

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

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Abstract

Background: Climate change is used to describe the gradual rise in global temperatures that is mostly accelerated by human activities and can cause serious impact on human health. Human daily living activities are result in different gases into atmosphere. University students' coping with climate change specifically nursing students is expected to be one of the important indicators to the attitudes of the general population. **Aim:** The study aimed to evaluate the effect of coping strategies on nursing students' daily living activities and attitude regarding climate change. **Subject and Methods:** This study was a quasi-experimental research design **Sampling:** A purposive sample was selected while this study was performed on 254 nursing students at Faculty of Nursing, Helwan University and data were collected using 1) Structured Interviewing Questionnaire Sheet, 2) Students' Daily Living Activities Questionnaire Sheet, 3) Students' Attitude regarding climate change Questionnaire Sheet and 4) Coping Scale with climate change **Results:** The main results 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:** the study concluded that implementation of the coping strategies had a positive change on the nursing students' daily living activities and attitude regarding climate change. **Recommendations:** This study recommended that implementing continuous programs for coping with climate change, integrating climate change coping strategies into the nursing curriculum and the further research should be done with a larger sample size in a several and broader geographical area.

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

Introduction

Climate change is currently one of the most pressing concerns in the world. It is a global environmental problem, causing catastrophic events such as drought, heat waves, and rain-related floods, storms, and hurricanes, which have a direct or indirect impact on the health and well-being of the population (Ghazy & Fathy, 2023). Climate change is the phrase used to describe the gradual rise in global temperatures that is mostly accelerated by human activities. Now, more than 90% of people on the planet breathe in harmful levels of air pollution brought on by the extensive combustion of fossil fuels, which emits greenhouse gas (GHG) emissions to the environment; these GHGs are the main and only cause of global

warming and the current climate problem (WHO, 2022).

The causes of climate change are anthropogenic in nature through lifestyles, consumption and choices that pollute and exploit resources in an unsustainably. It is also predicted that climate change will have harmful effects upon agriculture and fisheries and may even result in collapsing ecosystems (Richardson et al., 2019). Climate change impacts on human health; climate change is a ubiquitous phenomenon having wide-ranging social, economic, political, geographical, ecological, and psychological implications (WMO, 2019).

Climate Change can cause several serious alterations and eventually impacting human health. Those human health consequences include re-emergence of malaria, respiratory disorders,

malnutrition, different heat disorders as heat stress and stroke, infectious diseases like vector-borne and water-borne diseases including gastrointestinal problems and mental health disorders as stress disorders and depression, which associated with natural disasters (Abdallah & Farag, 2022).

Human daily living activities, particularly the burning of fossil fuels as coal, gas and oil to power vehicles, factories, and homes; result in unleashing greenhouse gas and different gases into atmosphere. Different activities, as deforestation (cutting down trees) and raising livestock, conjointly emit greenhouse gases (NOAA, 2020). The more concentrations of these gases within the atmosphere lead to additional heat on Earth, inflicting an evolution (human-caused) rise in global temperatures and climate change. Therefore, Climate scientists agree that human activity is the main cause behind global warming (NASA, 2021).

Climate change coping is an essential matter to achieve sustainability in developing countries. Lack of coping forms a significant obstacle to climate change adaptation in developing countries. Raising climate change coping at the local level is critical as climate change impacts are exacerbating the number and extent of disasters in this disaster-prone country. Vulnerability to climate change impacts is very high ranked the 12th in the world (Abbas, 2019). University students' coping with climate change, global warming, and greenhouse effect, specifically nursing students, is expected to be one of the important indicators to the attitudes of the general population. 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. Hence, nursing students must be ready for a new professional role keeping climate change in mind; and by extension, it is important to state that the concept of

sustainability in nursing practice and climate change-related knowledge must be an integral part of education, in theoretical and practical courses together, for enabling nurses to act as leaders and take action to build climate-safe health systems (ICN, 2018).

Significance of the study

Climate change and global warming are major problems affecting the world and its future. Globally, by 2030, more than 100 million people could be affected by negative population impacts. Low- and middle-income countries are also expected to be the most affected countries as they are disproportionately exposed and due to their weak adaptive capacity (Elsharkawy et al., 2023). Climate change also causes rising sea levels, increased transmission of infectious diseases, food and water shortages, mass migration, political conflict, and financial losses for individuals and governments; everything that harms human health in terms of physical, mental health and social status (Álvarez et al., 2022).

The Egyptian Meteorological Service published a report stated that summer 2021 had faced an unprecedented rise in temperatures five years ago, with temperatures rising by an average of 3-4 degrees above normal. This pushed the Egyptian government to take more serious and effective actions, to cope with the climate changes and its negative impacts (ACPSS 2021). Egypt applied to host the 27th session of the Conference of States Parties to the United Nations Convention on Climate Change (COP 27) in 2022 as a representative of the challenges, efforts, and priorities of the African continent in facing the climate change crisis (Enterprise, 2022).

From the researchers' point of view, it's very important for nursing students to have high level of coping strategies with climate change through daily living activities and attitude and this in turn is reflected on enhancing physical and social environments at the local, national, and international levels. Therefore, the preparedness of health professionals forms an important part of the world response to climate change.

Aim of the study

The aim of this study was to evaluate the effect of coping strategies on nursing students'

daily living activities and attitude regarding climate change through:

- 1- Assess the students' knowledge, attitude, and daily living activities regarding climate change pre/post program.
- 2- Assess the students' coping strategies regarding climate change pre/post program.
- 3- Design coping strategies about climate change.
- 4-Implement coping strategies about 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 result positively in the daily living activities of nursing students and their attitudes regarding climate change.

Subject and methods

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

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

Subject: A purposive sample of nursing students were attending 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:

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

$$N \times p(1-p) = 750 \times (0.5 \times (1-0.5))$$

$$N-1 = (750-1)$$

$$d^2/z^2 = 0.0025 / 3.8416$$

$$p(1-p) = 0.5 \times (1-0.5)$$

$$N = 254.4 = 254$$

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 students namely; gender, place of residence, academic year, number of family members, family income and email).

Part II: 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 $\geq 60\%$ was considered satisfactory knowledge and $< 60\%$ was considered unsatisfactory knowledge.

Tool II: 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 current 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 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 $\geq 60\%$ was considered good activities and $< 60\%$ was considered poor activities.

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

Students' attitude regarding climate change questionnaire sheet was developed by (Netravathia & Chauhan, 2014) then adapted by the researchers 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 $\geq 60\%$ 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 developed by (Hamby et al., 2015) then adapted by the researchers and validated. This scale was used to assess coping strategies of nursing students 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 $\geq 60\%$ was considered high coping and $< 60\%$ was considered low coping.

Pilot study

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

Content Validity and Reliability

The revision of the tools for clarity, relevance, comprehensiveness, understanding and applicability 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 students was done by using Microsoft Teams to identify the students who agreed to participate in the study after explaining the purpose and aim 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 open and closed ended and multiple choices questions. The time consumed to fill in the questionnaires for each student included 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 the previously mentioned tools through interviewing the nursing students online through Microsoft Teams as one group using the previously mentioned tools. The purpose 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 need 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 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 a variety of teaching methods as; lectures, group discussion and brain storming through chat rooms. Also, different audiovisual aids such as; sharing pictures and videos.

The coping strategies booklet was developed to be a guide and a reference 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 questionnaires in order to assess differences, similarities, 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 of the study to the nursing students included in the study, confidentiality of the gathered data and results were secured, and nursing students' informed consent 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 nursing students have knowledge about climate change, climate change causes mental harm as depression or anxiety and it causes heat related illness and birth 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 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 students have satisfactory total knowledge towards climate change post coping strategies implementation, compared to 76.4% of the studied 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 turn off lights that they are not using, buy energy efficient light bulbs and switch-off home 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 use stairs instead of using elevators and walk for short distances rather than using 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 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): clarifies that 76.8%, 81.1% & 85.8% of the studied nursing students agree that climate change is inevitable because of the way modern society work, people should be made to reduce their energy consumption and the government should provide incentives for people to look after the environment respectively post coping strategies implementation. While, 74.8%, 80.3% & 81.5% of the studied students agree about these items pre coping program implementation. There is a high statistically significant difference between mean scores of 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 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 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 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		
3 rd year	182	71.7
4 th 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 \pm SD	8.389 \pm 2.624		11.409 \pm 2.832	
	T test 3.366		P value 0.000 ** (HS)	

** Highly significant (HS) $p \geq 0.001$

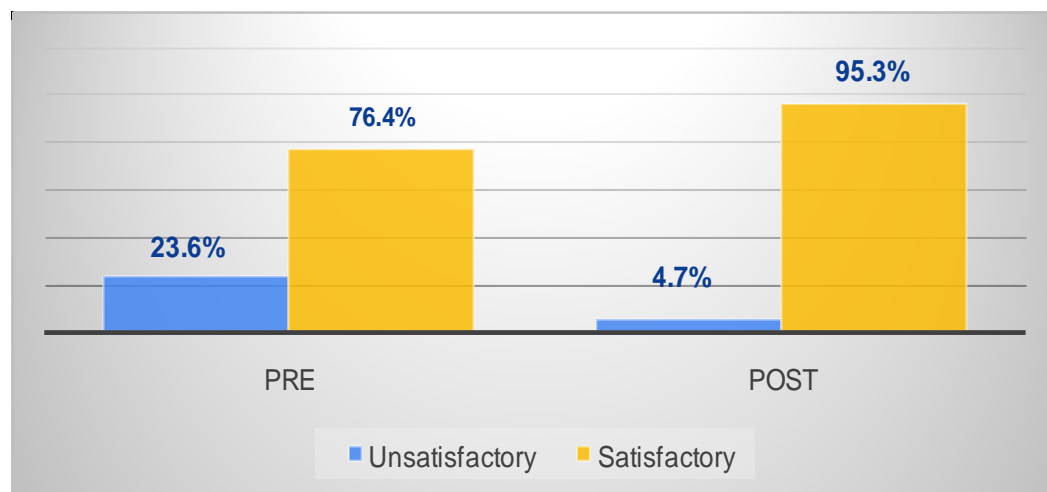
Figure (1): Comparison of nursing students' total knowledge regarding climate change pre and post coping strategies implementation (n= 254)

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						
▪ Turn off lights I'm not using	68.5	17.3	14.2	88.6	11.4	0.0
▪ Buy energy efficient light bulbs	40.9	39.4	19.7	79.9	14.2	5.9
▪ Switching-off home appliances	50	35.8	14.2	76.8	16.1	7.1
▪ Not keeping the laptop/ computer on stand-by or screensaver mode	57.1	29.5	13.4	72	16.2	11.8
▪ Buy organic food	40.9	45.7	13.4	53.1	32.7	14.2
▪ Replacement of regular lights with compact fluorescent	40.9	39.4	19.7	48.8	39.4	11.8
▪ Set air condition temperature at 24°C.(n=126)	41.3	27.2	31.5	61	20.5	18.5
▪ Use rechargeable batteries	68.5	17.3	14.2	75.2	15.4	9.4
▪ Decrease plastic products	40.2	50	9.8	47.2	45.7	7.1
▪ Encourage and use recyclable products	59.5	29.5	11	63	32.3	4.7
▪ Separate the wet from dry household waste	50.8	25.6	23.6	52	29.1	18.9
Outdoor daily living activities						
▪ Walk or ride bicycle to university	43.7	19.3	37	47.2	18.5	34.3
▪ Use stairs instead of elevators	58.7	29.9	11.4	70	20.5	9.5
▪ Walking for short distances rather than vehicles	59.5	29.5	11	83.9	10.2	5.9
▪ Minimum use of papers	38.6	46.4	15	47.3	36.2	16.5
▪ Use cloth/cartoon bags in shopping not plastic	30.7	48.4	20.9	36.2	33.5	30.3
▪ Reduction in consumption of packaged foods	53.9	38.2	7.9	65.7	24.8	9.5
▪ Participation in tree plantation drives	30.7	26	43.3	35.8	28.7	35.5
▪ Participation in cleanliness drives	39.8	37	23.2	45.7	33.8	20.5
Total mean \pm SD	24.87 \pm 6.547			27.259 \pm 7.479		
	T test 2.184			P value 0.03 * (S)		

* Significant (S) $p \geq 0.05$

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 can expressive the green transformation	58.2	39	2.8	72	25.6	2.4
▪ Climate change is inevitable because of the way modern society work	74.8	22.8	2.4	76.8	20.8	2.4
▪ People should be made to reduce their energy consumption	80.3	18.1	1.6	81.1	14.2	4.7
▪ Climate change will improve the weather	51.5	28	20.5	58.3	25.6	16.1
▪ Climate change is just a natural fluctuation in earth's temperatures	54.7	25.2	20.1	46.5	30.3	23.2
▪ I would only do my bit to reduce climate change if everyone else did as well	44.1	31.1	24.8	55.5	23.2	21.3
▪ The government should provide incentives for people to look after the environment	81.5	13.6	4.9	85.8	13.1	1.1
▪ It is already too late to do anything about climate change	13	24	63	14.2	37	48.8
▪ Human activities have no significant impact on global temperatures	11.0	21.3	67.7	25.6	39.4	35
▪ Climate change is something that frightens me	33.5	48.4	18.1	35	55.5	9.5
▪ Developing countries should take most of the blame for climate change	24.4	34.3	41.3	26	37.4	36.6
Total mean \pm SD		11.66 \pm 3.136			14.724 \pm 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)

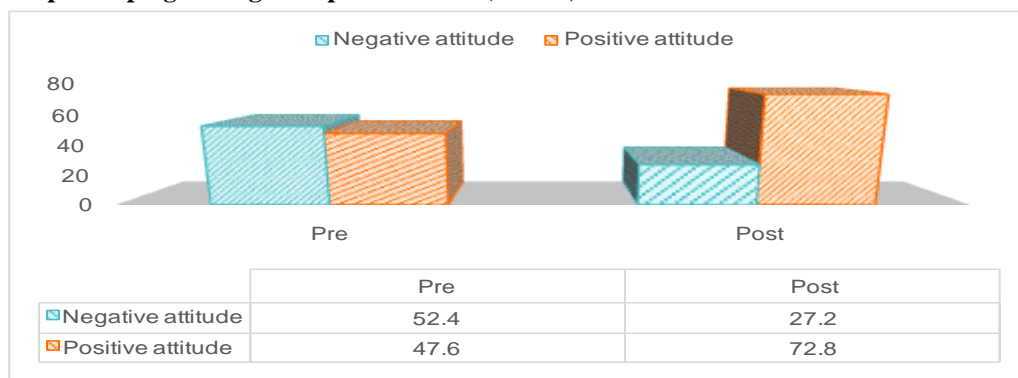


Table (5): Comparison of nursing students’ coping with climate change pre and post coping strategies implementation (n= 254)

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			27.448 ± 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)

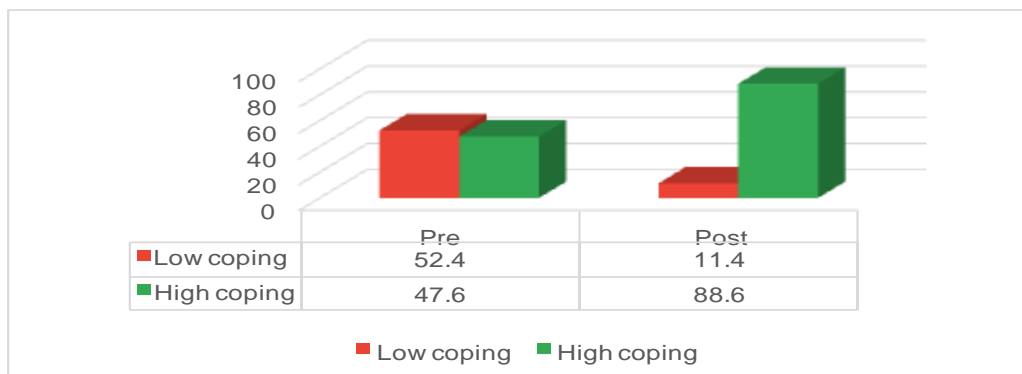


Table (6): Correlations between students’ coping with climate change and their knowledge, attitude and daily living activities post coping strategies implementation (n= 254).

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

Discussion

Climate change is one of the most important challenges facing the world currently. The negative impacts of climate change can be catastrophic and form a potential threat to the humanity existence. Therefore, it is essential for everyone, especially those in the scientific area to have a full appreciation of the problem as well as the potential solutions and adaptation to it so that they can initiate the necessary changes to the economies, resource utilization, behavior, and general approach to nature (Tiitta et al., 2021).

As for to demographic features of the current study showed that more than half of the nursing students were female and more than two third of them were at the third year. This illustrated that Faculty of Nursing is considered recent in having male students. This result may be consequence of constantly increasing the number of students who enrolled in nursing faculties recently due to

its advantages of human field, employment, high income, and helping others. This result was incongruent to the results of (Kah et al., 2021) who studied "Awareness of the Causes, Impact and Solutions to Global Warming among Undergraduate Students" from different schools 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, more than half of them were living 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 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, Kafrelsheikh University, Egypt and mentioned that more than half 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 lack of awareness among society groups of the need for 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, Kafrelsheikh University, Egypt and mentioned 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 present study result clarified 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 reflects the success and effect of the coping strategies in addition the role of media and the government efforts in raising awareness regarding climate change. These findings were similar to the results of (Almulhim, 2021) who conducted a study entitled "Knowledge and Perception of Climate Change and Global Warming in the Context of Environmental Challenges and Policies" in Dammam Saudi Arabia, who stated that one third of the study participants had poor knowledge about the causes and impacts of climate change. Also, more than one quarter of the studied sample had good knowledge and awareness of climate change at posttest.

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 regarding climate change post

coping strategies implementation. This finding reflects the success and effect of the coping strategies which enables nursing students to eliminate the hazards of climate change and detraction the health consequences. This study was in the same line with 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 students' co-operative in trees plantation and cleanliness drives, use carton page, use public transports, and walked rather than driving cars.

The present study result showed that there was a highly statistically significant difference post coping strategies compared to pre coping strategies regarding attitude among nursing students, where about three-quarters of nursing students had positive total attitude regarding climate change post coping strategies implementation. This finding reflects the success and effect of the coping strategies program in addition the global and Egyptian trend towards the necessity of compatibility with climate change through enactment of laws and policies. This study was in the same line with (Tiong et al., 2020) who studied "Knowledge, Perceptions of Risks, Attitudes and Practices of Environmental Health among University Students in Northern Malaysia" and detected that the majority of the study participants had a highly supportive level of pro-environmental attitudes, depending on strongly 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 of environmental problems.

The present study result showed

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 reflects the success and effect of the coping strategies in addition people all over the world are 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 conducted a study entitled "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 students' constructive hope well.

The present study result clarified that there was a statistically significant positive relation between students' coping with climate change knowledge, daily living activities and attitude post coping strategies implementation. This finding approved success and effect of coping strategies 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 towards 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 correlation between nursing students' coping with climate change and their knowledge, daily living activities and attitude post coping strategies implementation.

Recommendations

Based on the previous 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 coping strategies into the nursing curriculum.

- Further research should be done with a larger sample size in a several and broader geographical area.

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.

References

- Abbas, E. (2019): Climate Change Awareness and Ecological Public Health. Nurs Stand.; Vol.29, No.24, pp.37-41.
- Abdallah, Z. & Farag, A. (2022): Impact of Awareness Program Regarding Health Consequences of Climate Change on Knowledge, Perception and Daily Life practices among Nursing Students, Egyptian Journal of Nursing & Health Sciences, Vol.3, No.1, pp.367-390.
- Al-Ahram Center for Political & Strategic Studies (ACPSS) (2021): The fourth edition of its annual report, 40 Egyptian and Arab experts and researchers who offer their predictions for the future of the world, the Middle East, and Egypt.
- Almulhim, A. (2021): Public Knowledge and Perception of Climate Change and Global Warming in The Context of Environmental Challenges and Policies in Dammam Saudi Arabia. Conference Paper, December 2021. Available at: DOI: [10.2495/SC210471](https://doi.org/10.2495/SC210471).
- Álvarez, C. Richardson, J. Parra, G. Abad, M. Huss, N. Grande, M. & López, I. (2022): Developing digital Educational Materials for Nursing and Sustainability: The Results of An Observational Study. Nurse Education Today, Vol.60, No.1, pp.139-146.
- Elsharkawy, S. Abdelghani, A. & Refaat, L. (2023): Knowledge, perception, and practices regarding climate change among students of AlAzhar University for Girls in Cairo,

- Egypt. Journal of Public Health. Available at: <https://doi.org/10.1007/s10389-023-01901-9>.
- Enterprise, V. (2022):** Economy, and Reporting Frameworks and Guidelines Climate Change, Carbon, and Natural Resources Management.
- Ghazy, H. & Fathy, D. (2023):** Effect of Awareness Program Regarding Climate Change on Knowledge, Attitudes and Practices of University Students, International Egyptian Journal of Nursing Sciences and Research (IEJNSR), Vol. 3, No.2, pp.186-203.
- Hamby, S. Grych, J. & Banyard, V. (2015):** Life Paths Measurement Packet: Finalized Scales. Sewanee, TN: Life Paths Research Program. <http://www.lifepathsresearch.org/strengths-measures>.
- International Council of Nurses (ICN) (2018):** Nurses, Climate Change and Health. Retrieved from https://www.icn.ch/sites/default/files/inlinenfiles/PS_E_Nurses_climate%20change.
- Kah, M. Kargbo, A. Mendy, P. Jawo, E. & Mendy, E. (2021):** Awareness of The Causes, Impact and Solutions to Global Warming among Undergraduate Students from Different Schools in The University of The Gambia. Ghana Journal of Geography Vol.13, No. 3, pp. 258-277. Available at: <http://dx.doi.org/10.4314/gig.v13i3.12>.
- Kurup, P. Levinson, R. & Li, X. (2021):** Informed-Decision Regarding Global Warming and Climate Change among High School Students in the United Kingdom. Canadian Journal of Science, Mathematics and Technology-Education. Vol. 21, pp.166–185. Available at: <https://doi.org/10.1007/s42330-020-00123-5>.
- Mahmoud, F. & Mahmoud, B. (2023):** Effect of Climate Change on Health and Critical Care Nurses Practice, The Egyptian Journal of Hospital Medicine, Vol. 90, pp. 1149-1155.
- National Aeronautics and Space Administration (NASA) (2021):** Exploring the Climates of Earth's Future Supercontinent. NASA Earth knowledge, 2021.
- National Centers for Environmental Information (NOAA) (2020):** Assessing the Global Climate in 2020.
- Netravathia, G. & Chauhan, N. (2014):** A Scale to Measure Attitude of Research Scholars towards Climate Change Studying in Agricultural Universities, Indian Research Journal of Extension Education, Vol.14, No.1, pp. 83-86.
- Ratinen, I. (2021):** Students' Knowledge of Climate Change, Mitigation and Adaptation in The Context of Constructive Hope. MDPI Journal/Education, Vol.11, p.103.
- Richardson, J. Clarke, D. Grose, J. & Warwick, P. (2019):** A Cohort Study of Sustainability Education in Nursing. International Journal of Sustainability in Higher Education. Vol. 20, No.1, pp. 747-760.
- Tiitta, I. McDermott-Levy, R. Turunen, H. Jaakkola, J. & Kuosmanen, L. (2021):** Finnish Nurses' Perceptions of The Health Impacts of Climate Change and Their Preparation to Address Those Impacts, Nursing Forum Journal, Vol. 56, No.2, pp. 365-371.
- Tiong, C. Lean, Q. Ming, L. Abdullah, A. Mahalingam, S. Arshad, K. & Hock, L. (2020):** Knowledge, Perceptions of Risks, Attitudes and Practices of Environmental Health among University Students in Northern Malaysia. Med. Journal, Vol.12, No.8, pp. 1463-5240 Available at: <https://www.tandfonline.com/loi/rhpe20>.
- World Health Organization (WHO) (2022):** Climate Action: Fact Facts on Climate and Health. Available at: <https://www.who.int/news-room/fact-sheets/detail/climate>.
- World Meteorological Organization (WMO) (2019):** Statement on the State of the Global Climate in 2019. Available at: https://library.wmo.int/doc_num.php?explnum_id=10211#%5B%7B%22num22%3A41.