Literature Review

Embedding planetary health in nursing education: exploring the barriers and enablers to implementing changes in undergraduate Bachelor of Nursing curriculum

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ABSTRACT

Background: Due to the escalating severity of the impact of climate change on human and ecological health and its implications for nursing practice, it is imperative that *planetary health* is embedded into the undergraduate nursing curriculum.
Purpose: This rapid review was undertaken to identify the barriers and enablers to implementing *planetary health* into the undergraduate Bachelor of Nursing curriculum.
Methods: Databases (PubMed, Education Source, CINAHL, and Scopus) were searched for relevant studies between 2013 and 2023. Seven papers were eligible for review.
Findings: The studies demonstrated that adequate knowledge, skill development, social support, a supportive organization, and access to adequate resources were required to embed changes into the curriculum.
Conclusion: This study has identified enablers that can be leveraged to successfully integrate planetary health into the undergraduate nursing curriculum, preparing nurses who are working in a practice environment impacted by climate change.

Introduction

The climate crisis has become an omnipresent threat to global health (Horton & Lo, 2015; Whitmee et al., 2015). The window of opportunity to take measures to mitigate and reduce the impact of climate change is narrowing (IPCC, 2022). Scholars have historically argued the position of nurses in driving sustainable and regenerative practices within the high-emissions healthcare sector (Kalogirou et al., 2020; Vold & Meszaros, 2021). Kalogirou et al. (2020) explain that historical conceptualizations of the environment have cemented the nursing profession's focus on the individual, as opposed to on society as a whole. This has contributed to a profession-wide "blind spot." Though it is an essential determinant of health, the environment has not been a concern recognized across nursing philosophy. Rather, the nursing profession has settled itself into preoccupation with designing care interventions that improve the patient's response to the environment—instead of assuming a role that can alter the

environment itself. Fixation on downstream interventions has prevented nurses from assuming responsibility for taking measures to prevent environmental disruption (Dillard-Wright et al., 2020). Contemporary understanding has developed a case for the active engagement of nurses in preparing for practice and mitigating health impacted by climate change (Morgan, 2019; Ward et al., 2022). Nurses, comprising 60% of the healthcare workforce (Cook et al., 2019) are often in leadership positions within healthcare services (Kitson et al., 2011) and have the regional, contextual knowledge of the services, that allows for essential stakeholder engagement to elicit changes within their respective organizations. Further, nurses will be at the front line of health service delivery during natural disasters that arise out of anthropogenic climate change (Richards et al., 2023). It is clear that nurses will, by and large, continue to have an "up close view of the human cost of the climate crisis" (Dillard-Wright et al., 2020). There is therefore an impetus to acknowledge the justice issues that arise from the threat of climate change (LeClair et al., 2022). In recognition of the emerging responsibility to respond to the threat of climate change, the International Council of Nurses (ICN) has embedded climate change in their Code of Ethics

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(International Council of Nurses, 2021). This recognition by the ICN presents an opportunity to reconceptualize the nursing profession to realize its emancipatory potential (Dillard-Wright et al., 2020).

The field of planetary health nursing is developing (Kurth, 2017). This discipline recognizes the complex interrelatedness of ecological systems and human health, and argues a case for environmental public health action (Romanello et al., 2021). Planetary health, a multidisciplinary paradigm, is presently poorly defined within the nursing curriculum, and less so, in nursing philosophy (LeClair & Potter, 2022; Rosa & Upvall, 2019). Here, planetary health is defined as human and ecosystem health, and includes significant threats to both, such as the impact of climate change.

There is growing support for the inclusion of planetary health into nursing curricula (Álvarez-Nieto et al., 2022). Notably, the United Nations Sustainable Development Goals are required to be included in the Australian undergraduate nursing curriculum, as per the Australian Nursing and Midwifery Accreditation Council's (ANMAC) requirements for, "integrated knowledge of regional, national, and global health priorities," (ANMAC, 2019). This integration is supported by the Australian College of Nursing, which released a white paper explicitly responding to climate change, as a health priority and calling for the integration of climate health into the nursing curriculum (ACN, 2023). As nurses must be prepared for leadership challenges under a future of the escalating impacts of climate change, undergraduate education provides a policy lever to establish a research-based practice that encompasses an understanding of the intersection of climate, health, and sustainability, and practice implications for the nursing practitioner (El Ghaziri & Morse, 2020). Some professional organizations have established material to support the integration of planetary health education into the curriculum (McDermott-Levy et al., 2019; Neal-Boylan et al., 2019) and others have already begun to implement planetary health into nursing curriculum specifically (Lal et al., 2022), however, the integration is sparce and disjointed. Despite the need and precedence, academics often experience barriers when implementing a change to the curriculum, particularly a curriculum that is arguably already overcrowded (Leffers et al., 2017). To ascertain and adequately mitigate these challenges, this review aims to synthesize the barriers and enablers to changing the Bachelor of Nursing curriculum. Due to a paucity of research on the integration of planetary health into nursing curricula, this review utilized published examples of any changes in curriculum in Schools of Nursing around the globe. This review aims to present an understanding of measures that may support curriculum change, to ensure that planetary health can be incorporated in an undergraduate nursing curriculum.

Methods

Review Question

What are the barriers and enablers for academic stakeholders in implementing changes to undergraduate university curriculum within English-speaking members of the Organisation for Economic Co-operation and Development (OECD) countries?

Design

The purpose of this review was to identify the existing literature on changes in nursing curriculums to inform curriculum change proposals. For this reason, a rapid review methodology was selected, as it offers a timely and focused approach to provide actionable and relevant evidence to inform policy. This review followed the nine-step rapid review process outlined by Garritty et al. (2021) (Table 1). The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) was used.

Table 1
The eight-step rapid review process described by Garrity et al. (2021).

Stage	Process
Stage one	Setting the research question
Stage two	Setting eligibility criteria
Stage three	Searching databases
Stage four	Study selection/title abstract screening
Stage five	Study selection full-text screening
Stage six	Data extraction
Stage seven	Risk of bias assessment
Stage eight	Synthesis

Search Strategy

The search strategy was developed to identify studies across the key themes of undergraduate nursing curriculum change and barriers and enablers of this change. Researchers identified subject terms relevant to the population, context, and concept. Key search terms were then mapped to MeSH subject headings by two researchers (CR and SM). Several test searches were performed by SM. These tests led to the refinement of search terms. Terms such as "undergraduate," "curriculum change," "barrier," and "facilitator" were used to retrieve articles. The search strategy is summarized in (Table 2). The search was then validated by an experienced research librarian (TB). The search was conducted by SM in May 2023 across four databases: PubMed, Education Source, CINAHL, and Scopus.

Inclusion and Exclusion Criteria

The inclusion and exclusion criteria were preset. A decision to implement a year limiter of ten years, was applied at the abstract screening stage of the review, to ensure captured studies were contemporary to practice and context. Studies written in English that explored the experience of academics in implementing undergraduate nursing curriculum change were included. Articles that were not primary and empirical research were excluded. Research that explored curriculum development without the implementation or change to a curriculum were also excluded. Articles were also excluded if they were only from a student perspective, as students do not implement curriculum change.

Extraction

Data were extracted from PubMed (N = 226), Education Source (N = 129), CINAHL (N = 172), and Scopus (N = 605). Duplicate screening removed 143 papers. Title screening removed 749 papers. Abstract screening was conducted by two researchers, SM and CR. During this screening, 215 papers were removed if they did not meet the inclusion and exclusion criteria. This left 20 papers to be full-text screened. At full-text screening, 13 papers were removed, as they did not meet the inclusion criteria, leaving 7 papers.

Study Quality

Studies were then appraised against the Mixed Methods Appraisal Tool (MMAT) described by Hong et al. (2018). The MMAT is a critical appraisal tool, created to characterize the quality of a study design according to set criteria to minimize author bias (Hong et al., 2018). Papers were given a star rating according to the quality of each paper, where one star is indicative of it being lower quality and five where it is of higher quality (Hong et al., 2018).

Table 2
The search strategy used in PubMed.

	Undergraduate curriculum	Barriers, enablers	Change management	Nursing
Text word:	"undergraduate curricul*" "undergraduate program*" undergraduate universit* academi* facult* instructor* tutor*	opportunit* barrier* challeng* obstacle* limitation* constrain* experience* enable* facilitat* impact* adapt* effect*	"curriculum chang*" "curricular chang*" "curricula chang*" "curriculum implementation*" "curricular implementation*" "curricula implementation" "implementation of curricul*" "changed curricul*" "change curricul*" "changes to curricul*" "implementing curric*" "changing curricul*"	nurs* "register nurs*" "trainee nurs*" "teaching hospital*" "nursing students" "student nurse" "nursing education" "nurse education" "graduate nurse education" "graduate nursing education"
PubMed	**MeSH:** curriculum universities faculty		**Proximity Search:** "has changed" W/5 curricul*	**MeSH:** students, nursing education, nursing education, nursing, graduate

Thematic Analysis—Theoretical Domains Framework

Data was synthesized and mapped against the domains and constructs in the theoretical domains framework (TDF). Domains utilized by this review are summarized in Table 3. This framework was selected as it enables researchers to succinctly identify barriers and enablers to facilitating change, across a series of appraised themes and constructs. This framework was initially introduced in 2005, by Michie et al. (2005) and later redeveloped to include 14 domains (Atkins et al., 2017). Retained full-text articles were uploaded to the qualitative analysis software, Nvivo, where they were then read and analyzed. Key findings from the full-text articles were then "mapped" across the TDF domains and constructs. Commonly used domains represent themes that describe the key findings from the review. Thematic analysis was performed by two researchers (CR and SM), to ensure consistency and accuracy in synthesizing the key findings. The themes were then reviewed by two senior researchers (AW and SK) for agreement.

Results

Study Characteristics

Seven studies were analyzed for the barriers and enablers that were experienced during curriculum change. Fig. 1 shows the screening and article selection process, alongside exclusion reasons. Five studies were completed in the United States of America (Baron, 2017; Deane, 2017; Mathis, 2022; Petersen et al., 2017; Wilhelm et al., 2010), one in Rwanda (Muraranza & Mtshali, 2021), and one in

South Africa (Nyoni & Goddard, 2021). Data across the research was collected through semi-structured individual interviews, unstructured individual interviews, surveys, questionnaire, and small group discussions. A full summary of the included study characteristics retained can be accessed in Table 4. There were no studies focusing on specifically implementing planetary health or climate change into the curriculum that met all inclusion criteria.

The findings from the reviewed studies could broadly be divided into two categories, those integrating content into a curriculum (Mathis, 2022; Petersen et al., 2017), and those changing the underlying teaching paradigm of the curriculum (Baron, 2017; Deane, 2017; Muraranza & Mtshali, 2021; Nyoni & Goddard, 2021; Wilhelm et al., 2020). Here, most of the studies that featured paradigm changes were nursing schools shifting from a traditional, teacher-centered paradigm to a concept-based curriculum. The TDF domains most represented across the research included knowledge (n = 7), environmental context and resources (n = 4), social influences (n = 4), and skills (n = 3). The domains that were described less commonly in the literature included beliefs about consequences (n = 2), behavioral regulation (n = 2) emotions (n = 2), social/professional role and identity (n = 2), motivation (n = 2), belief about capabilities (n = 2), goal setting (n = 1) and behavioral regulation (n = 1).

Knowledge and Belief About Capabilities

Knowledge-related constructs were mentioned across all seven of the papers identified. Retrospectively, perceived inadequate knowledge was viewed as a barrier by academics when their knowledge needs were not adequately met (Baron, 2017; Deane, 2017; Mathis,

Table 3
Theoretical domains framework: domains and definitions, as per Atkins et al. (2017).

Domains	Definitions
Knowledge	An awareness of the existence of something.
Skills	An ability or proficiency acquired through practice.
Environmental context and resources	Any circumstance of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence, and adaptive behavior.
Social influence	Those interpersonal processes that can cause individuals to change their thoughts, feelings, or behaviors.
Belief about consequences	Acceptance of the truth, reality, or validity about outcomes of behavior in a given situation.
Nature of the behaviors	Routine/automatic/habit, breaking a habit, direct experience/past behavior, representation of tasks, stages of change model.
Emotion	A complex reaction pattern involving experiential, behavioral, ad physiological elements by which the individual attempts to deal with a personally significant matter or event.
Social/professional role/identity	A coherent set of behaviors and displayed personal qualities of an individual in a social or work setting.
Motivation and goal-setting	Intention stability of intention, certainty of intention, goals (autonomous, controlled), goal target/setting, goal priority, intrinsic motivation, commitment, distal and proximal goals, transtheoretical model, and stages of change.
Belief in capabilities	Acceptance of the truth, reality, or validity about an ability, talent, or facility that a person can put to constructive use.
Behavior regulation	Anything aimed at managing or hanging objectively observed or measured actions.

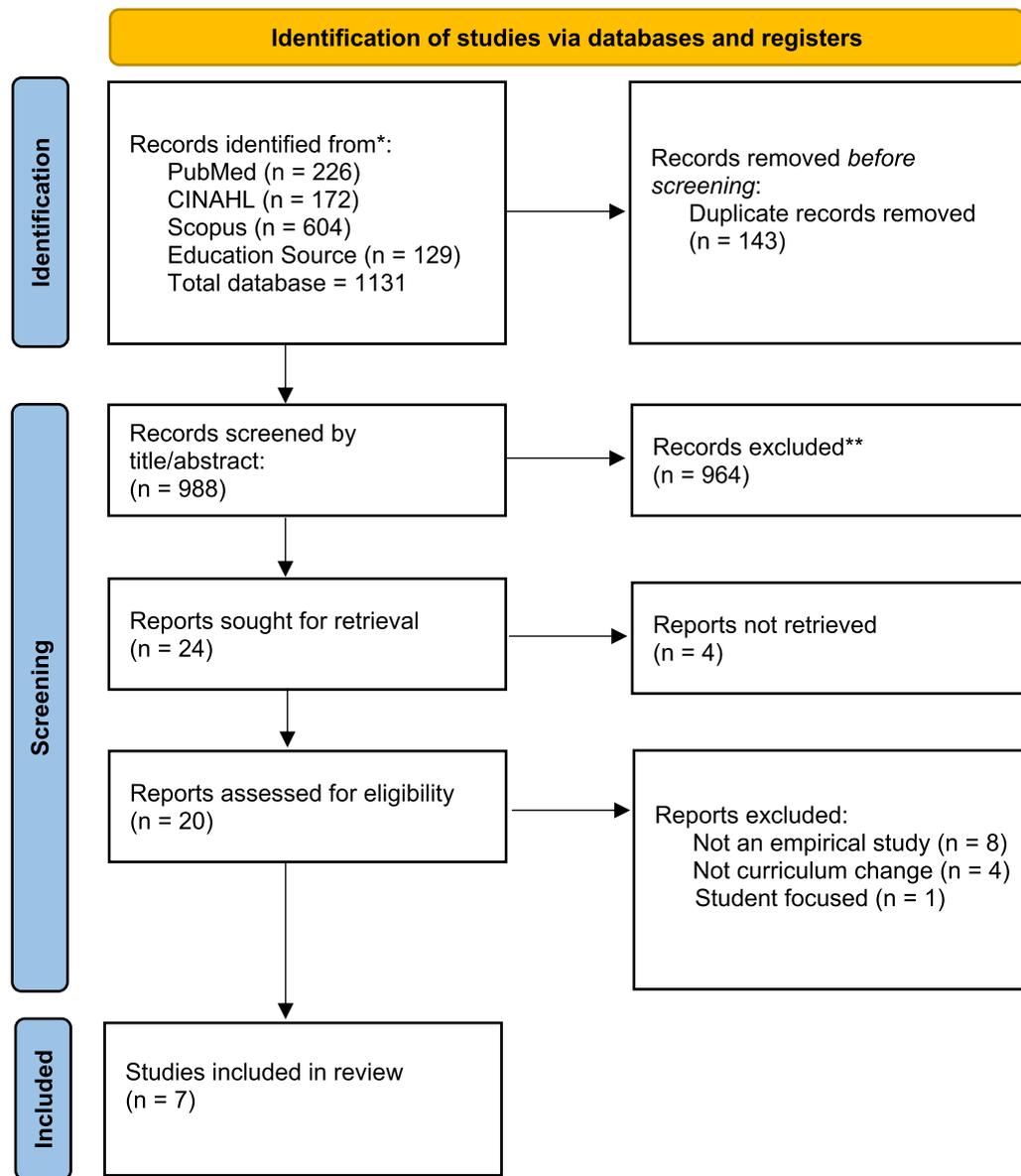## Identification of studies via databases and registers

Figure 1. PRISMA flow diagram.
Adapted from Page et al. (2021).
*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).
**If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools. http://www.prisma-statement.org/

2022; Nyoni & Goddard, 2021; Petersen et al., 2017; Wilhelm et al., 2020). Lack of knowledge appeared to present as either content-related, (i.e., the additions or alterations to the curriculum), or purpose-related (i.e., the reason behind changing the curriculum). For example, content-related knowledge issues were observed by Nyoni and Goddard (2021), where access to information supporting the curriculum was sparse. Initial training occurred, but for some participants of this study, there were considerable gaps (several months) between training and implementation of the new curriculum. This led to suboptimal knowledge retention, which impacted upon the participants' ability to implement the change. Additionally, there was no official training in the curriculum change for new staff. This then, left only a small subset of academics who were present for the initial training and had retained the knowledge from the training to sufficiently implement it. In comparison, others identified that knowledge-related challenges were mitigated through multiple workshops (Mathis, 2022; Muraraneza & Mtshali, 2021; Petersen et al., 2017),

seminar attendance, self-directed learning, and training (Deane, 2017), ultimately enabling more successful and sustainable curriculum change.

Purpose-related issues were observed by Wilhelm et al. (2020) and Petersen et al. (2017). In Petersen et al.'s (2017) study, the faculty's perception that curricular inclusion of smoking interventions were unimportant was mitigated through workshops, resulting in a shift in attitudes from the faculty toward smokers, and the point of interventions, thereby getting the faculty onside by clearly communicating knowledge early on. In some instances, a lack of knowledge surrounding the rationale for the change, escalated into reticence from the faculty to change, making the overall transition period more difficult (Wilhelm et al., 2017).

Increasing knowledge then directly impacted on increased confidence to teach (belief about capabilities) (Mathis, 2022). This was dependent on the content being integrated into the curriculum and faculty perceptions about its difficulty. For example, genetics and

Table 4
Summary of studies and critical appraisal, as per the MMAT (Hong et al., 2018).

Study (year)	Title	Country	Population	Study design	MMAT
Nyoni and Goddard (2021)	Needs of early adopters in supporting a nursing curriculum innovation in a low resource setting: an exploratory case study	South Africa	Low-resource undergraduate nursing program educators trying to implement a curriculum change	Exploratory case study	*
Muraraneza and Mtshali (2021)	Planning reform to competency-based curricula in undergraduate nursing and midwifery education: a qualitative study	South Africa	Staff teaching nursing or midwifery at the University of Rwanda, South Africa	Qualitative, grounded theory	*
Petersen et al. (2017)	Preparing nurses to intervene in the tobacco epidemic: developing a model for faculty development and curriculum redesign	United States America	Nursing faculty of Loma Linda University, Palo Alto, California	Quantitative descriptive study	****
Deane (2017)	Transitioning to concept-based teaching: a qualitative descriptive study from the Nurse educator's Perspective	United States America	Nursing faculty across the United States, through a shift from "traditional pedagogy" to a concept-based curriculum	Qualitative descriptive approach	*
Mathis (2022)	Reducing the intimidation factor of teaching genetics and genomics in nursing	United States America	Nursing faculty members	Descriptive qualitative	*
Baron (2017)	Changing to a concept-based curricula: the process for nurse educators	United States America	Nursing educators shifting from traditional curricula to concept-based curricula	Grounded theory qualitative	*
Wilheim et al. (2019)	Transitioning from a traditional to a concept-based curricula	United States America	Faculty shifting to a concept-based curricula at University of Nebraska	Qualitative descriptive	*

genomics content was perceived as difficult, and faculty lacked a belief in their capabilities to teach it (Mathis, 2022). In comparison, faculty needing to teach smoking awareness and interventions had a strong belief in their capabilities, despite lacking knowledge.

Environmental Context and Resources

Most papers identified environmental context and resources as being key determinants of success (N = 5). Resources were particularly important to participants of the studies. These included having sufficient time (Petersen et al., 2017; Deane, 2017; Baron, 2017); and learning materials for circulation across both academics and students (Nyoni & Goddard, 2021; Petersen et al., 2017; Mathis, 2022). The absence or presence of these materials could help or hinder the transition process. For example, four out of five studies explored insufficient time to meet deadlines, or insufficient time in their course (Baron, 2017; Deane, 2017; Nyoni & Goddard, 2021; Peterson et al., 2017). One study found that "faculty were rushed to meet deadlines; consequently, they did not get enough input from others" (Baron, 2017). When faculty experienced higher workloads for long periods, it led to members requiring sick leave (Deane, 2017), or leaving the workplace entirely (Nyoni & Goddard, 2021). Environmental factors were particularly impactful in low-resource environments where factors such as consistent internet and electricity supply and lack of appropriate technology, hindered the ability to access reliable supports (Nyoni & Goddard, 2021). Conversely, having adequate resources, such as educational materials for the faculty to utilize, was considered an enabler (Petersen et al., 2017).

Skills

The need for skill development before and throughout curriculum change was mentioned in three of the seven papers. Skills were both viewed as a barrier to change (Nyoni & Goddard, 2021) and an enabler (Baron, 2017; Petersen et al., 2017), depending on whether the need for skill development was adequately met throughout the change process.

Knowledge-building workshops were often integrated with skills development. In one publication, the workshops had almost 100% faculty attendance and were later positively reviewed as one of the "most helpful" aspects of the change process (Petersen et al., 2017). Participants Nyoni and Goddard's (2021) recommended that they

receive skills training and follow-up assessment, to ensure that they were properly implementing what they had learned.

Social Influence

Social influences appeared in four papers, as both a barrier (Wilhelm et al., 2020), and an enabler (Baron, 2017), and sometimes both (Deane, 2017). The Social influences domain includes a range of different constructs reflecting support, teamwork, and culture. Social interactions reported in the reviewed studies were complex and multifaceted and may present as such during a curriculum change. For example, faculty members in one study expressed concern that they would lose their power over their students, due to shifting away from a teacher-centered classroom (Deane, 2017). Additionally, faculty members were concerned about negative outcomes for their students under the new concept-based curriculum. However, this concern was alleviated when they saw the positive outcomes for their students, through higher test scores on average in the following years and observed improvements in critical thinking (Deane, 2017).

It was important to have a supportive organizational culture, which was highlighted across three of the four papers that included social influence (Deane, 2017; Nyoni & Goddard, 2021; Petersen et al., 2017), as this was associated with an administration that was understanding around time. Wilhelm et al. (2020) described poor leadership and lack of clear communication as considerable barriers to curriculum change. Social support, such as effective collegial communication (Baron, 2017) and cohesiveness in team dynamics (Deane, 2017) positively impacted the change process.

Social/Professional Role and Identity, Emotions, Goal Setting, Behavioral Regulation and Beliefs About Consequences

Academic staff across several studies were identified as lacking the motivation to change (Deane, 2017; Wilhelm et al., 2020), particularly where changes "lacked a shared vision" (Wilhelm et al., 2020) or when there was no institutional accountability to the government, despite government mandate to change (Nyoni & Goddard, 2021). The lack of institutional accountability to the government had a flow-on effect to inside the institution, where academic staff did not face consequences for not implementing new curriculums (Nyoni & Goddard, 2021), thereby compounding a lack of motivation to change due to a perceived lack of consequences.

Additionally, participants in studies reported experiencing some negative emotions, such as anger and anxiety, throughout the change process (Baron, 2017; Deane, 2017), especially throughout changes that were perceived poorly by faculty (Wilhelm et al., 2020). Shifting the underlying teaching paradigm required a considerable change in teaching habits (Baron, 2017; Deane, 2017). Transitioning old habits required ongoing support, through education and upskilling. Additionally, altering the teaching paradigm caused a change in professional identity, which was difficult for staff (Deane, 2017; Wilhelm et al., 2020).

Such negative emotions were managed through individual behavioral regulation, for example: positive self-talk and affirmations to build up confidence when experiencing stress (Deane, 2017). Negative emotions were also mitigated through goal setting, which enabled the change process as it gave the faculty members a framework to work from when implementing the change into their own, specific content areas (Petersen et al., 2017). A sense of motivation was identified as an enabler of change when faculty were intrinsically and positively motivated due to the perception that it would benefit students (Baron, 2017).

Discussion

Successfully and sustainably implementing changes to the tertiary nursing curriculum is often met with challenges, and it is, therefore, important to understand factors that may facilitate the change process. The TDF was used to advance understanding of the barriers and enablers experienced by nursing academics when enacting a curriculum change within an undergraduate degree. The determination of whether these factors became barriers or enablers to curriculum change was primarily contingent on the availability of support, an understanding of rationale, concept, and process, and personal belief and confidence.

Climate change literacy is being increasingly recognized as an area of focus for development in the health landscape (Limaye et al., 2020). However, curricular integration of climate change, or more broadly planetary health, into mainstream health degrees is still rare (Jagals & Ebi, 2021); perhaps due to a lack of knowledge leading to a lack of confidence in teaching (Tun et al., 2020). This would be consistent with our findings, where stakeholders' belief in their capabilities to assimilate and disseminate new knowledge impacted their confidence to initiate change (Mathis, 2022; Petersen et al., 2017). Here, content perceived to be outside of their field or comfort zone (Mathis, 2022) combined with a lack of knowledge (Baron, 2017) led to a reluctance to implement changes (Wilhelm et al., 2020). Likewise, studies specific to planetary health curriculum integration within Medicine cite the same barriers (Shea et al., 2020).

Climate change will impact humans and ecology in geographical areas in different ways, through differing exposure to different extreme weather events and heightening existing wealth inequalities (IPCC, 2022). This may potentially make it difficult to create curricular changes nationwide that speak to the specific impacts that nurses will observe over their careers where they live. This may create a need to tailor likely health impacts faced, based on the subject area, or create generic content that risks not connecting/speaking to its audience on a personal level. Therefore, the task of integrating planetary health into the curriculum may be particularly challenging.

Further, integration of content that has been previously outside the scope of the profession may be difficult (Harpe & Thomas, 2009). Indeed, in a cross-sectional study assessing academic health practitioners' understanding, perceptions, and confidence in teaching the impact of climate change on human health, lack of expertise was regarded as a primary barrier (Breakey et al., 2023). Here, faculty expressed that they were not comfortable teaching planetary health content despite it being perceived as relevant to patient care and

perceiving integration positively (Breakey et al., 2023). Together, this suggests that nursing faculty/schools/departments may need strong support to build knowledge, confidence, and belief in their capabilities to avoid faculty becoming resistant to integrating planetary health content.

Importantly, students appear to have a positive perception of the integration of climate change into the nursing curriculum (Álvarez-Nieto et al., 2022), with integration even occurring through student-faculty partnerships (Tun et al., 2020). Generally, student experience through curriculum change can elicit some negative feelings, such as stress, particularly when changing the underlying teaching pedagogy (Gooder & Cantwell, 2017). Overall findings indicate, however, that students are either neutrally impacted by curriculum change (Murphy et al., 2017; Theander et al., 2016), or eventually positively impacted (Deane, 2017; Landeen et al., 2016; Tse et al., 2014). Additionally, a substantial number of young Australians demonstrate significant worry and frustration about climate change (Hickman et al., 2021; Sciberras & Fernando, 2022), indicating that integrating planetary health into the nursing undergraduate curriculum would likely be positively perceived by students.

There is a lack of current research surrounding Australian nursing academics' perceptions of planetary health, and their attitudes towards integrating it into the curriculum, despite the requirement for Sustainable development goals to be included in the nursing curriculum (ANMAC, 2019) and prominent nursing support (ACN, 2023). Given that most of our studies had participants who required convincing to include more information into an already overly full curriculum (Baron, 2017; Deane, 2017; Petersen et al., 2017), it is entirely possible that a considerable number of Australian nursing academics may require similar convincing. Even if academics do acknowledge the relevance and importance of the integration of planetary health into the curriculum, the feasibility remains a challenge due to the previous identified barriers. To optimize a critical mass of support for any curricula change, cultivating a shared vision of and for the change, as well as why this should be done (Harpe & Thomas, 2009; Wilhelm et al., 2020) is essential to positive uptake and implementation (Petersen et al., 2017). Vision development is commonly represented in change management theory (Galli, 2018), where the need to develop a shared vision (Kotter, 1996) is optimally supported by key stakeholders and equally prioritized (Michaelis et al., 2009). This is supported by our findings, where effective curriculum changes arose from change management processes that engaged academics early in the process to anticipate their reluctances, concerns, and support needs (Petersen et al., 2017). If faculty are resistant to change, it is pivotal for external drivers of change to understand the resistance, so that the concerns can be navigated and perceptions of the importance of change can be shaped (Stouten et al., 2018).

Despite the paucity of literature on planetary health curriculum integration in nursing, several frameworks and templates supporting academics to develop their knowledge have been developed (Leffers et al., 2017; Schenk, 2019; Sorensen et al., 2023), as have the learning tools and materials (Richardson et al., 2014; Williams & Downes, 2017) that resource these frameworks. The presence of developed frameworks supported by governance bodies who mandate national curriculum should guide planetary health inclusion. This regulatory body would be useful, as they could: build knowledge and confidence within faculty to teach, provide teaching resources, motivate faculty, and mitigate discussions about what to include, and why. Nurses now and in the future face an important role in addressing the human health impacts of climate change, with respect to patient care, policy development, and advocacy (Neal-Boylan et al., 2019) and there is a pressing need for planetary health to be integrated into academic learning (Potter, 2021). Ultimately, a nationally supported approach would work to mitigate the barriers to changing localized

tertiary undergraduate curriculum, so that all nurses can prepare and respond effectively to the pressing threat of climate change.

Limitations

Limitations of this review were largely related to the paucity of studies generally exploring and reporting on the concept and by the limited global representation (i.e., eligible studies solely from America, Rwanda, and South Africa). This review was further limited by a paucity of studies analyzing the implementation of planetary health content into a nursing curriculum. There is a need for further research specifically within different contexts, examining the experiences of nursing faculty throughout curriculum change.

Conclusion

The need for the integration of planetary health into the undergraduate curriculum has become urgent, to ensure nurses can meet current and future challenges that are driven by the escalating impacts of climate change and extreme weather events. Governing bodies and professional organizations are supportive of this integration; however, academics are still facing numerous barriers to inclusion, which may be exacerbated by the fact that planetary health falls outside of the traditional scope of Western nursing knowledge. Moreover, climate change impacts are uncertain and heterogenous, which may consequently result in a curriculum that requires adaption by geographical region.

However, it is evident that nurses are positioned at the forefront of responding to the health impacts of climate within their communities and will be impacted both personally and professionally. Therefore, it must be an urgent priority for academics to address local and national barriers to the implementation of planetary health within the curriculum and move forward to prepare our nurses to best respond to this global practice challenge.

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Declaration of Competing Interest

SK's employer (QUT) has received monies on her behalf from BD Medical and ITL Biomedical for educational consultancies unrelated to this study. All other authors have no conflicts of interest to declare.

CRediT authorship contribution statement

Sophia Martin: Methodology, Validation, Formal analysis, Investigation, Writing − original draft. **Catelyn Richards:** Conceptualization, Methodology, Validation, Formal analysis, Writing − original draft, Supervision. **Samantha Keogh:** Methodology, Formal analysis, Writing − review & editing. **Aletha Ward:** Conceptualization, Validation, Writing − review & editing, Supervision, Project administration.

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