

Nursing Students' Knowledge and Reported Practices Regarding Health Effects of Climate Change in Sohag City

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Abstract

Background: Climate change is one of the major global health issues that have quickly moved to the top of the agenda. Its effects can be severe, impacting people not just physically but also mentally and socially. Nurses must be aware of its consequences and advocate for eco-friendly practices that will mitigate its harmful effects on health. **Aim:** To assess nursing students' knowledge and reported practices regarding health effects of climate change in Sohag City. **Study design:** A descriptive cross-sectional research design was used. **Setting:** The study was conducted at the faculty of nursing, technical health & technical nursing institutes in Sohag City. **Sampling:** A systematic random sample consists of 286 nursing students. **Tools:** **Tool I** included two parts; **part one** included demographic characteristics and **part two** included a questionnaire to assess the nursing students' knowledge regarding the health effects of climate change. **Tool II** assesses the nursing students' reported practices regarding climate change. **Results:** 82.5% of nursing students had poor knowledge, and 67.1% of them had unsatisfactory practices regarding climate change. **Conclusion:** There was a serious lack of information among nursing students about the phenomenon of climate change. Also, about two-thirds of them had unsatisfactory reported practice scores. **Recommendations:** Implement an educational program to raise nursing students' awareness about climate change and its adverse health effects.

Keywords: Climate change, Health, Knowledge, Nursing students, Reported Practices

Introduction

Climate change (CC) a worldwide concern, is the long-term, broad-scale alteration of the climate system brought about by natural processes or by human activities. The largest contributor to climate change is human activity; natural processes only play a minor role (Abdel Nabi et al., 2023).

It is considered one of the critical issues affecting the environment, society, and economy in the twenty-first century. Egypt is among the nations facing climate change (CC) and the challenges it poses to social, economic, and natural resources also the security of food, energy, and water resources (Ali et al., 2023)

The primary cause of climate change is human activity which releases greenhouse gases and other gases into the atmosphere, especially when fossil fuels like coal, gas, and oil are burned to power homes, industries, and automobiles. A variety of activities, such as cutting down of trees and the rearing of cattle, collectively release greenhouse gases. The more of these gases there are in the atmosphere, the more heat they trap to Earth, leading to a rise (driven by humans) in worldwide temperatures and therefore CC. Climate experts concur that human activity and creation are the

primary causes of the climate change that we are currently experiencing (NASA, 2021).

Its negative effects on human health include the return of malaria, respiratory problems, malnutrition, various heat-related illnesses like severe heatstroke and heat stress, transmissible infections like vector-borne and water-borne diseases like gastrointestinal issues, and mental health issues like anxiety and depression that are linked to natural disasters. According to the World Health Organization (WHO), global CC is responsible for at least 150,000 fatalities each year, a statistic that is projected to increase by 2030. When the temperature in Egypt reached roughly 47°C (116°F) in three days, the 2018 heat wave claimed the lives of about 65 people (Abdallah & Farag, 2022).

Although everybody is at risk of experiencing health issues due to climate change, some groups are more exposed to variables that raise their risk such as pregnant women, children, people with disabilities, the elderly, poor people, and outdoor workers (Chinthrajah et al., 2022).

Two directions are taken in the fight against climate change & its impact on humans and the environment: Mitigation which focuses on problems associated with the causes of climate change and is described as a human effort that decreases the sources or improves the removal of greenhouse gases." and

Adaptation, which is described as the process of adapting to the current or potential climate and its effects in human and environmental systems, is to reduce vulnerabilities and increase coping ability (Sharifi, 2021).

Community Health Nurses (CHNs) have a crucial role in tackling the impending public health emergency of climate change and its correlated negative health effects. The nursing profession must communicate with legislators and politicians, as well as individuals, communities, families, and societies, to acknowledge and address climate change. CHNs perform a variety of tasks in a unique position to tackle significant problems; health educators, care providers, managers, leaders, researchers, and advisers. are some of their key C/HN functions (Change., 2022).

Nurses possess an essential part in minimizing the effect of climate change on the healthcare industry and adapting to it. So, nursing students need to be prepared for a new professional role while keeping climate change in mind. As a result, it's critical to emphasize that the idea of sustainability in nursing awareness about climate change needs to become inherent in learning, in both theoretical and practical courses, to empower nurses to take the lead and create health systems that are climate-safe. (Ghazy, & Fathy 2023).

Significance of the study

Globally climate change is predicted to result in extra 250,000 fatalities per year between 2030 and 2050, mostly from respiratory illnesses, malaria, diarrhea, and heat stress (WHO, 2021). As a representation of the African continent's difficulties, endeavors, and priorities in the face of 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 Ventures,2022).

Egypt's percentage of mortality linked to climate change may increase to about 15.2% by the 2050s. It is anticipated that Egypt's rising temperatures and intense heat waves will majorly affect heat-related mortality, especially among vulnerable populations (World Bank., 2021). Nurses can cause change via health education. They must educate the people about climate change effects and encourage them to take part in environmental sustainability and accomplish the sustainable development goal of the United Nations (SDG 13) i.e., "to take urgent action to combat climate change and its impacts" (Kreslake et al.,2018).

Aim of the Study

This study aimed to assess nursing students' knowledge and reported practices regarding health effects of climate change in Sohag City.

Research questions

1. What is the level of students' knowledge regarding health effects of climate change in Sohag City?
2. What are the students' reported practices about climate change in Sohag City?

Subjects and Methods

Research design

A descriptive cross-sectional research design was utilized in the present study.

Setting of the study

This study was conducted at faculty of nursing, technical health & technical nursing institutes in Sohag City.

Sample

Sample technique

Systematic random sample technique was used for selecting the students with probability proportionate to their size. The following formula

K: systemic class interval

N: population size

n: Sample size

$K = N \setminus n$ (4056\286=14)

The first random was :3

Sample size

The total number of students during the academic year 2022-2023 in selected settings was 4056 students, by using the EPI info 2000 statistical package with a 95% confidence interval, and 80% power of the study, the final estimated sample size was 286 participants. A proportional sample was taken according to student numbers in each grade or setting. Calculated by number of students in each grade divided by the total number of students in 3 selected settings (4056), then multiplied by the estimated sample size (286).

The sample was distributed as following:

Academic year (2022-2023)	Number of students	Sample size	Percent (%)
Faculty of nursing			
First	664	47	16.4%
Second	692	49	17.1%
Third	637	45	15.7%
Fourth	375	26	9.2%
Total	2368	167	58.4%
Technical nursing institute			
First	550	39	13.6%
Second	552	39	13.6%
Total	1102	78	27.2%
Technical Health institute			
First	336		8.2%
Second	250	18	6.2%
Total	586	41	14.4%
Total	4056	286	100%

Exclusion criteria

Students who refused to participate.

Tools of study

It includes two tools:

Tool I: Self-administered questionnaire which include:

Part 1; included questions about the demographic characteristics. It included (5) items such as age, gender, residence, educational category, and academic years.

Part 2: included students' knowledge regarding health effects of climate change, modified from (Abdallah., & Farag, 2022), and (Abdullah et al.,2022). It included (11) closed-ended questions such as the definition of climate change, its causes, most affected populations, its effect on body systems, etc.

The scoring system of knowledge:

One grade was given for each correct answer and zero was given for an incorrect answer and I don't know. There was more than one answer to most of the questions. The grades for each item were summed and then converted into a percent score as poor knowledge <50% -fair knowledge 50-70% -Good knowledge >70%.(Abdallah., & Farag, 2022), and (Abdullah et al.,2022).

Tool II: Assess the nursing students' reported practices that can reduce the impact of climate change. it was developed by the investigator depending on the related review of the literature. It consisted of (11) statements. Indoor practices such as switching off devices and lights when not in use, limiting use of air conditioning in summer, and using energy-saving appliances. etc. Outdoor practices such as using bikes instead of vehicles,

using stairs instead of elevators, participating in tree plantation drives...etc.

Scoring system of reported practices:

Responses to each statement were "do," or "undo". A total score was calculated by the sum of done practices and then converted into a percent resulting in satisfactory practice: $\geq 60\%$ - unsatisfactory practice: $< 60\%$. (Baraka., & Maklad, 2023), and (Abdallah., & Farag, 2022).

Validity of the study tools

The face validity of the tool was reviewed by five (5) experts in community health nursing, Assiut University. All comments and suggestions were considered, reworded and a sequence of some statements was carried out accordingly.

Reliability

The reliability analysis was carried out to examine the internal consistency of its questions by using the alpha Cronbach test. The value was 0,825 for knowledge and 0,921 for reported practice.

Administrative design

Before starting the study, an official letter approval was obtained from the dean of the faculty of nursing, Sohag University, to vice for student affairs at the faculty of nursing, director of technical health & technical nursing institutes, this letter included permission to carry out the study and explained the purpose and nature of the study.

Pilot study

It aimed to test the clarity of tools and estimated the time needed to fill the sheet. It was carried out before data collection on 10% (29) who were excluded from the sample for the presence of some modifications in the clarity of statements. The necessary modification in the sheet was done.

Ethical consideration

Ethical approval was obtained from the scientific research ethics committees of the faculty of nursing, Assiut Universities. Oral consent was obtained from students who were willing to participate in the study, after explaining the nature and purpose of the study. Confidentiality and anonymity were assured. Study subjects had the right to refuse to participate and withdraw from the study without any rationale at any time.

Fieldwork

The researcher began collecting data from the first of April to the middle of June 2023 (10 weeks), for two days per week the average number of students met

per day was 13-15. The length of each class took from 15-20 minutes to fill out the questionnaire to assess students' knowledge and reported practices.

Statistical design

The data obtained were reviewed, prepared for computer entry, coded, analyzed, and tabulated. Descriptive statistics (i.e., frequencies, percentages, mean, and standard deviation) were done by using SPSS version 20 (Statistical Package for Social Science). Chi-square and Pearson's correlation tests were used. It is considered significant when ($P < 0.05$).

Results

Table (1): Clarifies that 65% of their age ≥ 20 years with Mean \pm SD (Range) 20.08 ± 1.2 (18 – 24). 52.8% of them were males. 67.5% of them were living in rural areas. 38.1% of them were from the faculty of nursing. 38.1% and 9.1% were in the first and fourth academic years respectively.

Figure (1): Clarifies that 82.5% of studied nursing students had a poor score of knowledge, 11.2% had a fair score and 6.3% had good scores.

Table (2): Concerning indoor practices, it reveals that 70.6% of nursing students switch off lights and devices when not in use. Only 15.7% of them limit

the use of air conditioning in summer. 67.5% of them don't decrease domestic plastic products. Regarding outdoor practices, it reports that 85.6% of them use public transportation to save fuel. Only 8.7% of them participate in tree plantation drives. 69.6% of them don't minimize use of papers. 74.1% of them don't use cloth/cartoon bags in shopping instead of plastic.

Figure (2): Indicates that 67.1% of students had unsatisfactory reported practice scores, and 32.9% had satisfactory scores.

Table (3): Shows that there were statistically significant differences between nursing students' level of knowledge about climate change, their educational category also, with their academic years (P -value = 0.014* and 0.001**).

Table (4): Reports that there were statistically significant differences between nursing students' level of practice, gender, educational category, and academic years (P -value = 0.009**, 0.003** and 0.019*).

Figure (3): displays significant positive correlation between the total score of nursing students' knowledge and their reported practice ($r = 0.165$ & $p = 0.005$ **).

Results

Table (1): Distribution of nursing students by their demographic characteristics (N=286)

Demographic characteristics	No. (286)	%
Age		
<20 year	100	35.0
≥ 20 year	186	65.0
Mean \pm SD (Range)	20.08 \pm 1.2 (18 – 24)	
Gender		
Male	151	52.8
Female	135	47.2
Residence		
Rural	193	67.5
Urban	93	32.5
Educational category		
Technical nursing institute	78	27.2
Technical Health institute	41	14.4
Faculty of Nursing	167	58.4
Academic year		
First	109	38.1
Second	107	37.1
Third	40	15.7
Fourth	29	9.1

Figure (1): Total scores of nursing students' knowledge regarding health effects of climate change

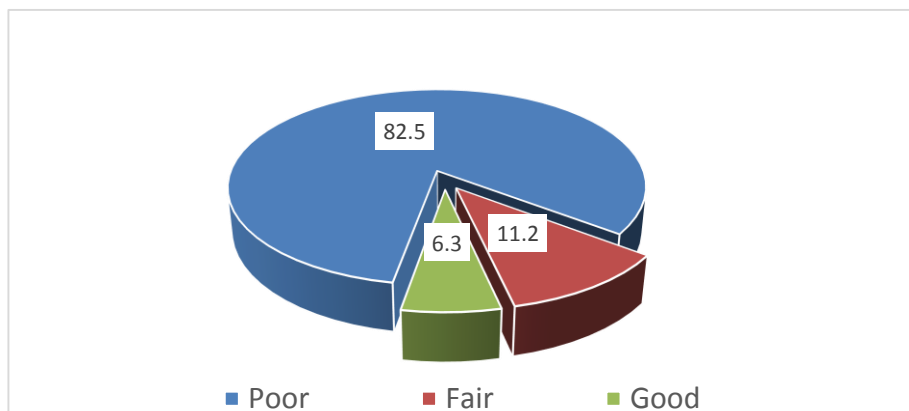


Table (2): Distribution of nursing students regarding their reported practices that can reduce climate change impact, Sohag City 2022-2023 (n=286)

Items	Done		Not done	
	No.	%	No.	%
Indoor practices:				
Switching off lights and devices when not in use	202	70.6	84	29.4
Limit the use of air conditioning in summer	45	15.7	241	84.3
Set the air condition temperature at 24°C	58	20.2	228	79.3
Use energy-efficient appliances and compact fluorescent lamps	74	25.9	212	74.1
Decrease domestic plastic products	93	32.5	193	67.5
Use recyclable products such as paper, glass, and Metals	128	44.8	158	55.2
Segregating the wet and dry household waste	106	37.1	180	62.9
Outdoor practices:				
Use public transportation to save fuel	245	85.6	41	14.4
Use bikes instead of vehicles	104	36.4	182	63.6
Use stairs instead of elevators	153	53.5	133	46.5
Walking for short distances rather than vehicles	96	33.6	190	66.4
Minimum use of papers	87	30.4	199	69.6
Use cloth/cartoon bags in shopping not plastic	74	25.9	212	74.1
Reduction in consumption of packaged foods	128	44.8	158	55.2
Participation in tree plantation drives	35	8.7	251	87.8
Participation in cleanliness drives	25	12.2	261	91.3

Figure (2) Total score reported practices of nursing students about climate change

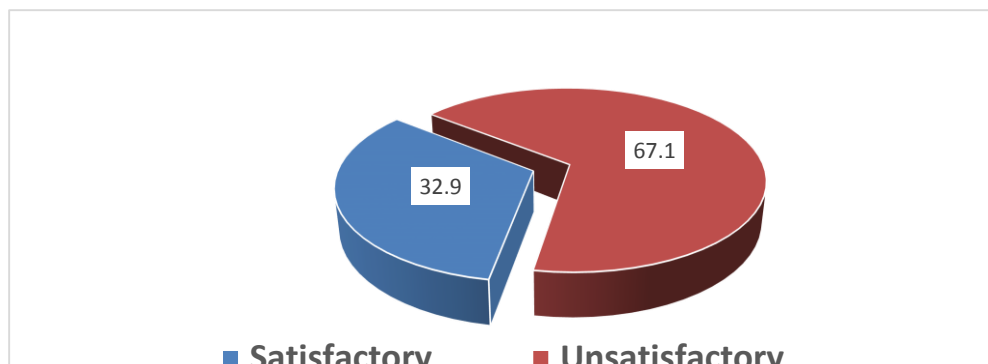


Table (3): Relationship between total score of nursing students' knowledge, and their demographic data.

Demographic characteristics	Knowledge levels						X ²	P. value
	Poor (n=236)		Fair (n=32)		Good (n=18)			
	No	%	No	%	No	%		
Age level								
<20 year	82	34.7	12	37.5	6	33.3	0.12	0.943
≥20 year	154	65.3	20	62.5	12	66.7		
Gender								
Male	125	53.0	18	56.3	8	44.4	0.66	0.719
Female	111	47.0	14	43.8	10	55.6		
Residence								
Rural	157	66.5	23	71.9	13	72.2	0.56	0.754
Urban	79	33.5	9	28.1	5	27.8		
Educational category								
Technical nursing institute	71	30.1	6	18.8	2	11.1	12.47	0.014*
Technical Health institute	38	16.1	1	3.1	1	5.6		
Faculty of Nursing	127	53.8	25	78.1	15	83.3		
Academic year								
First	91	38.6	9	28.1	9	50.0	22.41	0.001**
Second	95	40.3	8	25.0	2	11.1		
Third	36	15.3	7	21.9	3	16.7		
Fourth	14	5.9	8	25.0	4	22.2		

Chi-square test for qualitative data

*Statistically Significant level at P value < 0.05

**Highly Statistically Significant (p<0.01)

Table (4): Relation between the total score of nursing students' reported practices and their demographic data

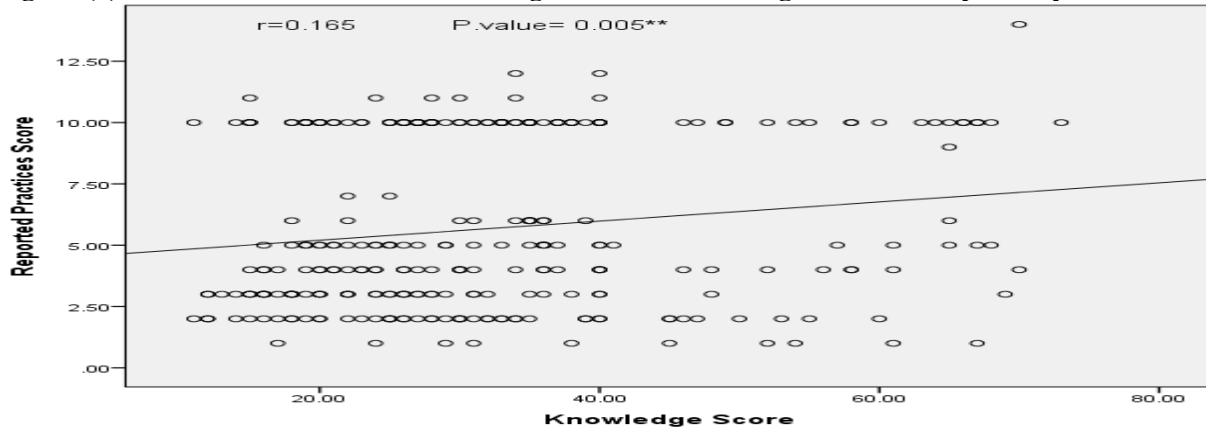
Demographic characteristics	Reported Practices level				X ²	P. value
	Satisfactory (n=94)		Unsatisfactory (n=192)			
	No	%	No	%		
Age level						
<20 year	35	37.2	65	33.9	0.32	0.573
≥20 year	59	62.8	127	66.1		
Gender						
Male	60	63.8	91	47.4	6.84	0.009**
Female	34	36.2	101	52.6		
Residence						
Rural	64	68.1	129	67.2	0.02	0.879
Urban	30	31.9	63	32.8		
Educational category						
Technical nursing institute	26	27.7	53	27.6	11.73	0.003**
Technical Health institute	4	4.3	36	18.8		
Faculty of Nursing	64	68.1	103	53.6		
Academic year						
First	31	33.0	78	40.6	9.92	0.019*
Second	30	31.9	75	39.1		
Third	18	19.1	28	14.6		
Fourth	15	16.0	11	5.7		

Chi-square test for qualitative data

*Statistically Significant level at P value < 0.05

**Highly Statistically Significant (p<0.01)

Figure (3): Correlation between the nursing students' knowledge and their reported practices



Discussion

Climate change is already having a significant impact on health in many ways, including the severity of extreme weather like floods, heat waves, and storms, food systems breaking down, an increase in infectious diseases and other vectors, food-, and water-borne diseases, and mental health issues (Mohammed, et al., 2022).

To face climate change, nursing students need to be ready to take action and support sustainable healthcare and community. The perspectives and experiences of students are essential to the ongoing advancement of education (Sperstad et al., 2020).

The current study aimed to assess nursing students' knowledge and reported practices regarding health effects of climate change in Sohag City.

The findings of the current study revealed that less than two-thirds of nursing students aged ≥ 20 years. These findings were in the same line with Mohammed et al., (2024) who carried out a study about the "effect of educational program regarding climate change on nursing students' awareness, attitude, and practices in Suez Canal University" and found that three-quarters of nursing students aged ≥ 20 years. These findings disagreed with Ali et al., (2023) who performed a study about "empowering nursing students to face climate changes and its effects on health" and proved that less than three-quarters of students aged less than 20 years.

This study indicated that more than half of the students were males. From the investigator's perspective, this finding refers to that there is a gradual increase in the number of male nursing students and no longer be an exclusively female profession. The study's findings agreed with Moselhy et al., (2022) who found that more than half of the nursing students were males. Despite that, this result contradicted with Reddy et al., (2022) who studied "the knowledge, perceptions, and practices of medical students towards climate change and global

warming" and demonstrated that less than two-thirds of students were females.

Students who came from rural areas represented more than two-thirds in the present study. This may be attributed to the nature of Sohag governorate where most people live in rural areas. This finding parallels to Soliman et al., (2023) who conducted a study about the effect of training program about sustainability and climate change on nursing internship students' awareness and revealed that less than three-fifths of nursing students were living in rural areas. The finding is congruent with Abdel Nabi et al., (2023) who performed a study about the assessment of nursing students' awareness regarding climate change and found that less than three-quarters of nursing students were living in urban areas.

The study illustrated that more than half of nursing students were from the faculty of nursing. The finding is similar to Ali et al., (2023) who presented that more than two-thirds of students were from the faculty of nursing. While, this result disagreed with Mekawy., (2023) who conducted a study about climate change and its relation to environmental sustainability practice as perceived by staff nurses, and demonstrated that nearly half of the students were from the Technical Institute of Nursing.

Regarding the academic years, the current study showed that more than one-third of nursing students were present from the first academic year, and the minority of them were from the fourth academic year. From the investigator's point of view, this may be due to that the first year included the three settings while the fourth year was just in the faculty. This finding supported by Elsharkawy et al., (2023) who studied the knowledge, perception, and practices regarding climate change among students of Al-Azhar University for girls in Cairo, Egypt, and concluded the same results. However, the finding disagreed with Gazzaz & Aldeseet., (2021) who performed a study about the assessment of the level of knowledge of

climate change of undergraduate science and agriculture students and showed that less than one-fifth of students were from the first year and less than half of them were from fourth-year students.

The results illustrated that most of the students had a poor score of knowledge about climate change. From the researcher's point of view, these results might be because the curriculum does not include information about climate change in nursing courses concisely and comprehensively. Additionally, the lack of sustainability priority in the national policy of the whole country has an impact, as was concluded by **El-Gamal, (2021)** who found that until a few years ago, environmental issues and climate change were not at the top of the Egyptian state's priorities. This finding agreed with **Mekawy., (2023) & Mohammed et al., (2022)** who studied nursing students knowledge, attitude, and practice regarding health effect of climate change and they disclosed that most of the students had a poor level of knowledge related to climate change. On the other hand, these findings contradicted with **Rahman et al., (2021)** who conducted a study about climate change and dengue fever knowledge, attitudes, and practices in Bangladesh & **Kolenaty et al., (2022)** who carried out a study titled "What triggers climate action: The impact of a climate change education program on students' climate literacy and their willingness to act" and illustrated that more than three-quarters of students reported good climate change knowledge scores. This may be due to sample size differences.

Regarding reported indoor practices that can reduce the impact of climate change, this study concluded that less than three-quarters of nursing students switch off lights and devices when not in use. These results were parallel to **Reddy et al., (2022)** who found that the majority of the participants turn off lights/devices when not in use. Conversely, this finding disagreed with **Ghazy & Fathy (2023)** who studied the "effect of awareness program regarding climate change on knowledge, attitudes and practices of university students" and revealed that before conducting educational intervention, only less than one-tenth of nursing students turn off the lights when not using them. Also, this finding contradicted with **Elewa et al., (2022)** who constructed a study about "mobile intervention to enhance adolescents' awareness about climate change and its adverse effect" and found that more than one-quarter of students turn off lights when not using.

In addition, the offered study stated that only less than one-fifth of them limit the use of air conditioning in summer. From the investigator's perspective, these results might be because students don't understand the importance of limiting its use to decrease greenhouse gas emissions and the effects of

climate change. This finding parallel to **Abdallah & Farag (2022)** who studied "the impact of awareness program regarding health consequences of climate change on knowledge, perception and daily life practices among nursing students" and displayed that at pre-intervention, nearly two-fifths of students limit the use of air conditioning in summer. Moreover, this finding accepted with **Elewa et al., (2022)** who found that before conducting educational intervention, only more than one-third of students limited use of air conditioning in summer. However, this finding inconsistent with **Dalindi et al., (2020)** who studied "global warming awareness on causes, consequences, and control among students of Modibbo Adama University of Technology, Yola, additionally" and presented that more than four-fifths of nursing students limit the use of and turn off air conditioning in summer.

Pertaining to reported outdoor practices that reduce the climate change impact, it was demonstrated that more than four-fifths of students use public transportation to save fuel. From the investigator's point of view, these results might be because it is the most suitable and accessible means of transportation for students. This finding similar to **Nzeobi et al., (2020)** who studied "Knowledge of health impact of climate change and practice of preventive measures among students of a Nigerian Tertiary Institution" and announced that more than four-fifths of nursing students use public transportation. Consequently, this finding agreed with **Dalindi et al., (2020)** who displayed that the majority of nursing students use public transportation. However, this finding contradicted with **Mohammed et al., (2024)** who found that in the pre-intervention program, less than two-fifths of nursing students use public transportation to save fuel.

Additionally, the present study proved that only less than one-tenth of students participated in tree plantation drives. From the investigator's point of view, these results might be because students don't recognize the importance of participating in tree plantation drives to reduce the effect of climate change. This finding accepted by **Ghazy & Fathy., (2023)** who found that before conducting an educational intervention, only less than one-tenth of students participated in tree plantation drives. Also, this finding agreed with **Tiong et al., (2021)** who conducted a study about "knowledge, perceptions of risks, attitudes and practices of environmental health among university students in northern Malaysia" and indicated that less than one-quarter of students participate in gardening or planting trees. Moreover, this finding in accordance with **Nzeobi et al., (2020)** who noted that nearly two-fifths of student participants engaged in the planting of trees/flowers

to combat climate change. Despite that, this finding disagreed with **Kurup et al., (2021)** who performed a study about “informed decision regarding global warming and climate change among high school students in the United Kingdom” and reported that the majority of studied students co-operative in tree plantation and cleanliness drive.

The findings presented that more than two-thirds of students had unsatisfactory scores of reported practices about climate change. From the researcher’s perspective, these results might be because students had a poor level of knowledge about climate change and they were not aware of how to modify their practices to prevent or reduce its impact. These findings agreed with **Rahman et al., (2021)** who presented that more than three-fifths of students had inadequate scores of reported practices about climate change. This finding in congruent with **Abdel Nabi et al., (2023)** who found that three-fifths of nursing students had adequate practices regarding climate change. This difference may be due to this study including only high-level fourth-academic-year students.

The findings presented that there were statistically significant differences between nursing students’ level of knowledge about climate change, their educational category, and their academic years. From the investigator’s point of view, this may be because the faculty of nursing students had more information about environmental health as it is a topic in the fourth-year curriculum. This finding accepted with **Elsharkawy et al., (2023)** who found that participants’ faculty, was significantly related to their knowledge. Moreover, this finding parallel to **Ofori et al., (2023)** who studied “climate change knowledge, attitude and perception of undergraduate students in Ghana” and identified that there were statistically significant associations between respondents’ knowledge and factors such as their level of education. Additionally, **Mohamed et al., (2024)** who revealed that there were highly statistically significant differences between students’ knowledge and their academic years. On the opposite side, this finding different with **Ghanem., (2022)** who constructed a study titled “assessment knowledge, perception, and behaviors towards climate change among universities youth in Egypt” and stated that there was no statistically significant between knowledge of climate change among participants and “education level. This is explained by residence and culture difference.

The offered findings stated that there were statistically significant differences between nursing students’ level of practice and gender. From the investigator's point of view, this may be due to the sample size of male students being more than female

students. This finding congruent with **Mohammed et al., (2022)** who concluded that there was a highly statistically significant association between students’ gender and their total score level of practice. Also, this finding agreed with **Sousa et al., (2021)** who studied “environmental knowledge, attitudes and behavior of higher education students: a case study in Portugal” and presented that there was a highly statistically significant association between students’ gender and their total score level of practice. On the opposite side, this finding different with **Mohammed et al., (2024)** who announced that there were no statistically significant differences between total performed practice levels and gender.

Furthermore, the offered study indicated that there were statistically significant differences between nursing students’ level of practice and educational category. This may be due to the faculty of nursing students having more information about sustainability than technical institutes students. This finding supported by **Mahmoud& Mahmoud (2023)** who carried out a study entitled “Effect of climate change on health and critical care nurses practice” and concluded that there was a highly significant relation between educational level and total nurse practice. However, this finding in contrary with **Mahmoud et al., (2023)** who studied “Knowledge and practices of maternity nurses related to the potential impacts of climate change on women's health” and illustrated that there was no relation between the overall score of practices and qualifications (educational category).

Additionally, there were statistically significant differences between nursing students’ level of practice and their academic years. This finding parallel to **Mohamed et al., (2024)** who identified that there were highly statistically significant differences between student's practices and their academic years. This is attributed to the more a student progresses, the more the student becomes knowledgeable on eco-friendly practices.

Significant positive correlation between the total score of nursing students’ knowledge and their reported practice was found in the current study. As seen by the investigator, this may be due to awareness level affecting the practices of any person, and since the knowledge of the nursing students was poor, the climate change reported practice was also unsatisfactory. This finding parallel to **Abdel Nabi et al., (2023)** who found that there was a highly statistically significant positive correlation between total knowledge and reported practices regarding climate change.

Conclusion

There was a serious lack of information among nursing students about the phenomenon of climate

change. Also, about two-thirds of them had unsatisfactory reported practice scores. There was a significant positive correlation between the total score of nursing students' knowledge and their reported practice.

Recommendations

Based on the findings of the study, the investigator recommended the following:

- Incorporating climate change topics into the nursing curriculum.
- Creation of awareness campaigns among Sohag University students about the health consequences of climate change.
- Social media can be utilized and community organizations mobilized to disseminate correct and relevant information on climate change.
- Implement an educational program to raise nursing students' awareness about climate change and its adverse health effects.
- Further research is needed in the field of climate change phenomena.

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