Integrating Climate Change into the Nursing Curriculum

In Collaboration With

Penn Nursing

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Penn Eco-Reps

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Introduction
As a top undergraduate nursing school, Penn Nursing aims to be at the forefront of nursing practices and research. As the effects of climate change become even more pertinent in the field of nursing, this must be addressed beginning at an undergraduate level. Various climate change-induced health conditions are increasing in prevalence and this has prompted Penn Nursing to identify a gap in the current nursing curriculum. Eco-Reps were enlisted during the 2017-2018 school year to support Penn Nursing in bridging this gap of education on climate change and its intersection with health and nursing.

The purpose of this project was to research current sustainability curriculums and initiatives at top undergraduate nursing programs and then use these findings to create a deliverable that would somehow be incorporated into the current Penn Nursing curriculum. Initially, the idea was to develop a course curriculum that would be offered to Penn Nursing undergraduate students. However, we also entertained the ideas of organizing a climate change and health focused conference and creating a module that nursing students would have to complete before arriving at campus. We ultimately decided to follow through with the last option of creating a nursing specific module, which we envision will integrate into the existing Thrive at Penn (TAP) program for incoming students seamlessly.

Project Goals
1. Reach out to other top nursing institutions to see what they are doing in the field of Nursing and climate change and sustainability.
2. Determine what the final deliverable should be based on this research as well as what Penn Nursing is already doing.
3. Create a deliverable (we chose to make a TAP module for incoming Nursing students) that would educate freshman about climate change and how it relates to them as nurse and leaders in this field. This module also aims to introduce freshmen to existing relevant resources at Penn (student groups and courses) as well as external nursing organizations.

Google Drive Folder Descriptions
1. Meeting Notes
   a. Notes from meetings with Penn Nursing partners throughout the year
2. Module
   a. Outline for module
   b. Multiple iterations of module
   c. Voice-over script for module
3. Penn Nursing Syllabi
   a. Collection of syllabi for existing Penn Nursing courses we determined to cover topics related to climate change
4. Preliminary Research
   a. PenninTouch information on Penn Nursing courses with some coverage of climate change
   b. Compiled responses from outreach
   c. Notes from preliminary research on top undergraduate nursing programs and most relevant topics in climate change for nurses
d. List of top undergraduate nursing programs and contact information

5. Resources from Other Schools
   a. Relevant course offerings from other institutions
   b. Presentation created by other nursing school on why nurses should care about climate change

**Email Outreach Methods and Findings**

During the first half of the year, we focused our efforts on outreach to other top undergraduate nursing schools. We conducted an audit to gauge what these institutions are currently doing to inform their students about climate change and nursing. We used various websites that rank nursing undergraduate programs, specifically US News, Niche, and College Choice, to determine the top thirty undergraduate nursing schools in America. We then found the contact information of the Deans of those institutions, or leveraged the connections of our Penn Nursing partners (utilizing Adriana’s and Lucia’s connections at other nursing schools improved our response rate), to email a brief explanation of our project and ask what they are currently doing in their curriculums regarding climate change. The list of top undergraduate nursing schools and the contact information of their representatives can be found in the “Top Nursing Schools” file within our “Preliminary Research” folder.

Among the 30 schools we reached out to, we received 10 responses, amounting to a 33% response rate. Only one, New York University, had a distinct academic initiative on nursing and climate change; however, the course offered by NYU is available only to its graduate nursing students. Two schools, University of Maryland in Baltimore and University of Michigan, had climate change incorporated into an existing lecture, but no stand alone course was offered. There was also no indication that these offered courses are required for nursing students. None of the nursing programs had a specific course dedicated to climate change and its effects on the nursing profession. The schools that replied all seemed interested in what we were doing and some asked to be updated with our findings and final project.

We were able to collect information from Penn Nursing’s peer institutions that are related to climate change, sustainability, and environmental health at large. We compiled the course titles and some of the course syllabi in the “Resources from Other Schools” folder.

**Module**

In the second half of the year, we dedicated our time to creating the deliverable for our Penn Nursing partners. Initially, the idea was to develop a curriculum for a course about climate change and nursing. However, due to logistical uncertainties at the time regarding whether the course would be mandatory or not, who would be suitable to teach it, and other issues surrounding the creation of a new course, Eco-Reps decided to shift the focus toward a more manageable deliverable with lower hurdles and higher chances of implementation. Thus, we settled on the idea of creating a module that would be incorporated in the TAP series that all incoming freshman students must complete. This module would of course only apply to nursing students and serves to reach the desired audience of future incoming nursing students.

The Thrive at Penn (TAP) module created for Penn Nursing incoming freshmen has three main components. The first provides a basic overview defining what climate change is, its causes and effects on
health and medicine, and how this issue is especially applicable to nurses. The second part of the module explores a case study on particulate matter to give nurses a more concrete example of how climate change effects their patients and practice methodology. The final segment of the module aims to inform nursing students about current resources at Penn and national nursing organizations. The final iteration of our module is listed as “Module v7” within the “Module” folder.

Although the module is accessible via Google Drive, it is displayed below for convenience:

Introduction:

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Climate Change and Nursing

Module for Academic Year 2018-2019
In Collaboration with Eco-Reps
Karen Cui, Noya Hanoch, Jessica Li

Module Objectives
Background about Climate Change and Health
- Define climate change
- Discuss climate change and its effects on health
- Understand how climate change affects nurses specifically

Case Study on Particulate Matter (PM)
- Describe PM and its health implications
- Identify treatment options

Resources for Penn Nursing and Beyond
- Learn about Penn’s commitment and initiatives on climate change
- Get involved with relevant courses and student groups at Penn

Background:

What is Climate Change?
Climate Change: change in global or regional climate patterns due to the increased levels of atmospheric carbon dioxide produced by fossil fuels
- Natural
- Man-made

Why do we care?

Climate Change Affects Health
- Changes in the environment negatively impact health
  - Lack of clean water supply → forced migration
  - Lack of food supply → malnutrition
  - Effects on mental health
- Climate change increases CO2 → finer particulate matter (PM) gets into the lungs/heart aggravates lung and heart disease

Department of Climate Change on Nurses Health

[Diagram of effects of climate change on nurses health]
Climate Change-Induced Health Issues are Growing

- Climate change and health are linked
- Examples:
  - Asthma
  - Heat stroke
  - Vector-borne diseases

Disproportionate Effects of Climate Change

- Certain populations are more vulnerable to climate change than others
  - Women, children, older adults
  - People in developing countries
- Social determinants make climate change both a health and human issue
  - Country-specific factors (war, political environment, agriculture, etc.)
  - Socioeconomic status
  - Gender

Climate Change Matters to Nurses

- Environment = internal and external factors that impact patient's health
  - Genetics, interpersonal relationships, and geography
- Climate change falls into Environment category
  - Transformation of global weather patterns
- Climate change will affect the future role and work environments of nurses

Nurses are Integral to the Workforce

- Nurses comprise the largest workforce in the healthcare system
- Nurses are regarded as trustworthy
  - “For the 16th consecutive year, Americans’ ratings of the honesty and ethical standards of 22 occupations finds nurses at the top of the list.” - Gallup
- Nurses already operate in an interdisciplinary environment

Nurses Can be Leaders in this Field

- Nurses are well-positioned to lead in this field
  - Nurses are integral to the workforce
  - Nurses have influence in 3 important areas
    - Hospitals and medical care facilities
    - Education and training
    - Policy
- Limited evidence of leaders at the intersection of climate change and health education
  - Audit on other top nursing schools
  - 51 responses
  - 510 offer sustainability-focused courses or programs
  - None have this as a requirement

Nurses Have Influences in 3 Main Areas

- Hospitals and healthcare facilities
  - Recognize expected increase in primary care, ER visits, and medication usage due to climate change-induced health effects
- Education and training
  - Incorporate knowledge of climate change effects on health and appropriate assessments of patients
- Policy
  - Advocate for certain policies geared toward mitigating climate change
Case Study:

**Case Study: Impacts of Increased PM$_{2.5}$ on Health**

- Fossil fuel extraction, processing, and eventual use...
- Contributing to increased CO$_2$ in the atmosphere...
- Which exacerbates climate change and particulate matter...
- And leads to more asthma in patients and hospital visits

- In 2011, NYC saw 3,600 ER visits for asthma in adults due to PM$_{2.5}$ exposure

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**Case Study: Proposed Treatment Plan**

- **Current regime**
  - Daily exercise, walk outdoors
  - Avoid pollution-heavy areas

- **New recommended regime**
  - on the Million Hours 2022 Framework
  - Check Air Quality Index (AQI)
    - Air Matters app
  - Modified exercise plan indoors
    - Avoid pollution-heavy areas
    - Indoor exercises and stretches

Resources:

**Penn’s Commitment to Addressing Climate Change**

- Climate Action Plan 20
  - Integrating sustainability into coursework
  - Campus waste minimization and recycling
  - And more

- As a top nursing school, Penn should be leading in this field.
  - Emphasize research
  - Incorporate climate change topics into nursing curriculum

**How Nursing Students Can Get Involved at Penn**

- Get involved in environmental groups on campus
  - Eco-Reps
  - SSAF and its constituent organizations

- Get involved in nursing leadership groups
  - Penn Nursing Sustainability Committee
  - Nursing Student Groups

- Take courses at Penn
We sought to make the module as clear and concise as possible, as its purpose is primarily an orientation and overview of the intersection of climate change and nursing. Thus, the main objectives of this module are to introduce nursing students to the field, inform about its importance and relevance to their studies, and engage them in resources available to them at Penn and beyond if they are interested in exploring it further. The module aims to lay a foundation for both nursing students and Penn Nursing altogether. For students, the module addresses the gap in education about climate change and health through University resources and external organizations. For Penn Nursing, this is a pioneering effort that will hopefully spur continued conversation about the importance of climate change and stimulate further development of a curriculum that reflects Penn’s characteristic commitment to lead in this emerging field.

**Questions for the Module (TAP Element)**

In addition to the module itself, which will be required by all Penn Nursing students, we thought a brief assessment of students’ understanding of the material covered would hone in the key takeaways. The module would thus be followed by a few multiple choice questions, similar to the general TAP structure of video presentations followed by comprehension questions. These questions will ensure that the students have paid attention and give them an opportunity to test their knowledge on the information provided. The questions we included for the module are:

1. Climate change is exacerbated by fossil fuels that are
   a. Natural
   b. Man-made
   c. Both (correct answer)
2. What are the four nursing paradigms?
   a. Nursing, person, environment, health (correct answer)
   b. Nursing, person, environment, medicine
   c. Nursing, society, environment, health
   d. Nursing, society, environment, medicine
3. What is the recommended safe range of AQI (air quality index)?
   a. 0-25
   b. 0-50 (correct answer)
Recommendations for Future Iterations of this Kind of Project and Module
1. Work closely with an academic expert in the particular field. This advice is instrumental in creating a polished, accurate module that is in line with other university educational material.
2. Create deadlines for each step of the project and meet with project sponsors along the way to ensure that progress is being made in the correct direction.

Recommendations for Penn Nursing
1. Work with student intern through ISAC (Integrating Sustainability Across the Curriculum) to develop a specific course syllabus that focuses on the relevance of climate change to nursing practices and training.
2. Encourage professors to incorporate topics in this field into their already existing curriculums.
3. Share the outcome of this project with other schools to influence the potential for other students participate in a similar module within SEAS, SAS, Wharton, etc.