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Integrating climate change into nursing curricula and continuing education: a scoping review protocol

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ABSTRACT

Introduction Climate change constitutes a major threat to human health. Nurses have an essential role to play in protecting populations from this threat, and to fulfil this role, they must be properly prepared. The purpose of this scoping review is to examine studies on the integration of climate change into the academic curriculum or continuing education of nurses so as to identify issues and opportunities related to this integration.

Methods and analysis The method being used is the methodological framework proposed by Arksey and O'Malley and Levac *et al*. First, a search strategy using keywords and their combinations will be developed. This strategy will be applied in four bibliographic databases: MEDLINE (PubMed), CINAHL, Embase, Web of Science. Second, an initial selection of studies based on titles and abstracts will be carried out by two members of the research team using the software Covidence. They will conduct this selection process independently, with the aim of identifying relevant studies that meet the inclusion criteria for our scoping review. Third, the second stage in the selection process will be carried out by examining the full text of each article to determine which studies to include in the review. Finally, data on year of publication, authors, geographical area, article type, study objectives, methodology and key findings will be extracted from selected articles for analysis. A search of the grey literature will also be conducted to supplement the results of the bibliographic database search. The scoping review is currently ongoing. Identification of relevant literature began in the first quarter of 2022 and is expected to be completed in the first quarter of 2023.

Ethics and dissemination Ethical approval is not required for this review. The results of this study will be presented in workshops and conferences and be submitted for publication to a peer-reviewed journal.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This review targets a wide range of interdisciplinary databases.
⇒ The search of bibliographic databases to be complemented by a search of the grey literature.
⇒ Since the quality assessment is not being considered, the interpretation of data may be open to bias.

INTRODUCTION

Climate change has been called the 21st century's most serious threat to global health.[1–5] The higher the global rise in temperature, the greater the risks to the health of populations.[6] The effects of climate change on the physical and mental health of populations vary according to their living environment and vulnerabilities.[7] The main concerns as regards climate change and health are extreme weather events such as floods, storms, forest fires or drought, heat waves, air pollution and allergies, waterborne and vectorborne diseases, water resources, food security, mental health and forced migrations.[8–10] The WHO estimates that climate change is expected to cause approximately 250 000 additional deaths per year between 2030 and 2050 due to malnutrition, malaria, diarrhoea and heat stress.[11]

As trusted front-line health professionals, nurses have an important role to play in protecting people from the health effects of climate change, being in close contact with those most vulnerable to climate change such as infants or elderly people, individuals living in hot climates or near endemic diseases, or people already having a compromised health due to chronic disease or immunosuppression.[12–14] They can also contribute to climate change adaptation by helping individuals and communities cope with the adverse effects of climate change and they can mitigate its severity by reducing greenhouse gas emissions,[15] for example, within the healthcare system.

To achieve this and considering climate change, adverse effects on health are becoming a more prevalent among many populations, nurses must be adequately prepared and motivated to act within the context of their professional practice to combat climate change and address its impacts on health.[16–18]

However, integrating climate change content into the academic curriculum and continuing education of nurses is not an easy

Table 1 Free-text search terms (keywords) and controlled vocabulary

Concept 1: climate change		
Free-text search terms (keywords)	Controlled vocabulary (thesaurus terms in electronic bibliographic databases)	
"climate change*" OR "global warming" OR "climate crisis" OR "climate warming" OR "climate issue*" OR "Climate vulnerabilit*" OR "Climate Emergenc*" OR "Greenhouse Effect" OR "climate action"	MEDLINE (PubMed)	"Climate Change"(Mesh] OR "Greenhouse Effect"(Mesh)
	CINAHL Plus with Full Text (EBSCO)	(MH "Climate Change") OR (MH "Greenhouse Effect")
	Embase	'climate change'/exp OR 'greenhouse effect'/de
Concept 2: Education of nurses		
Free-text search terms (Keywords)	Controlled vocabulary (thesaurus terms in electronic bibliographic databases)	
(Nurse OR nurses OR nursing) AND (educat* OR curricul* OR training OR student* OR academi*)	MEDLINE (PubMed)	"Education, Nursing"(Mesh] OR "Students, Nursing"(Mesh] OR "Schools, Nursing"(Mesh] OR "Curriculum"(Mesh)
	CINAHL Plus with Full Text (EBSCO)	(MH "Students, Nursing+") OR (MH "Education, Nursing+")
	Embase (embase.com)	'nursing student'/exp OR 'nursing education'/exp

task. We refer to 'academic curriculum' as any formal educational programme offered in a school or faculty leading to a degree, from undergraduate to postgraduate level. 'Continuing education' refers to any other learning opportunity offered by health organisations or workplace offered to nurses already in employment. In fact, several challenges facing such integration have been identified by studies conducted in recent years: instructors lacking climate change training; curriculum regulators not uniformly placing emphasis on climate change or providing resources for the integration of this topic into the curriculum; resistance from educational institutions due to an already very busy training programme; lack of time and resources for nurses; and the general lack of involvement in climate change on the part of health professionals.[19–23]

The main objective of this scoping review will be to examine studies on the integration of climate change into the academic curriculum or continuing education of nurses. Although a few previously mentioned studies have addressed this topic, to our knowledge, this study will constitute the first scoping review of the literature on the subject. In the last few decades, nursing has been gaining recognition as a stand-alone discipline, with the creation of schools and faculties dedicated to nursing all around the world and is contributing to its own body of knowledge (nursing science). A review focusing on nursing education may allow these institutions to use knowledge developed for nurses, possibly using nursing theoretical frameworks to integrate climate change at a paradigmatic level and in clinical settings.

This review would help determine whether the current literature is sufficient for faculty and organisations to base the addition of climate change content on enough research evidence. The results of this study should, on the one hand, help identify issues and opportunities related to the inclusion of climate change in nursing education. On the other hand, it should enable the identification of specific means for facilitating this integration. This study could also inform reflection by academic institutions and nursing organisations on nursing education, research and practice related to climate change.

METHODS AND ANALYSIS

Patient and public involvement

No patient involved.

This protocol describes the methodology for conducting a scoping review, as developed by Arksey and O'Malley[24] and improved by Levac *et al*.[25] This methodology consists of six steps, five of which are essential to exploring and analysing the scope of the existing literature on a research topic:

1. Identification of the research question.
2. Identification of relevant studies.
3. Selection of studies to include in the review.
4. Charting of information and data within the included studies.
5. Collating, summarising and reporting the results.
6. Stakeholder consultation.

This methodology has been chosen considering the variety of research methods on the topic (qualitative and quantitative studies, discussion papers, conceptual papers, grey literature) and the lack of synthesis on climate change and nursing education. A scoping review would thus help determine research priorities and informs whether there is sufficient amount of literature that can be used to contribute to curriculum transformation.

Identification of the research question

The question under study in this scoping review is: How are issues related to climate change addressed in the nursing curriculum?

Identification of relevant studies

We first developed a literature search strategy with the help of a specialised librarian. To this end, four bibliographic databases covering biomedical and interdisciplinary topics will be consulted: MEDLINE (PubMed), CINAHL, Embase and Web of Science. Two concepts will be chosen to guide keyword selection for the search strategy: climate

Table 2 Example of a search strategy in MEDLINE (PubMed)

#	Query	Search details
10	#8 OR #9 AND #3	((("Nurse"(Title/Abstract)OR "nurses"(Title/Abstract)OR "nursing"(Title/Abstract)) AND ("educat*"(Title/Abstract)OR "curricul*"(Title/Abstract)OR "training"(Title/Abstract)OR "student*"(Title/Abstract)OR "academia"(Title/Abstract)OR "school*"(Title/Abstract))) OR ("education, nursing"(MeSH Terms] OR "students, nursing"(MeSH Terms] OR "School Nursing"(MeSH Terms))) AND ("climate change*"(Title/Abstract)OR "global warming"(Title/Abstract)OR "climate crisis"(Title/Abstract)OR "climate warming"(Title/Abstract)OR "climate issue*"(Title/Abstract)OR "climate vulnerabilit*"(Title/Abstract)OR "climate emergenc*"(Title/Abstract)OR "Greenhouse Effect"(Title/Abstract)OR "climate action"(Title/Abstract)OR ("Climate Change"(MeSH Terms] OR "Greenhouse Effect"(MeSH Terms)))
9	"Education, Nursing"(Mesh] OR "Students, Nursing"(Mesh] OR "School Nursing"(Mesh)	"education, nursing"(MeSH Terms] OR "students, nursing"(MeSH Terms] OR "School Nursing"(MeSH Terms)
8	(Nurse(Title/Abstract)OR nurses(Title/Abstract)OR nursing(Title/Abstract)) AND (educat*(Title/Abstract)OR curricul*(Title/Abstract)OR training(Title/Abstract)OR student*(Title/Abstract)OR academia(Title/Abstract)OR school*(Title/Abstract))	("Nurse"(Title/Abstract)OR "nurses"(Title/Abstract)OR "nursing"(Title/Abstract)) AND ("educat*"(Title/Abstract)OR "curricul*"(Title/Abstract)OR "training"(Title/Abstract)OR "student*"(Title/Abstract)OR "academia"(Title/Abstract)OR "school*"(Title/Abstract))
7	#6 AND #3	((("Nurse"(Title/Abstract)OR "nurses"(Title/Abstract)OR "nursing"(Title/Abstract)) AND ("educat*"(Title/Abstract)OR "curricul*"(Title/Abstract)OR "training"(Title/Abstract)OR "student*"(Title/Abstract)OR "academi*"(Title/Abstract))) OR ("education, nursing"(MeSH Terms] OR "students, nursing"(MeSH Terms))) AND ("climate change*"(Title/Abstract)OR "global warming"(Title/Abstract)OR "climate crisis"(Title/Abstract)OR "climate warming"(Title/Abstract)OR "climate issue*"(Title/Abstract)OR "climate vulnerabilit*"(Title/Abstract)OR "climate emergenc*"(Title/Abstract)OR "Greenhouse Effect"(Title/Abstract)OR "climate action"(Title/Abstract)OR ("Climate Change"(MeSH Terms) OR "Greenhouse Effect"(MeSH Terms)))
6	#4 OR #5	(("Nurse"(Title/Abstract)OR "nurses"(Title/Abstract)OR "nursing"(Title/Abstract)) AND ("educat*"(Title/Abstract)OR "curricul*"(Title/Abstract)OR "training"(Title/Abstract)OR "student*"(Title/Abstract)OR "academi*"(Title/Abstract))) OR ("education, nursing"(MeSH Terms] OR "students, nursing"(MeSH Terms))
5	"Education, Nursing"(Mesh] OR "Students, Nursing"(Mesh)	"education, nursing"(MeSH Terms] OR "students, nursing"(MeSH Terms)
4	(Nurse(Title/Abstract)OR nurses(Title/Abstract)OR nursing(Title/Abstract)) AND (educat*(Title/Abstract)OR curricul*(Title/Abstract)OR training(Title/Abstract)OR student*(Title/Abstract)OR academi*(Title/Abstract))	("Nurse"(Title/Abstract)OR "nurses"(Title/Abstract)OR "nursing"(Title/Abstract)) AND ("educat*"(Title/Abstract)OR "curricul*"(Title/Abstract)OR "training"(Title/Abstract)OR "student*"(Title/Abstract)OR "academi*"(Title/Abstract))
3	#1 OR #2	"climate change*"(Title/Abstract)OR "global warming"(Title/Abstract)OR "climate crisis"(Title/Abstract)OR "climate warming"(Title/Abstract)OR "climate issue*"(Title/Abstract)OR "climate vulnerabilit*"(Title/Abstract)OR "climate emergenc*"(Title/Abstract)OR "Greenhouse Effect"(Title/Abstract)OR "climate action"(Title/Abstract)OR "Climate Change"(MeSH Terms] OR "Greenhouse Effect"(MeSH Terms)
2	"Climate Change"(Mesh] OR "Greenhouse Effect"(Mesh)	"Climate Change"(MeSH Terms] OR "Greenhouse Effect"(MeSH Terms)
1	"climate change*"(Title/Abstract)OR "global warming"(Title/Abstract)OR "climate crisis"(Title/Abstract)OR "climate warming"(Title/Abstract) OR "climate issue*"(Title/Abstract)OR "Climate vulnerabilit*"(Title/Abstract)OR "Climate Emergenc*"(Title/Abstract)OR "Greenhouse Effect"(Title/Abstract)OR "climate action"(Title/Abstract)	"climate change*"(Title/Abstract)OR "global warming"(Title/Abstract)OR "climate crisis"(Title/Abstract)OR "climate warming"(Title/Abstract)OR "climate issue*"(Title/Abstract)OR "climate vulnerabilit*"(Title/Abstract)OR "climate emergenc*"(Title/Abstract)OR "Greenhouse Effect"(Title/Abstract)OR "climate action"(Title/Abstract)

change (concept 1) and education of nurses (concept 2). The keywords used for the literature search will be classified as either free-text search terms or controlled vocabulary. The free-text keywords and controlled vocabularies, along with the thesaurus terms, for each of the four databases are shown in table 1. In order to create these search strategies, the research team tested different vocabulary and combinations until the suggested articles best corresponded to the objectives of this study.

An example of a MEDLINE (PubMed) search strategy is shown in table 2.

Selection of studies to include in the review

For this step, studies identified by the database search will first be imported into the bibliographic management

Box 1 Data extraction form

Title of study.
Authors.
Year of publication.
Geographical area.
Study population (student, practising nurse).
Type of educational curricula (university curricula; continuing education).
Aim of study.
Method.
Challenges and opportunities.
Strategies for integration (content, tools, learning methods).
Conclusion (key messages).

software EndNote and then transferred to Covidence to remove duplicates and facilitate the sorting and selection of relevant studies based on previously defined inclusion and exclusion criteria.

The study selection process will comprise two steps. The first step will be to select articles transferred to Covidence based on their titles and abstracts, using the following inclusion and exclusion criteria:

Inclusion criteria

- The study focuses on the integration of climate change issues into the academic curriculum (undergraduate to postgraduate programmes by nursing schools or faculties) or continuing education (hospital-led programmes or workshops, courses provided by nursing organisations) of nurses.
- The article is an empirical study (qualitative or quantitative), a conceptual paper, a discussion paper or an editorial focused on the integration of climate change in nursing education.

Exclusion criteria

- The study focuses on the integration of environmental issues other than climate change into the academic curriculum or continuing education of nurses.
- The study focuses on the integration of climate change issues into the academic curriculum or continuing education of other health professionals, in general.
- The documents are published in a language other than English or French.

This first step in the selection process will be performed by two members of the research team (TD and MR) independently. Any disagreement regarding inclusion or exclusion will be resolved by consensus and, as necessary, following consultation with a third team member.

The second step in the process of selecting articles for inclusion in the final analysis will be based on the full text of articles. This step will be carried out by the same two researchers performing the initial selection. Studies whose full text is not available, or that do not provide the authors' names or publication dates will be excluded. Again, any disagreements will be resolved by discussion between the two reviewers and, if necessary, by consultation with a third team member.

During the full text review of these articles, a backward citation searching might be used to identify additional potential studies to analyse. A forward citation searching will also be done to identify recent publications on a similar topic which have cited our selected articles.

The quantitative results of the selection process will be presented in a Preferred Reporting Items for Systematic Reviews and Meta-Analyses diagram.

Table 3 Nursing organisations identified for grey literature search

Location	Name of the association or organisation	Website
Province of Québec	Quebec Nurses' Association	https://www.aqii-qna.org/
	Ordre des infirmières et infirmiers du Québec	https://www.oiiq.org/
Canada	Canadian Nurses Association	https://www.cna-aiic.ca/en/home
	Canadian Association of Nurses for the Environment	https://cane-aiie.ca/
	Canadian Federation of Nurses Unions	https://nursesunions.ca/
	Canadian Nurse Educator Institute	http://cnei-icie.casn.ca/
	Canadian Association of Schools of Nursing	https://www.casn.ca/
USA	American Nurses Association	https://www.nursingworld.org/
	American Association of Colleges of Nursing	https://www.aacnnursing.org/
	American Academy of Nursing	https://www.aannet.org/home
	Alliance of Nurses for Healthy Environments	https://envirn.org/
	National Student Nurses' Association	https://www.nsna.org/
International	WHO	https://www.who.int/home
	International Council of Nurses	https://www.icn.ch/
	Secrétariat international des infirmières et des infirmiers de l'espace francophone	https://sidiief.org/
	Nurses Climate Challenge	https://nursesclimatechallenge.org/

Charting of information and data within the included studies

This step will consist of extracting the data from the articles selected following the full-text review. For this purpose, an Excel table will be developed. It will contain the following sections, among others (box 1).

Grey literature search

The consultation of bibliographic databases will be supplemented by a search of the grey literature. To this end, we will consult the websites of nursing organisations. We will focus on nursing organisations in the province of Québec, those active at the federal level in Canada and the USA, and those active at the international level. The following organisations (table 3) were identified through the scientific literature[13 20 22 26] and through a Google search using a combination of keywords related to nursing associations or organisations, climate change and geographical area of interest (active in Canada, the USA or internationally):

In conducting the search of the grey literature, we plan to make use of three strategies. The first strategy will consist of carrying out a search by browsing the sites of the various organisations and consulting their different sections, such as the section on publications. The second strategy will involve searching by keyword using the site's search function along with the keywords we defined for the bibliographic database search. Finally, the third strategy will consist of conducting a Google search combining the name of the nursing organisation with the keywords defined for the bibliographic database search. The data will be extracted into an Excel spreadsheet that will contain the following sections: date of search; site searched; type of search performed (referencing one of the three strategies described above); number of results found; number of results retained; relevant documentation regarding climate change and nursing; content regarding climate change and nursing. The content section may include details about educational programmes, results of educational intervention, curriculum guidelines, recommendations from organisations for education or any relevant content regarding nursing education and climate change. For searches conducted by navigating the sites, the sections consulted will be specified, and for keywords searches, the terms or expressions used in searches will be specified.

Collating, summarising and reporting the results

The data extracted in the previous steps will be analysed by the research team. This analysis may include an informed discussion based on an in-depth examination of the findings and directed toward answering the research question and fulfilling the study's objective.

The search strategies were used in the databases and the grey literature was searched for a first time on 31 January 2022. A second round was conducted on 1 December 2022 to identify additional articles for potential inclusion. Analysis and extraction are currently underway. The scoping review, including the consultation step, is expected to be completed by 30 April 2023.

Arksey and O'Malley[24] and Levac *et al*[25] do not include quality assessment of selected studies as a mandatory step in the completion of a scoping review but recognise it as a limitation of the method. That being said, the interpretation of data may be open to bias. To limit this risk, we work with an interdisciplinary team to consider multiple perspectives during the process. Conclusions of included studies may be summarised narratively and may help us identify gaps in research surrounding climate change, nursing and education.

This scoping review could represent the first step before initiating a systematic review of literature on the subject, which would then allow a critical appraisal of the results of selected studies and suggest recommendations for faculties, organisations or researchers on the integration of climate change in nursing education. The results of this scoping will also set out the basis for the development of studies to specifically address these gaps of knowledge.

Consultation

This step will be used, to share key findings, to obtain feedback on the interpretation of the results and to identify opportunities for knowledge transfer. The stakeholders that will be solicited are other researchers with expertise on nursing education and climate change, undergraduate and postgraduate nursing students, nurse practitioners, and nursing education programmes or faculty members, particularly in Canada.

Ethics and dissemination

Ethical approval is not a requirement for this review because the data collected will be drawn from publicly available documents. The results of this scoping review will also be presented at workshops and conferences organised by nursing organisations or academic institutions or on any appropriate platform.

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Contributors TD led the conceptualisation, design and wrote the manuscript. MR, AB and P-PA made critical inputs. All authors have read and approved the manuscript.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

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