The Effect of Climate Changes Educational Program on Asthmatic Women's Health Knowledge and Practices in Outpatient Chest Clinic

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Abstract

Background: Climate change has an effect on the most fundamental aspects of health; it poses a threat to factors fundamental to good health and has the potential to reverse decades of advancement in global health. **Aim**: this study aimed to evaluate the effect of climate changes educational program on asthmatic women's health knowledge and Practices in outpatient chest clinic. **Design:** A quasi-experimental research design was used in this study. **Setting**: The study was conducted in outpatient chest clinic at EL- Fayoum University Hospital. **Sample:** Convenience sample was used to choice 100 asthmatic women. **Tool**: one tool was used as structured interview sheet that divided into four parts, Demographic characteristic, current medical history, women knowledge, and reported practices regarding climate change **Results**: the current study revealed that the women mean knowledge and reported practices was improved post education program than pre (9.71 ± 3.75 to 21.21 ± 3.06), and (61.51 ± 12.56 to 85.86 ± 2.86) respectively at p-level ≤ 0.05. **Conclusion:** the present study concluded that educational program had a significant effect on women's knowledge and reported practices regarding climate change also delineates that positive significant correlation between women's knowledge and reported practices pre and post education program. **Recommendation:** continuous education program that would help women to improve knowledge, and reported practices in facing the effect of climate change.

Keywords: Asthmatic, Climate changes, Educational program, Outpatient chest clinic and women health

Introduction

Climate change considered as one of the most persistent issues in the world today. This is a global environmental problem that can lead to catastrophic events such as floods, storms, and hurricanes caused by droughts, heat waves, and rainfall, directly or indirectly affecting people's health and well-being, especially those with asthma (**Ahmed et al., 2023**).

The risk of developing asthma increases with exposure to various environmental allergens, climate change, irritants such as indoor and outdoor air pollution, house dust mites, molds, and occupational exposure to chemicals, fumes, or dust. Asthma is a common and chronic respiratory inflammation that poses a challenge to patients, their families, and healthcare systems. A global public health concern,

asthma affects 1% to 18% of people in various nations. Asthma affected over 339 million people in 2016, according to the World Health Organization **(World health organization, 2021).**

Approximately 1.3 billion individuals worldwide reside in low- and middle-income nations below the poverty level, with 70% of them being women. These females are more vulnerable to the negative effects of climate change and bear a heavier cost. In recent years, the United Nations has increasingly acknowledged that climate change acts as a risk multiplier for gender-based health disparities. This is because women often face higher vulnerability and mortality rates during climate-related disasters, as well as shorter life expectancies in their aftermath due to social, economic, and health-related factors **(Sorensen et al., 2020)**.

Asthma is considered as a long-lasting disease described through recurrent attacks of shortness of breath, breathlessness, wheezing, and chest tightness these symptoms are recurrent and are often increased at night and worse with exercise. Other common triggers can make asthma symptoms worse such as the weather or climate change, viral infections (colds), smoke, dust , grass, fumes , and tree pollen, feathers, strong soaps, animal fur and perfume **(Meek et al,2023) .** After puberty, asthma tends to be more common and sometimes more severe in females than in males. The exact reasons for this gender difference are not fully understood, but it is thought to be related to the effects of sex hormones, particularly those associated with the menstrual cycle. Hormonal changes can lead to inflammation and increased sensitivity in the airways, which may trigger asthma symptoms **(Trivedi and Denton, 2022).**

Health education program emerges as one among several approaches to enhance women understanding and actions concerning asthma management. Additionally, such programs have the potential to empower women, granting them greater control over their lives. Research conducted in Egypt demonstrated a marked improvement in women's knowledge, behavior, and attitudes following their participation in a health education intervention **(Gebretatyos et al., 2022).**

Both obstetricians and community health nurses have a crucial role in assisting communities in adjusting to climate change and offering insightful advice when creating lesson plans. In addition to educating, advocating for, and putting into practice sustainable policy and practice, nurses have a professional obligation to teach and educate asthmatic women about the health effects of climate change. Through this process, nurses can consider past and present effects of climate change, anticipate needs, and get women ready for future climate change events. Already, nurses are forming networks and organizations to drive change and make investments in a future that is more climate change resilient. The nursing profession illustrates its critical role in addressing climate change via research, networking, advocacy teaching, and compassionate care. **(Martin and Vold. 2019).**

Significance of the study:

Climate change can be considered a risk to global health, affecting water, food supplies and air quality. Present knowledge is taken from epidemiological and experimental studies in 2017 on the relationship between

asthma allergic respiratory diseases, and climate change, about 157 million vulnerable people especially old people were exposed to heat waves which affected the health and between 2030 and 2050 climate change is expected to cause near 250 000 additional mortalities per year from malnutrition, increased respiratory illness, increased in vector-borne diseases, heat-related morbidity and mortality due to extreme weather events **(Andersen., et al.,23)**.

Asthma affected an estimated 262 million individuals worldwide in 2019 and resulted in 455 000 deaths. Therefore, bronchial asthma is one of the most common chronic respiratory diseases worldwide. An estimated 8.2% of children and 6.7% of adults in Egypt are believed to have asthma. Teaching women with asthma about their illness is crucial because women bear the greater burden of asthma-related morbidity and mortality. Females with asthma account for a significant portion of the public health burden because the condition shifts from being more common in boys in early adolescence to more prevalent in girls for hormonal reasons **(Ishak et al., 2023).**

This study aimed to evaluate the effect of climate changes educational program on asthmatic women's health knowledge and practices in outpatient chest clinic. Through:

-Assessing asthmatic women knowledge and reported practices regarding climate changes.

-Designing and planning climate changes educational program on asthmatic women health knowledge and reported practices

-Implementing and evaluating climate changes educational program on asthmatic women health knowledge and reported practices

Research hypothesis:

After implementation climate changes educational program on asthmatic women health knowledge and reported practices will be improved.

Subjects and Method:

The subjects and method for this study were portraying under the four main items as follows:

I- Technical Items:

The technical item includes research design, setting, subject and tools for data collection.

Research design:

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

Study setting:

The study was conducted in outpatient chest clinic at EL- Fayoum University Chest Hospital**.**

Study subjects

Convenience sample was used to choice 100 asthmatic women, from 130 visited asthmatic women in outpatient chest clinic at EL- Fayoum Chest Hospital that represent flow rate in previous year.

Tools of data:

One tool as a structured interview sheet used for data collection which consisted of five (5) parts:

Part I: Demographic characteristics of asthmatic women include: age, marital status, and pervious occupation, level of education, and residence.

Part II: Health status of asthmatic women related to climate changes as period of bronchial asthma, asthma degree, asthma symptoms affected or worsened by climate change, affected with respiratory symptoms that appear during climate change, exposed to other health problems related to climate change, and smoking status.

Part III: asthmatic women knowledge regarding climate changes as definition of climate change and global warming, causes, types, effects of climate changes on human health, activities contribute to greenhouse gases, and harmful health effects that ozone can cause on the respiratory system.

Scoring system:

It is assessed with a true-false and unknown questionnaire with 12 statements. The knowledge unit was categorized on a scale of one to twelve, with nine to twelve degree representing good knowledge, fifty to less than seventy-five percent representing average knowledge, and fewer than fifty percent representing poor knowledge, or 0-5.9 degree.

Part IV: asthmatic women reported practices regarding climate changes which included practice related high temperature that contain 10 closed ended questions, preventive measure during cold wave that contain 14 closed ended questions, pollution preventive measure that contain 5 closed ended questions, infection disease preventive measure that contain 11 closed ended questions, and storm preventive measures practice that contain 7 closed needed questions assign a score of 1 for each practice marked as "Done and assign a score of 0 for each practice marked as "Not Done". Sum the scores of all practices to get the total score and then categorize the result as:

-Satisfactory if the percentage is 50% or higher (≥50%).

-Unsatisfactory if the percentage is less than 50% (<50%).

Validity

In order to evaluate the content validity of the generated tool, it was created and sent to five specialists in the fields of community health nursing, obstetric health nursing, and medical surgical health nursing. Any necessary adjustments were made.

Reliability:

The internal reliability of the instruments was assessed using Cronbach's Alpha, which yielded knowledge scores of 0.82 and reported practices scores of 0.88.

Ethical considerations

The Fayoum University Faculty of Nursing's Scientific Research Ethics Committee granted official permission to conduct the planned study. Before completing the informed permission form, participants received thorough information about the study and their engagement, and participation in the research was entirely voluntary. The study's nature and goal were explained, participants' right to withdraw at any time was affirmed, their information was kept private and accessible to no one else without their consent was ensured, and their views, ethics, culture, and values were respected, among other ethical considerations.

II- Operational Item:

The preparatory phase:

In order to construct tools for data collection, it involved reviewing previous and current national and international literature in addition to theoretical knowledge gained from books, articles, periodicals, magazines, the internet, and other sources regarding various areas of the study.

Pilot study:

A Pilot study was carried out on 10% (10) of asthmatic women under the study from outpatient chest clinic at EL- Fayoum university Hospital to test the applicability, clarity and the efficiency of the tools and then the tool was modified according to the result of pilot study.

Field work:

1- After attaining the approval to conduct the study, sample was collected during the period of working of outpatient chest clinic at EL- Fayoum Chest Hospital.

2- After establishing a trustful relation, every subject was interviewed individually by the researcher to explain the study purpose

3- Teaching techniques included group discussions, brainstorming, demonstrations and re-demonstrations, as well as the use of handouts and pictures as media. Researchers developed a booklet and cylinder disk.

Assessment phase:

The structured interviewing sheet was filled by the researcher from each participant in the study to assess their socio demographic data, health status, knowledge, and reported practice about climate change

Implementation phase:

Climate changes educational program on asthmatic women's health include (introduction of climate change, meaning, causes types, global warming, effect of climate change on asthmatic women's health, health education program adaption with climate change and prevention from climate change adverse effects also reported practices that cover dealing in contamination, cold and heat waves, communicable diseases, and storming the researcher collect data during six months one day per week, with four case per day.

Evaluation phase:

After implementation program the researchers conduct evaluation on asthmatic women's health according to measures change baseline data (knowledge, reported practice) regarding climate change using the identical tool.

III-Administrative item:

Approvals to conduct this study were obtained from Dean of Faculty of EL-Fayoum University. An official letter from the responsible authorities from Faculty of Nursing EL-Fayoum University was directed to Chest Outpatients Clinic at EL-Fayoum University Hospital which the study was conducted.

IV- Statistical Item:

The results of the study were analyzed using SPSS version 24. The significance level was set at 0.05 for all statistical tests. Descriptive statistics were used to summarize and describe the main features of the dataset .The data were presented in the form of percentages, mean values, and standard deviations (mean ± SD. Appropriate inferential statistical tests were employed to determine the relationships and differences between variables . Depending on the nature of the data and the research questions, tests such as the "F" test (ANOVA) or "t" test were used to analyze the data. The combination of descriptive and inferential statistics provided a comprehensive understanding of the data and helped in drawing meaningful conclusions from the study findings.

Results

Demographic characteristics of the studied sample shows that, 35% of studied subject aged between 18- <40, and 40-<60 and read and write as well as 56% worked as house wife. Regarding to marital status (68%) were married, 62% live in rural area & (61%) of them had insufficient income, 51% heard about climate change in Egypt through internet source.

Table 1 shows that 40% suffered from bronchial asthma for more than ten years, 35% had medium asthma degree, 100% had asthma Symptoms affected or worsened by climate change, and 62% not affected with

respiratory symptoms that appear during climate change respectively, 100% exposed to other health problems related to climate change, 57% from studied women exposed to hypotension and 100% not smoker.

Table 2 explains women knowledge scores that improved significantly post-education program compared to pre-program scores (9.71 ± 3.75 to 21.21 ± 3.06) respectively at p-level ≤ 0.05.

Table 3 indicates that, the women reported practice sub-items showed significant improvement post-education program compared to pre-program .There was a highly statistically significant difference in the reported practices at p ≤ 0.

Figure 1 illustrates that 90% of women achieved a satisfactory level of practices post-program, compared to 64% pre-program

Table 4 delineates that there was a positive significant correlation between women's knowledge and reported practice both pre- and post-education program, also -Positive significant correlation was found between Pre-program knowledge and pre-program reported practice.

Table (1): Frequency distribution of medical data among women (n=100)

Health status of asthmatic women	No.	%
Suffering from bronchial asthma duration		
Less than five years	30	30
From five to ten	30	30
More than ten years	40	40
Asthma grades		
Mild	27	27
Medium	35	35
Intermittently	27	27
Severe	11	11
Factors affect		
Cold and thunder	39	39
High temperature	61	61
Respiratory symptoms that appear during climate change		
Sore throat	9	9
Shortness on breath	13	13
Cough	10	10
Foamy phlegm	3	3
Cold and runny nose	3	3
Non	62	62
Health problems		
Hypotension	57	57
Skin allergy	43	43

Table (2): Total knowledge among asthmatic women pre and post program (n= 100)

Total climate change knowledge scores	women pre and post applying program			
	Pre-applying		Post- applying	
	No.	%	No.	%
Levels of total knowledge:				
Poor	71	71	2	2
Average	28	28	9	9
Good	1	1	89	89
Mean scores of total knowledge				
Range	16		20	
Mean ± SD	9.71±3.75		21.21±3.06	
Paired **T test**	29.53			
P value	0.000**			

: Significant at P ≤ 0.05. ** *: Highly significant at P < 0.001

Table (3): Mean difference scores of total reported practices and sub items among women's pre and post program (n=100)

Women practices	Pre education	Post education	t- value	P-value
	Mean ± Std. Deviation	Mean ± Std. Deviation		
Total high temperature	14.79±2.01	18.57±1.15	**18.82**	**0.000****
Total high cold	20.11±2.31	25.9±1.01	**25.76**	**0.000****
Total pollution	7.064±0.97	9.10±0.67	**14.32**	**0.000****
Total infection	15.02±1.96	19.68±1.22	**20.60**	**0.000****
Total storm	11.55±1.09	12.63±1.00	**7.32**	**0.000****
Total reported practices	61.51±12.56	85.86±2.86	**19.80**	**0.000****

: Significant at P ≤ 0.05. **: Highly significant at P < 0.001

Significant difference at p-level ≤ 0.05.

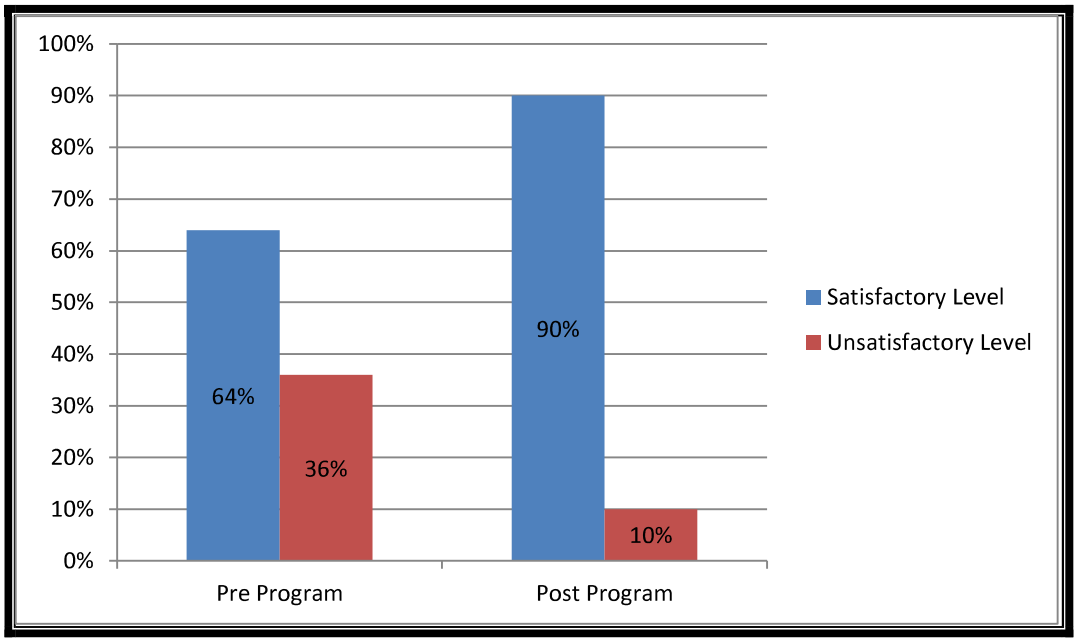

Figure (1): Total reported practices among women pre and post program (n=100).

Table (4): correlation between changes of knowledge, and reported practices regarding climate change pre/ Post applying program (n= 100)

Change of scores of total knowledge, reported practices	Change of scores of total knowledge, reported practices					
	Knowledge pre		Knowledge post		Reported practice pre	
	r	p	r	p	R	p
Knowledge Post	0.362	0.000	---	---	---	---
Reported practice pre	0.358	0.000	0.204	0.04	---	---
Reported practice post	0.068	0.504	0.095	0.346	0.209	0.03

****. Correlation is significant at the 0.01 level (2-tailed). r= person correlation coefficient**

***. Correlation is significant at the 0.05 level (2-tailed).**

Discussion

The World Bank Group estimates that by 2030, globally, more than 100 million people could be drawn into negative impacts on population health due to climate change. Low- and middle-income countries are also expected to be the most affected because they are disproportionately vulnerable, and also because of inadequate adaptability of infrastructure, including health systems **(Torre et al., 2023).**

Around the world, due to their higher nutritional requirements during menstruation and childbirth, women have higher rates of anemia and malnutrition worldwide and are particularly vulnerable to climate-related food insecurity. Due to the fact that women make up the bulk of smallholder farmer's worldwide, crop failure caused by climate change puts their livelihoods at risk and raises the possibility of both health problems and poverty **(Sorensen et al., 2020).**

The present study show that, more than one third of studied subject aged between 18- <40, and 40-<60 and read and write as well as more than half worked as house wife. Regarding to marital status more than two third were married, nearly two third live in rural area & had insufficient income, more than half heard about climate change in Egypt through internet source these results agree with **(Demir et al (2024)**, who studied "The relationship between Women's Climate Change Awareness and Concerns about Climate Change in Turkey" and concluded that The study sample consisted of 45.1% working women and 39.5% had elementary school graduates, with a mean age of 37.35 ± 11.57 (min-max: 18–65) years. The majority of women in the study, 56 percent—got their information about climate change from television and the internet, with 73.8% of them believing that climates are changing.

This finding is somewhat in harmony with the study done by (**Sambath et al. (2022)**,who found that about one-quarter of the study participants reported television and social media as their sources of information about climate change. Another relatively consistent study conducted by **(Mohammed et al. (2022)** , who conducted a study in Mansoura City on "Nursing Students Knowledge, Attitude, and Practice regarding Health Effect of Climate Change" discovered that just 18% of study participants said they got their information on climate change mostly from radio and television.

According to the researcher, these may have something to do with the internet and television, which are regarded as the primary information sources and are easily accessible to a big population seeking knowledge on a variety of topics in the modern era. Internet blogs have emerged as a highly valuable instrument for scientific discourse, with climate change emerging as a popular topic of discussion.

Additionally, the present study revealed that less than three quarter from participant had poor knowledge and more than one quarter had average level while the limit had good knowledge level these results consistent with the results from (**Demir et al (2024)**, who reported total mean score of the Awareness to Climate Change Scale for Women was 2.32 ± 0.61 (moderate awareness), and the total mean score of the Climate Change Worry Scale was 2.76 ± 0.84 (moderate anxiety).

From researcher point of view these results may be related to asthmatic women may had low educational level ,low socioeconomic status , live in rural residence and working as a house wife that mainly effect on sample knowledge level and desire to acquire and update knowledge

Furthermore, **(Channal et al., 2021**), who study "Awareness, Knowledge and Adaptation Reported practices of Farm Women in Relation to Climate Change in Northern Transitional Zone of Karnataka"

and reported that 36% of farm women fell into the category of having little knowledge of climate change indicators. Additionally, it was observed that none of the ladies knew about the modifications made to the farming system in light of the current environment.

The current study's findings conflict with **(Memon et al. (2022)** ,who study "Addressing Women's Climate Change Awareness In Sindh, Pakistan: An Empirical Study Of Rural And Urban Women" and concluded that, although their understanding of the issue is primarily derived from personal experience, women in Sindh, Pakistan, are aware of climate change.

In their study, **(Batool, et al. 2018**) titled "women's Perception of Climate Change and Coping Strategies in Pakistan: An Empirical Evidence", they reported that there is an urgent need to increase women's knowledge of climate change, offer finance options for taking adaption measures, promote unofficial social networks, and strengthen women's resilience to climate change.

Furthermore the overall level of knowledge was found to be low in a prior study by **(Mohammed et al. (2022) and Abdallah and Farag (2022)** titled "Impact of Awareness Programme regarding Health Consequences of Climate Change on knowledge, Perception and Daily Life Practices among Nursing".

The result of the existing study disagree with that of (**Xiao et al. (2020)** ,who investigate "Nurses' knowledge and Attitudes regarding Potential Impacts of Climate Change on Public Health in Central of China", and indicating that the majority of nurses are aware of climate change. Also, the current finding is relatively in accordance with that of **(Amin et al. (2023)**, who found that the level of knowledge about climate changes was satisfactory.

Regarding practices level of study participant 14.79±2.01 in total high temperature practice measure, 20.11±2.31 for high cold, 7.064±0.97 total pollution, 15.02±1.96 for total infection, and11.55±1.09 for total storm, moreover, more than two third had satisfactory total reported practice post program while less than half had unsatisfactory practice preprogram with mean ± SD 61.51±12.56.The current finding is consistent with **(Rahman et al. (2021)** ,who reported that the majority of study participants had correct reported practices in their study about "Knowledge, attitudes, and reported practices on climate change and dengue in Lao People's Democratic Republic and Thailand".

The findings of the current study contradict those of **(Lesley et al. (2018)**, who investigated "Knowledge, Attitudes, Reported Practices, and Action on Climate Change and Environmental Awareness of the Twenty-Two Villages along the River Banks in Cagayan de Oro City, Philippines." Lesley et al. found that the settlers exhibited a modest level of knowledge, attitudes, reported practices, and actions concerning climate change, with attitudes being more prominent than information, reported practices, and actions. They concluded that increasing awareness among settlers requires changes in their knowledge, attitudes, behaviors, and actions regarding climate change.

These results disagree with **(Mahmoud et al (2023)** ,who study "Knowledge and Reported Practices of Maternity Nurses Related to The Potential Impacts of Climate Change on Women's Health" Egypt and reported that the current study findings revealed that overall nurses' reported practices related to the impact of climate change on women's health were unsatisfactory. This finding is inconsistent with the result reported by **(Kircher et al. (2022)** ,who revealed unsatisfactory reported practices related to climate change among the study participants in the study titled "Recognizing Minnesota's Health Care Professionals' Knowledge, Attitudes, and

Reported Practices Regarding Climate Change and Health". Likewise, mismatching result was reported by **(Mohammed et al. (2022) ; Abdallah and Farag (2022)**, who found that the total level of practice was inadequate among their study participants.

From the perspective of the researcher this may be due to the fact that the phenomenon of climate change is new to our ears and we did not realize some of its practices until recently.

Concerning the effect of the program, women knowledge was improved post education program than pre (9.71 ± 3.75 to 21.21 ± 3.06) respectively at p-level ≤ 0.05, also reported practice level improved that, majority had satisfactory level post program than more than two third in preprogram, these results agree with (**Eissa et al (2020),** who study "Outcome of an Educational Program on Bronchial Asthma Self-Management , Egypt"; the study found that, prior to the program, the distribution of patients' understanding of asthma self-management was 37.1% poor, 35.1% adequate, and 27.8% good. Following the program, the proportion of patients with good knowledge rose significantly to 77.3%, with a notable statistical difference observed between pre- and post-program results (P < 0.001).

Similarly, **(Elbanna et al. (2020)** examined the impact of "Bronchial Asthma Education Program on Asthma Control among Adults in the Mansoura District" and found that a brief educational intervention enhanced patients' comprehension in key areas, including medication management and handling asthma symptoms. This aligns with (**Maulood et al. (2023),** who investigated "The Impact of A Health Education Intervention on Asthma Knowledge, Attitudes, and Reported Practices in A Cross-Sectional Study in Erbil" Iraq. They concluded that such programs significantly improved patients' understanding, attitudes, and behaviors related to asthma. Following a two-week health education period, most participants provided accurate responses regarding asthma, its causes, and triggers for asthma attacks.

In a similar vein, **(Abdel Nabi et al. (2023)** conducted a study on an educational program aimed at enhancing nursing students' awareness of the adverse health effects of climate change in Egypt. They observed notable improvements in the participants' knowledge, attitudes, and reported practices concerning climate change, with highly significant statistical differences pre- and post-program. Specifically, knowledge, attitudes, and reported practices improved from 42%, 37%, and 60% before the program to 94.5%, 83.5%, and 93.5% respectively, following the program's implementation.

(Abd El Hamid and Amer (2023) evaluated "The Effect of a Training Programme on Patients With Bronchial Asthma's Knowledge and Self-Care Reported Practices" ", finding that participants had a satisfactory understanding of asthma, which significantly improved following the intervention. Knowledge levels increased from 4.3% before the training to 77.1% afterward. This finding is consistent with (**Ali and Abou Elmaati (2020),** who studied "A Self-management Program aimed at enhancing asthma knowledge and inhaler technique among adults with asthma. They reported that after the Programme, they found that the percentage of participants with good knowledge increased to 77.3%, and there was a statistically significant difference (P < 0.001) between the pre- and post-program findings.

This agrees with the **(Ghozali, & Urrohmah, (2023)**, who study "Determining the Relationship between the Knowledge on Self-Management and Levels of Asthma Control among Adult Asthmatic Patients: A Cross-Sectional Study"; the majority of participants exhibited a low level of knowledge (66%; n=66), with a smaller proportion showing a good level of knowledge (34%; n=34). When

examining asthma control levels, 61% (n=61) of the participants had uncontrolled asthma, 35% (n=35) had partially controlled asthma, and only 4% (n=4) had well-controlled asthma. The Pearson Chi-square test results revealed a p-value of 0.001, indicating a significant relationship between the patient's knowledge of self-management and their asthma control levels.

According to researchers, this might have to do with how the program affects women's reported practices and knowledge. Additionally, climate change is regarded as a serious concern that could harm people's health.

Conclusion:

Based on the hypothesis of the current study, it can be concluded that the educational program positively impacted women's' knowledge and reported practices concerning climate change. There was also a significant positive correlation between women's' knowledge and their reported practices both before and after the educational intervention.

Recommendations:

Based on the research hypothesis the results of the present study recommended that:

- Conducting continuous education program that would help asthmatic women to improve knowledge, and reported practices in facing the effect of climate change.
- Distribute poster and brochure about climate change
- Further research on a large sample size and other settings.

References:

Abd El Hamid, F. M., and Amer, W. M.(2023): Effect of training program regarding knowledge and Self-care reported practices on patients with bronchial asthma ; Egyptian Journal of Health Care. September 2023 EJHC Vol.14 No.3.

Abdallah, Z. A., & Farag, W. A. A. (2022): Impact of awareness program regarding health consequences of climate change on knowledge, perception and daily life reported practices among nursing students; Egyptian Journal of Nursing and Health Sciences. 3(1), 367-390.

Abdel Nabi, E. A., Shafik, S. A., and Saad, A. M.(2023): an educational program to improve awareness of nursing students about adverse health effects of climate change ; HIV. vol. 23 no. 3nursing

Ahmed, A. L., Mohamed, N. E., and Hassan, G. S. (2023): Effect of health promotion program regarding environmental literacy and climate change health risks among Newly Nursing Students; Egyptian Journal of Health Care. September 2023 EJHC Vol.14 No.3 561.

Ali, W. G. M., and Abou Elmaati, H. (2020): Self-management program to improve asthma knowledge and inhaler technique among adult with asthma. IOSR J Nurs Heal Sci. 5(2), 37-47

Amin, S. M., Eldeeb, A. M. E.-M., and Elbialy, A. A. (2023): Predictors of climate change knowledge and risk perception among the adults in El beheira Governorate; Assiut Scientific Nursing Journal. 11(34), 41-51. https://doi.org/10.21608/asnj.2023.187563.1489.

Andersen, Z. J., Vicedo-Cabrera, A. M., Hoffmann, B., and Melén, E. (2023): Climate change and respiratory disease: clinical guidance for healthcare professionals; Breathe. 19(2).

Batool, H., Ali, W., Manzoor, R. and Mahmood, N. (2018): Women's perception of climate change and coping strategies in Pakistan: an empirical evidence Earth Syst Environ. 2, 609–619 https://doi.org/10.1007/s41748-018-0073-7.

Channal, G. P.; Rayangoudar, R.; and Patil, S. P.(2021): Awareness, knowledge and adaptation reported practices of farm women in relation to climate change in Northern Transitional Zone of Karnataka; Indian Res. J. Ext. Edu. 21 (4), October - December, 2021

Demir , R ., Yalazı , R. Ö., and DINÇ, A. (2024): The relationship between women's climate change awareness and concerns about climate change in Turkey ; Public Health Nurs. 2024 Mar-Apr; 41(2):215-220.

doi: 10.1111/phn.13269. Epub 2023 Dec 1.

Eissa , H .s., Farahat , T.M. Hegazy , N. N. and Barakat, A. M. (2020): Outcome of an educational program on bronchial asthma self-management ;The Egyptian Journal of Hospital Medicine (October 2020) Vol. 81 (3), Page 1699-1703 .

Elbanna, a., Ashraf,E. Sileem, b., Shereen, M., Bahgat, a., Gehan, A. and Ibrahem, A.(2020): Effect of bronchial asthma education program on asthma control among adults at Mansoura district Egyptian Journal of Chest Diseases and Tuberculosis. Vol. 66 (4), Pages 561-569

Gebretatyos, H., Ghirmai, L., Amanuel, S., Gebreyohannes, G. (2022): Effect of health education on knowledge and attitude of menopause among middle-age teachers BMC Women Health' 2020; 20: 232.

Ghozali, M. T., and Urrohmah, U. A. (2023): Determining the relationship between the knowledge on self-management and levels of asthma control among adult asthmatic patients: a cross-sectional study; Journal of medicine and life, 16(3), 442–446. https://doi.org/10.25122/jml-2022-0333.

Ishak, S. R., Abd El Sayed, S. T. K., & Wahba, N. S. (20203): Prevalence of common sensitizing aeroallergens in Egyptian asthmatic patients; World Allergy Organization Journal. 13(4), 100115.

Kircher, M., Doheny, B. M., Raab, K., Onello, E., Gingerich, S., and Potter. T. (2022): Understanding the knowledge, attitudes, and Reported practices of healthcare professionals toward climate change and health in Minnesota; Challenges. 2022; 13(2):57. https://doi.org/10.3390/challe13020057 57; https://doi.org/10.3390/challe13020057

Lesley C. Lubos and Lalevie C. Lubos (2018): Knowledge, attitudes, reported practices, and action on climate change and environmental awareness of the twenty-two villages along the River Banks in Cagayan de Oro City, Philippines; LICEO Journal of Higher Education Research. (Vol. 14, Issue 1).

Mahmoud, N. Sh., Ahmed, A.H. and Taman, A. H. (2023): Knowledge and reported practices of maternity nurses related to the potential impacts of climate change on women's health; Egyptian Journal of Health Care. Vol 14, No 2.

Martin, W. & Vold, N. (2019): Climate Change and Health: It's time for nurses to act. Canadian Association of Physicians for the Environment; Canadian Federation of Nurses Unions available at www.nursesunions.ca

Maulood, K. B., Khan, M., Sulaiman, S. A. and Khan, A. H. (2023): Assessing the Impact of Health Education Intervention on Asthma Knowledge, Attitudes, and Reported practices: A Cross-Sectional Study in Erbil, Iraq Healthcare. 11, 1886. https://doi.org/10.3390/healthcare1113188 6.

Meek, B., Bridges, J.W., Fasey, A. and Sauer, U.G., 2023. Evidential requirements for the regulatory hazard and

risk assessment of respiratory sensitizers: methyl methacrylate as an example; Archives of toxicology. 97(4), pp.931-946.

Memon, F. S., Abdullah, F. B., Iqbal, R., Ahmad, S.,Imtiaz Hussain and Abdullah, M. (2022): Addressing women's climate change awareness in Sindh, Pakistan: an empirical study of rural and urban women; Climate and Development .vol 15, 2023 - Issue 7.

Mohammed, E., El-Mouty,S.M., and Ameen, N. (2022): Nursing student's knowledge, attitude, and practice regarding health effect of climate change. Mansoura Nursing Journal. 9(2), 589-601.

Rahman , M .S., Overgaard , H. J., Pientong , C., Mayfong M. , and Tipaya, E. (2021): Knowledge, attitudes, and reported practices on climate change and dengue in Lao People's Democratic Republic and Thailand Environ Res. . Feb: 193:110509.

Sambath, V., Narayan, S., Kumar, P. and Pradyumna, A. (2022). Knowledge, attitudes and reported practices related to climate change and its health aspects among the healthcare workforce in India – A cross- sectional study; The Journal of Climate Change and Health, 6, 100147. https://doi.org/10.1016/j.joclim.2022. 100147.

k

Sorensen, C., Murray, V., Lemery, J., & Balbus, J. (2020). Climate change and women's health: Impacts and policy directions; PLoS medicine, 15(7), e1002603.

Torre, G., Baer, A., Sestili, C., Cocchiara, R., Barbato, D., Mannocci, A. and Cimmuto, A. (2023): Knowledge and perception about climate change among healthcare professionals and students: A cross sectional study; South Eastern European Journal of Public Health. Issue XIII, 2020 DOI: 10.4119/seejph33475**.**

Trivedi, M., & Denton, E. (2022): Asthma in children and adults—what are the differences and what can they tell us about asthma; Frontiers in pediatrics, 7, 256.

World health organization, (2021): Asthma available at https://www.who.int/news-room/facts-in-pictures/detail/asthma.2/2/2023.5:am.

Xiao ,J., Fan , W., Deng , Y., Li , S .,and Yan, P. (2020): Nurses' knowledge and attitudes regarding potential impacts of climate change on public health in central of China; International Journal of Nursing Sciences Volume 3, Issue 2, June 2016, Pages 158-161.