QANE AFI | Quality Advancement in Nursing Education
Avancées en formation infirmière

CASN ACESI

Volume 12 | Issue 1 Article 9

Student Voices to Integrate Planetary Health Into Nursing Curriculum

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Planetary health is emerging as a significant global framework for research, practice, and education—including in health professions—to address humanmade changes to the planet, such as climate change, pollution, and species extinction (Myers & Frumkin, 2020). Planetary health is "a solutions-oriented, transdisciplinary field and social movement focused on analyzing and addressing the impacts of human disruptions to Earth's natural systems on human health and all life on Earth" (Planetary Health Alliance, 2025, para. 1). There is tremendous momentum in youth action on planetary health that demands a response from nurse educators to demonstrate leadership for mitigating climate change and preparing the next generation of nursing leaders. Youth aged 10 to 24 are currently the largest generation in history, driving a powerful movement for climate change action and advocating for urgent systemic reforms (United Nations, n.d.). Greta Thunberg, for example, is a global leader from Sweden who has become an icon for the protection of our planet and climate action (Alter et al., 2019). In Canada, young activists like Sophia Mathur, a teenager from Sudbury, are challenging Ontario's climate policy in the country's highest court (The Canadian Press, 2025). It is inspiring to witness youth on a global scale advocating for a healthy planet and future. This movement demands transformation across sectors contributing to climate change, including health care.

One way nurse educators can respond to and support this advocacy is to hold meaningful discussions with students about their learning expectations for climate change action, environmental/ planetary health, and, importantly, how they may affect their future nursing practice for a healthy planet. A future-oriented nursing curriculum needs to give voice to students, the next generation of nurse leaders. Hence, in this study we explored *how* nursing students across all stages of undergraduate studies at a university in Atlantic Canada wish to be engaged in learning about planetary health, in what way they identify with the climate action movement, and what changes to our curriculum could better prepare them for environmentally sustainable nursing practices. This study provided opportunities for engaging bachelor of science in nursing (BScN) students to inform how nursing education can integrate planetary health, including climate change action, across an entire undergraduate curriculum.

Urgency for Climate Action and Planetary Health in Nursing Education

The urgency for action in response to unprecedented, catastrophic events related to climate change has never been greater. The *Health of Canadians in a Changing Climate* (Berry & Schnitter, 2022) report urges decision makers to prepare for significant health impacts by increasing collaboration among sectors to implement strong adaptation measures. The evidence of climate change is unequivocal, and 2024 was one of the hottest years on record globally (National Aeronautics and Space Administration, 2024), with direct consequences, such as ravaging forest fires and torrential floods. Canada experienced unprecedented weather extremes in 2023, which was Canada's worst year for wildfires, resulting in seven times the 10-year average of forests consumed by fires. That year also saw 82 tornadoes, most notably a tornado in Alberta that reached a wind speed of 275 km/h (Government of Canada, 2024). Extreme weather events will continue to result in enormous economic and human burdens through displaced populations, unexpected loss of life, and infrastructure costs for repairs. Further, intense heat and high temperatures are linked to excess mortality (Masselot et al., 2023), climate-driven infectious vector-borne diseases, and the melting of permafrost threatening entire communities in the Global North. Global warming due to carbon dioxide emissions in the atmosphere has direct and indirect population health consequences. Heat stroke, drowning, infections, injuries, displacement, homelessness, increased stress and mental health issues, prolonged drought, and water and food insecurity are all related to global warming (Nicholas et al., 2021). Further, severe environmental health concerns beyond global warming contribute to increased risk of chronic diseases, including pollution of air (e.g., particulate matter, volatile organic compounds), soil (e.g., pesticides, fertilizers, heavy metals), and water (e.g., plastic, chemicals,

metals); loss of species (which are needed for ecosystem balance, pharmaceuticals, agriculture); and resource depletion (e.g., food insecurity, Earth's capacity to absorb pollution) (Romanello et al., 2021; Watts et al., 2015). Health care systems both contribute to and are affected by climate change, accounting for almost 5% of global greenhouse gas emissions through energy use, waste production, and resource consumption, while also facing growing pressure from climate-related health issues, such as extreme heat, infectious diseases, and mental health challenges (Tee et al., 2024). According to Health Canada (Berry & Schnitter, 2022), the health sector must show leadership in reducing greenhouse gas emissions, as the future health of Canadians depends on such action.

The groundbreaking publication of the *Lancet* Commission on Planetary Health in 2015 (Whitmee et al., 2015) was followed by the *Planetary Health Education Framework* (Faerron Guzmán et al., 2021; Faerron Guzmán & Potter, 2021). Shortly thereafter, the Canadian Association of Schools of Nursing (CASN) adopted planetary health into its *National Nursing Education Framework* (CASN, 2022). According to the Canadian Nurses Association (CNA), "as nurses, we must integrate planetary health into our practice, advocacy and leadership" (CNA, 2024, p. 1). A baseline survey (Astle et al., 2025) to ascertain the integration of planetary health into curricula of Canadian schools of nursing in 2024 revealed a beginning uptake of related concepts.

Nurses, as frontline health care professionals, have a critical role to play in this transformation. Their unique position allows them to advocate for environmental sustainability in health care settings, educate patients and communities on climate-related health risks, and actively participate in shaping policies that promote planetary health. CNA (2024) asserts that "nursing education must acknowledge the inherent interconnections between human and ecosystem health and opportunities for integrating planetary health into their practice" (p. 1). To meet the demands of this transformation, nursing education must evolve. Nurse educators are called upon to engage students in meaningful conversations about their expectations for climate change action, planetary health, and how these issues will shape their practice as future health care leaders. A future-oriented nursing curriculum must not only provide students with the skills and knowledge to address climate-related health challenges but also empower them to lead the change towards a sustainable health care system.

Student voice for planetary health and climate change action is critical. Hanley and Jakubec (2019) found that students are asking for an early integration of environmental health content into curriculum. Leading scholars in environmental health call upon educators of health professions to integrate the ecological determinants of health to the same extent as they do the social determinants of health (Hancock et al., 2015). To date, the undergraduate curriculum framework of our school of nursing does not adequately address ecological determinants of health or planetary health. This study represents an important first step in engaging nursing students and building supportive evidence of recommendations to integrate planetary health into our undergraduate curriculum.

Student Voices in Curriculum

The concept of inviting student voices into the development of curriculum in higher education has many proponents who advocate for a participatory approach to engaging students in co-designing their own educational goals (Maunder et al., 2013; Organisation for Economic Co-operation and Development, n.d.; St. John & Briel, 2017). Eliciting students' perceptions and experiences through participatory engagement within curriculum design is consistent with a student-centred approach to pedagogy in higher education. From this lens, students are viewed as valuable partners and co-creators of continuously improving their curriculum, often increasing shared responsibility for learning, which results in tangible benefits, such as improved academic achievements (Brooman et al., 2015; St. John &

Briel, 2017). Student participation in curriculum design should be regarded as part of an ongoing process rather than as a consultation process when curriculum requires revisions (Carey, 2013). Moreover, participatory approaches are aligned with critical theories of pedagogies in which power dynamics are intentionally shifted and shared between teachers and students (O'Neill & McMahon, 2012; O'Reilly & O'Grady, 2024). Paolo Freire's (2004) dialogic epistemology claims that people come to understand something by engaging with each other in critical reflective conversations. Critical dialogue, then, enables exchanging views and ideas, recognizing assumptions, and, most importantly, recognizing common goals and opportunities to create a shared future.

Scenario thinking offers a powerful tool for imagining and co-creating the future of nursing education. "Scenarios and narratives are well-suited to moving beyond constraints of 'what is,' helping to inform and frame 'what should be,' and then moving towards designing and engaging 'what could be' as a precursor to 'what can be'" (Brown et al., 2010, as cited in Poland et al., 2020, p. 173). This forward-thinking methodology is similar to appreciative inquiry, which seeks to establish a shared vision for a positive future. Both approaches will be explored further in the methodology section below.

Design and Methodology

The purpose of this study was to include student voices into the curriculum design process to address climate change action, including the ecological determinants and planetary health within nursing education. We examined students' perceptions of climate change action or of acting as environmental stewards. By exploring students' perceptions of their future role as environmental stewards and leaders in climate health, we aimed to better understand their views of our current nursing curriculum and provide recommendations for embedding planetary health into nursing education.

Study Objectives

This study aimed to achieve the following objectives: a) to engage students in a dialogue about their identification with climate change action and planetary health; b) to involve nursing students in scenario thinking about climate change action and planetary health; c) to explore ways to fully integrate climate change content and planetary health into the curriculum; and d) to inform the development of an ecologically responsible nursing curriculum.

Methodology

Appreciative inquiry was chosen as the guiding research methodology for this study as particularly well suited to fostering positive, participatory engagement in curriculum development (Kadi-Hanifi et al., 2014). Appreciative inquiry emphasizes inclusivity and collaboration, positioning students as co-designers of their educational experience. By focusing on positive, affirmative questions, appreciative inquiry encourages the exploration of opportunities for innovation and growth, with the inclusion of student voices at the centre. Its philosophical underpinnings are congruent with Thunberg's Fridays for Future movement as it "seeks to engage key stakeholders in the conversation from the outset and involve them all in establishing their shared vision for a positive future" (Kadi-Hanifi et al., 2014, p. 586). We applied an adapted appreciative inquiry methodology using a four-stage process to engage participants in a discovery phase, a dream phase, and a design phase, followed by a destiny phase (adapted from Kadi-Hanifi et al., 2014).

1. Discovery phase: *Sharing positives*, focusing on strengths by asking, "What are we doing right?"
2. Dream phase: *Sharing a vision*, envisioning an ideal future by asking, "What would an ideal curriculum look like?"
3. Design phase: *Sharing what we think should be*, identifying guiding principles by asking, "What will be our guiding principles?"
4. Destiny phase: *Sharing a commitment to change*, committing to change by asking, "What are our first steps towards this future?"

Data Collection

Focus groups were the primary data collection method, offering a structured space for dialogue and collective exploration of ideas (Brooman et al., 2015; Maunder et al., 2013; Mitra et al., 2012). Focus groups enable consciousness-raising and collaboration towards solutions (Watson et al., 2020). Student participation in focus groups is often a preferred method as it offers opportunities for personal reflection and peer networking, thus enhancing engagement and learning (Khatamian Far, 2018), which is in line with our proposed methodology. Providing students an opportunity to participate in timely research that is relevant to their own practice has the potential to enhance participation and benefit students through self-discovery and networking opportunities (Cyr et al., 2013; Khatamian Far, 2018). We employed a semi-structured interview guide informed by the phases of appreciative inquiry. We opened the interviews by asking about participants' understanding of the relationship between climate change and health, followed by asking what content they would expect to see in our curriculum, and what they believed the nursing role to be within the health care system.

Participants

For this study, undergraduate nursing students from all semesters (one through eight) at a university in Atlantic Canada were invited to participate. Specifically, we aimed to recruit six to eight students per semester for a total of 40 participants. A self-select sampling method (Maunder et al., 2013) was employed, wherein students were invited via email. To increase participation, recruitment materials were shared by student collaborators, by course professors, and through course platforms (e.g., Brightspace). Potential participants were sent email reminders to confirm the date, time, and location of focus groups. Focus groups were held on campus (a familiar location) and scheduled to ensure no conflict with class or exam times. Participants received a $20 gift card to a local coffee shop or grocery store of their choice. Consent forms were emailed to students who agreed to participate and were available at the beginning of focus groups for signatures. This study received approval from the research ethics board at the university (#2024-7055).

Analysis

Data from focus groups were collected using flip-chart notes and audio recordings. Data analysis followed Braun and Clarke's (2022) six-step thematic analysis process: 1) become familiar with the data, 2) generate initial codes, 3) search for themes, 4) review themes, 5) define themes, and 6) write up findings. Specifically, the primary investigator and research assistant replayed the audio recordings and reviewed the corresponding notes from the flip charts to generate initial codes, which were further synthesized into themes. The codes and themes were reviewed and discussed with the entire research team, including students, until consensus was reached. Findings from the focus groups were synthesized into a draft report, which was reviewed again by all team members. To ensure the accuracy and relevance

of findings, we invited students from all focus groups to provide feedback and co-present the report with the research team to the curriculum committee for consideration. Thus, the student voice was central to data collection and analysis and knowledge translation and produced evidence for curriculum design.

Findings

A total of 18 students from the BScN program at a university in Atlantic Canada participated in the focus groups, representing a recruitment rate of 45% of our intended target of 40 students. In total, we conducted four focus groups. The initial three focus groups were conducted with cohorts from semester 3 (two students), semester 5 (eight students), and semester 6 (one student) between May 21 and May 30, 2024. One final focus group was conducted on January 20, 2025, with a combination of cohorts from semester 2 (four students) and semester 4 (three students). During each focus group, a project team member was responsible for notetaking, while a research assistant facilitated the discussion. Focus groups were audio-recorded and analyzed by the primary investigator and research assistant. The average focus group lasted approximately 45 minutes.

We met our objectives by engaging the participants in scenario thinking. Three themes emerged from the data. In the first theme, participants shared their perspectives on climate change and planetary health. In the second theme, the participants shared their opinions about our current nursing curriculum. In the third theme, participants identified the roles of nurses in helping to mitigate climate change.

Theme 1: Perspectives of Nursing Students on Climate Change and Planetary Health

When asked about their understanding of the relationship between climate change and health, participants responded by identifying phenomena such as poor air quality, rising temperatures, coastal erosion, unpredictable weather events, and natural disasters such as hurricanes and flooding. One participant remarked, “It’s scary. In the past 5 years, the wildfires in Canada have been unprecedented.” The resulting health implications from climate change are well understood by students and were articulated in line with physical and mental health concerns, including cardiovascular issues related to “breathing in toxic air,” cancer related to “ingesting microplastics in our food,” and infectious diseases as result of temperature change and “bug bites.” Mental health concerns were explained by feelings of powerlessness with limited personal choices in the face of unpredictable weather events, expressed as “knowing what I am not able to do versus what I can do in the moment.” Emotional burdens of living through natural disasters, constant stress about the future—“It’s scary as a young person; I don’t know what will happen if I have kids”—and climate anxiety were expressed as “I don’t think people realize how serious it is.”

Theme 2: Planetary Health to Permeate Curriculum

When we asked participants if they had received any education about planetary health or climate change in their nursing courses, they responded by sharing their opinions about perceived shortcomings and opportunities within our current curriculum. They perceived a clear lack of education about climate change. One participant stated, “We honestly don’t talk about climate change at all.” Others thought it was briefly discussed in either the Population Health course or the Foundations of Nursing course but could not identify specifics. One of the participants shared that they had received this content in a non-nursing elective course. Furthermore, according to participants, education about sustainable nursing practices was lacking, as they did not hear about it in any of their courses. One participant voiced, “[Our courses have] zero coverage of this and I would love to [have some]. I think it would be very valuable.” Again, one of the participants heard about this content from outside of our school.

Regarding opportunities in our curriculum to integrate planetary health, specifically content related to climate change and sustainable health care practices, participants suggested there was "space in our leadership" course: "It would feel more meaningful and applicable to a new generation of nurses." The Population Health course or the Foundations of Nursing course would be ideal to expand on the existing minimal content on planetary health. Additionally, participants recommended embedding planetary health within existing content across courses in the curriculum, such as "cancer and carcinogens in the pathophysiology course." A further suggestion was to invite guest lecturers with content expertise; one participant stated, "Have more guidance from leaders in the field. Guest lectures can have a really good impact." Furthermore, participants suggested that opportunities to integrate planetary health into the curriculum could include "advice and guidance during practicums from people with experience." Participants also offered pedagogical strategies to enhance their learning of climate change and planetary health by incorporating teaching-learning strategies and assignments in the form of "research papers/projects that involve collecting evidence in the community," or integrating the content into the school's annual interprofessional health education events. Participants were very enthusiastic during these focus groups and wanted to see more discussion about these issues, as illustrated by the following statement: "Future nursing students are ready to fight. We just need to be given the tools and opportunities."

Theme 3: Advocating for Sustainable Practices

In response to the question of how current students see their future role as nurses, participants shared the following insights. They saw a clear role in climate change mitigation through transportation choices, sustainable practices, and advocacy. To contribute to carbon-neutral or carbon-reduced transportation choices, participants suggested the use of active transportation, public transit, or carpooling as useful actions to mitigate climate change. While these suggestions may be individual choices, participants recommended that schools and employers set an expectation of using these forms of transportation.

The development of sustainable health care practices was a key expectation. Participants expressed that these practices should include reducing single-use plastics at school and clinical/workplaces, transitioning from paper records to electronic records, and enforcing policies on sustainable use of materials for care. One participant expressed, "During clinical I was told to grab as much as I needed and was told to ignore the signs [to use material sparingly]." Similar concerns were voiced regarding the lack of recycling: "I was working in a hospital, and everything was going in the garbage." Participants asked for additional training on how to manage different materials: "We're not taught how to take care of the equipment in a way that is sustainable."

Participants voiced that advocacy has a strong role to play, particularly regarding the need to adopt sustainable practices, including reducing waste and buying or procuring local materials. One participant expressed, "A lot of the material[s] we use in health care are not local. Maybe we can try to reduce the steps of production and transport." Becoming more mindful of daily practices was seen as an important contribution: "It's exhausting, but the role of the nurse is to be an advocate for your patients and for a better workplace." In the following sections, we discuss these findings within the framework of appreciative inquiry, which informs our recommendations to the curriculum committee at our school of nursing.

Discussion and Recommendations

During the discovery phase that aligned with *what is*, participants shared their perspectives about climate change and planetary health. Students' understanding of the implications of climate change on health and nursing practice are reflected in the current literature (Álvarez-Nieto et al., 2022; Astle, 2021; Hanley & Jakubec, 2019). Giving students a voice in curriculum design lays the foundation for a meaningful partnership in orienting nursing education for planetary health.

Participants' understanding of the relationship between climate change and health reflected recent weather events and is consistent with public awareness and scientific research (Masselot et al., 2023; Nicholas et al., 2021). Their perspectives of mental health concerns related to climate change are mirrored by well-established research findings (Clayton, 2020; Daly et al., 2024). Anxiety among youth related to severe weather events has been observed, and nurse educators in Canada have been asked to include content dealing with deleterious mental health consequences related to climate change in entry-to-practice competencies (Clayton, 2020; Daly et al., 2024). Students' understanding of climate change is foundational for nursing practices of health promotion and values of social justice for future generations (CASN, 2022; CNA, 2024). Young people are well informed about climate change and have demonstrated leadership through political action demanding better public policies to mitigate the negative consequences of climate change (The Canadian Press, 2025). Students' perspectives are informed by their lived experiences of local, national, and global events. As nurse educators, we appreciate this awareness, which provides opportunities to further engage with nursing students, building on their existing knowledge and integrating planetary health content into the nursing curriculum. This approach is consistent with emancipatory pedagogy that aims for just societies in which learners critically examine the status quo and engage in dialogue exploring nursing practices that align with planetary health (Freire, 2004). Matahela (2025) promotes Ubuntu, an African philosophy rooted in community, as a pedagogical strategy to promote an inclusive advocacy for social and environmental justice.

Participants recognized the lack of planetary health content in current curriculum and articulated a desire for it to be included. These responses supported findings from a multi-site survey that nursing students place a high value on the inclusion of sustainability and climate change and expect it to be part of their curricula (Álvarez-Nieto et al., 2022). In response to students' requests for tools and opportunities, faculty can integrate available resources into their teaching, such as *The Nursing Toolkit for Planetary Health* (Canadian Association of Nurses for the Environment [CANE] & Canadian Federation of Nurses Unions, 2023), or the Perinatal Planetary Health Assessment Tool (PeriPHAT) (CANE, n.d.), among others.

Participants suggested that health care institutions implement sustainability goals or ratings to keep health care professionals accountable. Tutticci and Huss (2025) recently suggested incorporating sustainable decision-making into clinical reasoning, which would help nurses to broaden their perspective from human health to planetary health. Thus, nurses could contribute to mitigating the high carbon emissions from health care practices.

During the dream phase that aligned with *what should be*, participants recognized gaps in our curriculum and shared ideas of how and where to integrate planetary health content throughout curriculum. Participants recommended procuring health care resources locally. This approach is aligned with what Indigenous Elders advise—health care systems need to become more conscious of and act in relation with their own environment and context (Redvers et al., 2024). Our design phase was informed by the discovery and dream phases. Consistent with a strengths-based approach, we offer three recommendations for the design of our nursing curriculum:

1. Build on students' knowledge about planetary health and climate change. Studies have shown that nursing students' attitudes about the importance of environmental literacy has increased over the past decade (Álvarez-Nieto et al., 2022). The seeds of change towards a sustainable future and planetary health need to be nurtured and students' desire for more content in our curriculum taken seriously.
2. Be explicit about the inclusion of planetary health into the existing curriculum. Clear visibility and articulation of planetary health in our curriculum documents and individual course syllabi will demonstrate a commitment to and facilitate adoption and evaluation of this content. Several existing frameworks can guide this work, including the *Planetary Health Education Framework* (Faerron Guzmán et al., 2025), Indigenous planetary health frameworks (Redvers et al., 2024), and the *National Nursing Education Framework* (CASN, 2022). These frameworks align with the numerous recommendations on how to integrate planetary health in nursing curricula in Canada and beyond (Calaguas, 2025; Castleden et al., 2020; Delnat, 2025; Flaten et al., 2023; Griffin et al., 2022; Martin et al., 2024; Mohamed & Shaban, 2025; Ross & Speirs, 2024; Stephens & Leslie, 2024).
3. Adopt concrete suggestions for planetary health content placement and integration into our current curriculum. Tutticci et al. (2025) suggest an integration of concept nodes whereby planetary health and climate change concepts are integrated as case studies into existing content, such as integrating cardiovascular content with heat stroke and climate change. This approach is consistent with the *Planetary Health Education Framework* that centres on health equity, which is applicable to all nursing content. Our participants also suggested specific courses for the integration of planetary health content, including in courses on population health, foundations of nursing, and leadership. However, as LeClair et al. (2024) argue, placing planetary health content into only a single course addresses the issues from a narrowed lens. Likewise, Redvers et al. (2024) recommend that concepts related to planetary health be connected to context around them—that is, nursing and health care.

The destiny phase aligns with identifying first steps towards action. Astle (2024) articulated a process for integrating planetary health and lists several facilitators, including timing, institutional and departmental support, readiness, space, expertise, and the *Planetary Health Education Framework*. Our school of nursing is well positioned to take advantage of these facilitators given the timing as we strive to align with the *National Nursing Education Framework*. We have institutional and departmental support as our university subscribes to the United Nations Sustainable Development Goals and other environmental initiatives. This study is evidence of readiness of our students' desire to be adequately prepared for planetary health. Regarding space in our curriculum, this study is the first step towards action (destiny phase) with the presentation of the results and recommendations from this study to our school's curriculum committee, which have recently been accepted. As the school moves forward with mapping planetary health across our curriculum, the *Planetary Health Education Framework* will be an invaluable tool. In addition, schools of nursing can participate in the Planetary Health Report Card for Nursing (https://phreportcard.org/nursing/), a student-led initiative to move schools towards embedding planetary health in their curriculum.

Limitations

Students self-selected to participate in this study, which may indicate previous knowledge and particular interest in the topic. We invited all students at our school to participate as collaborators in the

initial research proposal, and three out of seven remained actively involved research team members. Recruiting university students for research studies is a common difficulty (Khatamian Far, 2018).

Conclusion

Student voice for an ecologically responsible curriculum is necessary for the future of our planet. Social justice for future generations requires us to take climate change and planetary health seriously and act responsibly. Knowledge of climate change and planetary health demands that nurse educators plan for the future by equipping nursing students with prerequisite knowledge and skills to advance climate-resilient health systems and equipping this generation of nurse leaders with tools to critically address and engage with promotion of planetary health within their practices.

References

Alter, C., Haynes, S., & Worland, J. (2019). *TIME 2019 person of the year: Greta Thunberg*. https://time.com/person-of-the-year-2019-greta-thunberg/

Álvarez-Nieto, C., Richardson, J., Navarro-Perán, M. A., Tutticci, N., Huss, N., Elf, M., Anaker, A., Aronsson, J., Baid, H., & López-Medina, I. M. (2022). Nursing students' attitudes towards climate change and sustainability: A cross-sectional multisite study. *Nursing Education Today*, *108*, 105185. https://doi.org/10.1016/j.nedt.2021.105185

Astle, B. (2021). Planetary health in nursing: A transdisciplinary equity-centered approach. *Creative Nursing*, *27*(4), 237–241. https://doi.org/10.1891/cn-2021-0027

Astle, B. (2024). The triple planetary health crisis: Nursing leadership in championing the integration of planetary health in Canadian nursing education. *Quality Advancement in Nursing Education - Avancées en formation infirmière*, *10*(4), Article 7. https://doi.org/10.17483/2368-6669.1482

Astle, B., Reifferscheid, L., Komar, L., Jakubec, S. L., Chircop, A., Egert, A., Avanthay Strus, J., Lalonde, S., & Jones, A. T. (2025). Surveying planetary health curriculum: Integration in Canadian nursing education. *Nurse Education Today*, *154*, 106836. https://doi.org/10.1016/j.nedt.2025.106836

Berry, P., & Schnitter, R. (Eds.). (2022). *Health of Canadians in a changing climate: Advancing our knowledge for action*. Health Canada. https://changingclimate.ca/site/assets/uploads/sites/5/2022/02/CCHA-REPORT-EN.pdf

Braun, V., & Clarke, V. (2022). *Thematic analysis: A practical guide*. SAGE.

Brooman, S., Darwent, S., & Pimor, A. (2015). The student voice in higher education curriculum design: Is there value in listening? *Innovations in Education and Teaching International*, *52*(6), 663–674. https://doi.org/10.1080/14703297.2014.910128

Calaguas, N. P. (2025). Contemporary health challenges in the Anthropocene: Implications for nursing education. *Teaching and Learning in Nursing*, *20*(3), e791–e798. https://doi.org/10.1016/j.teln.2025.02.031

Canadian Association of Nurses for the Environment. (n.d.). *PeriPHAT resources*. https://cane-aiie.ca/periphat-resources/

Canadian Association of Nurses for the Environment & Canadian Federation of Nurses Unions. (2023). *Nursing toolkit for planetary health*. https://www.nursingtoolkit4planetaryhealth.ca/

Canadian Association of Schools of Nursing. (2022). *National nursing education framework*. https://www.casn.ca/wp-content/uploads/2023/09/National-Nursing-Education-Framework_2022_EN_FINAL.pdf

Canadian Nurses Association. (2024). *Position statement: Planetary health*. https://hl-prod-ca-oc-download.s3-ca-central-1.amazonaws.com/CNA/2f975e7e-4a40-45ca-863c-5ebf0a138d5e/UploadedImages/documents/policy-advocacy/CNA-Planetary-Health-position-statement_E.pdf

The Canadian Press. (2025, May 1). Supreme court won't hear province's appeal in youth-led Ontario climate case. *CBC News*. https://www.cbc.ca/news/canada/sudbury/ontario-youth-climate-court-challenge-1.7523634

Carey, P. (2013). Student as co-producer in a marketised higher education system: A case study of students' experience of participation in curriculum design. *Innovations in Education and Teaching International*, *50*(3), 250–260. https://doi.org/10.1080/14703297.2013.796714

Castleden, H., Lin, J., & Darrach, M. (2020). The public health emergency of climate change: How/are Canadian post-secondary public health sciences programs responding? *Canadian Journal of Public Health*, *111*, 836–844. https://doi.org/10.17269/s41997-020-00386-3

Clayton, S. (2020). Climate anxiety: Psychological responses to climate change. *Journal of Anxiety Disorders*, *74*, 102263. https://doi.org/10.1016/j.janxdis.2020.102263

Cyr, D., Childs, R., & Elgie, S. (2013). *Recruiting students for research in postsecondary education: A guide*. Higher Education Quality Council of Ontario. https://heqco.ca/wp-content/uploads/2020/03/Student_Recruitment_Guide.pdf

Daly, Z., Radu, R., & Jenkins, E. K. (2024). Positioning Canadian nurses as leaders in responding to the mental health impacts of climate change: A call to action. *Quality Advancement in Nursing Education - Avancées en formation infirmière*, *10*(4), Article 4. https://doi.org/10.17483/2368-6669.1471

Delnat, C. C. (2025). A systematic review of climate change content integration in nursing curricula. *Journal of Nursing Education*, *64*(4), 227–234. https://doi.org/10.3928/01484834-20241125-02

Griffin, M. T. Q., Alfes, C. M., Chavez, F., Ea, E. E., Lynn, K. A., Rafferty, M. A., & Fitzpatrick, J. J. (2022). Incorporating climate change into doctor of nursing practice curricula. *Journal of Professional Nursing*, *42*, 156–161. https://doi.org/10.1016/j.profnurs.2022.06.008

Faerron Guzmán, C. A., Aguirre, A. A., Astle, B., Barros, E., Bayles, B., Chimbari, M., El-Abbadi, N., Evert, J., Hackett, F., Howard, C., Jennings, J., Krzyzek, A., LeClair, J., Maric, F., Martin, O., Osano, O., Patz, J., Potter, T., Redvers, N., … Zylstra, M. (2021). A framework to guide planetary health education. *The Lancet Planetary Health*, *5*(5), e253–e255. https://doi.org/10.1016/S2542-5196(21)00110-8

Faerron Guzmán, C. A., & Potter, T. (Eds). (2025). *The planetary health education framework*. Planetary Health Alliance. https://planetaryhealthalliance.org/wp-content/uploads/2025/02/The-Planetary-Health-Education-Framework.pdf

Flaten, C. B., Pechacek, J. M., Potter, T. M., Mueller, C. (2023). Planetary health in nursing curricula: How one school transformed nursing curricula as they integrated planetary health concepts with the 2021 AACN essentials. *Journal of Professional Nursing*, *49*, 52–56. https://doi.org/10.1016/j.profnurs.2023.08.010

Freire, P. (2004). *Pedagogy of hope: Reliving pedagogy of the* oppressed (R. R. Barr, Trans.). The Continuum Publishing Company. (Original work published 1992)

Government of Canada. (2024, June 10). Canada's *top 10 weather stories of 2023*. https://www.canada.ca/en/environment-climate-change/services/top-ten-weather-stories/2023.html

Hancock, T., Spady, D., & Soskolne, C. (Eds.). (2015). *Global change and public health: Addressing the ecological determinants of health – the report in brief*. Canadian Public Health Association. https://www.cpha.ca/sites/default/files/assets/policy/edh-brief.pdf

Hanley, F., & Jakubec, S. L. (2019). Beyond the slogans: Understanding the ecological consciousness of nurses to advance ecological knowledge and practice. *Creative Nursing*, *25*(3), 232–240. https://doi.org/10.1891/1078-4535.25.3.232

Kadi-Hanifi, K., Dagman, O., Peters, J., Snell, E., Tutton, C., & Wright, T. (2014). Engaging students and staff with educational development through appreciative inquiry. *Innovations in Education and Teaching International*, *51*(6), 584–594. https://doi.org/10.1080/14703297.2013.796719

Khatamian Far, P. (2018). Challenges of recruitment and retention of university students as research participants: Lessons learned from a pilot study. *Journal of the Australian Library and Information Association*, *67*(3), 278–292. https://doi.org/10.1080/24750158.2018.1500436

LeClair, J. M., Luebke, J. M., Gingerich, S., Oakley, L. D., Timko Olson, E. R., & Potter, T. M. (2024). The future of nursing for planetary health is today: Essential transitions for education and research. *Quality Advancement in Nursing Education - Avancées en formation infirmière*, *10*(4), Article 3. https://doi.org/10.17483/2368-6669.1464

Martin, S., Richards, C., Keogh, S., & Ward, A. (2024). Embedding planetary health in nursing education: Exploring the barriers and enablers to implementing changes in undergraduate bachelor of nursing curriculum. *Teaching and Learning in Nursing*, *19*(2), e261–e268. https://doi.org/10.1016/j.teln.2023.11.008

Masselot, P., Mistry, M., Vanoli, J., Schneider, R., Iungman, T., Garcia-Leon, D., Ciscar, J.-C., Feyen, L., Orru, H., Urban, A., Breitner, S., Huber, V., Schneider, A., Samoli, E., Stafoggia, M., de'Donato, F., Rao, S., Armstrong, B., Nieuwenhuijsen, M., … Gasparrini, A. (2023). Excess mortality attributed to heat and cold: A health impact assessment study in 854 cities in Europe. *The Lancet Planetary Health*, *7*(4), e271–281. https://doi.org/10.1016/S2542-5196(23)00023-2

Matahela, V. E. (2025). Ubuntu philosophy as a transformative pedagogical approach for advancing planetary health in nursing education in the Anthropocene era. *Teaching and Learning in Nursing*, *20*(2), 164–173. https://doi.org/10.1016/j.teln.2025.01.011

Maunder, R. E., Cunliffe, M., Galvin, J., Mjali, S., & Rogers, J. (2013). Listening to student voices: Student researchers exploring undergraduate experiences of university transition. *Higher Education*, *66*(2), 139–152. https://doi.org/10.1007/s10734-012-9595-3

Mitra, D., Serriere, S., & Stoicovy, D. (2012). The role of leaders in enabling student voice. *Management in Education*, *26*(3), 104–112. https://doi.org/10.1177/0892020612445678

Mohamed, S. A. A. K., & Shaban, M. (2025). Global disparities and innovations in integrating planetary health into nursing curricula: A rapid review as a framework for change. *Teaching and Learning in Nursing*, *20*(2), 181–188. https://doi.org/10.1016/j.teln.2025.01.026

Myers, S., & Frumkin, H. (Eds.). (2020). *Planetary health: Protecting nature to protect ourselves*. Island Press. https://doi.org/10.5822/978-1-61091-966-1

National Aeronautics and Space Administration. (2024, October 23). *Evidence*. https://science.nasa.gov/climate-change/evidence/

Nicholas, P. K., Breakey, S., Tagliareni, M. E., Simmonds, K., Sabo, K. K. (2021). Climate change and population health: Incorporating stages of nursing's political development. *Nursing Outlook*, *69*(1), 65–73. https://doi.org/10.1016/j.outlook.2020.08.001

Organisation for Economic Co-operation and Development. (n.d.). *OECD future of education and skills 2030: Student voices on curriculum (re)design*. https://www.oecd.org/content/dam/oecd/en/about/projects/edu/education-2040/2-1-curriculum-design/Student-voices-on-curriculum-redesign%20(3).pdf

O'Neill, G., & McMahon, S. (2012). Giving student groups a stronger voice: Using participatory research and action (PRA) to initiate change to a curriculum. *Innovations in Education and Teaching International*, *49*(2), 161–171. https://doi.org/10.1080/14703297.2012.677656

O'Reilly, J., & O'Grady, E. (2024). 'Our opinions really matter': Conceptualising and operationalising authentic student voice through negotiated integrated curriculum. *Education*, *52*(6), 811–829. https://doi.org/10.1080/03004279.2024.2331954

Planetary Health Alliance. (2025). *What is planetary health?* https://planetaryhealthalliance.org/what-is-planetary-health

Poland, B., Parkes, M. W., Hancock, T., McKibbon, G., & Chircop, A. (2020). A changing role for public health in the Anthropocene: The contribution of scenario thinking for reimagining the future. In K. Zywert & S. Quilley (Eds.), *Health in the Anthropocene: Living well on a finite planet* (pp. 170–188). University of Toronto Press.

Redvers, N., Lockhart, F., Zoe, J. B., Nashalik, R., McDonald, D., Norwegian, G., Hartmann-Boyce, J., & Tonkin-Crine, S. (2024). Indigenous Elders' voices on health-systems change informed by planetary health: A qualitative and relational systems mapping inquiry. *The Lancet Planetary Health*, *8*(12), E1106–1117. https://doi.org/10.1016/S2542-5196(24)00277-8

Romanello, M., McGushin, A., Di Napoli, C., Drummond, P., Hughes, N., Jamart, L., Kennard, H., Lampart, P., Rodriguez, B. S., Arnell, N., Ayeb-Karlsson, S., Belesova, K., Cai, W., Campbell-Lendrum, D., Capstick, S., Chambers, J., Chu, L., Ciampi, L., Dalin, C., … Hamilton, I. (2021). The 2021 report of the Lancet Countdown on health and climate change: Code red for a healthy future. *The Lancet*, *398*(10311), P1619–1662. https://doi.org/10.1016/S0140-6736(21)01787-6

Ross, J., & Speirs, J. (2024). Championing a move from sustainability to planetary health in nursing curriculum. *Nurse Education Today*, *139*, 106220. https://doi.org/10.1016/j.nedt.2024.106220

Stephens, J., & Leslie, K. (2024). Environmental sustainability and climate change content in Canadian baccalaureate nursing programs. *Journal of Nursing Education*, *63*(4), 212–217. https://doi.org/10.3928/01484834-20240207-02

St. John, K., & Briel, L. (2017). *Student voice: A growing movement within education that benefits students and teachers*. VCU Center on Transition Innovations. https://centerontransition.org/publications/download.cfm?id=61

Tee, N. C. H., Yeo, J.-A., Choolani, M., Poh, K. F., & Ang, T. L. (2024). Healthcare in the era of climate change and the need for environmental sustainability. *Singapore Medical Journal*, *65*(4), 204–210. https://doi.org/10.4103/singaporemedj.smj-2024-035

Tutticci, N., Del Fabbro, L., Richards, C., Tulleners, T., Varsani, D., Best, O., & Ward, A. (2025). Reconceptualizing nursing curricula for planetary health: A web-based desktop audit. *Teaching and Learning in Nursing*, *20*(2), 106–112. https://doi.org/10.1016/j.teln.2024.06.016

Tutticci, N., & Huss, N. M. (2025). An analysis of sustainable decision-making using clinical reasoning. *Teaching and Learning in Nursing*, *20*(2), 131–136. https://doi.org/10.1016/j.teln.2024.11.013

United Nations. (n.d.). *Youth in action*. https://www.un.org/en/climatechange/youth-in-action

Watson, J., Horseman, Z., Fawcett, T., Hockley, J., & Rhynas, S. (2020). Care home nursing: Co-creating curricular content with student nurses. *Nurse Education Today*, *84*, 104233. https://doi.org/10.1016/j.nedt.2019.104233

Watts, N., Adger, W. N., Agnolucci, P., Blackstock, J., Byass, P., Cai, W., Chaytor, S., Colbourn, T., Collins, M., Cooper, A., Cox, P. M., Depledge, J., Drummond, P., Ekins, P., Galaz, V., Grace, D., Graham, H., Grubb, M., Haines, A., … Costello, A. (2015). Health and climate change: Policy responses to protect public health. *The Lancet*, *386*(10006), P1861–1914. https://doi.org/10.1016/S0140-6736(15)60854-6

Whitmee, S., Haines, A., Beyrer, C., Boltz, F., Capon, A. G., de Souza Dias, B. F., Ezeh, A., Frumkin, H., Gong, P., Head, P., Horton, R., Mace, G. M., Marten, R., Myers, S. S., Nishtar, S., Osofsky, S. A., Pattanayak, S. K., Pongsiri, M. J., Romanelli, C., … Yach, D. (2015). Safeguarding human health in the Anthropocene epoch: Report of The Rockefeller Foundation–*Lancet* Commission on planetary health. *The Lancet*, *386*(10007), P1973–2028. https://doi.org/10.1016/S0140-6736(15)60901-1