Effect of Coping Strategies on Nursing Students' Daily Living Activities and Attitude Regarding Climate Change

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Abstract

Background: Climate change refers to the slow increase in global temperatures that is mostly brought on by human activity and has the potential to have detrimental effects on human health. The actions of daily living release a variety of gases into the environment. One of the key determinants of public opinion is predicted to be how university students particularly nursing students are handling climate change. **Aim:** The study aimed to evaluate the effect of coping strategies on nursing students' daily living activities and attitude regarding climate change. **Design:** A quasi-experimental research design. **Sampling:** A purposive sample of 254 nursing students at Faculty of Nursing, Helwan University. **Tools:** Four tools were used to collect data, the 1st tool was Structured Interviewing Questionnaire Sheet to assess nursing students' knowledge about climate change, the 2nd tool was Students' Daily Living Activities Questionnaire Sheet to assess indoor and outdoor daily living activities, the 3rd tool was Students' Attitude regarding climate change Questionnaire Sheet to assess the nursing students' attitude regarding climate change and the 4th tool was Coping Scale with climate change to assess coping strategies of nursing students with climate change. **Results:** The study findings showed that there was a statistically significant positive correlation between students' coping with climate change and their knowledge, daily living activities and attitude post coping strategies implementation. **Conclusion:** Implementation of the coping strategies had a positive effect on the nursing students' daily living activities and attitude regarding climate change. **Recommendations:** Implementing continuous programs for coping with climate change and integrating climate change topics into nursing education.

Key words: Attitude, Climate Change, Coping Strategies, Daily Living Activities.

Introduction

Climate change is one of the most urgent issues in the world. It is a worldwide environmental issue that contributes to catastrophic occurrences including heat waves, droughts, and rain-related floods, storms, and hurricanes that affect people's health and well-being either directly or indirectly **(Watts et al., 2023)**. Climate change is the term used to describe the gradual rise in global temperatures that is primarily caused by human activities. Because of the widespread burning of fossil fuels, which releases greenhouse gas (GHG) emissions into the atmosphere, over 90% of people on the earth now breathe in dangerously high amounts of air pollution. GHGs are the primary cause of global warming and the current climate crisis **(WHO, 2022).**

The causes of climate change are anthropogenic, resulting from consumption patterns, lifestyle decisions, and unsustainable resource exploitation. Furthermore, it is anticipated that climate change would negatively impact fisheries and agriculture, maybe even leading to the collapse of entire ecosystems **(Richardson et al., 2019).** Effects of climate change on human health; climate change is a pervasive phenomenon with broad implications for social, economic, political, geographical, ecological, and psychological variables **(WMO, 2019).**

Climate change can cause several serious alterations impacting human health. These changes include the resurgence of malaria, respiratory issues, malnutrition, heat-related illnesses like heat stress and stroke, infectious diseases like water- and vector-borne illnesses like gastrointestinal issues, and mental health issues like depression and stress disorders that are linked to natural disasters **(Abdallah & Farag, 2022).**

Human daily living activities, especially the burning of fossil fuels like coal, gas and oil to power vehicles, factories, and homes; result in unleashing greenhouse gas and other gases into atmosphere. In addition to other activities, as deforestation (cutting down trees) and raising livestock, conjointly emit greenhouse gases **(NOAA, 2020).** More of these gases within the atmosphere lead to additional heat on earth, which causes an evolution rise in global temperatures and climate change that is driven by

human. Therefore, Climate scientists agree that human activity is the primary driver of global warming **(NASA, 2021).**

Climate change coping is an essential matter to achieve sustainability in developing countries. Lack of coping is a major barrier to climate change adaptation in developing countries. Encouraging climate change coping at the local level is crucial because climate change impacts are intensifying the frequency and severity of disasters in this disaster-prone nation, which is ranked 12th in the world **(Abbas, 2019).** University students' coping with climate change, global warming, and greenhouse effect, specially nursing students, is anticipated to be one of the important keys to the public attitudes. Also, coping considered the major defense line to adapt with the environment, and higher education students should lead by example to all other educational levels **(Mahmoud & Mahmoud, 2023).**

Nurses play a pivotal role in mitigating the effect of climate change on the healthcare sector and adapting to the phenomenon. Because of this, nursing students need to be prepared for a new professional role that takes climate change into consideration. As a result, it's critical to emphasize that the concept of sustainability in nursing practice and knowledge related to climate change must be an essential part of education, in both practical and theoretical courses, to enable nurses to act as leaders and take action to create health systems that are climate-safe **(ICN, 2018).**

Significance of the study

Climate change and global warming are serious issues affecting the world and its future. Over 100 million individuals worldwide may be impacted by adverse demographic effects by 2030. It is anticipated that low- and middle-income countries will be the most impacted because of their disproportionate exposure and weak adaptive capacity **(Elsharkawy et al., 2023).** In addition, increasing sea levels, an increase in the spread of infectious illnesses, a shortage of food and water, mass migration, political unrest, and financial losses for both individuals and governments are all consequences of climate change that negatively impact people's physical and mental well-being as well as their social standing **(Álvarez et al., 2022).**

According to a study released by the Egyptian Meteorological Service, five years before to summer 2021, there had been an extraordinary temperature increase of three to four degrees above average. This forced the Egyptian government to respond to climate change and its detrimental effects with more decisive and effective measures **(ACPSS, 2021).** As a representative of the difficulties, endeavors, and priorities of the African continent in addressing the climate change catastrophe, Egypt submitted an application to host the 27th session of the Conference of States Parties to the United Nations Convention on Climate Change (COP 27) in 2022 **(Enterprise, 2022).**

From the researchers' point of view, it's critical that nursing students have a high level of coping strategies for climate change through daily living activities and attitude, as this has a knock-on effect on improving social and physical environments locally, nationally, and globally. Thus, a key component of the global response to climate change is the readiness of health professionals.

Aim of the study

This study aimed to evaluate the effect of coping strategies on nursing students' daily living activities and attitude regarding climate change through:

1- Assess the nursing students' knowledge, attitude, and daily living activities regarding climate change pre/post program.

2- Assess the nursing students' coping strategies regarding climate change pre/post program.

3- Design coping strategies regarding climate change.

4- Implement coping strategies regarding climate change.

5- Evaluate the effect of coping strategies on nursing students' daily living activities and attitude regarding climate change.

Research hypothesis:

The implementation of coping strategies will have a positive effect on nursing students' daily living activities and attitudes regarding climate change.

Subjects and methods

Research Design: A quasi experimental research design was used to achieve the aim of the study.

Setting of the Study: The study was conducted at Faculty of Nursing, Helwan University.

Subject: A purposive sample of nursing students were selecting from the previously mentioned setting and satisfying the following inclusion criteria:

- Third and fourth academic year students.
- Both genders.
- Students who did not attend any workshop or conference about climate change.

The sample size was calculated by adjusting the power of the test to 80%, and the confidence interval to 95% with a margin of error accepted adjusted to 5% using the following equation:

$$n = \frac{N \times p(1-p)}{\left[\left[N-1 \times \left(d^2 \div z^2\right)\right] + p(1-p)\right]}$$

Nxp(1-p)	= 750x (0.5 x (1-0.5)
N-1	= (750-1)
d2/z2	= 0.0025 / 3.8416
p(1-p)	= 0.5 x (1-0.5)
N	= 254.4= 254

N= Community size

z= Class standard corresponding to the level of significance equal to 0.95 and 1.96 d= The error rate is equal to 0.05

p= Ratio provides a neutral property = 0.50 Based on the above equation, the sample size is 254 students participated in this study.

Data Collection tools

Data were collected by using the following tools:

Tool I: Structured Interviewing Questionnaire Sheet (was used pre coping strategies)

Structured Interviewing Questionnaire Sheet that was designed by the researchers after reviewing the current available literature and was written in simple Arabic language to suit level of understanding of nursing students to assess the following:

Part I: Characteristics of nursing students namely; gender, place of residence, academic year, number of family members, family income and email).

Part II: Nursing students' knowledge regarding climate change (was used pre/post coping strategies)

This part was concerned with assessment of nursing students' knowledge about climate change such as definition, causes, signs and effect of climate change on nursing students. Related to nursing students' knowledge assessment pre & post program, a correct answer was scored one and incorrect answer was scored zero, a total of ≥60% was considered satisfactory knowledge and <60% was considered unsatisfactory knowledge.

Tool II: Nursing Students' Daily Living Activities Questionnaire Sheet (was used pre/post coping strategies)

Students' daily living activities questionnaire sheet was designed by the researchers after reviewing the recent available literature and was written in simple Arabic language to suit level of understanding of nursing students to assess indoor and outdoor daily living activities. It consisted of 11 statements measuring the indoor daily living activities and 8 statements measuring the outdoor daily living activities. The scoring responses to each statement was "done = 2" "to somewhat = 1" "not done = zero". A total of ≥60% was considered good activities and < 60% was considered poor activities.

Tool III: Nursing Students' Attitude regarding Climate Change Questionnaire Sheet (was used pre/post coping strategies)

Nursing students' attitude regarding climate change questionnaire sheet was adapted from **Netravathia & Chauhan (2014)** and validated. This sheet was used to assess the nursing students' attitude regarding climate change. It formed from 11 statements. Scoring responses to each statement were (agree, to somewhat and disagree) by score (2, 1, 0). A total of ≥60% was considered positive attitude and <60% was considered negative attitude.

Tool IV: Coping scale with climate change (was used pre/post coping strategies)

Coping scale with climate change was global standardized tool which was adapted from **(Hamby et al., 2015)** and validated. This scale was used to assess coping strategies of nursing students with climate change and contained 13 items. Each answer category was assigned a value from 3 to 1. Scoring responses to each statement were (Always 3, sometimes 2 and rare 1) Higher scores indicate higher levels of coping, a total of ≥60% was considered high coping and <60% was considered low coping.

Pilot study

It was carried out including 10% (25) of the nursing students at the previously mentioned setting to test the clarity, applicability, and efficiency of the tools and then the necessary modifications were done accordingly. Nursing students under pilot study were excluded from the sample if major modifications were done.

Content Validity and Reliability

The revision of the tools for clarity, relevance, applicability, comprehensiveness, and understanding was done by a panel of 3 experts in the field of pediatric nursing and psychiatric mental health nursing to assess the content validity of the tools and the necessary modifications were done accordingly. Internal consistency and reliability were performed by using Cronbach's alpha- coefficient test.

Tool	Number of items	Cronbach's Alpha
Students' knowledge regarding climate change	13	0.777
Students' daily living activities questionnaire	19	0.814
Students' attitude regarding climate change questionnaire	11	0.681
Coping Scale with climate change	13	0.711

Field Work

The first interview with nursing students was done by using Microsoft Teams to identify the students who agreed to participate in the study after explaining the aim and objectives of the study. Questionnaire was available in Google form to reduce paper wastes and distributed through WhatsApp groups and telegram groups before the coping strategies through link (https://docs.google.com/forms/d/e/1FAIpQLScGD4EJq0pNtc7_bs0FkDyGOXV3wrAWN1OpkSqyLACXMTblg/viewform and after the coping strategies through Link (https://forms.gle/8quZwdL7DA7wvHUV6). Questions were in the form of closed and open ended and multiple choices questions. The time consumed to fill in the questionnaires for each student participated in the study was 20-30 minutes. The program sessions were conducting through Microsoft Teams.

The coping strategies regarding climate change were divided into four stages: assessment, planning, implementation, and evaluation

I. Assessment phase (the first phase):

The data were collected by using the previously mentioned tools through interviewing the nursing students online through Microsoft Teams as one group using the previously mentioned tools. The aim of the study was simply explained to the nursing students who agreed to participate in the study.

II. Planning phase (the second phase):

According to the initial assessment, the content of the coping strategies program was designed. The researchers developed coping strategies based on the actual educational needs assessment of the studied nursing students. These strategies were developed after reviewing the related literatures. The content of these strategies was developed for the studied nursing students and was written in a simple Arabic language. Furthermore, coping strategies met the nursing students' needs and their level of understanding. This coping strategies booklet used to improve the knowledge, daily living activities and attitude of the nursing students regarding definition, causes, signs of climate change, effect of climate change, coping strategies with climate change, building climate resilience, energy use/transfer, waste management, food consumption, climate adaptation in water, sanitation and hygiene services, sustainable energy and disaster risk response in universities, reduce emissions and pollution and ways for eliminating climate change by using different teaching methods as; lectures, brain storming and group discussion through chat rooms. Also, a variety of audiovisual aids such as; sharing pictures and videos.

The coping strategies booklet was developed to be a reference and a guide for the studied nursing students and distributed on the nursing students in the form of PDF file through Whatts app and telegram groups.

III. Implementation phase (the third phase):

The coping strategies were designed to provide the studied students with knowledge, skills and positive attitude toward the effect of coping strategies on nursing students' daily living activities and attitude regarding climate change.

The field work of this study was implemented from the first of July 2023 to the end of September 2023 and covered three months. It was implemented through 6 sessions that were divided into 2 sessions for theoretical part and 4 sessions for practical part. It was carried out over two weeks with two hours for each one. The total duration of all sessions was 12 hours. The nursing students were motivated and rewarded for their active participation during coping strategies.

The content of the coping strategies was covering the nursing students' knowledge towards fundamental facts about climate change as definition, factors affecting on climate change, effects of climate change on the environment. Also, the nursing students' attitude toward concerns of climate change is optimism, sense of responsibility and commitment.

furthermore, the nursing students' daily living activities as indoor and outdoor activities.

IV. Evaluation phase (the fourth phase):

It was carried out via pre/ post the coping strategies implementation by using the same study tools to assess similarities, differences, and improvements, in addition to defects at the end of the three months following implementation.

Ethical considerations

The ethical research considerations in this study included the following; prior study conduction, ethical approval was obtained from the Scientific Research Ethical Committee of Faculty of Nursing, Helwan University granted ethical approval with the code number (35- 10/7/2023) the researchers clarified the aim and objectives of the study to the nursing students who accept to participate in the study, confidentiality of the gathered data and results were secured, and nursing students' verbal approval was obtained.

Results

Table (1): presents that 51.6% of the studied nursing students are female. As for the academic year, 71.7% of the studied nursing students are at the third year and 51.2% are living at urban areas. As for number of family members, 78.7% of the studied nursing students have 5 or more family members. As well, 91.7% of the studied nursing students have enough family income.

Table (2): shows that 96.1%, 95.3% & 94.1% of the studied nursing students have knowledge about climate change, climate change causes mental harm as depression or anxiety and it causes heat related illness and vector born infectious diseases respectively post coping strategies implementation, compared to 76.4%,76.4% & 85% respectively pre coping strategies implementation. There is a high statistically significant difference between mean scores of nursing students' knowledge regarding climate change pre and post coping strategies implementation with (p value= 0.000**).

Figure (1): reveals that 95.3% of the studied nursing students have satisfactory total knowledge towards climate change post coping strategies implementation, compared to 76.4% of the studied nursing students have satisfactory total knowledge towards climate change pre coping strategies implementation.

Table (3): clarifies nursing students' daily living activities regarding climate change pre and post coping strategies implementation. As for indoor daily living activities, 88.6%, 79.9% & 76.8% of the studied nursing students switch off the lights that they don't use, purchase energy-saving light bulbs and turning off household appliances respectively post coping strategies implementation, compared to 68.5%, 40.9% & 50% respectively pre coping strategies implementation.

As for the outdoor daily living activities, 70% & 83.9% of the studied nursing students take the stairs rather than the elevators and walk short distances rather than cars and vehicles respectively post coping strategies implementation, compared to 58.7% & 59.5% respectively pre coping strategies implementation. Besides, there is a statistically significant difference between mean scores of the studied nursing students' daily living activities regarding climate change pre and post coping strategies implementation with (p value= 0.03*).

Figure (2): shows that 81.5% of the studied nursing students have good total reported practices towards climate change post coping strategies implementation, compared to 66.5% pre coping strategies implementation. Whereas, only 18.5% of the studied nursing students have poor reported practices towards climate change post coping strategies implementation, compared to 33.5% pre coping strategies implementation.

Table (4): states the studied nursing students' attitude regarding climate change pre and post coping strategies implementation. 76.8%, 81.1% & 85.8% of the studied nursing students agree that climate change is an inescapable consequence due to the ways modern society operates, people ought to be forced to consume less energy and the government ought to offer rewards to those who protect the environment respectively post coping strategies implementation. While, 74.8%, 80.3% & 81.5% of the studied nursing students agree about these items pre coping program implementation. There is a high statistically significant difference between mean scores of the studied nursing students' attitude towards climate change pre and post coping strategies implementation with (p value= 0.001*).

Figure (3): shows that 72.8% of the studied nursing students have positive total attitude towards climate change post coping strategies implementation, compared

to 47.6% pre coping strategies implementation. Whereas, 27.2% of the studied nursing students have negative total attitude regarding climate change post coping strategies implementation, compared to 52.4% pre coping strategies implementation.

Table (5): presents nursing students' coping regarding climate change pre and post coping strategies implementation. It reveals that the same percentage of the studied nursing students (65.4%) are occasionally thinking about the climate change from a different point of view and thinking about bigger lifestyle changes in dealing with climate change post coping strategies implementation, compared to 52.4% & 51.2% respectively pre coping strategies implementation. Besides, 55.9 % of the studied nursing students are always taking steps to take better care of themselves and their families for the future post coping strategies implementation, compared to 42.1% pre coping strategies implementation. There is a statistically significant difference between mean scores of students' coping regarding climate change pre and post coping strategies implementation with (p value= 0.008*).

Figure (4): shows that 88.6% of the studied nursing students have high coping level towards climate change post coping strategies implementation, compared to 47.6% pre coping strategies implementation. Whereas, only 11.4% of the studied nursing students have low coping level regarding climate change post coping strategies implementation, compared to 52.4% pre coping strategies implementation.

Table (6): shows that there is a statistically significant positive correlation between the studied nursing students' coping with climate change and their knowledge post coping strategies implementation with (p value= 0.005*). While, there is a high statistically significant positive correlations between the studied nursing students' coping with climate change and their daily living activities and attitude with (p value= 0.000**).

Table (1): Frequency and percentage distribution of the studied nursing students according to their demographic characteristics (n= 254)

Students' characteristics	No	%
Gender		
Male	123	48.4
Female	131	**51.6**
Academic year		
3rd year	182	**71.7**
4th year	72	28.3
Residence		
Urban	130	**51.2**
Rural	124	48.8
Number of family members		
2-4	54	21.3
≥ 5	200	**78.7**
Family Income		
Enough	233	**91.7**
Not enough	21	8.3

Table (2): Comparison of nursing students' knowledge regarding climate change pre and post coping strategies implementation (n= 254)

Items	Pre coping strategies		Post coping strategies	
	Yes	No	Yes	No
	%	%	%	%
▪ Do you know that climate change is happening?	76.4	23.6	**96.1**	3.9
▪ Is climate change caused by humans?	73.6	26.4	81.5	18.5
▪ Is climate change affects nursing practice?	66.1	33.9	81.5	18.5
▪ Is climate change causes worry to you?	62.6	37.4	71.7	28.3
▪ Is climate change causes harm for people and patients?	91.3	8.7	92.9	7.1
▪ Is climate change will affect the future generations?	84.3	15.7	88.2	11.8
▪ Is climate change causes illness due to reduced outdoor air?	85.4	14.6	92.9	7.1
▪ Is climate change causes mental harm as depression or anxiety?	76.4	23.6	**95.3**	4.7
▪ Is climate change increases poverty due to economic hardship?	76.4	23.6	90.6	9.4
▪ Is climate change causes malnutrition or hunger due to rising food prices?	82.3	17.7	88.6	11.4
▪ Is climate change causes heat related illness and vector born infectious diseases?	85	15	**94.1**	5.9
▪ Is climate change causes violence, conflicts, or dislocations or all?	65.4	34.6	79.1	20.9
▪ Is climate change causes physical and mental harm from droughts?	85	15	92.9	7.1
Total mean ± SD	8.389 ± 2.624		11.409 ± 2.832	
	T test 3.366 P value 0.000 ** (HS)			

*** * Highly significant (HS) p≥ 0.001**

Figure (1): Comparison of nursing students' total knowledge regarding climate change pre and post coping strategies implementation (n= 254)

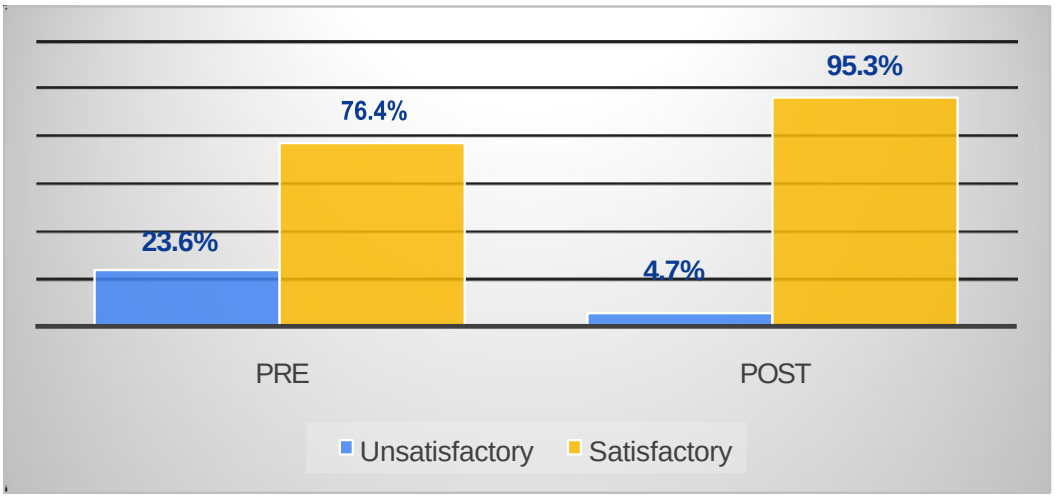


Table (3): Comparison of nursing students' daily living activities regarding climate change pre and post coping strategies implementation (n= 254)

Daily living activities	Pre coping strategies			Post coping strategies		
	Done	To somewhat	Not done	Done	To somewhat	Not done
	%	%	%	%	%	%
Indoor daily living activities						
▪ Switch off the lights, I don't use.	68.5	17.3	14.2	**88.6**	11.4	0.0
▪ Purchase energy-saving light bulbs.	40.9	39.4	19.7	**79.9**	14.2	5.9
▪ Turning off household appliances.	50	35.8	14.2	**76.8**	16.1	7.1
▪ Not leaving the computer or laptop in screensaver or standby mode.	57.1	29.5	13.4	72	16.2	11.8
▪ Purchase organic food.	40.9	45.7	13.4	53.1	32.7	14.2
▪ Substituting small fluorescent lights for conventional ones.	40.9	39.4	19.7	48.8	39.4	11.8
▪ Maintain a 24°C air conditioning setting (n = 126).	41.3	27.2	31.5	61	20.5	18.5
▪ Make use of recharging batteries.	68.5	17.3	14.2	75.2	15.4	9.4
▪ Make use of recharging batteries.	40.2	50	9.8	47.2	45.7	7.1
▪ Promote the use of recyclable products.	59.5	29.5	11	63	32.3	4.7
▪ Distinguish the moist from the dry household garbage.	50.8	25.6	23.6	52	29.1	18.9
Outdoor daily living activities						
▪ Use bicycle or walk to the university.	43.7	19.3	37	47.2	18.5	34.3
▪ Take the stairs rather than the elevators.	58.7	29.9	11.4	**70**	20.5	9.5
▪ Walk short distances rather than cars and vehicles.	59.5	29.5	11	**83.9**	10.2	5.9
▪ Minimal utilization of papers.	38.6	46.4	15	47.3	36.2	16.5
▪ Use cloth or carton bags instead of plastic when shopping.	30.7	48.4	20.9	36.2	33.5	30.3
▪ Eliminate the amount of packaged food you eat.	53.9	38.2	7.9	65.7	24.8	9.5
▪ Taking part in campaigns to plant trees.	30.7	26	43.3	35.8	28.7	35.5
▪ Taking part in campaigns for cleanliness.	39.8	37	23.2	45.7	33.8	20.5
Total mean ± SD		24.87 ± 6.547			27.259 ± 7.479	
		T test 2.184 P value		0.03 * (S)		

*** Significant (S) p≥ 0.05**

Figure (2): Comparison of nursing students' total daily living activities regarding climate change pre and post coping strategies implementation (n= 254)

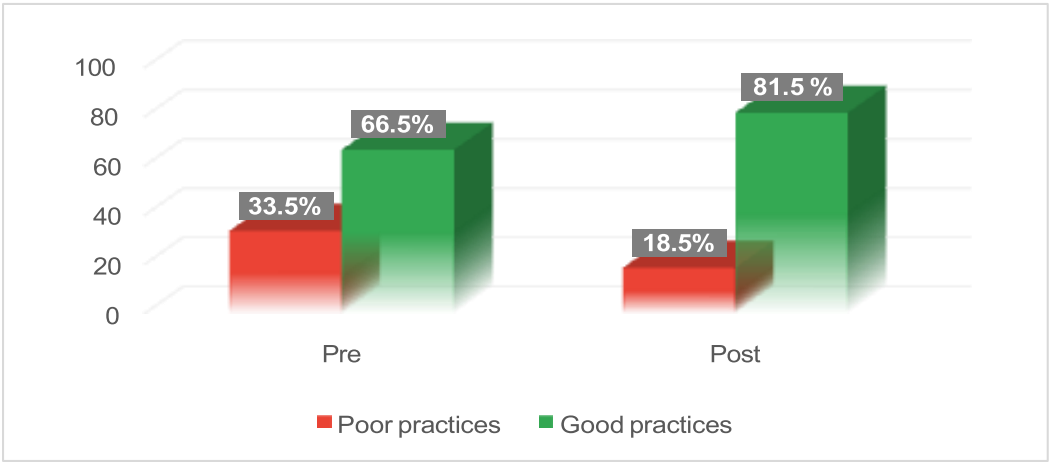
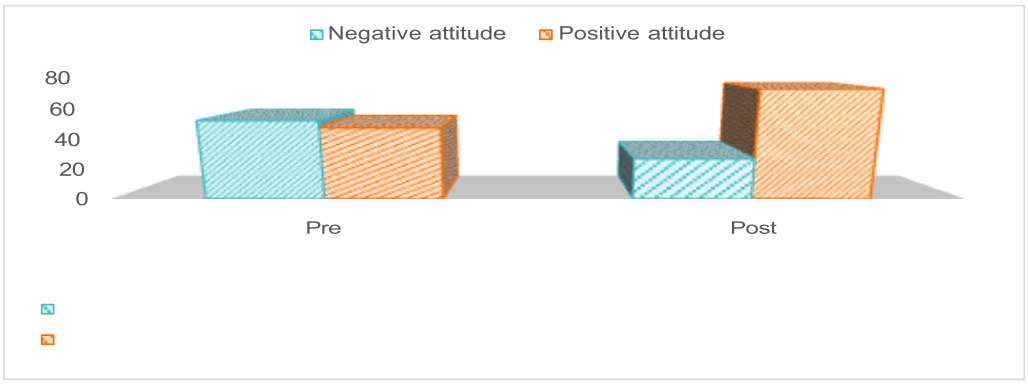


Table (4): Comparison of nursing students' attitude regarding climate change pre and post coping strategies implementation (n= 254)

Items	Pre coping strategies			Post coping strategies		
	Agree	To somewhat	Disagree	Agree	To somewhat	Disagree
	%	%	%	%	%	%
▪ We are able to articulate the green transformation.	58.2	39	2.8	72	25.6	2.4
▪ Climate change is an inescapable consequence due to the ways modern society operates.	74.8	22.8	2.4	**76.8**	20.8	2.4
▪ People ought to be forced to consume less energy.	80.3	18.1	1.6	**81.1**	14.2	4.7
▪ Climate change is going to make the weather better.	51.5	28	20.5	58.3	25.6	16.1
▪ A natural variation in earth's temperature constitutes climate change.	54.7	25.2	20.1	46.5	30.3	23.2
▪ I would only contribute to reducing climate change if everyone else did, too.	44.1	31.1	24.8	55.5	23.2	21.3
▪ The government ought to offer rewards to those who protect the environment.	81.5	13.6	4.9	**85.8**	13.1	1.1
▪ It is too late to do anything about climate change.	13	24	63	14.2	37	48.8
▪ Global temperatures are not much impacted by human activity.	11.0	21.3	67.7	25.6	39.4	35
▪ Climate change is something that scares me.	33.5	48.4	18.1	35	55.5	9.5
▪ Developing countries should take most of the responsibility for climate change.	24.4	34.3	41.3	26	37.4	36.6
Total mean ± SD		11.66 ± 3.136			14.724 ± 3.792	
		T test 3.366 P value		0.001 * (HS)		

*** * Highly significant (HS) p > 0.001**

Figure (3): Comparison of nursing students' total attitude regarding climate change pre and post coping strategies implementation (n= 254)



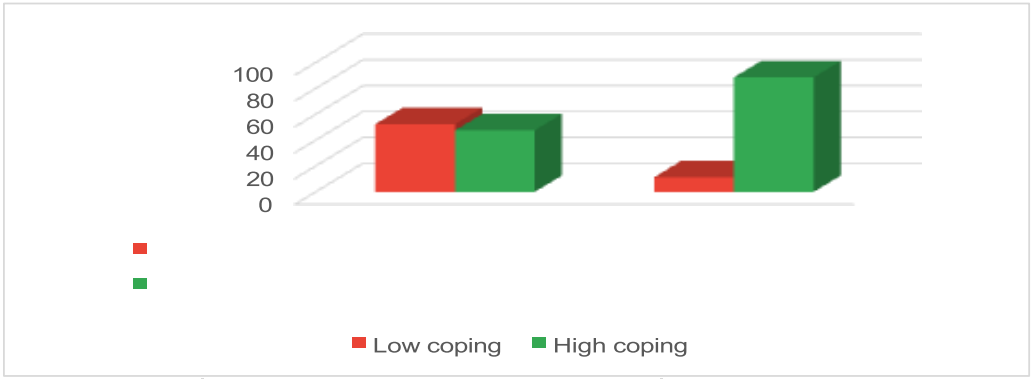
	Pre	Post
Negative attitude	52.4	27.2
Positive attitude	47.6	72.8

Table (5): Comparison of nursing students' coping with climate change pre and post coping strategies implementation (n= 254)

Items	Pre coping strategies			Post coping strategies		
	Always	Sometimes	Rare	Always	Sometimes	Rare
	%	%	%	%	%	%
▪ I spend time trying to understand what climate change is.	11	68.1	20.9	18.5	42.1	39.4
▪ I try to see the positive side of the climate change.	35	51.2	13.8	30.4	50.8	18.8
▪ I try to think about the climate change from a different point of view.	19.6	52.4	28	30.3	**65.4**	4.3
▪ I consider several alternatives for handling the climate change	40.2	42.1	17.7	48.4	44.9	6.7
▪ I try to see the humor in climate change.	24.4	48	27.6	32.3	44.5	23.2
▪ I think about bigger lifestyle changes in dealing with climate change.	31.1	51.2	17.7	25.2	**65.4**	9.4
▪ I often wait and don't do anything ▪ in dealing with climate change.	25.6	46.1	28.3	13.8	42.1	44.1
▪ I often try to remember that the climate change isn't as serious as it seems.	22	45.3	32.7	45.7	23.6	30.7
▪ I often use exercise, hobbies, or meditation to get through a tough time in dealing with climate change.	38.6	40.6	20.8	39.8	55.5	4.7
▪ I make jokes about climate change ▪ or try to make light of it.	16.1	37.4	46.5	16.6	48.8	34.6
▪ I make compromises on many things of my life in dealing with ▪ climate change.	16.5	42.2	41.3	10.2	50.8	39
▪ I take steps to take better care of myself and my family for the future.	42.1	46.5	11.4	**55.9**	32.3	11.8
▪ I work on making things better for the future by changing my habits, such as diet, exercise, sleep, or budgeting.	48.8	44.1	7.1	53.9	39.4	6.7
Total mean ± SD		26.44 ± 4.232		2	7.448 ± 4.202	
		T test 2.653		P value	0.008 *(S)	

*** Significant (S) p≥ 0.05**

Figure (4): Comparison of nursing students' total coping regarding climate change pre and post coping program implementation (n= 254)



	Pre	Post
Low coping	52.4	11.4
High coping	47.6	88.6

Table (6): Correlations between students' coping with climate change and their knowledge, daily living activities and attitude post coping strategies implementation (n= 254)

Items		Total coping
Knowledge	**R**	0.174
	P	.005* (S)
Daily living activites	**R**	0.412
	P	0.000** (HS)
Attitude	**R**	0.420
	P	0.000** (HS)

Discussion

Climate change is one of the biggest issues that currently facing by the world. The negative Consequences of climate change have the possible to be catastrophic and pose a threat to human survival. In order to initiate the essential changes to the economies, resource use, behavior, and general approach to nature, everybody, especially those in the scientific area, must fully understand the problem as well as probable solutions and adaptation to it **(Tiitta et al., 2021)**.

According to the demographic features of the present study, more than two thirds of the nursing students were in third year, and more than half of the students were female. This demonstrated that the number of male students in the Faculty of Nursing is relatively new. This result may be consequence of the continuous increase in the students' numbers enrolling in programs regarding nursing in recent years because its benefits in the human field, work, wealth, and assisting others. This result was dissimilar to the results of **(Kah et al., 2021)** who conducted a study "Awareness of the Causes, Impact and Solutions to Global Warming among Undergraduate Students" in the University of the Gambia and mentioned that more than two thirds of students were males, and four academic year students were more than other levels.

Regarding the residence of the nursing students, over half of the nursing students resided in urban areas inside the great Cairo governorate because the regional distribution was among the application rules to nursing colleges in previous years. This result was contradicted with the study of **Ali et al. (2023)** who studied "Empowering Nursing Students to Face Climate Changes and Its Effects on Health" in

Nursing Faculty–Mansoura University, and Technical Nursing Institute, Egypt. and mentioned that more than three quarter of students were living in rural areas.

As regards number of family members, more than three-quarters of nursing students had five or more family members, it may be due to certain social groupings are unaware of the importance of family planning. This result was contradicted with the results of **Ghazy & Fathy (2023)** who studied "Effect of Awareness Program Regarding Climate Change on Knowledge, Attitudes and Practices of University Students" in Faculty of Nursing, Kafr Elsheikh University, Egypt and reported that more than half of students were from two to four in family size. Additionally, almost of students had enough income, it may be due to most nursing students working full or part time night shifts beside the faculty study.

The current study result showed that there was a highly statistically significant difference post coping strategies compared to pre coping strategies regarding total knowledge among nursing students in relation to meaning of climate changes, climate change causes mental harm as depression or anxiety and it causes heat related illness and vector born infectious diseases, the total knowledge was satisfactory for almost of nursing students, which indicate the effect and success of the implemented program in addition the role of media and the government efforts in raising awareness regarding climate change. These findings were in the same line of **Almulhim (2021)** who studied "Knowledge and Perception of Climate Change and Global Warming in the Context of Environmental Challenges and Policies" in Dammam Saudi Arabia, and stated that one third of the participants had poor knowledge about the causes and effects of climate change. Also, more than one quarter of the studied participants posttest had good knowledge and awareness of climate change.

The present study result showed that there was a statistically significant difference post coping strategies compared to pre coping strategies regarding total daily living activities among nursing students towards indoor and outdoor activities, the majority of the studied nursing students had good total practices toward climate change post coping strategies implementation. This finding reflects the success of the current program which enables nursing students to decrease the hazards of climate change and the consequences on health. This study was similar to the study of **Kurup et al. (2021)** entitled "Informed Decision Regarding Global Warming and Climate Change among High School Students" in United Kingdom and stated that the majority of studied participants co-operated in using public transports, walking rather than driving cars, using carton page and trees implantation and cleanliness drives.

The current study result stated that there was a highly statistically significant difference post coping strategies compared to pre coping strategies regarding attitude among nursing students, about three-quarters of nursing students had total positive attitude regarding climate change post coping strategies implementation. This result illustrates how effective and successful the coping methods program was in addition the global and Egyptian trends toward the necessity of compatibility with climate change through enactment of laws and policies. This study was similar to with **Tiong et al. (2020)** who conducted a study on "Knowledge, Perceptions of Risks, Attitudes and Practices of Environmental Health among University Students in Northern Malaysia" and detected that the majority of the study students had a high level of supportive pro-environmental attitudes, depending on highly belief of more than two thirds of students in negative impact of pollution on human health in addition to agreement in changing values which would help in solving some problems of the environment.

The current study result presents that there was a statistically significant difference post coping strategies compared to pre coping strategies regarding coping among nursing students, the majority of students had high coping level regarding climate change post coping strategies implementation. This finding illustrates the effect of program training in addition people all over the

world became aware of climate change, especially the recent changes, which are evident in the extreme rise in air temperatures, fires and melting of ice, which led to shedding light on this issue politically and in the media. This study was supported by the findings of **(Ratinen, 2021)** who studied "Students' knowledge of Climate Change, Mitigation and Adaptation in The Context of Constructive Hope" in Finland and stated that the students had a relatively high level of adaptation and general climate change knowledge predicted constructive hope well of students.

The current study result clarified that there was a statistically significant positive correlations between students' coping with climate change knowledge, daily living activities and attitude post coping strategies implementation. This finding approved effect of the application-based program in addition to gaining knowledge, skills and positive attitude regarding climate change with ways of coping for these changes whether personal, educational, and societal levels.

Conclusion

Based on the study findings, it was concluded that implementation of the coping strategies had a positive effect on the nursing students' daily living activities and attitude toward climate change. There was a high statistically significant difference between students' knowledge, daily living activities, attitude and coping towards climate change pre and post coping strategies implementation. In addition, there was a statistically significant positive correlations between nursing students' coping with climate change and their knowledge, daily living activities and attitude post coping strategies implementation.

Recommendations

Based on the previous study findings, the following recommendations are suggested:

- Implementing continuous programs for coping with climate change.
- Evaluating student's daily living activities and attitude regarding climate change continuously.
- Integrating climate change topics into nursing education.
- Further research should be done with a larger sample size in a broader and several areas.

Limitations of the study:

The current study had one limitation that the program sessions were unsuitable to be conducted face to face because all students were in summer vacation and the program implementation was from the beginning of July to the end of September 2023 and the researchers overcome this limitation by conducting program sessions online through Microsoft Teams.

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