pre program which decreased to 8% post program implementation.

Table (4): Shows that, there were statistically significant positive correlation between total knowledge score and total practices score of the studied older adult with bronchial asthma pre and post program implementation ($p<0.05$). Also, there were statistically significant positive correlation between total knowledge and total quality of life of the studied older adult with bronchial asthma post program implementation ($p<0.05$).

Table (5): Presents that; there was statistically significant positive significant correlation between total quality of life score and total practices score of the studied patients pre program ($P< 0.05$)and there was a high statistically significant positive correlation between total quality of life score and total practices score of the studied patients post program implementation ($P<0.001$).

Table (1): Distribution of the studied older adult with bronchial asthma regarding their socio demographic characteristics (n=100).

Socio demographic characteristics	No	%
Age/years		
60<65	**80**	**80.0**
65<70	18	18.0
70+	2	2.0
Mean ±SD 64.51+6.11		
Gender		
Male	**65**	**65.0**
Female	35	35.0
Social status		
Single	30	30.0
Married	**49**	**49.0**
Widowed	19	19.0
Divorced	2	2.0
Level of Education		
Can't read and write	29	29.0
Read and write	18	18.0
Basic education	16	16.0
Secondary education	**31**	**31.0**
University education and more	6	6.0
Occupation		
Work	**60**	**60.0**
Not work	40	40.0
Residence place		
Urban	37	37.0
Rural	**63**	**63.0**
Monthly Income		
Adequate and save	29	29.0
Adequate only	**66**	**66.0**
Inadequate	5	5.0

Table (2): Distribution of the studied older adult with bronchial asthma regarding to characteristics of their home environment (n=100).

Home environment	Present		Absent	
	No	%	No	%
Good ventilation at home.	**83**	**83.0**	17	17.0
The home is clean and tidy.	75	75.0	25	25.0
Available number of windows.	62	62.0	**38**	**38.0**
The house is free of odors and perfumes.	57	57.0	**43**	**43.0**
There is air conditioning in the house.	36	36.0	**64**	**64.0**
There is fans in the house.	**83**	**83.0**	17	17.0
There is dust or dirt in the house.	21	21.0	79	79.0
There are insects and rodents in the house.	24	24.0	76	76.0
There is crowding inside the house.	16	16.0	84	84.0
There are pets in the house (such as cats and dogs).	23	23.0	77	77.0
There is a carpet and rug cover in the house.	**100**	**100.0**	0.0	0.0
There is mold on the bathroom walls or windows.	23	23.0	77	77.0
There are trees and green places or a garden near the house.	55	55.0	45	45.0

Table (3): Distribution of studied older adult with bronchial asthma regarding their medical history (n=100).

Medical history	No	%
Duration of the disease		
< 5 yrs.	41	41.0
5 <10 yrs.	**52**	**52.0**
>10 yrs. and more.	7	7.0
Recurrent hospitalization due to asthma		
None	13	13.0
Once	**55**	**55.0**
Twice and more	32	32.0
The most frequent times when an asthma attack occurs#		
Early in the morning	41	41.0
At night	**68**	**68.0**
Day and night	10	10.0
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 answer isn't mutually exclusive.

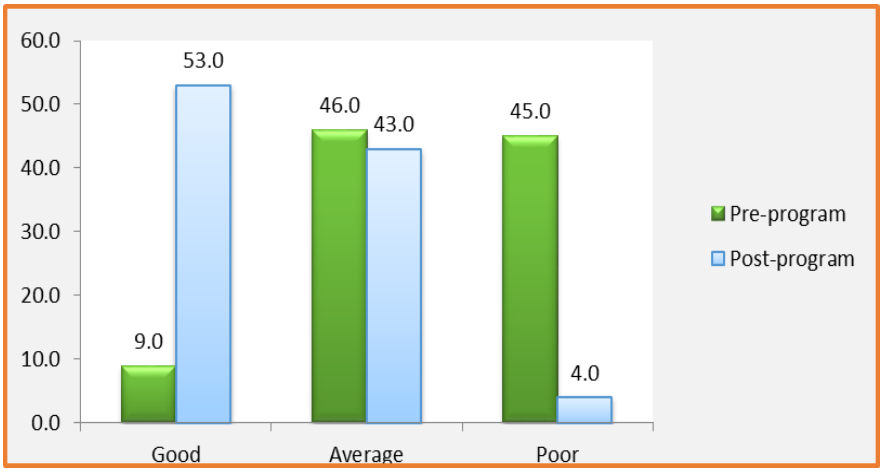

Figure (1): Percentage distribution of studied older adult with bronchial asthma regarding their total knowledge about bronchial asthma and climate change pre and post program (n=100).

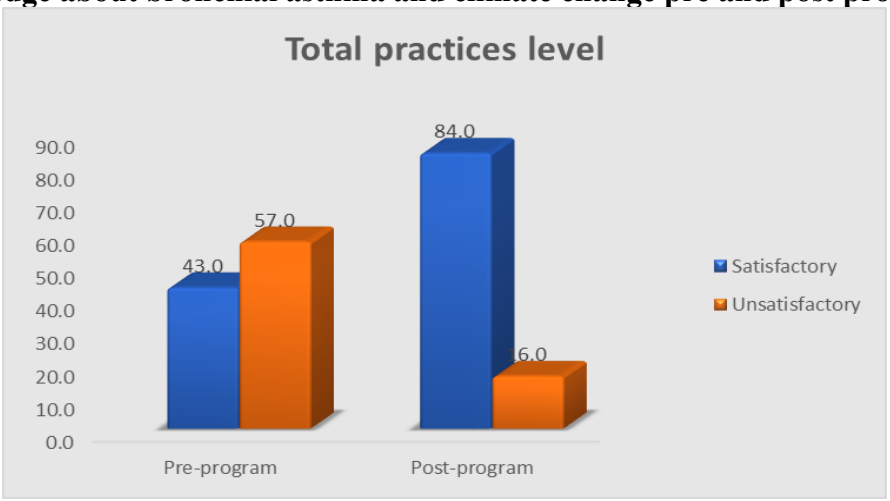

Figure (2): Percentage distribution of studied older adult with bronchial asthma regarding their total practices pre and post program (n=100).

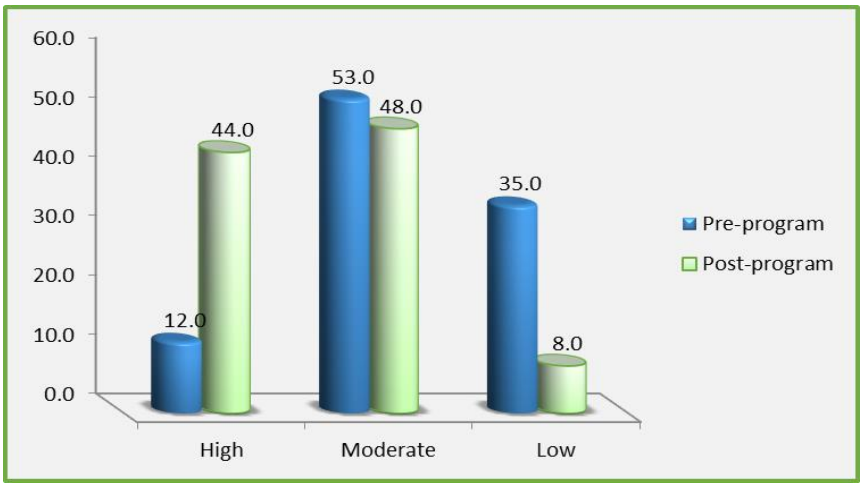

Figure (3): Percentage distribution of studied older adult with bronchial asthma regarding their total quality of life pre and post program implementation (n=100).

Table (4): Correlation between total knowledge, practices and quality of life among studied older adult with bronchial asthma regarding climate change pre and post program implementation (n=100).

Items	Total Knowledge Scores			
	pre program		post program	
	R	p-value	R	p-value
Total practices scores	.281	.005*	.212	.034*
Total quality of life scores	.068	.502	.641	.041*

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

Table (5): Correlation between total practices score and total quality of life score among the studied patients pre and post program implementation (n=100).

Items	Total practices score.			
	Pre- program		Post- program	
	R	P-value	R	P-value
Total quality of life score	.264	.008*	.836	.000**

** Highly significance p<0.001 * Statically significance P < 0.05

Discussion:

Older adults people age over 60 years of age is the fastest growing age group. By the year 2050, one in six people will be aged over 65 years. Older adult 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. Not only do shifting weather patterns, temperature changes and extreme weather events have a profound effect on the environment with physiological, functional and psycho-social consequences for older adults who are often unable to adapt to these changes. Climate related adverse effects can be either a direct consequence of extreme weather events or as an indirect consequence of poor water, air and soil quality. Longevity results in prolonged exposure to various pollutants and environmental toxins which increases the risk of morbidity in older age **(Anu et al., 2023).**

According to socio demographic characteristic of the studied older adult with bronchial asthma. The present study showed that; majority of the studied older adult with bronchial asthma their age ranged from 60 years to less than 65 years old with mean stander deviation 64.51+6.11. This finding agreed with **Hassan et al., (2020),** who conducted a study of " Modified Nursing Program to Improve Health Condition Asthmatics Older Adult in Chest Qena Hospital, Egypt", (n=97), reported that 75.3% for patients their age from 60 to 69 years old, while 18.6% for patients 70–79 years. This might be due to older adults are more

vulnerable stage and exposure to many risks for developing bronchial asthma as natural changes to decline lung function and associated with airflow limitation with this age.

The present study revealed that; almost two thirds of the studied older adult with bronchial asthma were male. This finding was agreed with **IElsayed 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 older adult with bronchial asthma were male. This might be due to the male older adults more exposed to predisposing risk factors of bronchial asthma as smoking.

The current study revealed that; approximately two fifths of the studied older adult with bronchial asthma were married and lived in nuclear family. This finding supported by **Sánchez et al., (2023),** who conducted a study of "Limitations in Activities of Daily Living among Older Adults with COPD, Asthma or Asthma-COPD Overlap Residing in Spain", (n=944), reported that 42.2% of older adult with bronchial asthma were married and 58.1% of them were living together. This might be due to most of older adult from rural areas and preferred to live together as traditional of their community.

The present study revealed that; less than third of the studied older adult with bronchial asthma were secondary level of education. This finding agreed with **Wan et al., (2021),** who conducted a study of " Prevalence of and Risk Factors for Asthma among People Aged 45 and Older in China: A cross- Sectional Study in China",(n=19.816), reported that 22.2% of the older adult with bronchial asthma were secondary level of education.

The current study revealed that; more than three fifths of the studied older adult with bronchial asthma 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 older adult with bronchial asthma were from rural areas.

Also, the results of this study showed that; two thirds of the studied older adult with bronchial asthma had adequate monthly income. This finding supported by **Zeng et al., (2023),** who conducted a study of "Epidemiological Status and Associated Factors of Frailty and Pre-frailty in Older Adults with Asthma in China", (n= 9416) reported that 55.1% of older adult with bronchial asthma had adequate economic status. This might be due to most of the older adult from rural areas and the majority of them worked in their agriculture lands.

Regarding to characteristics of home environment, the present study revealed that; most of the studied older adult with bronchial asthma had a carpet and rug cover in the house. This finding supported by **Yang et al., (2021),** who conducted a study of "The Home Environment in A nationwide Sample of Multi-Family Buildings in Sweden: Associations with Ocular, Nasal, Throat and Dermal Symptoms, Headache and Fatigue among Adults in Sweden", (n=5775), reported that; 89.6 % majority of older adult with bronchial asthma were had wall to wall carpets. This might be due to older adult more risk to fall and in the winter weather they used the carpet to provide the warmth.

The present study revealed that; majority of the studied older adult with bronchial asthma had good ventilation at home and had

fans in the house. This finding supported by **Carrillo et al., (2024),** who conducted a study of "Hispanic Housing Disparities and its Relationship with Asthma in South Texas,United States", (n=350), reported that 92.3% of older adult with bronchial asthma were had proper ventilation at home. This might be due to majority of older adult patients from rural areas and their home characterized by widening and well ventilated.

Regarding medical history, the present study revealed that; more than half of the studied older adult with bronchial asthma were suffer from the disease for 5 <10 years. According **Abuaish et al., (2023),** who conducted a study of "The association of Asthma with Anxiety, Depression and Mild Cognitive Impairment among Middle-Aged and Elderly Individuals in Saudi Arabia ",(n=84), reported that 11.9% of the older adult patients with bronchial asthma were suffered from the disease for <12 years old. This might be due to the majority of the studied older adult their age from 60 years and the disease start to be badly from this age.

The present study revealed that; more than half of the studied older adult with bronchial asthma had recurrent hospitalized once time due to asthma. This finding disagreed with **Puci et al., (2023),** who conducted a study of "Asthma, COPD, Respiratory and Allergic Health Effects in an Adult Population Living Near an Italian Refinery: A cross- Sectional Study. In Health care in Italy" (n=54), reported that 17% of the studied older adult with bronchial asthma were recurrent hospitalized due to asthma. This might be due to chronicity of the disease, decrease respiratory function and related exposure to different weather factors that lead to increase asthma attack.

The present study revealed that more than two thirds of the studied older adult with bronchial asthma exposed to asthma attack daily at night. This finding was in the same line with **Makki et al., (2024),** who conducted a study of "A cross- Sectional Study on the Self-Management of Asthma and Asthma Control among Adult Asthmatic Patients in the Aseer Region, KSA", (n=306), reported that 73% of older adult with bronchial asthma had asthma symptoms when wake up at night or earlier than usual in the morning. While, this finding disagreed with **Ghaleb & Dailah, (2021),** who conducted a study of "Investigating The outcomes of An asthma Educational Program and Useful Influence in Public Policy in KSA", (n=263), reported that 35% of the older adult patients with bronchial asthma had asthma symptoms when wake up at night or earlier than usual in the morning. This might be due to that asthma worse at night when the airway are cooler and mucus doesn't removed as effectively.

The present study revealed that; approximately two fifths of the studied older adult with bronchial asthma had repeated asthma attacks most frequently during winter. This finding was in the same line **Paudel et al., (2023),** who conducted a study of "Living with Bronchial Asthma: A qualitative Study Among Patients in A hill Village in Nepal", (n=11), who reported that 36.5% of the studied older adult with bronchial asthma had repeated asthma attacks during the winter. This might be due to cold, dry air and sudden shifts in the weather can irritate the airways and causing produce more mucus.

Regarding total knowledge score of the studied older adult with bronchial asthma. The present study revealed that; minority of the studied older adult with bronchial asthma had good total knowledge score pre program which improved to more than half post

program implementation. This finding supported 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 older adult patients with bronchial asthma had unsatisfactory regarding total knowledge pre program which improved to 77.1% post program implementation. This might be due to educational program was more effective on improving knowledge of the older adult patients with bronchial asthma.

Regarding total practices of the studied older adult with bronchial asthma. The present study revealed that; more than half of the studied older adult with bronchial asthma had unsatisfactory reported practices pre program which improved to the majority of satisfactory post program implementation. This finding agreed with **Shahin & Abdelkadr, (2019),** who reported that 58.9% of the studied older adult with bronchial asthma had unsatisfactory regarding total practices pre program which improved to 71.1% satisfactory post program implementation.

Concerning total quality of life score of the studied older adult with bronchial asthma. The present study revealed that; more than tenth of the studied older adult with bronchial asthma had high total quality of life preprogram which improved to more than two fifths post program implementation. This finding disagreed with **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 older adult with bronchial asthma had good 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 older adult patients from practice daily living activities.

Regarding correlation between total knowledge score and total practices score of the studied older adult with bronchial asthma. The present study revealed that; there statistically significant correlation between total knowledge score and total practices score pre and post program implementation ($P<0.05$). This finding in the same line with **Ibrahim et al., (2023),** who reported that there was statistically significant relation between total knowledge score and their total practices score of the studied older adult pre program ($P<0.05$) which improved to a highly statistically significant post program ($P<0.001$).This finding might be due to success of educational program to improved older adult their knowledge which contributed to improved positively their practices score.

Regarding the correlation between total knowledge score and total quality of life score of the studied older adult with bronchial asthma. The present study revealed that; there was a positive statistically significant correlation between total knowledge score and total quality of life post program implementation ($p<0.05$). This finding agreed with **Elkafrawy et al., (2024),** who reported that there was a positive statistically significant correlation between total knowledge score and total quality of life score post program implementation ($p<0.05$).This finding might be due to knowledge play important role for change of behavior leading to change of practices and effect on the quality of life.

Regarding the correlation between total practices score and total quality of life score of the studied patients. The present study revealed that there was statistically positive significant correlation between total practices score and total quality of life score pre programe ($P<0.05$). This finding was

agreement with **Rizky et al., (2023),** who conducted a study of "Effectiveness of Asthma Self-Management Education Asthma on Improving The Quality of Life A literature Review in Indonesia", and reported that there were statistically significant relation between total practices and total quality of life level of the studied older adult patients with bronchial asthma preprogram (P<0.05).This finding might be due to older adults had decreased their functions with age which lead to impact on their practices and QoL.

Conclusion:

The program succeeded to improve quality of life of older adult with bronchial asthma and decrease the harmful effect of climate change.

Recommendations:

- Disseminated booklet illustrated pictures about climate change and bronchial asthma disease to all older adult with bronchial asthma at outpatient clinic of chest hospital.
- Educational program should be developed and implemented for older adult patients to improve their knowledge, practices and quality of life toward decreased the effect of climate change.
- Further researches are proposed to explore the effect of home health care model on the prevention of complication related impact of climate change on their health and quality of life.

References:

Abuaish, S., Eltayeb, H., Bepari, A., Hussain, S., Alqahtani, R., Alshahrani, W. S., & Alzahrani, W. (2023). The Association of Asthma with Anxiety, Depression, and Mild Cognitive Impairment among Middle-Aged and Elderly Individuals in Saudi Arabia. Behavioral Sciences, 13(10), 842.

Aheto, J., Udofia, E., Kallson, E., Mensah, G., Nadia, M., Nirmala, N., & Yawson, A. (2020). Prevalence, Socio-Demographicand Environmental Determinants of Asthma in 4621 Ghanaian adults: Evidence from Wave 2 of the World Health Organization's Study on Global Ageing and Adult Health. Plos One, 15(12),67.

Ali, R., Ahmed, N., Salman, M., Daudpota, S., Masroor, M., & Nasir, M. (2024). Assessment of Quality of Life in Bronchial Asthma Patients. Cureus, 12(10).

Anu, A., Sonia, L., & Ismail, K. (2023). Effect of Climate Change on Health in Older Persons. Wits Journal of Clinical Medicine, 5(2), 79-84.

Belachew, A., Sendekie, K., Tadess, S., & Alemayehu, M. (2023). Health Related Quality of Life and its Associated Factors Among Patients with Asthma: A multi-Centered Cross-Sectional Study in Selected Referral Hospitals in Northwest Ethiopia. Plos one, 18(2), e0281742.

Cao, Y., Chen, S., Chen, X., Zou, W., Liu, Z., Wu, Y., & Hu, S. (2023). Global Trends in the Incidence and Mortality of Asthma from 1990 to 2019: An age-Period-Cohort Analysis Using the Global Burden of Disease Study 2019. Frontiers in Public Health, 10, 1036674.

Carrillo, G., Dominguez, N., & Rangel, A. (2024). Hispanic Housing Disparities and its Relationship with Asthma.

Elkafrawy, L., Saleh, N., Ahmad, M., & Mohamed, H. (2024). Effect of Buteyko Breathing Exercise on Pulmonary Functions Tests and Quality of Life in Asthmatic Elderly Patients. International Journal of Nursing Didactics, 14(07), 01-12.

Figueiredo, T., Midão, L., Rocha, P., Cruz, S., Lameira, G., Conceição, P., & Costa, E. (2024). The interplay between Climate

Change and Ageing: A systematic Review of Health Indicators. Plos One, 19(4), e0297116.

Ghaleb Dailah, H. (2021). Investigating the Outcomes of an Asthma Educational Program and Useful Influence in Public Policy. Frontiers in Public Health, 9, 736203.

Hassan, S., Mostafa, O., & Mohamed, E. (2020). Modified Nursing Program to Improve Health Condition Asthmatics Older Adult. Egyptian Journal of Health Care, 11(1), 329-353.

Hiasat, A., Bara'ah Wleed Amireh, A., Alamareen, R., & Quraan, R. (2023). Evaluation of Knowledge and Skills of Using Inhalation Techniques among Patients with Pulmonary Diseases. Sch Acad J Pharm, 8, 219-224.

I Elsayed, E., A Abd El-Megeed, H., Mohy El-Deen, H., & A Afifi, H. (2024). Health Risks Related to Extreme Temperature Resulting from Climate Changes among Older Adults with Respiratory Diseases. Benha Journal of Applied Sciences, 9(4), 57-

Ibrahim, S., Elmawla, A., Abd Elhameed, D., & Ali, S. (2023). Climate Change and Health: Effect of Awareness Program on Knowledge, Attitudes and Practices of Community Dwelling Elderly. Tanta Scientific Nursing Journal, 32(4), 245-272.

Juniper, E., Buist, A., Cox, F., Ferrie, P., & King, D. (1999). Validation of a Standardized Version of the Asthma Quality of Life Questionnaire. Chest, 115(5), 1265-1270.

Kharaba, Z., Feghali, E., El Husseini, F., Sacre, H., Abou Selwan, C., Saadeh, S., & Malaeb, D. (2022). An assessment of Quality of Life in Patients with Asthma Through Physical, Emotional, Social and Occupational Aspects. A cross-Sectional Study. Frontiers in Public Health, 10, 883784.

Makki, S., Siddiqua, A., Alqahtani, B. A., Alkhuwaylidi, H., Alhefzi, L., Hussain, M., & Khaled, A. (2024). A cross-sectional study on the self-management of asthma and asthma control among adult asthmatic patients in the Aseer region, KSA. Scientific Reports, 14(1), 16095.

Marks,G. (1999). The Marks Asthma Quality of Life Questionnaire: Further Validation and Examination of Responsiveness to Change, J Clin Epidemiol . 52(7): Pp. 667–675.

Mehandiratta, C., &Gugnani, A. (2020). Effect of Diaphragmatic Breathing and Pursed Lip Breathing in Improving Dyspnea-A Review Study. European Journal of Molecular & Clinical Medicine, 7(06), 6.

Mohamed, F., & Mohamed, W. (2023). Effect of Training Program Regarding Knowledge and Self Care Practices on Patients with Bronchial Asthma. Egyptian Journal of Health Care, 14(3), 167-183.

Mohammad Esmat, O., Thabet Hasaneen, S., & Khalil Ibrahim, W. (2022). Health Risks Related to Climate Changes among Older Adults. Egyptian Journal of Health Care, 13(3), 678-690.

Nicholas, P., Breakey, S., & Blank, P. (2020). Roles of Nurse Practitioners: Health Consequences of Climate Change in Vulnerable Older Adults. The Journal for Nurse Practitioners, 16(6), 433-437

Omar Elsadee, M., Talaat Elshamaa, E., Mostafa Mahrous, F., & Nabil Abdelsalam, S. (2024). Patients' Knowledge& Practice Regarding Bronchial Asthma Self-Care Management. Egyptian Journal of Health Care, 15(1), 1232-1247.

Paudel, S., Shankar, P., Subedi, N., & Palaian, S. (2023). Living with Bronchial Asthma: A qualitative Study among Patients in A hill Village in Nepal. Plos one, 18(10), e0291265.

Puci, M., Ferraro, O., Monti, M., Gnesi, M., Borrelli, P., Cadum, E., & Montomoli, C. (2023). Asthma, COPD, Respiratory, and Allergic Health Effects in an Adult Population Living Near an Italian Refinery: A

Cross-Sectional Study. Healthcare 2023, 11, 1037.

Rizky, N., Maisyaroh, A., Fibrianti, D., Kurnianto, S., & Widianto, E. (2023). Effectiveness of Asthma Self -Management Education (ASME) on Improving the Quality of Life: A Literature Review. Nurse and Health: Jurnal Keperawatan, 12(2), 164-171.

Sánchez Castillo, S., Smith, L., Díaz, A., & López, G. (2023). Limitations in Activities of Daily Living among Older Adults with COPD, Asthma, or Asthma-COPD Overlap Residing in Spain. International Journal of Environmental Research and Public Health, 20(4), 3467.

Shahin, E., & Abdelkadr, H. (2019). Effect of an Educational Program Regarding Self-Care Management Behaviors for Patients with Bronchial Asthma. Port Said Scientific Journal of Nursing, 6(2), 1-22.

Sockrider, M. (2020). Nebulizer Breathing Treatments at Home. American Journal of Respiratory and Critical Care Medicine, 202(3), P7-P8.

Wan, J., Zhang, Q., Li, C., & Lin, J. (2021). Prevalence of and Risk Factors for Asthma among People Aged 45 and Older in China: A cross-Sectional Study. BMC Pulmonary Medicine, 21, 1-9.

Yang, Q., Wang, J., & Norbäck, D. (2021). The home Environment in A nationwide Sample of Multi-Family Buildings in Sweden: Associations with Ocular, Nasal, Throat and Dermal Symptoms, Headache and Fatigue among Adults. Indoor Air, 31(5), 1402-1416.

Zeng, X., Meng, L., Jia, N., Shi, J., Zhang, C., Li, Y. & Liu, D. (2023). Epidemiological Status and Associated Factors of Frailty and Pre-Frailty in Older Adults with Asthma in China: A national Cross-Sectional Study. Frontiers in Public Health, 11, 1136135.

برنامج تثقيفي صحي عن تأثير تغير المناخ على جودة حياة كبار السن المصابين بالربو الشعبي

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يلعب تغير المناخ دورًا مهمًا في التهديدات الصحية العالمية لكبار السن المصابين بالربوالشعبي والتأثير علي جودة حياتهم. لذلك هدفت الدراسة إلى تقييم برنامج تثقيفي صحي عن تأثير تغير المناخ على جودة حياة كبار السن المصابين بالربو الشعبي وقد أجريت هذة الدراسة على ١٠٠ عينة عشوائية من كبار السن المصابين بالربو الشعبي المترددين على عيادات مستشفي الصدربمدينة بنها. حيث كشفت النتائج عن ٩٪ من مرضي كبار السن المصابين بالربو الشعبي لديهم معرفة جيدة فيما يتعلق بمرض الربوالشعبي وتغير المناخ قبل البرنامج وتحسنت الي ٥٣٪ بعد تنفيذ البرنامج. ٥٧٪ من مرضي كبار السن لديهم مستوى غير مرضى من الممارسات قبل البرنامج وتحسنت الي٨٤٪ بعد تنفيذ البرنامج. ١٢٪ من مرضي كبار السن لديهم جودة حياة جيدة قبل تنفيذ البرنامج وتحسنت الي ٤٤٪ بعد تنفيذ البرنامج وقد لخصت النتائج على أن هناك علاقة ارتباطية موجبة بين معلومات مرضي كبار السن وممارساتهم، وقد نجح البرنامج في تحسين جودة حياة كبار السن والحد من الآثار الضارة لتغير المناخ، وأوصت الدراسة بتوزيع كتيبات مصوره حول تغير المناخ ومرض الربو الشعبي على جميع مرضى كبار السن في العيادات الخارجية بمستشفى الصدر.