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REVIEW ARTICLE

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Climate change and mental health and wellbeing: Reflections from a health geography lens

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Abstract

There is a growing recognition of the importance of research into the effects of climate change on mental health and wellbeing. This paper provides an overview of the pathways through which climate change can affect mental health and wellbeing, highlighting the valuable contribution that health geography can make in this field of study. Given expertise in spatial processes, human-environment interactions, and diverse research methods, health geographers are well-equipped to enhance our understanding of the connection between climate change and mental health and wellbeing. The paper proposes two key areas of future focus: (1) exploring the reciprocal relationships between mental health and place, and (2) integrating knowledge from health geography and environmental sustainability. Health geography can play a critical role in developing knowledge to support mitigation strategies and promote mental health and wellbeing in the face of climate change.

KEYWORDS
climate, geography, health, social geography, sustainability, 2000-present

1 | INTRODUCTION

Climate change is widely considered the greatest contemporary threat to human health (The Lancet, 2023; World Health Organization, 2021). There is general scientific consensus that human-induced climate change will lead to increases in temperatures, CO^2, and sea level, and will also result in an increased frequency and duration of extreme

weather events (CDC, 2022; IPCC, 2021). Consequently, we have seen, and are projected to continue to see, a destabilisation of the social, environmental, and economic determinants of health and wellbeing (Thoma et al., 2021).

While historically physical health impacts have been the focus of most research attention about the climate change-human health connection (Harper et al., 2021), there has been a recent shift towards also investigating the impacts on mental health and wellbeing. The American Psychological Association and ecoAmerica published a series of reports highlighting the links between climate change and psychological health (Clayton et al., 2017, 2021). In the years since the first of these publications, there has been an increase in research on the links between climate change and mental health and wellbeing within various disciplines, including psychology and public health (Martin et al., 2023; Massazza et al., 2022). Given the urgency of the climate change crisis, it is important to consider if, and how, various academic fields can contribute to building a better understanding of the climate change–mental health and wellbeing connection (Charlson et al., 2022). This evidence base is essential to inform mitigation and support strategies. However, currently, the study of the relationship between climate change and mental health and wellbeing has not been widely incorporated into the sub-discipline of health geography—defined as "the study of the distribution, diffusion, determinants, and delivery associated with health and health systems in human populations" (Elliot, 2014). This is surprising as the well-documented pluralism of theory and methods in health geography, with its focus on the linkages between environment, place, and health, could enhance the understanding of this topic.

In this paper, I argue that approaches from health geography are well-suited to investigate the connections between climate change and mental health and wellbeing, due to a focus on spatial processes, human-environment interactions, and use of a diverse methodological toolkit. Such foci are needed to address the complexity of this issue. Additionally, I identify two opportunities for inquiry that can contribute to these studies through a health geography lens: (1) exploring the potential bidirectional relationships between place and mental health and wellbeing, and (2) integrating knowledge from environmental sustainability and health geography.

2 | CLIMATE CHANGE AND MENTAL HEALTH AND WELLBEING—A BRIEF OVERVIEW

Climate change is a substantial threat to mental health and wellbeing. Various theoretical and commentary papers exist outlining this relationship (see Berry et al., 2010; Charlson et al., 2021; Cianconi et al., 2020; Clayton et al., 2021; Cunsolo Willox et al., 2015; Palinkas & Wong, 2020). Generally, there are three pathways in which climate change is theorised to impact mental health and wellbeing: (i) direct, (ii) indirect, and (iii) overarching (see Hayes et al., 2018; Treble et al., 2023). These pathways are described below. Of note, these pathways are not mutually exclusive, and they may influence and compound each other.

Direct impacts are mental health and wellbeing impacts related to experiencing acute events linked to climate change, like extreme weather (e.g., floods, hurricanes, wildfires, and heat waves) and more gradual changes to the earth's systems, such as warming temperatures and sea-level rise. The range of mental health and wellbeing outcomes that are experienced by those effected by extreme weather events are becoming well documented and include anxiety, sleep disturbances, mood disorders, depression, and post-traumatic stress (see Cianconi et al., 2020 for a detailed review). For example, extreme heat exposure is a known risk factor for poor mental health outcomes. A recent meta-analysis of mental health-related mortality and morbidity outcomes from healthcare data (i.e., hospital admissions and emergency departments) found that heatwaves increased the risk of mental health-related visits (Liu et al., 2021). Further, national-level survey data in Bangladesh found co-occurrence of anxiety and depression related to increased temperature and humidity, and experience of a flood (Wahid et al., 2023).

Another example of extreme weather-related events that have increased and are projected to continue to increase due to climate change is wildfires. Experiencing a wildfire can impact mental health and wellbeing in that (1) the event can be a traumatic experience and (2) potentially through smoke exposure (Eisenman & Galway, 2022). For example, a survey of adult evacuees taken 1-year after a 2016 wildfire event in Fort McMurray, Alberta, Canada found that 38% (more than 1/3) had a probable diagnosis of one or more of post-traumatic stress, depression,

insomnia, anxiety, or a substance use disorder (Belleville et al., 2021); these conditions weren't felt equally among people in the community with those reporting a mental health condition or financial difficulties prior to the fires being at increased risk for poorer mental health post-wildfire. After the same wildfire event, a survey of students in grades 7–12 (aged 11–19) conducted 18 months after the event, found the students most directly impacted by the fire (seeing the fire or having their home destroyed) had significantly higher scores on post-traumatic stress, depression, anxiety, and substance misuse scales as well as lower resilience, quality of life and self-esteem scores than those less directly impacted (Brown et al., 2019).

Indirect impacts are mental health and wellbeing consequences that occur from social, economic, and daily life disturbances (e.g., stress from migration or school/work disruptions) that are due to climate change (Heeren & Asmundson, 2022; Torres & Casey, 2017; Walls & McGarvey, 2023). Climate change influences the wider social determinants of health and wellbeing (Curtis & Oven, 2012; Wigand et al., 2022) as well as health and social care systems (Curtis et al., 2017), with the impacts being diverse and extensive. An example of an indirect impact is the effect of climate change on food and water security. Climate change is placing stress on food and water systems (Myers et al., 2017) and food insecurity has been shown to be associated with poorer mental health outcomes (Pourmotabbed et al., 2020). Further, impacts on physical health can also impact mental health and wellbeing, as physical and mental health are linked (Ohrnberger et al., 2017); thus, mental health problems and reduced wellbeing could stem from increased occurrences of disease, injury, and illness to both self and loved ones. As indirect impacts are less straightforward in terms of attribution to climate change, they have tended to receive less research attention (Myers & Bernstein, 2011). However, these observable effects that lie on the pathway between climate change and mental health and wellbeing will be increasingly widespread and could have knock-on effects on many determinants of health with global consequences.

Overarching impacts refer to the psychological and emotional impacts that come from the awareness of the threats and impacts of climate change on the current and future welfare of humans and the planet. The distress, anxiety (sometimes termed eco-or climate anxiety; see Pihkala, 2020), worry, fear, feelings of hopelessness, and/or other negative (i.e., unpleasant or difficult) emotions that stem from an overarching awareness of climate change and its impacts globally, are often considered to be related to the broader concept of psychoterratic syndromes, a term coined by the environmental philosopher Glenn Albrecht. Psychoterratic syndromes are defined as psychological responses to negative changes to the state of the planet (Albrecht, 2011).

A variety of climate change emotions, including worry, sadness, anxiety, and fear, have been reported in multi-country studies (Hickman et al., 2021; Ogunbode et al., 2022). Although the media has picked up the language of climate anxiety, academic and professional use of the term tends to be more cautious and critical (Budziszewska, 2023). Particularly, it is important to note that experiencing such emotional responses to climate change is a rational response to the serious issues facing the planet (Heeren & Asmundson, 2022; Martin et al., 2022, 2023). Such emotions can be both adaptive and constructive in that they may motivate pro-environmental action. Emotions can be the first trigger of personal behaviour change and collective action (Davidson & Kecinski, 2021). Yet, such emotions can also be overwhelming and impede functioning in aspects of daily life. It has also been theorised that such emotional responses could stop some people from acting, as they may feel hopeless or paralysed against engagement. Heeren and Asmundson (2022) discuss this in terms of a 'Goldilocks zone', in which the level of negative climate emotions is not too high that it causes a sense of paralysis in terms of action or reduces overall mental wellbeing, nor too low that one downplays the seriousness of climate change, thus impeding the motivation for action and pro-environmental behaviour. Although it is unlikely to find a universal 'just right,' as this would vary based on a multitude of individual and contextual factors, the allegory demonstrates the complexity of the issue.

3 | A HEALTH GEOGRAPHY LENS

Health geography is a subfield of the discipline of geography that at its core focuses on spatial variations in health behaviours and outcomes, as well as the health impacts of human-environment interactions (Dummer, 2008). Central

to this is a viewpoint that recognises the importance of location, place, and space in understanding health, wellbeing, and disease (Mayer, 2000; Severson & Collins, 2018). Further, health geography examines social, cultural, and political factors that shape health behaviour and outcomes within a spatial context. This approach allows for investigation across a range of scales, from the local neighbourhood up to the global level (Elliot, 2014). Curtis and Oven (2012) outlined how health geography can contribute to the understanding of climate change and health, and they highlighted that mental health and wellbeing was an emerging area at this time (more than 10 years before the publication of this article).

The focus of the discipline of geography on place, space, and environment, supports my argument that a health geography lens will contribute to a greater understanding of the climate change-mental health and wellbeing connection. This is especially true given the geographically unequal exposures and experiences of climate change that are being observed across local, regional, and international scales. Investigations at a range of scales are important when examining the climate change-mental health and wellbeing connection. At the national level—climate change will likely add to existing inequity in mental health and wellbeing across nations; therefore, investigating national, and regional-level inequities in climate change impacts on mental health and wellbeing should be a focus of inquiry (Cuijpers et al., 2023). Additionally, many policies that are developed to influence climate change are taken at the national level; thereby, government (in)action could influence the mental health and wellbeing impacts of climate change (Hickman et al., 2021). At the community level, local conditions and needs are also important to consider, particularly for communities directly impacted by climate change related events (Hu et al., 2023). Mental healthcare service provision may need to consider impacts of extreme weather and other climate change related events as mental health service accessibility varies by location (Wigand et al., 2022). Further, it is often at the community-level that collective action begins; the role of action (collective and individual) in the climate change -mental health and wellbeing connection is a key area for future study.

Various fields of scholarship and theoretical frameworks are drawn on in health geography. These include feminist geographies, Indigenous geographies, posthumanism, environmental justice, and theories of sense-of-place, among others (Andrews et al., 2018; Richmond & Nightingale, 2021). As such, health geography is well situated to examine the mental health and wellbeing impacts of climate change drawing on a multitude of perspectives and methodologies. For instance, health geography approaches have been used to examine inequality and injustice related to environmental exposures (Gatrell & Elliott, 2014). By conducting such research, it is possible to identify populations that are at risk of experiencing the impacts of climate change and from there assess the mental health and wellbeing effects associated with these exposures. When understanding the climate change-mental health and wellbeing connection it is important to acknowledge that structural inequities and systemic marginalisation can influence impacts across scales. Sultana (2021), advocates for a feminist lens to allow for a more nuanced and intersectional understanding of how these injustices are produced. Further, Indigenous geographies support and apply a relational ontology that interprets innate connections between people and the Land (see Richmond & Nightingale, 2021). These approaches can add a theoretical richness and bring context to an understanding of the climate change–mental health and wellbeing connection.

Climate change is an 'uneven global crisis' that has unequal impacts (Sultana, 2021). Accordingly, a health geography lens will enable new insights, which will support a better understanding of the links between climate change and mental health and wellbeing. Vulnerabilities, injustices, and diverse experiences are aspects of climate change research and discourse that have received attention among other sub-disciplines of geography, such as social and political geography (Mikulewicz et al., 2023; Sultana, 2021). Inequities in mental health and wellbeing will likely stem from climate change, with some regions and populations considered more at risk than others (Cianconi et al., 2020). For example, children and youth are populations that are particularly at risk of the mental health and wellbeing impacts of climate change as they are undergoing many key physical and cognitive developmental changes, building a sense of their identity within the broader world, and lack the structural decision-making power held by adults (Börner, 2023; Martin et al., 2022; McDonald-Harker et al., 2021; Treble et al., 2023). That said, children and youth have been important drivers for change by implementing youth-led actions, such as global demonstrations and court

cases against government inaction (Chalifour et al., 2021; Stafford et al., 2023; Wallis & Loy, 2021). This highlights that not only should risks be investigated, but also that strengths within key demographics should be given consideration.

Climate emotions research is an area where health geography can bring new perspectives. One example is the concept of *solastalgia*, "the distress that is produced by environmental change impacting on people while they are directly connected to their home environment" (Albrecht et al., 2007). This concept is often discussed in the climate change and mental health and wellbeing discourse (Albrecht, 2005; Galway et al., 2019) and draws largely on geographical theories of human attachment to place (Curtis & Oven, 2012; Ferrarello, 2023). Beyond solastalgia, a range of emotions about climate change are experienced (Marczak et al., 2023; Martin et al., 2023). Understanding various emotions could be an important area for future inquiry as different emotions may be related to mental health and wellbeing outcomes in different ways (Martin et al., 2022). For example, research has found that anger about climate change is associated with better mental health outcomes and engagement in pro-climate activism while feeling anxiety about climate change is associated with reduced mental health outcomes and less pro-climate activism (Stanley et al., 2021). Geographies of emotion, with a focus on the relations between emotions and space and place (Anderson & Smith, 2001; Gregory, 2011), can provide insights into the human understandings of, and responses to, climate change (Curtis & Oven, 2012). For example, climate change emotions, specifically the term climate anxiety, have been discussed in the context of posthumanism, which emphasises the connection and balance between humans and other life forms, processes, and relations (see Boyd et al., 2023). Considered in this way climate change emotions are expressions of human connection and inter-relations with other parts of the living world. By forging links between geographies of emotion with health geography, there exists potential to enhance research on climate change and mental health and wellbeing.

Health geography draws on multiple methodologies to produce evidence. These include quantitative and qualitative approaches, mixed-methods, and the use of geographic information systems (GIS) (Gatrell & Elliott, 2014). Such diverse methodological tools are needed to add a geographical lens to the study of human health and wellbeing at various scales (Elliot, 2014). Similarly, diverse methods are needed to understand the complexity of climate change and mental health and wellbeing, including inequities by population group and geography as well as the intersectionality of these. In quantitative approaches, an intersectional lens would benefit from disaggregated data as well as knowledge of local contexts (Sultana, 2021). Such approaches will also require careful consideration regarding the design and interpretation of disaggregate findings; for example, use of strength-based approaches (Thurber et al., 2020). Further, GIS can be useful in mapping and studying spatial patterns of exposures and vulnerabilities to climate change and linking various datasets to consolidate our understanding of these relationships in geographical space (Kamel Boulos & Wilson, 2023; Luber & McGeehin, 2008). GIS can also be useful in conceptualising and measuring climate change related environmental exposures (Sadler & Larsen, 2022). Qualitative methods (such as interviews, participatory methods, and case studies) can be utilised to investigate the lived experiences of climate change and yield key insights into how mental health and wellbeing may be influenced. For instance, in a community-led case study conducted in Rigolet, Nunatsiavut, Labrador, Canada, Cunsolo Willox et al. (2013) employed in-depth interviews within an Inuit context. They found that climate change had led to deviations in weather, snow, ice, wildlife, and vegetation—all of which were negatively impacting mental health and wellbeing because of disruptions in land-based activities, as well as loss of place-based solace and cultural identity. Additionally, the increasing focus on participatory methods in health geography, such as arts-based and digital approaches, can allow for a better understanding of the environment-health relationship (Richmond & Big-Canoe, 2018) and can therefore yield insights into how climate change is impacting mental health and wellbeing in communities. For example, Börner (2023) examined the emotional experiences of young people in the context of experiencing recurrent flooding and landslides in the urban periphery of Sao Paulo, Brazil. Drawing on research about climate change emotions to develop strategies of affective learning, Börner describes how youth engaged participatory research informed a framework (titled EMPOWER) that integrated emotions into disaster preparedness to support long-term emotional wellbeing and resilience. In sum, by utilising a diversity of tools and methods, health geographers can explore the complex interplay between climate change and mental health and wellbeing, while accounting for population differences and geographical nuance.

4 | FUTURE DIRECTIONS

4.1 | Bidirectional relationships between health and place

Understanding the bidirectional influences between health and place is central to health geography (Springer Book Series, 2023). Despite the acknowledgment of bidirectional influences (Cutchin, 2007), many health geography studies examine place-based characteristics and processes and how they impact health outcomes or behaviours. In this line of research, environmental conditions are a determinant of health. This is suitable for many research questions about the relationship between climate change and mental health and wellbeing. Yet, in addition to this, the connection between climate change and mental health and wellbeing is an excellent example of how the relationships between health and place may be bidirectional. For example, the negative emotions that stem from an awareness of climate change (overarching effects) allow for an illustration of this. Specifically, it is theorised that emotional responses, such as worry and anxiety, can be overwhelming and impact on daily functioning; with that there is the potential for a state of hopelessness or paralysis that could impede pro-environmental action (both individual and collective) (Heeren & Asmundson, 2022). Alternatively, feelings of worry and anxiety can also lead to action as a motivating force and a way of dealing with such emotions (Heeren & Asmundson, 2022; Marks & Hickman, 2023). Adopting a bidirectional view supports a more nuanced perspective that allows for theories of the complex interactions between human health and environments to be examined in a more nuanced way. Taking such a view could lead to quantitative studies that are designed to test such theoretical relationships and could also support the development of theoretical frameworks that move beyond documenting pathways to a conceptualisation of the connection between climate change and mental health and wellbeing that allows for interrelationships between humans and other parts of the living world.

4.2 | Bringing together knowledge of environmental sustainability and health geography

The field of geography is inherently interdisciplinary (Baerwald, 2010). Geography has been described as a 'bridge discipline' in that it can connect the study of human and environmental systems (Gober, 2000). It encompasses various sub-disciplines and incorporates subject matter from physical sciences, social sciences, and the humanities. Such a field allows for a holistic examination of environment-human interactions, and as such, it provides a unique framework to explore the multifaceted aspects of climate change and mental health and wellbeing. To fully comprehend the intricate dynamics of climate change and its effects on mental health and wellbeing, and to develop knowledge that allows for the complexity of climate change impacts, various disciplinary lenses are needed. This approach enables researchers to bring together diverse viewpoints to develop integrated research questions and generate knowledge that accounts for the complexity of the climate change-mental health and wellbeing connection. For example, developing and evaluating public health interventions that support mental health and wellbeing, as well as the natural environment, need the dual knowledgebase that comes from an understanding of both environmental sustainability and health geography. By integrating the geographies of health with environmental sustainability, researchers can examine the connections between climate change and mental health and wellbeing and bring an understanding of broader social and environmental factors more thoughtfully. Indeed, Curtis and Oven (2012) noted that in the study of climate change and health "knowledge of geographies of health and of sustainability needs to be brought more closely together." Such an interdisciplinary approach can potentially support valuable insights and a better understanding of the underlying mechanisms that contribute to mental health and wellbeing impacts in the context of climate change. It also allows for the development of comprehensive strategies and interventions that address the interconnected challenges of environmental sustainability and health.

5 | CONSIDERATIONS

This paper set out to illustrate that the sub-field of health geography is well-suited to investigate the connections between climate change and mental health and wellbeing and to encourage a greater uptake of this important and

complex topic in the sub-field. High-quality research is needed to understand and mitigate the mental health and wellbeing impacts of climate change. A current lack of such research limits evidence-based action planning (Cuijpers et al., 2023). Although this paper argues that health geography has a role to play, it is important to note that other disciplinary lenses outside of geography are also needed to fully address the complexity of this issue; hence, there is a broader need for a wide array of interdisciplinary research on this topic. Such collaborations will increase rigour in study design and add value to the interpretation of results (Sadler & Larsen, 2022). Additionally, although health geography has traditions with a variety of methodological approaches, each approach comes with its own set of strengths and limitations. Therefore, mixed-methods approaches as well as the development of new methods or the utilisation of new technologies may be warranted to understand and address the complexity of the relationship between climate change and mental health and wellbeing.

6 | CONCLUSIONS

The connection between climate change and mental health and wellbeing has become an increasingly researched area; this is promising as evidence is required to support health policy and planning in the face of climate change. Health geography has a valuable role to play in investigating these connections. By focusing on spatial processes and human-environment interactions, as well as utilising diverse methodologies, health geography is optimally positioned to contribute to the emerging and complex field of research on the climate change-mental health and wellbeing connection. By exploring the bidirectional relationships between health and place and integrating knowledge from environmental sustainability, health geographers can enhance our understanding of the relationships between climate change and mental health and wellbeing. Interdisciplinary collaborations as well as the integration and development of new methods, creates promise for future research. Growing knowledge on the climate change-mental health and wellbeing connection is crucial for developing effective mitigation strategies and promoting mental health and wellbeing in the face of threats and challenges stemming from climate change.

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