Climate Conversations
Registered Nurses Perspectives, Knowledge, and Behaviors on Climate Change and Climate-Related Health Threats: A Literature Review

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Introduction

Climate change is the source of widespread global impacts extending across air, sea, and land. These changes are creating environmental imbalances that have a negative effect on health and wellbeing. Human-caused climate change is driven by emissions of greenhouse gases, primarily from burning fossil fuels and deforestation, resulting in the release of more carbon dioxide into the atmosphere and ocean than can be removed by natural processes (National Oceanic and Atmospheric Association [NOAA], 2024). Atmospheric carbon dioxide and other greenhouse gases naturally contribute to the stability of the atmosphere by absorbing and radiating heat. Increasing levels of carbon dioxide are resulting in higher average global temperatures. Carbon dioxide also dissolves into the ocean and reacts with water molecules, with higher levels resulting in ocean acidification and corrosive marine conditions (National Aeronautics and Space Administration [NASA], 2024; NOAA, 2023).

The nursing paradigm considers the interconnected elements of person, health, nursing, and environment (Alligood, 2018). Health is a state in which people can holistically function and express their full potential within their environment (Svalastog et al., 2017). In New York State, extreme heat, precipitation, flooding, vector borne disease, and poor air quality are projected to increase and impact the capacity of humans to adapt to their environment, resulting in worsening morbidity and mortality (Barnes et al., 2024; USDA, 2023). Although efforts are underway to slow the course of climate change, global temperatures have continued to rise. The previous 10 years have been the warmest recorded, with 2023 being the warmest year on record for both land and ocean temperatures (NOAA, 2024). Climate projections indicate that average and extreme temperatures will continue to rise in New York State with New York City as the hottest region (Lamie et al., 2024). New York City is affected by the urban heat island effect. In urban areas pavements, buildings, and other infrastructure absorb and radiate the sun's heat resulting in temperatures 1-7 degrees warmer than outlying areas (Environmental Protection Agency [EPA], 2024).

Climate-related health threats include exacerbations of chronic disease, heat related illnesses, infectious disease, adverse pregnancy outcomes, and higher rates of cardiopulmonary, neurological, and kidney diseases (USDA, 2023). Although climate change is a regional and global threat it will not affect all people equally. Those who contribute the least to climate change are likely to be affected most resulting in unequitable burdens and health disparities (Intergovernmental Panel on Climate Change [IPCC], 2023). Discriminatory practices and structural racism place communities of color and Indigenous Peoples at higher risk for climate-related health threats related to resource allocation, inadequate access to healthcare, and greater exposure to climate change effects (Barnes et al., 2024). Other vulnerable groups include those with low socioeconomic status, women, children, sexual and gender minorities, and those with chronic disability and disease (World Health Organization [WHO], 2023; United States Department of Agriculture [USDA], 2023).

The healthcare sector is responsible for caring for those who are affected by climate-related health threats. Concurrently, the healthcare sector is a major contributor to climate change, accounting for 8.5% of emissions in the United States. Several healthcare organizations have pledged to reduce their climate impact through a variety of initiatives including reducing emissions from medical gases, investing in clean energy, carbon neutrality, building climate resilience, and increasing transparency (White House, 2022). As the largest group of healthcare professionals, nurses can contribute to climate action through research and implementation of solutions at the practice, organizational, and policy level.

Multiple organizations have written position papers and calls to action regarding the role of nursing in climate change action including the American Nurses Association, International Council of Nurses, American Academy of Nurses, and National Academy of Medicine. These statements highlight the importance of nursing in addressing the challenges posed by climate change. The aim of this literature review is to examine what is known about nurse's perspectives, knowledge, and behaviors related to climate change and climate-related health threats. Understanding current perspectives, knowledge, and behaviors is essential for identifying gaps, addressing barriers, and designing interventions to meet the needs of registered nurses.

Methodology

A literature review was undertaken to answer the question, 'In Registered Nurses, what are the perspectives, knowledge and behaviors related to climate change and climate-associated health risks?' A search was completed on February 6, 2024 using the databases Medline Complete, CINAHL, and Academic Search Complete. Search was limited to full text, peer reviewed ar-

ticles, human population, and English language. Climate change is a rapidly evolving topic, so the search was limited to articles published between January 2019 and January 2024. Key terms were used to examine "nurse or nurses or nursing", "climate change or global warming", "knowledge", "perspective", "practice", and "competence". Results were exported into EndNote, duplicates were removed, and 106 articles remained for title and abstract screening. A full text review was undertaken for 18 articles. Articles were analyzed for relevance to the research question and methodological strengths and weaknesses. Reference lists were screened for additional articles of interest. Results from an included PhD dissertation were brought to the author's attention via a virtual dissemination session. A total of 8 peer reviewed articles and 1 PhD dissertation are included in this review. Research design included qualitative (n=4), quantitative (n=4), and literature review (n=1). Qualitative study design included focused ethnography (Cairns, 2023; Kalogirou et al., 2020), cohort design with inductive content analysis (Aronsson et al., 2020), and Gadamerian hermeneutic phenomenological (Terry et al, 2019). The quantitative study design included descriptive, cross sectional, survey (Schenk et al., 2021; Amerson et al, 2022; Kotcher et al., 2021) and a cross-sectional time series (Alvarez-Nieto et al., 2022). The literature review was completed using the JBI scoping review methodology (Vandenberg et al., 2023). Studies were organized on a table based on study design, level of evidence, sample and setting, purpose, outcome measure, findings, strengths and limitations, and recommendations.

Results

The available climate-related sources include position statements and commentary papers highlighting the importance of climate change action and the role of nurses (American Nurses Association [ANA], 2023; Leffers & Butterfield, 2018; International Council of Nursing [ICN], 2018). There were a limited number of both qualitative and quantitative studies

examining the perspectives, knowledge, and behaviors of practicing registered nurses. Research participants included direct care registered nurses in a variety of roles, nursing faculty, nursing students, and healthcare worker samples that included nurses.

Study findings were synthesized, and overarching themes were identified. The four themes that emerged include variable knowledge about climate change, role confusion, disconnect between professional and personal lives, and barriers to implementation.

Variable Knowledge about Climate Change

Variable levels of knowledge about climate science and health were identified in several articles. Registered nurses' and health professional's knowledge were described as lacking (Aronsson et al., 2020; Kotcher et al., 2021; Vandenberg et al., 2023) and ranging from limited to well informed (Kalogirou et al., 2020). In their review of vector-borne diseases, Vandenberg et al. (2023) asserted that nurses must be knowledgeable about these disease types, but that there was a dearth of literature on whether nurses were prepared to address the needs of patients. In a survey of 468 nurses and nursing students, respondents self-reported moderate levels of climate awareness, but this was not shown to automatically translate to action (Schenk et al., 2021).

Incorporating climate change competencies into nursing curriculum would provide nursing students with a baseline understanding of the science and health impacts, but curriculum design and climate inclusion is program specific. A survey of South Carolina nursing programs revealed only 19% included health implications of climate change and 33% included health implications of sustainability (Amerson et al., 2022).

Role Confusion

Role confusion was a nursing theme that emerged during analysis of the literature (Alvarez-Nieto et al., 2022; Cairns, 2023;

Kalogirou et al., 2020; Schenk et al., 2021). Subjects reported uncertainty in the role of nursing (Cairns, 2023; Kalogirou et al., 2020; Schenk et al., 2021) and a mismatch between climate issues, sustainable practice, and their daily work (Alvarez-Nieto et al., 2022; Kalogirou et al., 2020). Nursing students were able to recognize that the nursing profession engages in unsustainable practices but were unsure of how to address these behaviors (Alvarez-Nieto et al., 2022). Schenk et al. (2021) found that nurses reported feeling overwhelmed and unsure of which actions to take.

Disconnect Between Professional and Personal Lives

Climate action comparisons in personal and professional lives appeared in both qualitative and quantitative studies. Participants reported a stronger understanding of climate action that could be taken in their personal lives (Cairns, 2023; Kalogirou et al., 2023) including composting, recycling, community gardening, and tree planting initiatives, but had difficulty translating these actions into professional contexts. Similar to knowledge about climate change, respondents reported moderate motivations to reduce emissions, but these motivations did not necessarily translate to actions at home or work (Schenk et al., 2021; Terry et al., 2019).

Barriers to Implementation

Several other barriers to implementing climate action into practice were identified (Alvarez-Nieto et al., 2022; Aronsson et al., 2020; Kalogirou et al., 2020; Kotcher et al., 2021; Schenk et al., 2021; Vandenberg et al., 2023). These barriers include time constraints, feeling unsupported by peers (Aronsson et al., 2020; Kalogirou et al., 2020; Kotcher et al., 2021; Terry et al, 2019) and lack of confidence (Alvarez-Nieto et al., 2022; Aronsson et al., 2020; Schenk et al., 2021; Vandenberg et al., 2023). Terry et al. (2019) identified nurses viewing the role as a job rather than a

career as a potential barrier to action as environmentally engaged nurses reporting drawing on their professional nursing values when implementing environmental action in practice.

Clinical, Research, and Policy Implications

Climate Change Knowledge

Nurses can be valuable sources of information about strategies for prevention, adaptation, mitigation, and resilience to climate change and the associated health threats. In order to achieve this, nurses need to have knowledge and confidence about climate change science and health (Vandenberg et al., 2023). Incorporation of climate competencies into nursing education is recommended to educate the workforce of the future (ANA, 2023; Leffers & Butterfield, 2018). Registered nurses will need continuing education to incorporate these principles into daily practice. Suggested climate and environmental competencies include climate change science, advocacy, upstream policies for sustainability, and downstream policies to protect individuals and communities against climate-related events (Jagals & Ebi, 2021; Leffers & Butterfield, 2018). Rather than treating climate as a separate topic, there is an opportunity to incorporate climate-related impacts into existing disease education. An example would be respiratory modules reviewing the standard curriculum but also discussing the additive, negative impacts of increased ozone levels, extreme heat, and an extended allergy season. Climate curriculum and continuing education can be supported on a policy and professional organization level by including relevant topics in licensure (Butterfield, et al., 2021) and continuing education requirements (ICN, 2018).

Nurse's Role

Although nurses reported awareness and motivation (Schenk et al., 2021) about climate and climate-related health threats, there was uncertainty about the role of nursing. Nurses can support changes at the practice, organizational, and policy levels. At the practice level, registered nurses can engage in environmental stewardship through reduction of waste, water and energy conservation, and active transportation (Schenk, 2019). Climate change implications for health can be incorporated into care planning and education materials, providing nurses with the guidance needed to actively translate management of climate-related health threats into patient care activities. At the organizational level, nurses and nurse leaders can advocate for the implementation of green teams and reduce the climate impact of healthcare through policies, product selection, and sustainability practices (ANA, 2023; ICN, 2018; Leffers & Butterfield, 2018). This type of organizational initiative can empower nurses and promote innovative thinking about climate solutions in practice (Terry et al., 2019). Although sustainability practices may provide a fiscal benefit for the organization, messaging should focus on the environmental benefit to improve role clarity and prioritize climate action in practice (Kalogirou et al., 2020). At the policy level, nurses can engage with their elected officials and professional organizations to support policies and laws that limit the effects of climate change, benefit the environment, and promote health equity.

Nurse's Behaviors

Nurses reported a higher level of control and understanding in the actions they can take in their personal life to reduce climate impact. Inability to incorporate these values into practice can potentially foster moral distress, where nurses feel a responsibility to take climate action but feel unable to take that action in their professional lives. Education, role clarity, and organizational support are needed to bridge the gap between personal and professional activities that can reduce climate impact. Actions that can be taken at home, such as energy conservation, reducing and proper disposal of waste, avoiding single use plastics, and advocacy (United Nations, n.d.) can also be enacted in the workplace (ANA, 2023; ICN, 2018; Leffers & Butterfield, 2018, Schenk, 2019). Nurses who act in their personal lives may represent early adopters who can help drive the implementation of climate-related practice changes.

Practice, Research, and Policy

Successful implementation of climate-related policies and practices considers the identified barriers of time constraints, peer support, and lack of confidence. Research is needed to demonstrate practical interventions effective in improving outcomes of climate-related health threats. Nursing research has a responsibility to ensure the intervention designs address health disparities, promote equity, and meet the needs of vulnerable populations (ANA, 2023). The articles reviewed provided limited discussion on environmental justice and health disparities exacerbated by climate change. Equity impacts must be a central consideration in research and intervention design and evaluation (National Academies of Science, Engineering, and Medicine, 2021). Climate change is a rapidly progressing threat to global health and the health of New Yorkers. Nursing scholars need to act swiftly to research effective interventions, best practices, education strategies that can empower the workforce to care for individuals and communities at risk.

Conclusions

Active engagement of the nursing profession is essential to address climate change-related health threats at the practice, organizational, and policy levels. This literature review of current registered nurses' perspectives and knowledge revealed opportunities in the areas of climate change education, role clarification, professional and personal behaviors, and barrier elimination. There are multiple opportunities to address these

challenges and mobilize the nursing workforce to drive innovations that will limit impacts from climate-related health threats, equitably improve outcomes, and establish the profession as climate leaders.

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