



Nursing Students' Attitudes Towards Climate Change and Sustainability: A Cross-Sectional Study

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ABSTRACT

Background: Climate change stands as the preeminent challenge of our time. It represents a multifaceted phenomenon resulting in global warming and shifting weather patterns. Its study is indispensable for comprehending the scope and criticality of this impending threat. Understanding this issue is crucial for recognizing the immense scale and urgency of the threat.

Methods: A quantitative descriptive cross-sectional survey was conducted using 254 nursing students. The research questionnaire was administered using online survey. A convenience sampling techniques was used in selecting the study participants of the study.

Results: The nursing students have a good academic engagement as nearly 82% has generally high grades of 2.5 and above. The level 8 nursing students comprised the largest academic levels of nursing. The attitudes were moderately positive where a notable portion of nursing students either agreed or strongly agreed especially about their role in environmental health and sustainability education.

Conclusion: The study participants have moderately positive attitude towards climate change and sustainability. The nursing students accept that climate change is real and that human activities are a primary cause and believe in the importance of sustainable practices for the long-term health of the society

Keywords: Climate change, Sustainability, Sustainable practices, Nurses Attitudes, Academic performance

1. Introduction

The effects of climate change on the environment and human wellbeing have become more frequent and severe in recent years, representing a hazard to present and future generations (Romanello et al, 2022). In 2010- 2019 noticed that :rising sea levels, an increase in the spread of communicable diseases, More consequences of global warming that harm people's physical, mental, and social well-being include food and water shortages, mass migration, political instability, and economical losses that affecting both persons and governments. (Watts, et al ,2019).

The critical necessary for global intervention to alleviate climate change is a top priority, according to the Sustainable Development Goals. Numerous studies highlight the need of educating the general public about health and sustainable consumption, stating that teachers are the primary source of high-quality instruction on sustainable habits at all ages. urgent medical situation (Cook, Demorest, and Schenk, 2019). Nursing represent the large percentage of the healthcare part, and they can represent important role in environmental care and control through effective contribution in general health awareness to decrease climate change and its negative sequences (Masson-Delmotte et al , 2021).

It has been acknowledged that integrating sustainable healthcare into nursing curricula is a crucial step in improving awareness and teaching students concerning the need to alleviate the planet's climate by 2050 (López-Medina et al., 2019). Future nursing students will benefit from the inclusion of climate change and sustainability, so nursing programs must include these topics in the curriculum. As a result, the focus of this study is to evaluate the attitudes and knowledge of undergraduate nursing students about climate change, sustainability, and its inclusion in nursing curricula. Additionally, it will aid with curriculum development and updating and assess the degree to which students accepted into higher education recognise the importance of sustainability and climate change for their future careers.

1.1 Research Objectives

This study aimed to determine the nursing students' attitudes towards climate change and sustainability, specifically it sought to answer the following objectives:

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1. To identify the demographic characteristics of the nursing students in terms of
 - 1.1. Age in years
 - 1.2. Gender
 - 1.3. Semester
2. To determine the academic performance and academic levels of the nursing students.
3. To determine the nursing attitudes towards climate change and sustainability
4. To ascertain the dataset reliability and cleaning approach

2. Research Methodology

Study Design

This study utilized a quantitative, descriptive, cross-sectional research design. Using an online survey, the questionnaire was administered to the nursing students enrolled in the nursing department of Riyadh Elm University.

Data collection method

Tools:

- 1-Sociodemographic data includes students names ID, academic level and semester, GPA.
- 2- "The Sustainability Attitudes in Nursing Survey" (SANS_2):

This tool utilized to assess nursing students' attitudes, knowledge, and practices regarding to sustainability in healthcare. It aims to measure their awareness and perspectives on incorporating sustainability principles into nursing education and practice, particularly in relation to environmental, social, and economic dimensions of health. A five point Likert scale for scoring each item was utilized. Respondents rate their level of agreement or confidence on a scale which indicate from one strongly disagree to five strongly agree.

Sample characteristics

Nursing student including both sexes and all levels was recruited for the study. Inclusion criteria of the study includes: students who are available during the study period and have access to the online or in-person survey platform. Exclusion criteria include students who have withdrawn or are on a leave of absence from their nursing program during the study period.

Sample size

Convenient sample was used. Applying the PASS11 system to calculate the proper sample size, with a 95% confidence level and a 5% margin of error, it is calculated that 254 students is required for the study.

Study preparation

The framework of the study is the following steps:

1. The Research Ethics Committee at Riyadh ELM University will provide ethical approval for the study.
2. A pilot study engaging 10% of the study sample will be done to evaluate the accuracy and applicability of the established tool. The results from the pilot study were excluded from the main research sample, and any required modification to the tool was implemented.
3. Date collection period started to gather data from student who prefer to share in the study
4. The investigator will initiate data collection and assessing socio-demographic data using a tool I and tool II attitude, awareness about climate change and sustainability.

Statistical analysis

The Statistical Package for the Social Sciences (SPSS), edition 22.0 (IBM Corp., Armonk, NY, 2013), operated to code the data, analysis, and tabulation. After data collection, the SPSS software facilitates data revision, organization, and statistical analysis. Prior to any calculations, the data was assessed for normality of distribution. Continuous data was presented as mean \pm standard deviation, whereas categorical data was summarized by frequency and percentages. For continuous variables, a t-test was utilized for means comparison, whereas the chi-square test was employed for comparisons involving categorical variables. Statistical significance was determined at a threshold of $p < 0.05$.

Ethical Considerations

Agreement for the research was achieved from the Research Ethics Committee of Riyadh Elm University. Each participant was provided with a detailed explanation of the study's purpose, nature, and benefits, followed by a request for their written consent. The researcher point up that enrolment is

completely voluntary, and all contributors are set free to leave the study according to their wellness without any negative sequences. Confidentiality, privacy, safety, and anonymity were upheld in all stages of the study.

3. Findings and Results

Table 1: Demographic Characteristics of Nursing Students (N = 254)

No.	Variables	Category	Frequency	Percentage
1	Age in years	18-20	95	37.5
		21-23	64	32.0
		24-26	37	18.5
		27-30	4	2.0
2	Gender	Female	240	94.5
		Male	14	5.5
3	Semester	First	56	22.05
		Second	198	77.95

The table 1 shows the demographic profile of the nursing students. Based on the table, the majority of participants (47.5%) were aged between 18 and 20 years, followed by 32% aged 21–23 years. The results reveal a highly skewed gender distribution, with 94.5% being female, as expected in many nursing programs. Most of the students (77.95%) were in their second semester, indicating a substantial representation of students progressing in their academic journey.

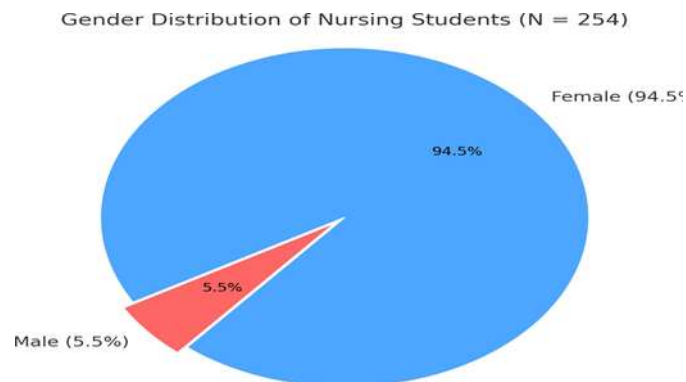


Figure 1: Gender distribution of the study participants

On the figure 1 which represents the gender distribution of the respondents, it can be seen that almost 95 percent of the study participants were female and 5.5 percent were male.

Table 2: Academic performance of nursing students

GPA range	Frequency	Percentage
<2.5	40	18.3
>2.5	179	81.7

The table above represents the academic performance of the nursing students. Based on the table, the academic performance of nursing students is generally high, with 81.7% achieving a GPA of 2.5 or above. A mean GPA of 3.90 suggests strong academic engagement. The consistency between the mean, median, and mode indicates a symmetrical distribution of GPA scores with minor deviations.

Table 3: Academic levels of the nursing students

Nursing Academic Level	Frequency	Percentage
Level 8	89	35.3
Level 6	38	15.1

Level 7	25	9.9
Level 2	25	9.9
Intern	24	9.5
Level 4	19	7.5
Level 5	12	4.8
Level 1	12	4.8
Level 3	8	3.2

The table 3 illustrate the nursing academic level of the students. Based on the table, it can be seen that nursing students from Level 8 formed the largest academic group (35.3%), followed by Level 6. This suggests that the survey reached a larger number of upper- level students, possibly due to their greater availability or engagement in sustainability topics.

Academic Level Distribution

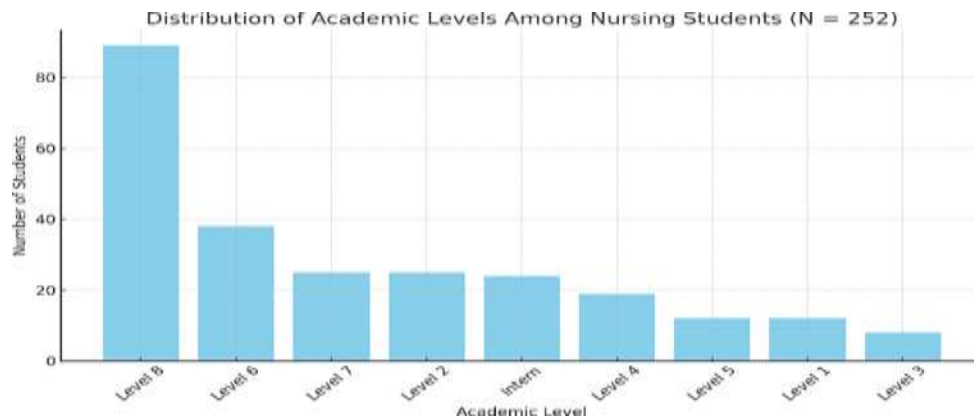


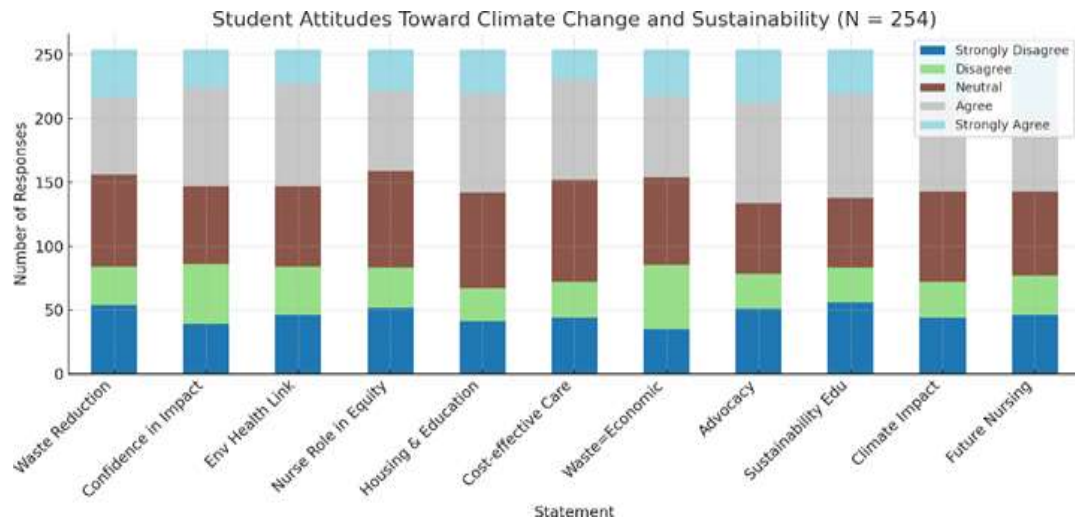
Figure 2. Academic level distribution of the nursing students

Table 4: Students Attitude toward Climate Change and Sustainability (N=254)

Statement/s	SD	D	N	A	SA	Mean
Waste reduction in healthcare	54	30	72	61	37	2.99
Confidence to reduce environmental impacts	39	47	61	78	29	3.04
Environmental health linked to outcomes	46	38	63	80	27	3.02
Nurses and health equities	52	31	76	63	32	2.97
Housing and education for sustainability	41	26	75	78	34	3.15
Cost-effective care is essential	44	28	80	78	24	3.04
Waste reduction is economically beneficial	35	50	69	64	36	3.06
Advocacy for balanced policies	51	27	56	79	41	3.13
Sustainability in education	56	27	55	81	35	3.05
Climate change impacts health	44	28	71	72	39	3.13
Sustainable practices in nursing future	46	31	66	61	50	3.15
Average Mean						3.065

Legend: SD-Strongly Disagree, D-Disagree, N-Neutral, A-Agree, SA-Strongly Agree

Attitude towards Climate Change and Sustainability



The table above presents the students attitudes toward climate change and sustainability. This reveals that attitudes were moderately positive. Across most items, a notable portion of students either agreed or strongly agreed, particularly on items about their role in environmental health and sustainability education. However, a significant number also expressed neutrality or disagreement, reflecting variability in awareness or confidence levels.

Table 5. Summary of dataset reliability and cleaning approach

Step No:	Procedure	Description
1	Standardized numerals	Converted Arabic digits ,and commas (e.g., $\text{₹},^{\wedge}\text{₹}$ 4,79) to decimal points (4.84)
2	Filtered GPA Range	Only values between 0 and 5 were retained
3	Removed invalid entries	Excluded timestamps, text responses, and outliers like “123” or “8”
4	Computed valid statistics	Used 219 cleaned GPA entries for analysis

The table 5 presents the summary of dataset reliability and cleaning approach. The dataset underwent thorough cleaning to ensure statistical accuracy. This involved filtering out incorrectly formatted or irrelevant responses and focusing on valid GPA data. This robust cleaning process enhances the reliability of the analysis presented.

4. Conclusion

This research shows that nursing students have moderately positive attitude towards climate change and sustainability. The findings demonstrate that with their attitude, they still acknowledge the seriousness of the climate change and become part of the solution. The nursing students still feel that they are a catalyst for empowering actions towards sustainability.

The research further confirms that they are positively take part of the sustainability practices for the future. This means that they at least part of minimizing waste practices like reducing consumption, reusing items, repairing products and recycling practices. The findings underscore how increasing attitude to climate change and sustainability can change the environment as a whole for the future.

Recommendations

Based on the study's findings, the following recommendations were drawn to convert students intention to good action and deeen their engagement to sustainability:

1. Empowering action through accessibility: Provide concise, easy-to-understand lists of practical, low-effort actions they can take at home, work, or in their community.
2. Local Resources Guide: Offer information on local recycling centers, sustainable businesses, public transport options, or community gardens.
3. Underscoring Personal Benefits and to the Environment: Emphasize how sustainable actions can save money (e.g., lower utility bills from energy conservation, reduced grocery costs from meal planning and food waste reduction. This can also connect actions to personal health.
4. Fostering community connection and shared progress. Recognizing how many people adopt to sustainable practices which can help the community.
5. Further research study. A similar study should be conducted in a bigger population to generalize the findings of the study.

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