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## Research

## Reconceptualizing nursing curricula for planetary health: A web-based desktop audit

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## ABSTRACT

**Background:** Despite international support for integrating planetary health into nursing curricula from academia, clinicians, and students themselves, there is limited evidence of incorporation into undergraduate curricula in Australia and New Zealand.

**Aim:** To obtain a snapshot of planetary health theory and practice in nursing curricula, to inform future education development at a professional and policy level.

**Methods:** A descriptive study incorporated a web-based desktop audit of preregistration nursing programs in Australia and New Zealand and surveyed program directors to ascertain the perceived level of importance of climate change and carbon emission reduction in curricula.

**Results:** The audit and survey demonstrated sparse evidence of planetary health in the Australian and New Zealand undergraduate nursing curriculum (11%), and the sub-optimal response to a survey regarding the integration of planetary health into the curriculum further supported evidence of limited integration.

**Conclusion:** The pedagogic recontextualization of planetary health within nursing curricula by employing case study concept nodes and utilizing the person-centered care framework by centering patients at the core of planetary health is required to amplify nursing's response to the global health priorities caused by climate change.

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## Introduction

There is a growing consensus among world health leaders, that the urgent need to preserve natural ecosystems cannot be understated (Romanelli et al., 2015; Romanello et al., 2021). It has long been understood that human health is wholly dependent on flourishing natural environments, and disruptions to these environments have detrimental impacts on achieving optimal health (United Nations, 2012). Climate Change is widely regarded as the greatest threat to human health, and it can potentially disrupt many of our time's global public health advancements (World Health Organisation [WHO], 2023). The International Panel on Climate Change (IPCC) has outlined that extreme weather events will continue to increase with greater frequency and severity in years to come if global

warming is not kept within acceptable limits of 1.5 degrees Celsius (IPCC, 2022b).

Extreme weather events not only have primary impacts on communities during direct exposure (IPCC, 2022a), but they also result in social disruption that culminates in suboptimal environments for public functioning and healthy living (Butler & Harley, 2010). Intensification of heat-related mortality and illness (Hanna & Tait, 2015; Wu, et al., 2023); a rising presence of vector-borne diseases (Franklinos et al., 2019); and mechanical injuries are all examples of the health consequences that may be sustained during extreme weather events, particularly across vulnerable populations (Kriebel-Gasparro, 2022). The effects of such threats detrimentally impact mental health, where increases in climate change anxiety are already being identified (Paolo et al., 2020). Additionally, air pollution (Orellano et al., 2020), loss of biodiversity and degradation of food and water systems, collectively threaten optimal human health; prompting urgent calls for health professionals at all levels to take action (Travers et al., 2019; Whitmee et al., 2015).

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E-mail address: [n.tutticci@griffith.edu.au](mailto:n.tutticci@griffith.edu.au) (N. Tutticci).<https://doi.org/10.1016/j.teln.2024.06.016>1557-3087/© 2024 The Authors. Published by Elsevier Inc. on behalf of Organization for Associate Degree Nursing. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>)

The transdisciplinary paradigm of planetary health encompasses the health of the entire planet and the complex interactions between threats such as climate change, our ecosystem and human health (Martin et al., 2024). To influence actions that advance global receptivity to the threat of climate change, planetary health education must be made widely available and prioritized for all health professionals (WHO, 2023; Shea et al., 2018). Nurses, as the largest health profession, must be supported to advance their knowledge and competence in the area of planetary health (Diallo et al., 2023; Griffin et al., 2022) and, as recognized leaders in addressing national and global health priorities, nurses are well positioned to respond to the health impacts imposed by climate change and ecosystem shifts (Richards et al., 2023; Rosa et al., 2021). As populations and communities already experiencing health inequities are more likely to be impacted by climate change, nurses must support vulnerable groups across multiple levels of influence (Leffers et al., 2017). This includes policy and clinical leadership in providing fundamental care to all people despite prevailing contextual influences (Kitson et al., 2023).

Global support for integrating themes of planetary health into nursing curricula at all levels is emerging (Leffers et al., 2017; Lilienfeld et al., 2018; McDermott-Levy et al., 2019). For example, the Massachusetts General Hospital (MGH) Institute of Health Professionals in the United States established the Centre for Climate Change, Climate Justice, and Health (CCCCJH) to advance the priorities of nursing scholars (Neal-Boylan et al., 2018), and The University of Minnesota, School of Nursing, Centre for Planetary Health and Environmental Justice. Through offering symposiums and education programs, the CCCCJH provides a platform for leadership and communication with legislators to advance the development of nursing competence in climate and health. Further, International Groups such as the Alliance of Nurses for Healthy Environments (ANHE) (ANHE, 2022), the Global Consortium on Climate and Health Education, funded by the Rockefeller Foundation (Sullivan-Marx & McCauley, 2017), Healthcare Without Harm and the Nursing Collaborative on Climate Change and Health facilitate opportunities for collaboration between nursing scholars across organizations on national and international platforms. The formation of these collaboratives has resulted in the development of key networks such as the Global Nurses Climate Challenge and the Global Nurses Working Group which support access to education materials for nurses internationally (Amerson et al., 2022).

Recent studies have suggested that nursing students are also favorable to the inclusion of climate and health-related content in their education programs (Álvarez-Nieto et al., 2022; Richardson et al., 2015; 2016; Ryan et al., 2020). A study examining environmental attitudes found that nursing students with less knowledge of the links between the environment and health demonstrated fewer positive attitudes toward environmentalism, whereas positive attitudes developed through participation in training programs (Cruz et al., 2018).

Despite these advancements, the integration of planetary health education into nursing schools globally, is suboptimal, with very few nursing programs integrating this material into their programs (Amerson et al., 2022; Eide & Odom-Maryon, 2019; Flatten et al., 2023). Barriers to implementation have been found to include a lack of knowledge and skills from educators themselves in teaching planetary health to students (Martin et al., 2024). Furthermore, strict regulatory requirements for Nursing Degree programs, as set out by nursing registration bodies (for example State Boards of Nursing in the United States of America and The Australian Nursing & Midwifery Accreditation Council in Australia), underpin the ongoing perception that nursing curricula are already too crowded (Dalley et al., 2008). Consequently, nurses are not consistently and adequately educated to address the risks and impacts of climate change (Barna et al., 2012; Xue et al., 2020) and remain vastly underutilized in the efforts to mitigate the risks and impacts of climate change (Ward, 2022). However,

modern approaches to curriculum development could incorporate the lessons learned in other contexts and focus on student-centered (Epp et al., 2021) concept-rich curricula (Giddens & Brady, 2007).

There is presently a paucity of literature on the implementation of planetary health education provision across Australian schools of nursing. This web-based desktop audit aimed to obtain a snapshot of planetary health theory and practice in nursing curricula, to inform future education development at a professional and policy level. Web-based desktop audits quantify publicly available information (e.g. subject outlines/course descriptors) regarding specific learning objectives and assessment items published on university websites for preregistration/licensure nursing programs (Mistry et al., 2019).

Despite the well-established links between climate change and health (WHO, 2023), the researchers were cognizant of the persistent knowledge/research implementation gap (Balas & Boren, 2000), in addition to curriculum innovation barriers. Therefore, a range of planetary health content was anticipated to be embedded in Australian and New Zealand Nursing Curricula from extensive to minimalist, and from explicit to implicit from undertaking this audit. Nursing Bachelor of Degree programs in Australia and New Zealand are also referred to as preregistration, similar to prelicensure nursing programs.

The study specifically addressed three research questions:

- Q1. What units/courses/subjects in preregistration nursing programs include the use of (either stand-alone or in combination) sustainability, *planetary health*, climate, climate health, *environmental determinants of health*, emissions reduction in the course code name, learning objectives, or learning outcomes?
- Q2. Were there any stand-alone courses offered in climate change, climate health, sustainability, *planetary health*, or emissions reductions that preregistration nursing students could enroll in?
- Q3. What was the perception of preregistration nursing faculty directors/program directors about the inclusion of climate change and *planetary health* in preregistration nursing education?

## Methods

This study's descriptive design incorporated a web-based desktop audit of university preregistration nursing curricula and a mixed-method, online cross-sectional survey using closed and open-ended questions. The study design replicated a published, peer-reviewed study using the same two data collection methods (Mistry et al., 2019) and the qualitative component was undertaken using the Standards for Reporting Qualitative Research (SRQR) (O'Brien et al., 2014). The web-based desktop audit and survey were administered concurrently in November 2022, to all Australian and New Zealand universities offering preregistration Nursing bachelor's programs. The inclusion criteria for both data collection approaches were as follows: 1) Australian and New Zealand universities, and 2) offering a preregistration Bachelor of Nursing Program.

Details for all Australian universities offering Bachelor of Nursing (preregistration) programs were sourced from the Australian Health Practitioner Regulation Agency (AHPRA) website. New Zealand preregistration programs were sourced from the Nursing Council of New Zealand. A list of names, emails, and phone numbers for faculty teaching directly into the Bachelor of Nursing curriculum or coordinating (program director) the preregistration nursing program at respective universities was collected using publicly accessible university websites. Thirty-six universities were identified and were invited to participate in the research study, with the expectation of having one faculty member per university program participate in the study to share information about their university curriculum.

The audit of eligible universities captured the university name and degree structure (single or dual), the program type (i.e., preregistration, mode of delivery) and included the course description (Course Name/Course Code/Subject), learning outcomes, and content for each subject that included the terms sustainability, *environmental determinants of health*, climate change, climate, climate health, carbon emissions, emissions reduction, and *planetary health*, if available. Auditing of stand-alone climate change, climate health, sustainability, *planetary health*, or emissions reduction courses offered to preregistration nursing students was also included. Terms were selected from an extensive review of the literature in climate health and nursing education, and expert consultation to ensure selected terms were comprehensive and captured the critical elements of the audit. Expert review prioritized terms for academic relevance and practical significance in nursing curricula and relevance to preregistration nursing knowledge necessary to address the health impacts of climate change. Upon review of published information by universities about each course, two main questions were asked to explore climate change and health content covered in preregistration bachelor nursing programs. Responses to question number two were scored 0 or 1 (0 = No and 1 = Yes). The questions addressed in the audit were:

- 1) What units/courses/subjects in the preregistration Bachelor of Nursing include the use of (either stand-alone or in combination) sustainability, *environmental determinants of health*, climate change, climate, climate health, carbon emissions, emissions reduction, and *planetary health* in the course code name, learning objectives or learning outcomes? and
- 2) Are there any stand-alone courses offered in climate change, climate health, sustainability, or emissions reduction that preregistration Bachelor of Nursing students can enroll in?

The survey for this study similarly identified student demographics: entry pathways (i.e., 3-year bachelor's degree, direct entry into the second year of the 3-year bachelor's degree, transfer from another university) and course cohort size for each university, yet differed by including climate change and health-related course descriptions, barriers, and enablers to the inclusion of climate change and planetary health into preregistration nursing bachelor programs, graduate attributes linked to climate change and health and future opportunities and challenges (Supplementary file). Preregistration Bachelor of Nursing Program Directors' perceived level of importance for climate change and carbon emission reduction in curricula, was measured by Likert scale responses. Open-ended survey responses were thematically analyzed individually by two authors (NT and TT) and then collaboratively (NT and TT), to identify key themes for strengths, weaknesses, and facilitators for inclusion of climate change and carbon emission reduction content in Bachelor of Nursing curricula. Survey data was collected using LimeSurvey®. The survey link was emailed to participants in November 2022 and was open for 8 weeks and a reminder email was sent to participants after 2 and 4 weeks. Survey responses were de-identified. Consent was implied with survey completion as per the approved ethics process (Human Research Ethics Council approval number H22REA278).

## Results

Web-based desktop Audit: Four (11%) of the 36 Bachelor of Nursing programs included climate change and health-related terms in the course description (Course Name/Course Code/Subject), learning outcomes, and content. The frequency of terms was Sustainability (n=2), *environmental determinants of health* (n=2), and climate change (n=2), and these terms were included in the University of Southern Queensland (n=2), Monash University (n=1) and Charles Darwin University (n=1) course descriptions and/or content. The

audit terms (sustainability, *environmental determinants of health*, climate change, climate, climate health, carbon emissions, emissions reduction, and *planetary health*) were mentioned 6 times in the audit of 36 Australian and New Zealand Bachelor of Nursing programs.

The web-based desktop audit analyzed course learning outcomes and content using a word cloud generated by web-based software (Zygomatic, 2023). This word cloud (Fig. 1) provides a visual source of analysis and synthesis. The Q1 word cloud highlights words by displaying them in order of frequency by the size of the font. Health is the most commonly occurring term, with only Auckland University of Technology linking human health with *planetary health*, all other mentions of health were in the context of human health for both course learning outcomes and content, except for the analysis of principles and goals of global health. Social was the next most frequently reoccurring word, used to describe justice, a determinant of health and the strength of relationships (cohesion). Social (and social justice) were mentioned in the context of both terms, sustainability, and *environmental determinants of health*.

Survey: Of the possible 36 Australian and New Zealand universities, with preregistration nursing programs, four responded to the online survey (response rate 10%). Table 1 provides an overview of the university's demographic data. Due to the low response rate, insufficient data was available for descriptive statistical analysis. Likewise, the free-text responses were insufficient for coding and thematic analysis. Whilst statistically insignificant, the responses still provide insight into the current inclusion of climate and environmental health in the Australian and New Zealand preregistration curriculum.

The survey began by asking "Is climate and environmental health integrated into the Bachelor of Nursing curriculum at your university". Of the four responses, participants One and Four provided a "No" response (see Appendix 1 for survey questions). If a "no" response was received in this question the participants were then asked if there were plans to implement climate change education into the curriculum. Participant One provided a "no" response and no further information. Participant Four provided a no response however indicated:

"It does (need to be implemented) as this is very important and something that our students need to be aware of".

Two of the 4 survey respondents indicated that climate and environmental health were included in their preregistration Bachelor of



Fig. 1. Q1 Word cloud highlighting most frequently occurring words related to course learning outcomes and content.

**Table 1**  
Web-based desktop audit demographics.

Respondent	1	2	3
Total no. of students enrolled in the BN BN entry pathways	1500 Year 12 or equivalent or 2nd Year entry for previous degree or Diploma of Nursing	3000 As per university guidelines	Approximately 1000 Year 12 or equivalent or 2nd year entry for previous degree or Diploma of Nursing
Percentage of domestic to international students	Data not reported	90% domestic 10% international	Approximately 70% domestic 30% international
Is climate and environmental health integrated into the BN?	Yes	Yes	No
What year of the degree is this unit of study offered?	2nd year	1st and 3rd year	N/A

Nursing program. The inclusion varied and was indicated to be across the first, second, and third years. In the second year, this course was compulsory for students and involved 16 hours of tutorials. Of the two participants who indicated inclusion in their course, only one responded to the following topics included in the course: Emissions reduction, Climate and Health, Sustainability, Waste management, Environmental or climate activism or advocacy. Learning objectives related to these topics were as follows:

*“Demonstrate an understanding of the impact of planetary change on health including globalisation, migration, climate change, pandemics, and environmental sustainability”* (Participant 2).

One participant provided responses on the barriers and enablers to the inclusion of climate change information in the curriculum. Enablers were indicated to be:

*“Supportive teams and knowledge and awareness of climate change and its impacts on health”* (Participant 2).

Barriers were identified as

*“awareness of climate is not a Nursing standard and the curriculum is crowded. As climate change is one of the biggest issues facing global health, it would be helpful if there was an additional Australian Nursing and Midwifery Accreditation Council (ANMAC) requirement for knowledge about climate change to be embedded in the curriculum”* (Participant 2).

Interestingly, even when climate change was not included in the current curriculum, barriers to implementation were not identified:

*“We feel we have a very progressive program and are constantly identifying topics that need to be covered”* (Participant 4).

## Discussion

The near absence of planetary health and climate change in Australian and New Zealand nursing curricula highlights the well-known gap between research implementation and uptake. Our findings provide an important baseline, establishing the current state of planetary health education provision across Australian and New Zealand schools of nursing. This snapshot of nursing curricula, about planetary health content, is emblematic of the ongoing struggle that nursing educators face. In health education and beyond there is a tension between, on the one hand, ensuring appropriate governance of nursing degree content, as required by regulatory authorities (at a minimum) and, on the other hand, passing the litmus test of contemporaneity, whereby teaching content remains relevant to the prevailing zeitgeist. The notion of over-crowded curricula (Dalley et al., 2008) becomes a routinely stated barrier to the exploration of new concepts. As leaders in our field, nursing academics are implored

to “provide leadership in embedding SDGs in curricula enabling the next generation of nurses and midwives to be positive mediators in creating health and social-economic policy” (Frazer & Davidson, 2022 p.3889). The exploration of planetary health and Sustainable Development Goals (such as climate action) may not be mandated in nursing degrees; however, we must not shy away from “(we) must not become a neutral observer in the Culture Wars, unable or unwilling to contribute collegially to difficult or contentious discussions or debates, fearful of ‘offending’, or ‘saying the wrong thing’, or of personal, professional, or organizational punishment. There is too much at stake here for nursing not to ‘speak truth to power’, regardless of where such power lies” (Darbyshire et al., 2020 p. 2788).

These audit results may indicate a lack of awareness of the depth and breadth of planetary health as a problem which relates to nursing, and thereby highlight a gap, and an opportunity to meaningfully integrate critical thinking about these important concepts in nursing curricula, and curricula implementation processes. The literature is rich with rationales for ‘why’ we need to innovate nursing curricula for planetary health (Astle, 2021; Best et al., 2023) however, as our audit indicates, international policies, recommendations and contemporary research evidence are not readily incorporated in nursing curricula, and there are few examples of ‘how’ these changes should be implemented (Hess & Rihtman, 2023; Martin et al., 2024; WHO, 2023).

## Centering the Patient/Person/Community in Planetary Health and Climate Change Nursing Practice

As Registered Nurses, Nurse Educators and Students of Nursing we intuitively locate the person/patient or community at the center of our practice. It is the primary role of nurses to provide fundamental person-centered care, in all circumstances/contexts, and to have an understanding and insight into these contexts of care (Kitson et al., 2023). A person-centered approach to planetary health will inevitably result in the realization that the people and patients that we care for as nurses are already being impacted by shifts in planetary health, most impactfully, climate change. Conceptualizing planetary health as person-centered care is a necessary evolution in nursing curricula.

## Considerations in Contemporary Curriculum Planning and Implementation

Contemporary approaches to curriculum development and implementation must go beyond the discussion of content saturation, to more fruitful considerations of concept-based curricula (Giddens & Brady, 2007) and student-centred pedagogic constructivism (Epp et al., 2021; Vygotsky, 1978). In a social constructivist paradigm, nursing students are active collaborators in their learning, they learn to apply high-level knowledge, engage in thinking and reasoning, and consider their professional identity as a nurse, as they address complex problems (Epp et al., 2021), such as the risks and impact of climate change on health care systems and the provision of nursing

care. These considerations are essential to integrating planetary health within nursing curricula, to ensure nurses can respond to the global health priorities emerging from climate change's impacts.

### Theorizing Opportunities for Pedagogic Recontextualization of Planetary Health and Climate Change in Nursing Curricula

In this milieu we have reflected on these audit results, using Bernstein's principles of pedagogic discourse (1990; 1996; 2000) as a touchstone for theorizing the broader pedagogic field of practice, featuring knowledge creation and recontextualizing fields, and examples of relevant agents in these fields. In our theorization of opportunities for the pedagogic recontextualization of planetary health and climate change in nursing curricula (Fig. 2) (Bernstein, 1990 p. 197; Hordern, 2021; Whatman & Singh, 2015 p. 224) we have sought to consider the barriers to the implementation of knowledge into curriculum practice by conceptualizing the utilization of "case study concept nodes" in the purposeful, and collaborative, recontextualization of planetary health and climate change knowledge by key agents in the pedagogic recontextualizing field (e.g. academics, tutors and students). Central to Fig. 2 are examples of bounded units of knowledge related to planetary health that teachers can engage with and recontextualize when teaching.

By implementing case studies nodes (Fig. 2) that link with existing key nursing curriculum/scope of practice and leadership concepts, for example, a case study on heat waves and emergency department (ED) patient care (Wu, et al., 2023), agents (namely academics and tutors), in the pedagogic recontextualizing field, take on a leadership role in the mediation of knowledge into pedagogic practice. Importantly, the role of teachers in recontextualization of knowledge is acknowledged (Hordern, 2021). Our theorization recognizes the tightly bounded nature of accredited nursing curriculum content and posits "case study concept nodes" as a meaningful articulation between the broader knowledge context and contemporary nursing scope of practice with the recognition of person-centered care as a central concept.

### Recommendation

The authors recommend that the BN web-based desktop audit be repeated in 3 to 5 years, as BN cycles for accreditation are of 3-year duration, along with emerging research in this area by Australian and International Nurse Leaders. We also recognize the importance of laying the foundations for an analytical approach to retrospective and prospective investigation, of climate change impacts on the health of individuals and communities.

### Limitations

Our study has clear limitations, with a poor response rate to the survey our findings cannot be broadly generalized. Also, responses were incomplete, which could be indicative of survey fatigue or a reluctance to disclose inadequacies in the curriculum of the respondents, additionally, planetary health is a relatively new consideration in the broader sphere of nursing curriculum innovation.

Our theorization of the pedagogic recontextualization of planetary health and climate change in nursing curricula should be considered a starting point for discussion. In future conceptualizations more consideration could have been given to power and control relationships, between actors, and the intricacies of knowledge classification and framing throughout the broader field of practice (Bernstein, 1990; Hordern, 2021; Whatman & Singh, 2015).

### Conclusion

This exploration of the extent of planetary health education provision in Australia provides a timely snapshot of implementation gaps in this important area. Our theorization of opportunities for pedagogic recontextualization of planetary health and climate change in nursing curricula, via "case study concept nodes", represents a robust contribution to discussions regarding curriculum innovation on this topic, with applicability for curriculum implementation more generally. By centering the patient within planetary health considerations,

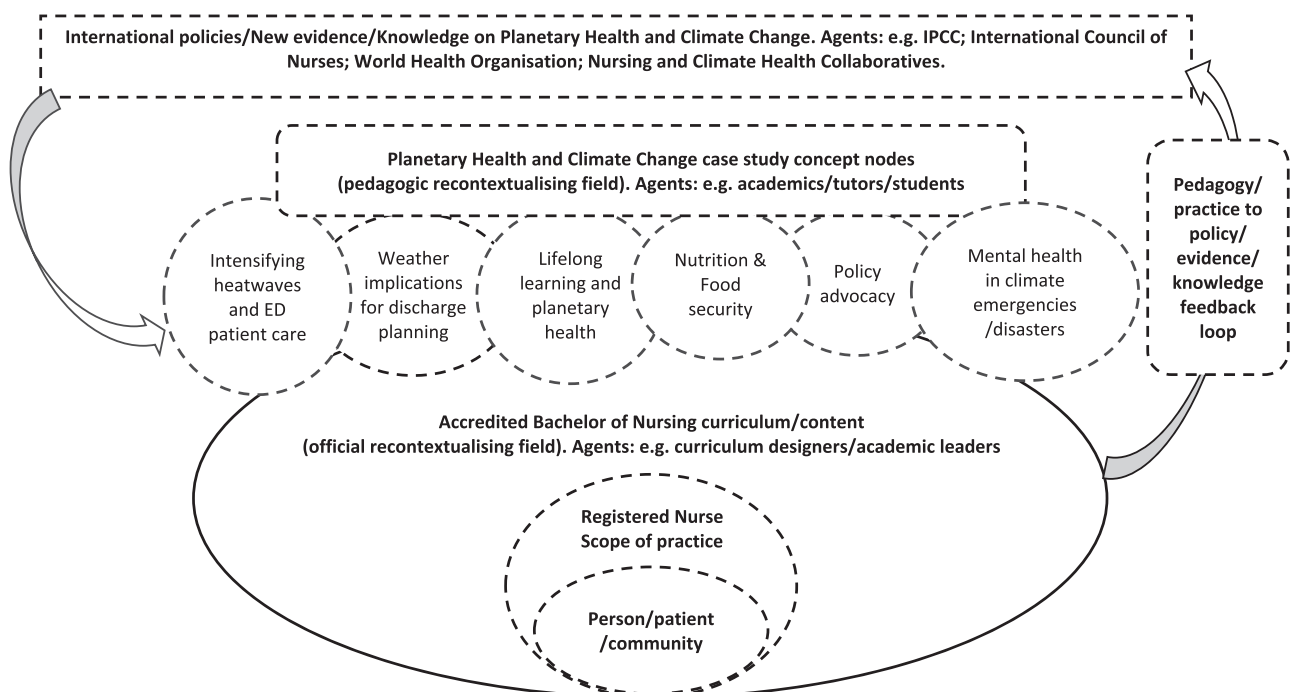


Fig. 2. Theorizing opportunities for pedagogic recontextualization of planetary health and climate change in nursing curricula via case study concept nodes (adapted from Bernstein, 1990 p. 197; Whatman & Singh, 2015 p. 224).

in everyday person-centered care, the discipline of nursing can make a compelling contribution to ensure healthcare is prepared for and responsive to the global health challenges caused by climate change.

### Declaration of competing interests

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Naomi Tutticci declares that a co-author Dr Aletha Ward is a guest editor for the special edition 'Transformative Education for Nurses in the Anthropocene', of which this manuscript is being submitted for consideration.

### CRedit authorship statement

**Naomi Tutticci:** Conceptualization, Formal analysis, Methodology, Writing – original draft, Writing – review & editing. **Letitia Del Fabbro:** Conceptualization, Formal analysis, Methodology, Visualization, Writing – original draft, Writing – review & editing. **Catelyn Richards:** Writing – original draft. **Tracey Tulleners:** Formal analysis, Methodology, Writing – original draft. **Devika Varsani:** Investigation, Validation. **Odette Best:** Conceptualization, Methodology, Writing – review & editing. **Aletha Ward:** Conceptualization, Investigation, Methodology, Project administration, Writing – original draft, Writing – review & editing.

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### Supplementary materials

Supplementary material associated with this article can be found in the online version at [doi:10.1016/j.teln.2024.06.016](https://doi.org/10.1016/j.teln.2024.06.016).

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