



What are the Impacts of Concern about Climate Change on the Emotional Dimensions of Parents' Mental Health? A Literature Review

Elizabeth Bechard^{1*}, Jennifer Silverstein², Jennifer Walke³

¹Moms Clean Air Force, United States

²LCSW Infant-Family Mental Health Specialist, Climate Psychology Alliance-North America, United States

³Health Service and Population Research, King's College London, United Kingdom

ABSTRACT

Background: Climate change threatens our mental health. While a growing body of literature highlights the impacts of climate change on the mental health of young people and the general adult public, relatively little is known about how climate change affects the mental health of parents. Through a literature review conducted with a systematic approach, this paper's aim was to understand how climate concern affects the emotional dimensions of parents' mental health.

Methods: This review was initially conducted in April 2022 as part of a graduate program. Searching methods aimed to identify papers addressing the impact of concern about climate change on parents' emotional well-being. A thematic analysis approach was used to identify themes. Database searches were reconducted in April 2023 to identify new eligible papers that had been published within the past year.

Results: 25 papers met criteria for inclusion. Thematic analysis revealed three main themes:

- Parents experience emotional distress that can be described as moral injury;
- Parents use distancing strategies to cope; and
- For some parents, embracing the challenges of climate change can be a catalyst for personal growth, meaning, and hope.

Conclusions: This review highlights the need for research on how to help parents cope with climate distress, as well as a need for parent-supportive policies. Parents play a critical role in supporting the well-being of young people, who will be disproportionately burdened by the climate crisis. Understanding how to promote resilience and emotional well-being in parents is an essential part of building the well-being of future generations.

Keywords: Parents; Climate change; Mental health; Climate anxiety; Climate psychology

INTRODUCTION AND BACKGROUND

Climate change threatens human well-being around the world, with extreme weather events like heat waves, hurricanes, and wildfires happening with greater frequency and intensity every year [1,2]. The physical health threats associated with climate change are well-described and increasingly, research is showing that climate change is adversely impacting our mental health [3-7].

Climate change's impact on our mental health can travel

through multiple, often synergistic pathways that can loosely be categorized as direct, indirect, and vicarious [7-9]. Exposure to extreme heat and air pollution may directly impact mental health, as can the traumatic experience of living through climate disasters. Indirectly, climate change disrupts social and physical infrastructure and can exacerbate existing structures of inequity, amplifying the daily burdens felt by marginalized and vulnerable communities. Awareness of climate change can be experienced as a vicarious threat even among individuals who haven't yet lived through a climate-related disaster or ex-

Received:	01-August-2023	Manuscript No:	IPJHCC-23-17296
Editor assigned:	03-August-2023	PreQC No:	IPJHCC-23-17296 (PQ)
Reviewed:	17-August-2023	QC No:	IPJHCC-23-17296
Revised:	22-August-2023	Manuscript No:	IPJHCC-23-17296 (R)
Published:	29-August-2023	DOI:	10.36846/2472-1654-8.4.8039

Corresponding author Elizabeth Bechard, Moms Clean Air Force, United States, E-mail: ebechard@momscleanairforce.org

Citation Bechard E, Silverstein J, Walke J (2023) What are the Impacts of Concern about Climate Change on the Emotional Dimensions of Parents' Mental Health? A Literature Review. J Healthc Commun. 8:8039.

Copyright © 2023 Bechard E, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

treme weather event. Worry about the future harms of climate change—often described as “climate anxiety” or “ecoanxiety” is rising [7,9,10]. Climate change’s impacts on mental health are so significant that the new, transdisciplinary fields of climate psychology and climate psychiatry have emerged in response to the need to more deeply understand and effectively address the myriad ways that climate change and other forms of environmental destruction affect our emotional, psychological, and social well-being [11,12].

Some research on climate concern has focused on related behaviors and preferences, exploring associations between concern about climate change and the likelihood of engaging in pro-environmental behaviors, voting for pro-environmental candidates, or aligning with a particular political party [13-16]. Other research has focused more on the emotional dimensions of climate concern, assessing experiences like worry, anxiety, fear, anger, and hope [17-23]. For example, a 2021 survey found that 65% of Americans reported being worried about climate change, suggesting widespread concern about climate change. An even higher portion (71%) reported a belief that climate change will harm future generations [19]. Given this concern for future generations, a focused body of research has begun to explore the impact of climate change on youth mental health [18,24-26]. In 2021, a large survey study of over 10,000 young people around the world documented significant emotional distress about climate change in this population, finding that 59% were very or extremely worried about climate change. More than 45% reported that their feelings about climate change negatively affected their everyday lives and functioning [18]. However, in spite of the increased exploration of the impact of climate concern on the emotional aspects of youth mental health, relatively little attention has been paid to the impact of climate concern on the emotional well-being of parents [27-33].

The impact of climate concern on parents’ mental health is an issue of public health concern for two primary reasons: Firstly, parents form a large portion of the global population, whose mental health deserves attention and support in its own right; and secondly, research has identified that parents’ mental health and emotional well-being has a direct influence on the mental health of their children [28,34-38]. Parents and children function as a dyad, and child health experts recognize that the role that parents play in this dyad is critical to healthy attachment and neurodevelopment in children [39-41]. When caregivers aren’t able to be present for children in a calm, regulated way, children’s psychological well-being is compromised [42,43]. Emerging research has already found that a caregiver’s psychological state can influence how a child experiences an extreme weather event [35,44,45], and perinatal distress in disasters has been linked to a range of adverse child health outcomes [28]. As the cascading impacts of climate change accumulate, the overall level of stress in parents’ lives will likely be amplified [28,35,36,46].

In order to adequately address the mental health needs of children and families in the coming decades, we need to better understand the impact of climate concern on parents’ mental health and to identify resources or interventions that may help. The primary aim of this literature review was to explore and summarize what is currently known about how concern about

climate change affects the emotional dimensions of parents’ mental health, in the hopes of generating insight around future research, intervention, and policy needs. Specific objectives included:

- **Objective 1:** Identify and evaluate dominant themes around concern about climate change that may affect parents’ emotional well-being.
- **Objective 2:** Identify and evaluate proposed interventions for climate distress for parents.
- **Objective 3:** Critically appraise proposed moderating factors.
- **Objective 4:** Synthesize evidence to generate recommendations for research, policy, and practice.

Findings from objectives 1, 2, and 3 are presented in the results; findings from objective 4 are presented in the discussion.

METHODS

Search Strategy

This research was undertaken as part of a master’s degree at the London School of Hygiene and Tropical Medicine (LSHTM). The format of a literature review was chosen in order to generate a solid overview of what is presently known about climate concern and the emotional dimensions of parents’ mental health, thereby highlighting opportunities for future research, intervention, and policy needs. Given limited time and resources, this review incorporated a systematic approach to searching methods, rather than attempting a fully detailed systematic review [47].

Five databases were searched for terms relating to the broad themes of climate change, mental health, and parents: MEDLINE, EMBASE, PsychINFO, PsychEXTRA, and Web of Science. The full search strategy can be found in the **Appendix**. Two searches took place: One for the original master’s thesis project in April 2022, and one in April 2023 to identify papers that had been published in the previous year. All abstracts were reviewed by one of the authors (EB) against the inclusion/exclusion criteria to identify papers for potential inclusion in the review. Papers identified for potential inclusion were reviewed in full-text form, and citation chaining was performed on each paper identified for inclusion to search for additional relevant literature. One paper was identified through personal correspondence. In addition, to make the search as comprehensive as possible within project limitations, two subject matter experts were consulted for further recommendations on potentially eligible literature.

Inclusion and Exclusion Criteria

Although climate change can affect mental health through numerous pathways, this review was focused on the effects of concern or worry about the idea of climate change on the emotional dimensions of parents’ mental health. Literature describing the direct mental health impacts of extreme weather like hurricanes or wildfires without mentioning concern about the concept of climate change was excluded. In addition, papers that discussed only the behavioral and cognitive impacts of climate concern were also excluded. These limitations were

used primarily to keep the scope of the literature review manageable within the resource bounds of the master's project. Given the expectation of a relatively small dataset, the search was not restricted to a particular geographic region.

Inclusion criteria:

- Language: English
- Publication year: No limit
- Study population: Parents of one or more children, of any age group (including pregnant people)
- Geographic location: Any
- Published research studies of any kind (qualitative, quantitative, and mixed methods); position papers; and literature reviews addressing the impact of concern about climate change on parents' emotional well-being
- Papers primarily focused on the impact of climate change concern on the psychological well-being of youth, but discussing or acknowledging parents' experiences
- Papers primarily focused on the impact of climate-related weather events on parents' mental health that also specifically address the emotional impact of concern about the concept of climate change
- Papers primarily focused on concern about climate change that includes specific references to the emotional experi-

ences of parents.

Exclusion criteria:

- Does not address impact of climate concern on parents
- Focused on the influences of climate-related events (e.g., extreme weather) on parents' mental health, but not mentioning any aspects of climate concern as a concept
- Addressing parents' concern about climate change, but without addressing emotional dimensions (e.g., focused only on behavioral or cognitive impacts, such as how climate concern impacts pro-environmental behaviors)
- Popular media articles, editorials, journal commentaries, conference abstracts, or books

Quality Appraisal

Given the small body of literature published on the topic at the outset of the project, it was necessary to include a mixed evidence base of qualitative, quantitative, and mixed methods studies, as well as position papers and literature reviews. Papers that were identified for inclusion after being fully reviewed were critically appraised for quality using the Critical Appraisal Skills Program (CASP) quality appraisal checklist that best fit each type of publication [48-51]. While CASP checklists do not generate specific scores, an overall summary of the quality of each paper is provided in [Table 1](#).

Table 1: Basic characteristics of included papers

Author	Year	Country	Type of Paper/ Study Design	Sample Size	Title	Quality Appraisal Notes
Baker et al.	2021	United States	Mixed methods survey study	N=141	Educating for resilience: Parent and teacher perceptions of children's emotional needs in response to climate change	Minimal quality concerns
Barkin et al.	2022	United States	Narrative review	Not named	Climate change is an emerging threat to perinatal mental health	Minimal quality concerns
Benoit et al.	2022	United States	Scoping review	131 articles included in review	Review: Ecological awareness, anxiety, and actions among youth and their parents—a qualitative study of newspaper narratives	No noted quality concerns
Bodin and Bjorklund	2022	Sweden	Qualitative research (focus group interviews)	23 focus groups; N=98 total	“Can I take responsibility for bringing a person to this world who will be part of the apocalypse!?”: Ideological dilemmas and concerns for future well-being when bringing the climate crisis into reproductive decision-making	No noted quality concerns
Bonuck et al.	2020	United States	Mixed methods survey study	N=1189	National Parent Survey 2017: Worries, hopes, and child well-being	Minimal quality concerns
Budziszewska and Kalwak	2022	Poland	Narrative review, also reporting on qualitative research	7 papers related to climate depression; 19 papers related climate change and mental health; qualitative research on-going	Climate depression: Critical analysis of the concept	Narrative review; significant gaps in description of authors' process for searching for relevant literature and recruiting qualitative research participants
Dayton et al.	2022	United States	Mixed methods survey study	N=214	Family communication about climate change in the United States	Minimal quality concerns

Ekholm	2020	Sweden	Quantitative research (survey)	N=1078	Swedish mothers' and fathers' worries about climate change: A gendered story	Minimal quality concerns
Ekholm and Olofsson	2017	Sweden	Quantitative research (survey)	N=1376	Parenthood and worrying about climate change: The limitations of previous approaches	Minimal quality concerns
Fuentes et al.	2020	Canada	Quantitative research (survey)	N=251	Impacts of environmental changes on well-being in Indigenous communities in Eastern Canada	Minimal quality concerns
Galway and Beery	2022	Canada	Quantitative research (survey)	N=627	Exploring climate emotions in Canada's Provincial North	Minimal quality concerns
Gaziulusoy	2020	Finland	Qualitative research (individual interviews)	N=12	The experiences of parents raising children in times of climate change: Towards a caring research agenda	No noted quality concerns
Heffernan et al.	2023	United States	Quantitative research (survey)	N=1620	Parental Concerns about Climate Change in a Major U.S. City	No noted quality concerns
Howard et al.	2021	United Kingdom	Qualitative research (diary entries and interviews)	N=20	(Re)configuring moral boundaries of intergenerational justice: The UK parent-led climate movement	Minimal quality concerns
Howard	2022	United Kingdom	Qualitative research (diary entries and interviews)	N=20	When global problems come home: Engagement with climate change within the intersecting affective spaces of parenting and activism	Minimal quality concerns
Lawrance et al.	2022	United Kingdom	Narrative review	Not mentioned	The impact of climate change on mental health and emotional well-being: A narrative review of current evidence, and its implications	Minimal quality concerns
Leger-Goodes et al.	2022	Canada	Scoping review	N=18	Eco-anxiety in children: A scoping review of the mental health impacts of the awareness of climate change	Minimal quality concerns
Ma et al.	2022	Australia	Scoping review	61 papers included in review	Climate change impacts on the mental health and wellbeing of young people: A scoping review of risk and protective factors	Minimal quality concerns
Rothschild and Haase	2022	United States	Narrative review	Not mentioned	Women's mental health and climate change part II: Socioeconomic stressors of climate change and eco-anxiety for women and their children	Minimal quality concerns
Sanson et al.	2018	Australia	Position paper	N/A	Climate change: Implications for parents and parenting	Minimal quality concerns
Schneider-Mayerson	2022	Singapore	Qualitative analysis of a mixed methods survey	N=607	The environmental politics of reproductive choices in the age of climate change	Minimal quality concerns; primarily homogeneity of the sample
Schneider-Mayerson and Leong	2020	Singapore	Mixed methods survey study	N=607	Eco-reproductive concerns in the age of climate change	Minimal quality concerns, though sample is very homogenous
Stanford Center on Early Childhood	2023	United States	Mixed methods survey	N=1040	Most families are worried about environmental issues, have experienced extreme weather	Difficult to assess quality given format of publication (fact sheet)
Sundblad et al.	2007	Sweden	Quantitative research (survey)	N=621	Cognitive and affective risk judgments related to climate change	Some quality concerns; men overrepresented in sample; would have liked to see more reporting about potential bias and confounding
Thomas et al.	2022	United States/ France	Qualitative research (focus group surveys)	N=74	Understanding youths' concerns about climate change: A binational qualitative study of ecological burden and resilience	No noted quality concerns

Data Extraction and Thematic Analysis

Each included paper was reviewed multiple times for passages relevant to the research objectives, and key data was extracted into a Microsoft Word document used for coding for thematic analysis. Reflexive thematic analysis was performed using the methodology described by Braun and Clarke [52,53]. This method was identified as ideal for analyzing themes from a mixed evidence base within a short time frame, and the analysis was informed by the lead researcher's (EB) own experience as a climate-concerned mother who works full-time as a climate activist in a parent-focused environmental nonprofit. The thematic analysis was conducted with an inductive approach, in which a broad research question is used and data are coded and themes identified without pre-determining themes in advance.

Although the process of thematic analysis informed all study objectives, it was primarily relevant for objectives 1 and 4. Other objectives (proposed interventions and modifying factors) were met through coding, organizing, and summarizing relevant data.

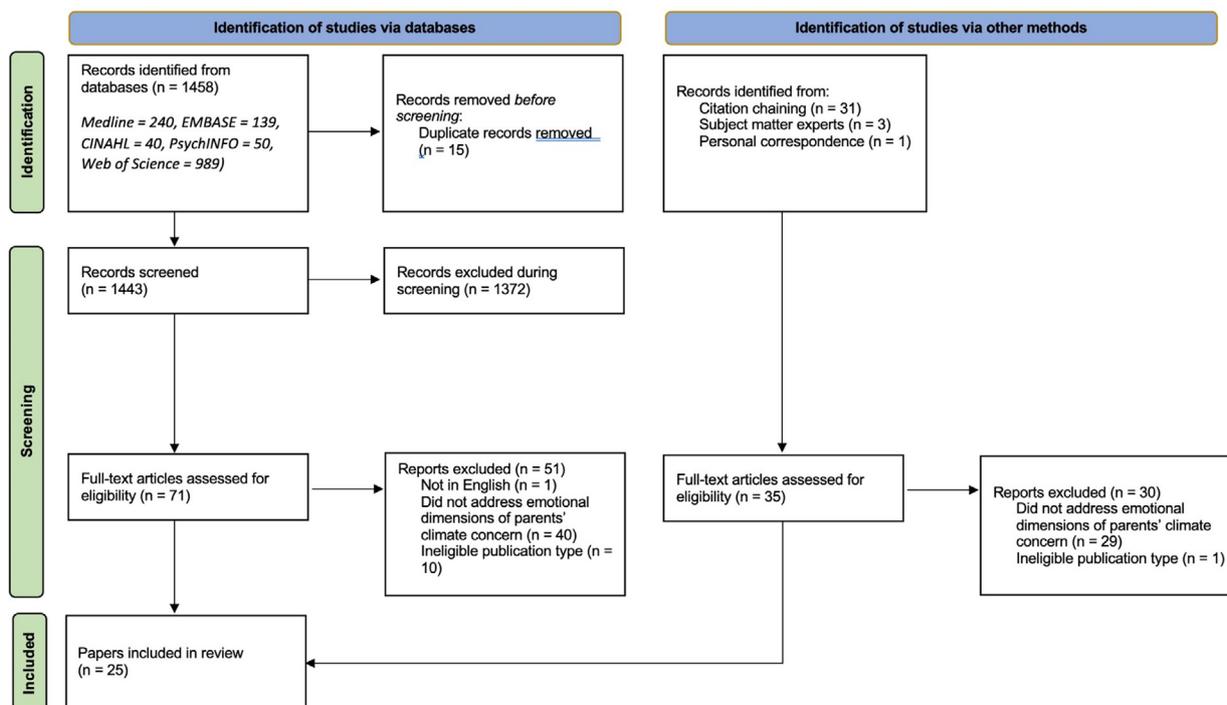
Ethical Considerations

The project was reviewed by the LSHTM Research Governance and Integrity Office. Given that this was a literature review, there were no ethical concerns, and full review by the ethics committee was not required.

RESULTS

Overview of Literature Characteristics

A total of 13 papers were identified for inclusion during the initial search in April 2022, and 12 additional papers were identified during the second search in April 2023, for a total of 25 included overall. The PRISMA diagram **Figure 1** illustrates the search and selection process. 23 out of 25 studies were published in Europe, North America, or Australia, and two studies published in Singapore were focused on a dataset from the United States. All but one study had been published in the last 7 years (2017-2023), and more than half (15) had been published during 2022 or 2023. Basic characteristics of included papers can be found in **Table 1** [7,25,28-33,35,46,53-67].



Adapted from: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: 10.1136/bmj.n71. For more information, visit: <http://www.prisma-statement.org/>

Figure 1: PRISMA Diagram

Thematic Analysis

The thematic analysis revealed three main themes:

- Parents experience emotional distress that can be described as moral injury;
- Parents use distancing strategies to cope with climate distress; and
- For some parents, embracing the challenges of climate change can be a catalyst for personal growth, transformation, meaning, and hope. A visual representation of the research findings can be found in **Figure 2**.

Theme #1: Emotional Distress as Moral Injury

All papers reviewed named concern about climate change as a source of emotional distress for parents, describing emotions that ranged from anxiety and worry to hopelessness and despair (see **Figure 2**) [7,25,28-33,35,46,53-56,59-65,68]. Those that explored qualitative aspects of parents' emotional experience painted a picture of moral injury [31,32,46,53-55,61,62,64,65,68]. Moral injury is the experience of psychological harm resulting from witnessing or engaging in actions that violate an individual's core moral values or beliefs [69,70], or from "betrayal by a trusted leader or authority [69]." In a landmark paper addressing the extraordinary burden of cli-

mate distress on the mental health of young people around the world, Hickman et al. stated: “Failure of governments to protect [young people]... from climate change could be argued

to be a failure of human rights and a failure of ethical responsibility to care, leading to moral injury [18].”

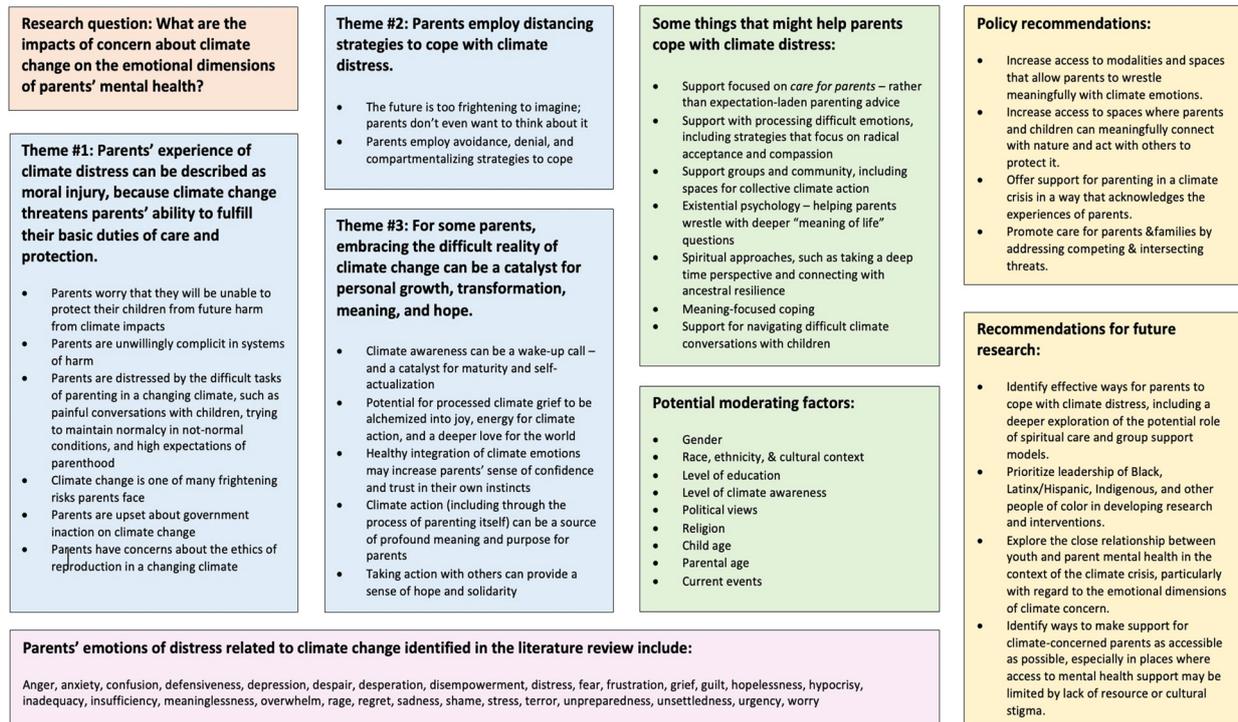


Figure 2: Visual representation of research findings

The findings of this review suggest that parents, too, may experience several dimensions of moral injury in relation to climate change. Parents are morally and ethically obligated to provide physical and emotional care and protection for their children; climate change directly interferes with these fundamental parental duties. Parents experience emotional distress because they are worried they will be unable to protect their children from future harm from climate change; unwillingly complicit in systems of harm; distressed by the challenges of parenting in a changing climate; distressed by government inaction on climate change; navigating multiple competing and intersecting threats; and concerned about the ethics of reproduction in a time of climate change.

Parents worry that they will be unable to protect their children from future harm from climate impacts: Parenthood is naturally associated with some degree of concern for what children and future generations may be exposed to. Fear of an uncertain future is not new for many communities, such as those that have experienced the existential threats of colonization, genocide, and slavery. However, the threat of climate change represents a particularly overwhelming, unsettling risk for many parents [30]. In a 2022 survey of Chicago parents, nearly two-thirds reported worrying about climate change, with 30.5% reporting worrying “a great deal”; nearly three-quarters of parents in this survey expressed concern that climate change would impact them or a member of their family [60]. A 2023 survey of parents of young children from the U.S. found that 78% expressed worry about climate change and the impact it might have on their children [68]. Climate-concerned parents view the future as a frightening place that will expose their children to harm from a range of potential climate impacts,

from extreme weather to food shortages, species extinction, climate migration, lowered standard of living, eco-reproductive concerns, heightened inequity, and civil/social unrest [30,31,33,46,53,54,56,61,62,64,65,68]. In a paper exploring eco-reproductive concerns, Schneider-Mayerson found that 96.5% of parents and climate-concerned potential parents reported an “overwhelmingly negative expectation” of a climate-changed future [64].

Gaziulusoy reported on a qualitative study exploring the concerns of climate-aware parents:

“Without exception, the interviewed parents indicated that their children will experience the impacts of climate change during their lifetime, while some also mentioned that the impacts are already occurring, particularly referencing extreme and abnormal weather events [31].”

And Howard reported on the emotional experiences of parent climate activists in the United Kingdom:

“For Sophia, concerns about ‘societal breakdown, lots of death across the world, large parts of land underwater’ were a scenario impossible to ignore [62].”

The thought of a disaster-filled future creates emotional distress for parents because they cannot protect their children-which threaten one of the fundamental roles of parenthood:

“I was first committed not to bring any children into this doomed world, but then I met my husband and fell in love and I wanted them. They have brought me so much joy, but I feel so guilty about it. I don't want them to have to suffer through the future humans have created for them [65].”

"I feel extremely sad. For your kids, you always want to be there, but you can't in this case. It's against everything that being a father means. I cannot protect them [31]."

"We had this great fear for our families and for our children, and this sense of wanting to look them in the eye later on. There's so much based on what a sense of what the future may be. It's an awful shadow to live with [61]."

Parents are unwillingly complicit in systems of harm: Parents want to act in ways that preserve a liveable future for their children, but feel constrained by both the hectic pace of parenthood and the limitations of social structures, such as the fossil fuel infrastructure that makes everyday life possible for many [31]. This creates a sense of guilt, shame, and compromised integrity when they have to act in ways that might perpetuate the environmental damage they're afraid will hurt their children [30,31,54,62].

"Having to operate within the limitations of systemic affordances, parents act in ways that clash with their values or their thoughts on what are the right ways of acting. This creates a sense of compromised integrity and gives way to feelings of guilt towards their children, which, in some cases, inhibits their capacity to implement preparatory measures for their children's long-term resilience [31]."

Everyday activities, like driving, can become fraught with guilt and moral anguish. Parents wonder how they can acknowledge to their children that fossil fuels are bad for the environment—and then proceed to use them to fulfill family activities:

"Charlotte's child's birth brought on guilt around car use: 'I remember suddenly becoming really anxious about driving a lot, and that being a bad thing. You suddenly see it for what it is, that everything I did, and we all did, and all the choices we make, are going to cause problems or be solutions [62].'"

Parents are also aware of the need for change to happen at a large scale—which can seem beyond the reach of their own perceived capacity to effect change:

"If you're not engaged, not doing anything at all, you can feel fairly hopeless. Small things we can do, like being active politically. But that's difficult when the change needs to happen at a global level [31]."

"I feel responsible to recycle and reduce use of single-use plastics and other items. But I wish I could do more. I just don't know where to start and it feels like whatever else I could do would be so small in comparison to what needs to be done [68]."

Parents are distressed by the difficult tasks of parenting in the context of climate change: Conversations about climate change with children can be challenging: Several papers noted the challenge of navigating how and when to have conversations about climate change with children, and this emerged as a significant source of emotional distress [24,31,35,46,53,57,67]. Guidance for climate-concerned parents encourages them to talk with their children about climate change [35,57,63,67], but talking about climate change also risks provoking children's emotional distress, potentially generating another source of moral injury. In a review of media narratives about climate distress, Benoit et al. highlighted the following quote from a newspaper article:

"Parents are left to walk a tightrope between being honest and being comforting, between empowering their kids and weighing them down with the responsibility of saving the world [53]."

Parents worry about the impact their own emotional distress about climate change will have on their children, as popular media narratives sometimes warn that talking about climate change is "potentially harmful to children and detrimental to family relationships [53]." Parental distress can become a barrier to family climate communication [46,57,67]. A survey conducted by Baker et al. asked parents to respond to the question: "What challenges have you faced in communicating with your children/students about climate change and the state of the world?" 54% of parents responded that they were "anxious/fearful/sad" about climate change themselves, and nearly half expressed worry that they would only exacerbate their children's distress about climate change [46]. Another survey conducted by Dayton et al. found that nearly 40% of parents identified their own emotional distress about climate change as a perceived barrier to family communication about the topic, and approximately a third expressed worry that climate conversations would exacerbate their children's emotional distress [57]. In Gaziulusoy's interviews, one parent reported:

"I need to prepare myself. I get very emotional, and I don't want my children to see me like this [crying] [31]."

Additional challenges in communicating with children about climate change included difficulty remaining optimistic, particularly in the face of government inaction; not knowing what to say; difficulty in finding age-appropriate ways to communicate; and inability to shield children from media coverage of climate change [32,46,57].

Parents may experience cognitive dissonance while trying to maintain a sense of normalcy at home: The phenomenon of cognitive dissonance happens when contradictory beliefs or values cause a misalignment between values or beliefs and behavior, causing mental discomfort [71]. In the context of climate change, misalignment between one's beliefs and actions may also be a source of moral injury. Parents may experience a sense of cognitive dissonance as they navigate a confusing dance between trying to project a sense of normalcy in everyday family routines while aware of and trying to prepare for a climate-changed future that may be radically different from the present:

"[This is] the weirdest moment to be alive. At the same time, we have everything and everything is at stake, and it's crazy to live that. How are you going to deal with this with regard to your children because you cannot prepare them? You don't know what kind of a world we'll be in, but at the same time, you have to psychologically prepare them for a different world, for a different way of being [31]."

"It's [climate change] terrifying of course, but it's part of this contradiction that we live with, isn't it? I get up, I do these things, I make coffee, I carry on life [62]."

Parents' awareness of what may be needed to prepare for the future (or to avoid contributing to future climate impacts) directly competes with their families' needs in the present. According to Benoit et al.:

“[A] pattern emerged of parents displaying detachment and maintaining some semblance of ordinary life while planning for natural disasters: ‘Over the course of two days, while both of my children were out, I finally organized an emergency kit in our basement...’ Parents are expected to consider alternative futures, such as migration, while ensuring a peaceful routine for their offspring [53].”

Parents are aware of the high, and sometimes conflicting, expectations of them: Several papers offered or critically reviewed guidance for parents as to how they are expected to relate to their children in the context of climate change [32,46,57,60,63,67]. In spite of their own climate distress, parents are expected to master a delicate balance between protecting their children from the emotional harm that climate awareness may cause and preparing them to live in a climate-changed future, which requires honesty [31,32,46,53,57]. While climate-concerned parents may wish to rise to this challenge, they don’t always feel confident in their ability to do so:

“The parents feel insufficient and disempowered because they do not think that they have the necessary resources and capabilities to prepare their children for the future [31].”

Some parents may face harsh social judgment for supporting their children in climate activism [53]. Parents also face conflicting expectations that have implications at the level of policy:

“Parental experiences of raising children during times of climate change is not an isolated and internal affair... it has significant interlinkage with the policies in place, the behavioral advice parents receive and to the very materiality of caring for children (such as using air-conditioning to keep the indoor temperature healthy conflicting with the desire to reduce energy consumption or taking children to visit their relatives living in another country conflicting with reducing air travel) [53].”

Climate change is one of many risks parents face: Several papers contextualized climate change as one of many worrisome threats parents face, from challenges in parenting individual children (e.g., concerns about internet use, special needs) to broader social challenges, like concerns about national security, increased socio-political tensions, economic upheaval, gun violence, COVID-19, growing inequality, and racism [29-31,54,55,60,62,64,65]. Schneider-Mayerson noted that “climate change is frequently de-prioritized in favour of more psychologically proximate concerns,” suggesting that even parents who care about climate change may be limited in their ability to engage with it by other, more pressing concerns [64].

Just as the impacts of climate change are not distributed evenly, neither are the competing concerns. For example, in one survey assessing general worries of parents in the US, numerous parents reported concerns related to racial discrimination [55]. Parental concerns relating to systemic forms of oppression are likely more present for those belonging to oppressed and marginalized communities. Many of the competing concerns parents face, such as racism and growing inequality, can also be seen through the lens of moral injury [72].

Parents are distressed by government inaction on climate change: Hickman et al. reported that for youth, one of the most significant drivers of climate distress was a feeling of

betrayal by governments who are failing to act adequately to protect them from current and future climate impacts [18]. Parents are aware of-and distressed by-government inaction as well [31,46,62,65].

“With the IPCC report that came out last year evidence that everything is going quicker, that we’re reaching tipping points much quicker what I would expect presidents to do at the moment is... to really pull the countries together and make people aware that big steps are needed... I don’t see any of this. So, at the moment the situation is pretty dire [31].”

Parents are concerned about the ethics of reproduction in a changing climate: While much of the attention on eco-reproductive concerns has been focused on the worries of prospective parents or people who have decided not to have children because of climate change, emerging research indicates that many parents feel distress about the ethics of having children in a time of climate change, as well [54,56,61,62,64,65]. This distress may be causing some individuals to have fewer children than they desire, due to concerns about the environmental impact of reproduction [54,56,62,64]:

“...a 2018 poll found that 33% of all respondents who ‘had or expected to have fewer children than they considered ideal’ cited ‘worried about climate change’ as one of the motivating factors [64].”

“When my first daughter was born I said to my mother-in-law, it would be irresponsible to have any more children because of global warming [62].”

In a survey exploring the eco-reproductive concerns of parents and potential parents, Schneider-Mayerson and Leong found that over half (59.8%) of respondents felt significant concern about the carbon footprint of having children, and an overwhelming 96.5% of respondents “were ‘very’ or ‘extremely concerned’ about the well-being of their existing, expected, or hypothetical children in a climate-changed world [65].” Yet many people may view the experience of parenthood as the “meaning of life,” and a fundamental human right for those who wish to build families [54]. The emotional experience of questioning the ethical implications of something many see as central to the human experience-to the extent of regretting having children at all-can be considered a form of moral injury:

“Parental anxiety about how their children will fare in a climate-changed future was so strong that 6.3% of parents confessed to feeling some regret about having children due a sense of hopelessness and despair about climate change. For example, [one mother] wrote, ‘I regret having my kids because I am terrified that they will be facing the end of the world due to climate change [65].’”

On the other hand, in spite of intense distress related to reproductive concerns, Bodin and Bjorklund found that climate change might not be a deciding factor in the decision to become a parent:

“Even though [awareness] of climate issues was high, it was striking how little significance it eventually had in the reasonings around decision-making. Often, people found new ways to negotiate around and justify their wish to reproduce [54].”

Theme #2: Strategies for Creating Distance from Climate Distress

In the face of profoundly distressing awareness of climate change, many parents employ distancing strategies as a form of coping [31,55,62,65]. Distancing strategies might take the form of viewing climate change as a future threat that will affect others, but not oneself or one's own children [32]; mentally and emotionally tuning out the problem, such as by avoiding the news or intentionally disengaging from climate change to preserve mental health and family cohesion; or an inability to imagine the future at all [31,32,62,65].

"...[One mother] explicitly stated that she was not able to imagine her children as adults and that it was hard to imagine her children's life beyond her own [31]."

"To be honest I haven't yet digested the latest IPCC report. I read the headlines. I cannot fully admit it to myself. I mean, I can but I can't. It just makes me hopeless. I don't want to feel that way [31]."

"...the survey contained an open-ended question about the future, 'What do you think the world will be like in 2050?'... 98 respondents did not answer this question, or wrote some version of 'I'm not sure or maybe I don't want to think about it.... [65]'"

Howard's study of parent climate activists noted a striking lack of anger in response to "inadequate government and societal responses to the injustice of climate change for children," which contradicted earlier findings on anger as a personal motive in political action for parents [62]. Some parents may suppress emotions like anger in order to preserve cohesive relationships with children and partners at home:

"Anger was... tempered by guilt by Peter, this time for compromising his 'good' fatherhood, telling me he'd got frustrated about recent government inaction, but added 'it's really hard to be a good dad when you're angry about things [62]."

Parents may also consciously manage distressing emotions about climate change in order to maintain mental health and function as parents:

"Participants reported that climate action... imbued every moment of their daily lives. The emotional charge of activism was at times exhausting and required various strategies to 'make headspace'... many reported they guiltily scrolled past bad news stories, or avoided watching any upsetting nature documentaries because they 'needed a break [62].'"

Theme #3: Climate Change as a Catalyst

Although parents' emotional experiences relating to climate concern were overwhelmingly described as negative [25,29-33,46,53-55,57,58,62,64,65], for some parents, embracing the distressing reality of climate change may also be a catalyst for personal growth, transformation, meaning, hope, and solidarity [46,53,54,61,62,64,65]. Parenthood is inherently transformative [29,53], but in the context of climate change, this transformation can take on different dimensions—the idea of loving the future is imbued with new meaning. The process of embracing painful climate emotions may be essential to accessing these emotions' catalytic potential:

"Processing climate change requires parents to welcome distressful feelings and to accept their transformative effect... 'As my awareness grew, I went through stages of grief. I've cried over ecosystems disintegrating, over the looming possibility of social breakdown, over the scale of suffering and death this will unleash. Letting in the grief allowed me to reach acceptance and get to work.' Welcoming their grief enables parents to process it, and, afterward, to feel genuine joy and energy [53]."

"Integrated" parents who have found ways to embrace and process difficult climate emotions may translate their heightened awareness of the inherent impermanence of life into an intentional focus on being more mindful, joyful parents [53]:

"Parents focus on several aspirations: Anchoring life experience in the present, helping children become integrated persons, broadening their understanding of time, enabling them to have a voice, and finally, helping them accept the anxiety inherent to the human condition. Some parents shifted to further anchor their experience in the present: 'I have made a large pivot in my life, as a parent, toward the cultivation of joy on a daily basis [53].'"

Some parents are able to experience a sense of meaning and connection with their children through the process of engaging with climate change. The survey conducted by Baker et al. invited parents and teachers to respond to the question: "What positive experiences have you had with your children/students in regards to climate change and the state of the world?" Respondents reported experiences that included witnessing their children express gratitude/joy for the world; taking meaningful personal action; working in collaboration with others to help protect the planet; moments of insight and growth; and spending time in connection with nature. In spite of numerous challenges also named in survey responses, parents and teachers actually reported more positive experiences overall [46]. One parent climate activist described a poignant moment with her daughter:

"Walking with my daughter to school though the countryside, morning: We chat about how it is a lovely morning and the landscape is beautiful and I'm so proud of her for finding beauty in the slightest things and showing kindness to everything, no matter how small.... [62]."

The act of parenting itself may be seen as a contribution to a more positive future: Schneider-Mayerson found that a significant majority (81%) of parents and people planning to have children responded "yes" when asked if they viewed their current or future parenting as a contribution to a better world [65]. For some, the choice to become a parent is experienced as an embodied commitment to hope in a better future:

"My partner and I both discussed at length whether or not we should have a child into a world we feel is essentially doomed. There are a few reasons we decided to go through with it. The first is that when our niece was born we both felt a galvanizing energy around our climate activism. We weren't working for abstract survival, but for a world we could see her thriving in [64]."

"There is a bad conscience, but if I had not had children, it would not have made sense to do so much [about the climate]. It gives me a reason to try [54]."

"We had some friends who had made the choice that they didn't want to bring children into this world. They had a really negative idea of the impact of it. But [my] perspective is actually, children bring hope... by raising our children in the way that we think needs to happen, they [will] help make the world a better place [61]."

In Howard's research, many parents described specific catalytic moments as "moral shocks" where their newfound climate awareness triggered intensely negative emotions and drove them into climate activism. Despite the emotional challenges of climate activism, these parents also described activism as a source of hope and solidarity, with meaning derived from action and relationship with other activists [61,62]:

"I have found that throwing myself into all of this actually really does help. Because you're doing something about it... when I'm anxious, I'm having those pangs of grief and anxiety a bit less [62]."

"Participants found a shared sense of desperation but also a sense of purpose and solidarity with other activists... regular activist group meetings provided 'connection and space to talk about feelings' that related to fear anger and sorrow [61]."

Proposed Interventions

Several papers named general advice for coping with climate distress, including acknowledging and validating difficult emotions, meaning-focused coping, limiting news exposure, and other strategies emerging from the expertise of mental health researchers and clinicians [32,46,53]. This review did not identify any evidence-based interventions aimed at helping parents cope with climate distress. Proposed parent-specific strategies for navigating climate distress included: Encouraging care for parents themselves; supporting parents in embracing the difficult reality of climate change in order to access a deeper sense of spirituality, perspective, and meaning; and supporting parents in navigating difficult climate conversations with children.

Parents need care themselves: When it comes to navigating the emotional territory of climate change, parents face the dual challenge of managing both their own emotions and providing support for their children's experiences of climate change. A growing body of research acknowledges the significant burden of climate anxiety on youth [7,18,25], suggesting that youth experience more climate distress than adults, but in Baker et al.'s research, parents and teachers tended to have higher levels of stress than children [46]. In order to fulfill high parenting expectations and to cope with their own distress in a changing climate, parents need support and care:

"The findings of this research can be interpreted as indicating that parents need to be cared for in order to become parents who care for their children in times of climate change [31]."

"Children's capacity to cope with disasters rests in large part on their parents' coping and support. Therefore, parenting advice emphasizes the need for parents to look after themselves as well. When parents are themselves feeling cared for, they are better able to respond to the needs of their children [32]."

"More than half of adults felt their own sadness/anxiety/fear was a challenge in supporting their children and many request-

ed resources for managing their own anxiety. Therefore, efforts to support children should also consider how to emotionally support children's caretakers [46]."

"Parents may also need support in coping with their own feelings and could benefit from parent-centered climate groups... [57]."

In spite of the emphasis around the necessity for care and support for parents themselves, relatively few concrete suggestions were provided as to what this might look like in practice beyond suggestions in Baker and Dayton that parents may benefit from parent-centered groups that allow space for caretakers to process their own emotions around climate change [46,57]. It's likely that the multiple competing demands and worries parents face also compete with time and opportunities for parental care [29-32,55,65].

Embracing the difficult reality of climate change may help parents access a deeper sense of perspective and meaning:

Multiple papers explicitly noted the importance of compassionately allowing and embracing painful climate emotions, such as anxiety and grief [32,46,53,57]. The ability to process climate emotions in meaningful ways was described as key to accessing the "transformative" potential of climate awareness [53]. According to Benoit et al., existential psychology may be a useful framework for supporting parents in working through difficult climate emotions [53]. Existential psychology addresses themes that are universal to the human experience, such as death, freedom, and the meaning of life:

"In the context of climate change, existential psychology is a useful framework to help adults confront difficult truths, process distressing feelings, take responsibility as role models, and through their actions empower children...Yalom's existential psychology of death anxiety can help move beyond these defences by:

- a. Revealing finiteness—rather than occupying time, helping parents and children to savour life in the moment;*
- b. Accessing the authentic self—to marvel, not at the way things are, but simply at their existence; and*
- c. Mourning—the loss of a loved place confronts one's own finitude and can lead to personal growth [53]."*

Other strategies highlighted in Benoit et al. spoke to adopting a deep time perspective and honoring connection to ancestral resilience, both of which acknowledge the present reality of climate change while placing it in a much broader historical context:

"...African American climate scientists recall the loneliness and resilience of their ancestries: 'She wants to instill the perseverance and perspective of her ancestors in her 3-year-old son and 14-year-old daughter [53]."

Five papers in this review noted Maria Ojala's research on meaning-focused coping for climate distress in Swedish youth [25,30,32,46,63], which involves strategies like positively appraising difficult circumstances, cultivating gratitude, and intentionally activating positive emotions [73-75]. Baker et al. noted Ojala's findings that the development of adolescent coping strategies around climate change was directly influenced by

how parents communicate about climate change, noting that a positive, solutions-focused communication style in parents and friends predicted higher levels of meaning-focused coping in youth [46,75]. Although Ojala's work wasn't eligible for inclusion in this review, it provides important insight about how parents' coping styles affect family dynamics. Meaning-focused coping may help parents access a deeper sense of meaning and perspective.

Outside of the explicit naming of existential psychology and meaning-focused coping [25,30,46,53,63], relatively few concrete suggestions were provided as to how parents experiencing climate distress can move towards embracing difficult emotions and moving towards broader spiritual and existential perspectives. For some parents, this may be an intuitive process or a process that can be supported by access to professional psychotherapy; for others, it may not be intuitive, and individual professional support may be inaccessible for financial or other reasons. Supporting parents in embracing a broader, existential perspective on climate change may mean moving past offering standardized advice on coping with eco-anxiety, and providing greater access to spaces in which parents can wrestle meaningfully with the deeper questions climate change asks of us:

"...providing parents with standardized instructions for combating climate change and eco-anxiety allows them to delegate to others the responsibility of choosing which climate actions to engage in, which to ignore, and of reimagining how they live their lives [53]."

Parent-centered climate activist groups may provide such spaces [57,61,62]. These spaces explicitly acknowledge the reality of climate change, offer opportunities for meaning-focused coping and acting on moral values through collective action, and generate social support for parents who may feel isolated in their climate concern:

"Ryan [described] an emotional moment at a protest event when he reflected on the shared feelings and solidarity formed against a backdrop of public silence that often made him feel he was 'crazy': 'On one of the first Extinction Rebellion protests I went along with my daughter [...] and thinking, look at all these people who feel the same as me! And that was quite an emotional point, and I felt actually, I'm not some sort of crazy person who is isolated and on his own! There are actually lots of people! And that's something I found through all the groups that I've participated in, the more valuable thing has almost been building relationships with other people [62].'"

Parents need support in navigating difficult climate conversations with children: Multiple studies acknowledged parents' emotional distress in relation to conversations with their children about climate change [31,32,35,46,53,57,67]. Dayton et al. offered detailed suggestions for supporting parents in family climate communication:

"Most parents in this study expressed wanting to connect their children with nature. These parents may benefit from organized support such as activity guides, conversation starters, or organized groups that include other parents and children. Another strategy to promote family communication about climate change is to provide guidance on collective action [57]."

Rothschild and Haase suggest that health care providers may be able to support parenting patients by "developing effective strategies to navigate these difficult conversations with children, such as validating the child's emotions and finding ways to promote resilience and empowerment within families [35]."

Proposed Modifying Factors

Parenthood status itself may be a moderating factor for emotional responses to climate change [7]. Although research on whether parents are more concerned about climate change than non-parents has been inconclusive [30,33], Ekholm and Olofsson propose that when questions about climate distress are posed in ways that inquire about parents' emotional (affective) experience of climate change, rather than simply inviting cognitive evaluations of risk, the correlation between parenthood and climate views becomes visible:

"Clearly, the correlation between parenthood and views on climate risk first becomes apparent when the questions factor in worry or conscience, and the respondent is not simply asked to assess risk. In... questions about feelings, parenthood is significant, proving that it has considerable bearing on people's worry about the impact of climate change [30]."

Several papers identified additional factors that may modify parents' experiences of emotional distress related to concern about climate change, including race, ethnicity, and cultural context; gender; level of education and climate awareness; political views and religion; child and parent age; and current events [29-31,35,46,53,54,58,60,63,65,67].

Race, ethnicity and cultural context: Parents from historically oppressed communities have always had to worry about amplified risks for their children, such as the ongoing threat of violent systemic racism. Research indicates that people of color in the U.S. worry more about climate change than white people in general [76], and around the world, they are disproportionately impacted by the adverse impacts of climate change [77-79]. Several papers reviewed noted that parents who are Black, Latinx/Hispanic, Indigenous, and other people of color experience unique dimensions of climate concern related to how race and ethnicity may amplify climate threats [31,53,55,60,68]. While a 2023 survey of parents in the U.S. did not find that race and ethnicity significantly influenced general worry about climate change, it did find that Black, Latinx, and other parents of color were more concerned than white parents about local environmental issues related to climate change, such as air quality and access to green space [62]. Two papers found that Hispanic parents in the U.S. worry more about the environment than non-Hispanic parents [55,60]; another described one mother's worries about how climate change might exacerbate racism:

"...[one mother] mentioned that her children might be exposed to racism as a potential second-order impact resulting from increasing social tensions if they choose to continue living in their current home country [31]."

For parents who are Black, Latinx/Hispanic, Indigenous, and other people of color, climate change may reinforce a familiar sense of systemic abandonment, recalling their ancestors' experience of survival in the face of existential threats [53]. Connecting with people who may experience similar systemic

injustice can be a source of resilience:

“...a Black climate scientist and mother says: ‘I want to connect with moms who look like me. Black moms and Brown moms, and moms who are in communities of color, because we are disproportionately affected by the impacts of climate change. I just want other moms who look like me to know they have a role in combating this crisis [53].’”

Cultural context may modify the emotional impact of climate concern in other ways, as well. In Fuentes et al.’s research on climate distress and resilience in Indigenous communities in Canada, the lack of an effect of parenthood on the felt impacts of perceived environmental changes was attributed to the cultural conception of parenthood as a community activity, rather than an individualized undertaking:

“Maybe the lack of an effect of parenthood is due to the fact that Indigenous peoples in Canada tend to live in an extended family setting where everyone (parent or not) contributes to children’s education [58].”

Gender: Gender influences the experience of parenthood, and the relationship between gender, parenthood status, and climate concern is complex. Gender also influences the experience of climate change. Multiple systematic reviews have found that women tend to be more concerned about climate change than men [10,35,80], and several papers in this review identified female gender as risk factor for heightened emotional distress related to climate change [7,28-30,33,35,59]. Both Barkin and Rothschild describe in detail the gendered impacts of climate change on women’s mental health, with particular attention to the vulnerability of the perinatal period [27,35]. Some research suggests that mothers are more worried about climate change than fathers [29,30]. Ekholm quantitatively analyzed Swedish parents’ worries about climate change by gender, finding that fathers worry about climate change more than men who aren’t parents. However, fathers had lower mean levels of climate concern than women whether or not they were mothers:

“...women, regardless of parenthood status, generally worry about the effects of climate change for the next generation more than men [29].”

In one form of modelling, Ekholm found that for women, parenthood was not a significant factor moderating climate worry:

“Regarding women’s climate worries, there is no significant association with parenthood. Mothers are not significantly more worried about the effects of climate change than women who are not parents [29].”

When eco-reproductive concerns were assessed, Schneider-Mayerson and Leong found that there were no differences between men and women-however, this also includes data on people who were just considering parenthood, as well as people who were already parents [65]. Another survey of U.S. parents also did not find statistically significant differences in level of climate concern by gender [60].

Level of education, climate awareness and income: Research suggests that globally, higher levels of education are associated with greater knowledge of climate change [81]. In the research presented here, the evidence of education as a moderating

factor for parents’ climate distress was inconclusive [29,30,60]. Higher levels of climate awareness in parents appear to be more strongly associated with greater degrees of distress about perceived or potential climate impacts [30,31,58,60]. Parents with heightened climate awareness, such as those who engage in climate-related work or activism, may have emotional experiences influenced by specific knowledge [31,32]:

“All the impacts mentioned by one mother... included locality specific references and examples. She was also one of the two parents who, with references to her professional work on climate and energy, stated that the worst-case scenarios are coming and that they are coming sooner than previously predicted [31].”

Heightened environmental awareness may also be the result of a close relationship with land, as described in Fuentes’ work with Indigenous communities in Canada:

“When Indigenous people perceive more environmental changes in the eastern Canadian boreal forest, they feel more impacts on their well-being [58].”

However, when climate awareness is combined with an ability to cope with distressing emotions in healthy ways, it may also be a catalyst for positive growth and other meaningful experiences [53,62].

One paper looked at income as a potential modifying factor for U.S. parents’ climate concern, finding that while it did not significantly impact overall levels of climate worry, parents living at 200% of the federal poverty level or below did express more concern about local environmental impacts related to climate change [68].

Political views and religion: Parents who hold left-leaning political views tend to worry more about climate change [29,30,54,64], and parents who identify as non-Christian may also worry more [55].

Child and parent age: The ages of both children and parents were noted as potential modifying factors for parents’ climate distress [46,54,55,57,60,65,67]. Schneider-Mayerson found that younger respondents in a survey about eco-reproductive concerns indicated higher levels of worry about the potential climate impacts their children might face, likely highlighting generational differences in concern [65].

In Bonuck et al., parents of the youngest children (ages 0-5) had the highest levels of concern about their children’s future environment [55]. The birth of a baby was noted by Howard as a transformative event that could heighten both climate awareness and distress [61], and both Barkin and Rothschild describe the perinatal period as a time of unique vulnerability to the mental health impacts of climate change [27,35]. Children’s age was found to impact parents’ climate communication, with parents of the youngest children reporting greater hesitancy and feelings of unpreparedness for climate conversations [46,57,67].

Notably, however, Heffernan et al. did not find differences in levels of climate concern by parent or household child age [60].

Current events: Specific current events, such as extreme weather, the publication of climate reports, or political set-

backs related to climate change may intensify parents' climate distress [31,55,62]. This may be because they are generally accompanied by increased news coverage of frightening aspects of climate change:

"A confluence of factors in or by the United States in 2017 likely exacerbated climate worries: Three major hurricanes, withdrawal from the Paris Climate accords, and rollback of environmental regulations [55]."

"Charlotte described how the arrival of her 4th child coincided with the publication of the 2018 IPCC Report... Other objects acted as an alarm bell such as the popular book Uninhabitable Earth by David Wallace-Wells... Sophia explained her feeling after reading it: 'I felt absolutely shock, and panic... It was like grief. It was a really powerful switch, and I switched from being completely naive to kind of being awake to it [62].'"

DISCUSSION

Climate change is a rising threat to our collective mental and emotional health. A growing body of research highlights the impact of concern about climate change on the mental health of young people, and numerous studies have shown that parenting style, parents' level of distress, and family relationships are key moderators for children's well-being when they are exposed to climate change events [25,46,57,82-88]. Yet relatively little attention has been paid to the mental health of parents and caregivers, in spite of strong evidence that parents' mental health and child mental health are closely interconnected [27-35,41,42,46], and in spite of evidence that parents play a critical role in children's experience of climate change [25,46,57,63,67,89,90]. Understanding how climate concern is affecting parents' mental health is critical to supporting parents as an important population in and of themselves, and may allow for identification of important needs and resources. Though an important critique of the current body of literature on climate change and mental health has been that it tends to center adult perspectives [63,67], better understanding parents' mental and emotional health needs in the context of climate change may indirectly support children and youth, as parents who are more resourced may be better able to meet the physical, mental, and emotional needs of their children.

This literature review was conducted with a systematic approach to explore and summarize what is currently known about an emerging area of research. The lead researcher's own experience as a climate-concerned parent and climate activist (EB) informed reflexive thematic analysis of the literature based on Braun and Clarke's methodology [51,52]. Current literature addressing climate concern and parents' mental health paints a picture of parents in emotional distress, which aligns with the broader literature on climate and mental health [5-7,26,83]. Present findings also indicate that climate-concerned parents experience multiple dimensions of moral injury as climate change inhibits the fundamental parental responsibilities of care and protection.

The concept of moral injury emerged from work with health care professionals and military veterans [69,91], but has recently been applied in the field of climate change and mental health [18,70,92,93]. Youth may experience profound moral distress in witnessing the failure of governments to act in ac-

cordance with the urgency of the climate crisis [18], or in being unable to extract themselves from lifestyles causing climate harm [70]. Parents experience these harms as well, and also face the unique psychic injuries of being obstructed from protecting their children from climate-related harm and of being forced to participate in various forms of harm in order to fulfill the social expectations of parenthood. There is increasing and many would argue appropriate and necessary encouragement for parents to engage in climate action as part of their moral responsibility to care for their children and future descendants [94-98]. However, given what Shrum et al. describe as the "countervailing forces of increased time and energy demands of parenthood [16]," and given the multiple competing, emotionally intense threats faced by many parents, acknowledging and tending to the inner and outer challenges parents face is likely necessary in helping parents respond effectively to the call for climate action. The framing of moral injury is significant for two reasons: Firstly, the concept of moral injury acknowledges parents' pain and highlights a need for spiritual care in supporting those who are injured, in addition to (or instead of) conventional mental health treatments. Secondly, the concept of moral injury "widens our understanding of current experiences of climate change through recognizing varying degrees of power, powerlessness, and responsibility [70]," potentially offering clearer pathways to actions that might generate collective healing and repair.

Moral injury is not a mental health disorder. There is no official diagnosis for moral injury in the DSM [99], and currently, there are no evidence-based treatments [100]. In the context of climate change, Henritze and Weintrobe argue that moral injury may actually be a sign of mental health, rather than dysfunction, as it indicates that individuals are emerging from states of denial [70,92]. However, injuries of any kind require tending, and Williamson et al. suggests that an approach including spiritual care may be useful:

"Approaches that focus on self-forgiveness, acceptance, self-compassion, and (if possible) making amends, might hold more promise. In cases in which the effects of moral injury extend beyond psychological to spiritual harms, spiritual care providers could have a role alongside mental health clinicians [100]."

Jones also suggests that spirituality may be a valuable tool in treating moral injury, given its correlation with post-traumatic growth [99]. This guidance aligns with Benoit et al.'s suggestion that existential psychology may be a valuable resource for parents who are experiencing climate distress, as it seeks to support individuals in exploring the broad, meaning-of-life questions that also fall within the realm of spirituality [53]. Parents who reported experiences of "transcendence" related to climate distress in Benoit et al.'s analysis described spiritual approaches that reached for connection with something beyond oneself: Considering deep time perspective, connecting with ancestral wisdom, and seeking community. Moral injury's implication of the need for a compassionate, caring response also aligns with the emphasis in Gaziulusoy, Baker, Sanson, and Dayton that parents need care and support in order to be caring parents towards their children [31,32,46,57].

As described in Henritze et al., seeing climate distress through

the lens of moral injury may also help individuals and clinicians understand how social position and geographic location affect the emotional experience of climate change, and thus impact responses [70]. For example, a parent from a high-emitting country in the Global North may feel guilt and shame alongside awareness of the outsized climate impact of their lifestyle compared to lifestyles in the Global South. These emotions of distress can serve to clarify personal values, which then have the potential to be translated into action, such as endeavoring to make amends through collective action for climate and intergenerational justice:

“By associating distress with moral injury, avenues open for the actualisation of values and reduction of cognitive dissonance, which must be based in solidarity with wide-scale sustainable change [70].”

“Participants expressed a great deal of worry about the future climate-changed world, and many spoke explicitly of feeling morally compelled to act. One mother told me: ‘I approach activism as a moral thing on the grounds of that I couldn’t not do it. Like I would feel like I was failing as a mum if I wasn’t doing it. I don’t think it’s a choice for me [61].’”

One of the most striking facets of the moral injury theme was the contextualization of climate change as one of multiple competing threats that parents face [29,31,54,55,61,62,64]. Competing and intersecting threats add to the allostatic load parents carry, and may increase an overall sense of the world as a frightening place for children and future generations. The range and scope of competing threats that individual families face varies widely and is strongly influenced by multiple dimensions of privilege. As noted earlier, many of these threats can also be seen through the lens of moral injury, such as systemic racism [72]. Henritze et al. note that the framing of moral injury “foregrounds the challenge of demanding climate justice and addressing intertwined systemic and structural violence [70].” The studies cited here were all conducted with populations in western, educated, industrialized, rich, democratic (WEIRD) countries, where parents’ competing concerns may be quite different than the concerns of parents in the rest of the world. However, even within WEIRD nations, profound inequities exist that demand climate justice. For parents in these countries, contextualizing climate worry as one of multiple worrisome threats may be important in generating resources that offer both meaningful experiences of care and pathways to repairing moral harm through collective climate action.

Another important finding was that for some parents, allowing and even embracing painful climate emotions may be a catalyst for positive personal growth, transformation, and purposeful collective action [46,53,62,64,65]. While much of the literature on climate and mental health focuses on emotions associated with distress, like anxiety and grief, the possibility that processing these emotions in healthy ways may lead to meaningful growth is significant. The concept of climate distress as a catalyst for some parents aligns with research on post-traumatic growth, which highlights humans’ potential to experience positive psychological transformation in the wake of struggling with profoundly difficult circumstances [101,102]. The Post-Traumatic Growth Inventory developed by Tedeschi and Calhoun assesses five primary domains, each of which ap-

peared in the present literature: Appreciation of life; relationships with others; new possibilities in life; personal strength; and spiritual change [103].

This finding also aligns with Ojala’s work on meaning-focused strategies for coping with climate distress [73–75]. Meaning-focused coping involves drawing on personally significant values to find a sense of meaning in challenging circumstances, particularly those that do not have an easy or imminent resolution but still require active engagement, like climate change. According to Ojala:

“[Meaning-focused coping] can involve finding meaning in a difficult situation, drawing on values and beliefs, and using strategies whereby one acknowledges the threat but re-appraises it in a more positive manner and thereby makes it more manageable. Meaning-focused strategies are more closely related to the activation of positive emotion than to the reduction of negative emotions. Positive emotions, in their turn, can buffer negative emotions, help people to face the difficult situation and build resources, and thereby promote problem-focused efforts [74].”

Understanding how some parents are able to alchemize climate distress into experiences of growth, purpose, meaning, and even joy may allow clinicians and researchers to develop approaches that help more parents experience climate emotions as a catalyst for positive change.

Strengths, Limitations and Current Challenges in the Field

This is a novel review that contributes to emerging knowledge about climate change and parents’ mental health, which is a critical public health concern that is likely to grow in the coming years. Conducting a full systematic review was not feasible, as this literature review was a master’s thesis project, and time and resources were limited. It is possible that relevant literature was inadvertently overlooked, in spite of efforts to conduct a search as comprehensive as possible within project boundaries. A significant proportion of the included papers were incorporated into the analysis after the second search for papers published in 2022 and 2023 [7,28,35,53,56,57,59–63,68] and were not coded and analyzed at the same time as the other literature. The lead researcher’s own perspective as a white, North American, educated, climate-concerned mother (EB) was both a strength and a limitation, as it informed the reflexivity of the thematic analysis, but also introduced potential bias. Additionally, by limiting the review to looking at a relatively narrow portion of the psychological impacts of climate change for parents, rather than looking more broadly at both direct and indirect impacts, the resulting analysis offers a limited perspective on how climate change is affecting parents’ mental health.

Other key limitations reflect current challenges in the field of climate and mental health research. There was a relatively small pool of data eligible for inclusion overall, particularly during the first stage of the project, reflecting a lack of data on climate change and the emotional well-being of parents. This may be the result of a lack of funding for such research and/or a lack of awareness about the need for such research. All papers identified focused on study populations in WEIRD coun-

tries, and many lacked racial and ethnic diversity in the study populations. The lack of geographic, racial, and ethnic diversity significantly limits the generalizability of the results. Additionally, none of the papers directly addressed the experiences of nonbinary or transgender parents who may not identify with the gendered labels of “mother” or “father,” potentially limiting the generalizability of the findings to LGBTQ+ parents.

Outlook and Policy Recommendations

The findings of this review underline a clear need for policies and programs that support parents’ well-being in the context of the climate crisis. Parents’ mental health is an important public health concern in its own right, but the vital role parents play in supporting the mental, emotional, physical, and spiritual well-being of children and young people makes ensuring that parents are well-supported especially critical.

Policy Recommendations

- 1. Increase access to modalities and spaces that allow parents to wrestle meaningfully with climate emotions:** Parent-centered climate action groups may offer opportunities for parents to connect with other climate-concerned parents, process climate emotions in a supportive group setting, and engage in meaningful collective action [57,61,62]. Group approaches to mental health support may offer particular promise in contexts where the mental health care system is overburdened or under-resourced, and/or in settings where seeking individual therapy may be financially inaccessible or stigmatized for cultural reasons. Other existing group models for processing climate distress include climate cafés, which are designed to offer a safe, welcoming environment for people to intentionally reflect on their thoughts and feelings about the climate crisis [104,105], and the Good Grief Network, which supports individuals and communities in cultivating resilience and meaning in times of social and environmental crisis [106]. Climate-concerned parents’ heightened need for spiritual care may indicate an increasingly important role for faith communities and other forms of spiritual community in addressing the climate crisis. Finally, climate-aware therapy is an emerging therapeutic discipline that seeks to support individuals in confronting and processing emotions related to the broader context of climate and ecological crisis; for some parents, this may be a useful resource [11,12].
- 2. Increase access to spaces where families can connect with nature-and act to protect it:** Several papers in this review noted that for some parents, climate awareness can lead to profound, positive experiences in their family life, such as spending meaningful time in nature with their children or experiencing parental pride while watching their children engage in pro-environmental behaviors with others [46,61,62]. These findings align with research showing that time spent in nature offers profound benefits for mental health [107-109], as well as research on the mental health benefits of collective climate action [23]. Increasing access to spaces where such positive experiences are possible, such as by promoting equitable access to green space and encouraging family-friendly forms of collective
- 3. Offer support for parenting in the climate crisis through a lens that acknowledges the unique experiences of parents:** On top of individual family challenges, parents face high expectations and a constellation of difficult social and environmental circumstances. Recommendations for how to parent in a climate crisis, such as guidance on supporting children who are experiencing climate anxiety or guidance on how to talk to children about climate change, are necessary and important. And, they should acknowledge directly that parents may be struggling themselves and offer resources for support. These resources might include specific events or groups designed to support parents in processing climate emotions; resources tailored to specific stages of parenthood, such as the perinatal period; information about parent-centered climate action groups; and/or information about how to access climate-aware therapy. In addition, recommendations for supporting youth mental health in the context of climate change should acknowledge the important intersections between children’s mental health and the mental health of their parents and caregivers.
- 4. Promote care for parents and families by addressing competing and intersecting threats:** Parents’ experience of moral injury in the context of the climate crisis indicates a need for compassionate care and support. Parents face multiple competing threats that add to the overall allostatic load they carry, and the burden of these competing threats is not distributed evenly. Climate change is unavoidably intertwined with other forms of structural injustice, such as racism and gender inequity; these inequities also impact the emotional experience of climate change. Meaningfully addressing the mental health burden of climate change on parents-as well as youth and other adults-requires addressing these competing and intersecting threats. Caring policies for parents should address the unique needs of families that often go unmet due to weak or inadequate social infrastructure, such as promoting equitable access to affordable childcare, food, housing, and health care.

Suggestions for Future Research

In light of the lack of evidence-based interventions, future research should focus on furthering an understanding of how to effectively help parents cope with climate distress, including a deeper exploration of the potential role of spiritual care, group-based support models, access to natural spaces, and parent-centered spaces for collective action. The lack of geographic and racial diversity in much of the present dataset indicates a need to prioritize the leadership of the Global South and Latinx/Hispanic, Black, Indigenous, and other people of color in developing research and interventions for parents, particularly given climate change’s disproportionate impact on these communities. Further research should address the intimate relationship between youth and parent mental health in the context of the climate crisis, particularly with regard to the emotional dimensions of climate concern. Additional research is warranted to explore climate change and mental health during the perinatal period, given the unique vulnerabil-

ities of this stage of parenthood. Finally, future research should identify ways to make support for climate-concerned parents as accessible as possible, especially in places where access to mental health support may be limited by lack of resources, an overburdened health care system, or cultural stigma.

CONCLUSION

Climate change's impact on mental health is an urgent, growing public health concern. This literature review has identified key themes related to parents' emotional experience of concern about climate change, furthering understanding in a nascent area of research. Parents' climate distress may be moderated by a range of factors, including race, ethnicity, and cultural context; gender; level of education and climate awareness; political views and religion; child and parent age; and current events. This review highlights the need for future research on how to help parents cope with climate distress, as well as a need for parent-supportive spaces and policies. Parents play a critical role in supporting the well-being of children and youth, who will be disproportionately burdened by the climate crisis. Understanding how to promote resilience and emotional well-being in parents is an essential part of building the resilience and well-being of future generations as we collectively navigate a changing climate.

AUTHOR CREDIT STATEMENT

Elizabeth Bechard: Conceptualization, methodology, investigation, data curation, writing-original draft preparation, reviewing, and editing, visualization. Jennifer Walke: Supervision; writing-review and editing. Jennifer Silverstein: Writing-review and editing.

COMPETING INTERESTS

The authors have no competing interests to declare.

ACKNOWLEDGEMENT

The authors would like to thank Jade Sasser and Rebecca Weston for providing subject matter expertise during the process of identifying publications, and Bob Friedlander for the identification of an additional publication through personal correspondence. Special thanks also go to the London School of Hygiene and Tropical Medicine MSc in Public Health distance-learning program, which supported the initial iteration of this research while one of the authors (EB) was a graduate student.

FUNDING SOURCE

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

REFERENCES

1. IPCC (2021) Climate change 2021: The physical science basis. Contribution of working group I to the sixth assessment report of the intergovernmental panel on climate change.
2. IPCC (2022b) Climate change 2022: Impacts, adaptation, and vulnerability. Contribution of working group II to the sixth assessment report of the intergovernmental panel on climate change.
3. CDC (2021) Climate effects on health.
4. Romanello M, Di Napoli C, Drummond P, Green C, Kennard H, et al. (2022) The 2022 report of the *Lancet* Countdown on health and climate change: Health at the mercy of fossil fuels. *The Lancet*. 400(10363):1619-1654.
5. Cianconi P, Betro S, Janiri L (2020) The impact of climate change on mental health: A systematic descriptive review. *Front Psychiatry*. 11(74):1-14.
6. Clayton S (2021) Climate change and mental health. *Curr Environ Health Rep*. 8(1):1-6.
7. Lawrance EL, Thompson R, Le Vay JN, Page L, Jennings N (2022) The impact of climate change on mental health and emotional wellbeing: A narrative review of current evidence, and its implications. *Int Rev Psychiatry*. 34(5):443-498.
8. Berry HL, Bowen K, Kjellstrom T (2010) Climate change and mental health: A causal pathways framework. *Int J Public Health*. 55(2):123-132.
9. Hayes K, Blashki G, Wiseman J, Burke S, Reifels L (2018) Climate change and mental health: Risks, impacts and priority actions. *Int J Ment Health Syst*. 12:28.
10. Soutar C, Wand APF (2022) Understanding the spectrum of anxiety responses to climate change: A systematic review of the qualitative literature. *Int J Environ Res Public Health*. 19(2):990.
11. Psychiatrists raising awareness about the impacts of climate change on mental health (2023) Climate Psychiatry Alliance.
12. Exploring psychological responses to the climate crisis to strengthen relationships and resilience for a just future (2021) Climate Psychology Alliance.
13. Campbell E, Kotcher J, Maibach E, Rosenthal SA, Leiserowitz A (2021) Predicting the importance of global warming as a voting issue among registered voters in the United States. *J Cresp*. 2:100008.
14. Gregersen T, Doran R, Bohm G, Tvinnereim E, Poortinga W (2020) Political orientation moderates the relationship between climate change beliefs and worry about climate change. *Front Psychol*. 11:1573.
15. Marshall NA, Thiault L, Beeden A, Beeden R, Benham C, et al. (2019) Our environmental value orientations influence how we respond to climate change. *Front Psychol*. 10:938.
16. Shrum TR, Platt NS, Markowitz E, Syropoulos S (2023) A scoping review of the green parenthood effect on environmental and climate engagement. *Wiley Interdiscip Rev Clim*. 14(2):e818
17. Bloodhart B, Swim JK, Diccico E (2019) "Be worried, be very worried:" Preferences for and impacts of negative emotional climate change communication. *Front Commun*. 3:63
18. Hickman C, Marks E, Pihkala P, Clayton S, Lewandowski ER,

- et al. (2021) Young people's voices on climate anxiety, government betrayal and moral injury: A global phenomenon. *Lancet*. 5(12):e863-e873.
19. Marlon J, Neyes L, Jefferson M, Howe P, Mildenerger M, et al. (2021) Yale Climate Opinion Maps 2021.
 20. Marlon JR, Bloodhart B, Ballew MT, Rolfe-Redding J, Roser-Renouf C, et al. (2019) How hope and doubt affect climate change mobilization. *Front Commun*. 4:1-15.
 21. Pihkala P (2020) Anxiety and the ecological crisis: An analysis of eco-anxiety and climate anxiety. *Sustainability*. 12(19):7836.
 22. Pihkala P (2022) Toward a taxonomy of climate emotions. *Front Clim*. 3:1-10.
 23. Schwartz SEO, Benoit L, Clayton S, Parnes MF, Swenson L, et al. (2022) Climate change anxiety and mental health: Environmental activism as buffer. *Curr Psychol*. 42:16708-16721
 24. Burke SEL, Sanson AV, Hoorn JV (2018) The psychological effects of climate change on children. *Curr Psychiatry Rep*. 20(5):35.
 25. Ma T, Moore J, Cleary A (2022) Climate change impacts on the mental health and wellbeing of young people: A scoping review of risk and protective factors. *Soc Sci Med*. 301:114888.
 26. Martin G, Reilly K, Everitt H, Gilliland JA (2022) Review: The impact of climate change awareness on children's mental well-being and negative emotions-A scoping review. *Child Adolesc Ment Health*. 27(1):59-72.
 27. Barkin JL, Curry CL, Goss L (2022) That is one important wrapper: Mental health considerations related to climate change in the perinatal period. *Perspect Psychiatr Care*. 58(1):7-8.
 28. Barkin JL, Philipsborn RP, Curry CL, Upadhyay S, Geller, et al. (2022) Climate change is an emerging threat to perinatal mental health. *J Am Psychiatr Nurses Assoc*.
 29. Ekholm S (2020) Swedish mothers' and fathers' worries about climate change: A gendered story. *J Risk Res*. 23(3):288-296.
 30. Ekholm S, Olofsson A (2017) Parenthood and worrying about climate change: The limitations of previous approaches. *Risk Anal*. 37(2):305-314.
 31. Gaziulusoy IA (2020) The experiences of parents raising children in times of climate change: Towards a caring research agenda. *Curr Res Environ Sustain*. 2:100017.
 32. Sanson AV, Burke SEL, Van Hoorn J (2018) Climate change: Implications for parents and parenting. *Parent Sci Pract*. 18(3):200-217.
 33. Sundblad EL, Biel A, Garling T (2007) Cognitive and affective risk judgments related to climate change. *J Environ Psychol*. 27(2):97-106.
 34. Centers for Disease Control and Prevention (2021) Mental health of children and parents-A strong connection.
 35. Rothschild J, Haase E (2023) Women's mental health and climate change Part II: Socioeconomic stresses of climate change and eco-anxiety for women and their children. *Int J Gynaecol Obstet*. 160(2):414-420.
 36. Rothschild J, Haase E (2023) The mental health of women and climate change: Direct neuropsychiatric impacts and associated psychological concerns. *Int J Gynaecol Obstet*. 160(2):405-413.
 37. Weissman MM, Wickramaratne P, Gameroff MJ, Warner V, Pilowsky D, et al. (2016) Offspring of depressed parents: 30 years later. *Am J Psychiatry*. 173(10):1024-1032.
 38. Wolicki SB, Bitsko R, Cree RA, Danielson ML, Ko JY, et al. (2021) Mental health of parents and primary caregivers by sex and associated child health indicators. *Advers Resil Sci*. 2:125-139.
 39. Cohen SD (2017) Three principles to improve outcomes for children and families. Center on the developing child at Harvard University. ERIC.
 40. Morven H (2018) The parent-child dyad in the context of child development and child health. *Group T. I. A. R. C. H. A. M. P. R.*
 41. Why do we focus on the prenatal-to-3 age period? Understanding the importance of the earliest years.
 42. Spruit A, Goos L, Weenink N, Rodenburg R, Niemeyer H, et al. (2020) The relation between attachment and depression in children and adolescents: A multilevel meta-analysis. *Clin Child Fam Psychol Rev*. 23(1):54-69.
 43. Stolper H, Van Doesum K, Steketee M (2021) How to support parents of infants and young children in mental health care: A narrative review. *Front Psychol*. 12:745800.
 44. Barkin JL, Buoli M, Curry CL, Von Esenwein SA, Upadhyay S, et al. (2021) Effects of extreme weather events on child mood and behavior. *Dev Med Child Neurol*. 63(7):785-790.
 45. Garcia DM, Sheehan MC (2016) Extreme weather-driven disasters and children's health. *Int J Health Serv*. 6(1):79-105.
 46. Baker C, Clayton S, Bragg E (2021) Educating for resilience: Parent and teacher perceptions of children's emotional needs in response to climate change. *Environ Educ Res*. 27(5):687-705.
 47. Aveyard H (2014) Doing a literature review in health and social care: A practical guide. Open University Press.
 48. CASP cohort study checklist (2018) Critical appraisal skills programme.
 49. CASP qualitative studies checklist (2018) Critical appraisal skills programme.
 50. CASP systematic review checklist (2018) Critical appraisal skills programme.
 51. Braun V, Clarke V (2006) Using thematic analysis in psychology. *Qual Res Psychol*. 3(2):77-101.
 52. Braun V, Clarke V (2022) Thematic analysis: A practical guide. SAGE Publications LTD.

53. Benoit L, Thomas I, Martin A (2022) Review: Ecological awareness, anxiety, and actions among youth and their parents-A qualitative study of newspaper narratives. *Child Adolesc Ment Health*. 27(1):47-58.
54. Bodin M, Björklund J (2022) "Can I take responsibility for bringing a person to this world who will be part of the apocalypse!?" : Ideological dilemmas and concerns for future well-being when bringing the climate crisis into reproductive decision-making. *Soc Sci Med*. 302:11498.
55. Bonuck K, McGrath K, Gao Q (2020) National parent survey 2017: Worries, hopes, and child well-being. *J Community Psychol*. 48(8):2532-2551.
56. Budziszewska M, Kałwak W (2022) Climate depression. Critical analysis of the concept. *Psychiatr Pol*. 56(1):171-182.
57. Dayton L, Balaban A, Scherkoske M, Latkin C (2022) Family communication about climate change in the United States. *J Prev*. 44:373-387
58. Fuentes L, Asselin H, Belisle AC, Labra O (2020) Impacts of environmental changes on well-being in indigenous communities in Eastern Canada. *Int J Environ Res Public Health*. 17(2):637.
59. Galway LP, Beery T (2022) Exploring climate emotions in Canada's provincial North. *Front Psychol*. 13:920313.
60. Heffernan ME, Menker C, Bendelow A, Smith TL, Davis MM (2023) Parental concerns about climate change in a major U.S. city. *Acad Pediatr*. S1876-2859(23)00058
61. Howard L, Howell R, Jamieson L (2021) (Re)configuring moral boundaries of intergenerational justice: The UK parent-led climate movement. *Local Environ*. 26(12):1429-1444.
62. Howard L (2022) When global problems come home: Engagement with climate change within the intersecting affective spaces of parenting and activism. *Emot Space Soc*. 44:1-8.
63. Leger-Goodes T, Malboeuf-Hurtubise C, Mastine T, Genereux M, Paradis PO, et al. (2022) Eco-anxiety in children: A scoping review of the mental health impacts of the awareness of climate change. *Front Psychol*. 13:872544.
64. Schneider-Mayerson M (2022) The environmental politics of reproductive choices in the age of climate change. *Env Polit*. 31(1):152-172.
65. Schneider-Mayerson M, Leong KL (2020) Eco-reproductive concerns in the age of climate change. *Clim Change*. 163(2):1007-1023.
66. Stanford Center on Early Childhood (2023) Most families are worried about environmental issues, have experienced extreme weather.
67. Thomas I, Martin A, Wicker A, Benoit L (2022) Understanding youths' concerns about climate change: A binational qualitative study of ecological burden and resilience. *Child Adolesc Psychiatry Ment Health*. 16(1):110.
68. RAPID Survey Project (2023).
69. Griffin BJ, Purcell N, Burkman K, Litz BT, Bryan CJ, et al. (2019) Moral injury: An integrative review. *J Trauma Stres*. 32(3):350-362.
70. Henritze E, Goldman S, Simon S, Brown AD (2023) Moral injury as an inclusive mental health framework for addressing climate change distress and promoting justice-oriented care. *Lancet Planet Health*. 7(3):e238-e241.
71. Festinger L (1957) A theory of cognitive dissonance. Stanford University Press.
72. Barbot O (2020) George Floyd and our collective moral injury. *Am J Public Health*. 110(9):1253.
73. Ojala M (2012) Hope and climate change: The importance of hope for environmental engagement among young people. *Environ Educ Res*. 18(5):625-642.
74. Ojala M (2012) How do children cope with global climate change? Coping strategies, engagement, and well-being. *J Environ Psychol*. 32(3):225-233.
75. Ojala M, Bengtsson H (2019) Young people's coping strategies concerning climate change: Relations to perceived communication with parents and friends and proenvironmental behavior. *Environ Behav*. 51(8):907-935.
76. Ballew M, Maibach E, Kotcher J, Bergquist P, Rosenthal S, et al. (2020) Which racial/ethnic groups care most about climate change? Yale Program on Climate Change Communication.
77. Berberian AG, Gonzalez DJX, Cushing LJ (2022) Racial Disparities in climate change-related health effects in the United States. *Current environmental health reports*. *Curr Environ Health Rep*. 9(3):451-464.
78. EPA (2021) Climate change and social vulnerability in the United States: A focus on six impacts.
79. IPCC (2022) Climate Change 2022: Impacts, adaptation, and vulnerability.
80. Coffey Y, Bhullar N, Durkin J, Islam MS, Usher K (2021) Understanding eco-anxiety: A systematic scoping review of current literature and identified knowledge gaps. *J Joclim*. 3:100047.
81. Lee TM, Markowitz EM, Howe PD, Ko CY, Leiserowitz AA (2015) Predictors of public climate change awareness and risk perception around the world. *Nat Clim Chang*. 5(11):1014-1020.
82. Abramson DM, Park YS, Stehling-Ariza T, Redlener I (2010) Children as bellwethers of recovery: Dysfunctional systems and the effects of parents, households, and neighborhoods on serious emotional disturbance in children after Hurricane Katrina. *Disaster Med Public Health Prep*. 4(1):17-27.
83. Clayton S (2020) Climate anxiety: Psychological responses to climate change. *J Anxiety Disord*. 74:102263.
84. Cobham VE, McDermott B, Haslam D, Sanders MR (2016) The role of parents, parenting and the family environment in children's post-disaster mental health. *Curr Psychiatry Rep*. 18(6):53.

85. Felix E, Affi T, Kia-Keating M, Brown L, Affi W, et al. (2015) Family functioning and posttraumatic growth among parents and youth following wildfire disasters. *Am J Orthopsychiatry*. 85(2):191-200.
86. La Greca AM, Lai BS, Llabre MM, Silverman WK, Vernberg EM, et al. (2013) Children's postdisaster trajectories of pts symptoms: Predicting chronic distress. *Child Youth Care Forum*. 42(4):351-369.
87. McDermott BM, Cobham VE (2012) Family functioning in the aftermath of a natural disaster. *BMC Psychiatry*. 12(1):55.
88. McDonald KL, Vernberg EM, Lochman JE, Abel MR, Jarrett MA, et al. (2019) Trajectories of tornado-related posttraumatic stress symptoms and pre-exposure predictors in a sample of at-risk youth. *J Consult Clin Psychol*. 87(11):1003-1018.
89. Lawson DF, Stevenson KT, Peterson M, Carrier SJ, Seekamp E, et al. (2019) Evaluating climate change behaviors and concern in the family context. *Environ Educ Res*. 25(5):678-690.
90. Mead E, Roser-Renouf C, Rimal RN, Flora JA, Maibach EW, et al. (2012) Information seeking about global climate change among adolescents: The role of risk perceptions, efficacy beliefs, and parental influences. *Atl J Commun*. 20(1):31-52.
91. Čartolovni A, Stolt M, Scott PA, Suhonen R (2021) Moral injury in healthcare professionals: A scoping review and discussion. *Nurs Ethics*. 28(5):590-602.
92. Weintrobe S (2021) Psychological roots of the climate crisis: Neoliberal exceptionalism and the culture of uncare. Bloomsbury Academic.
93. Wray B (2022) Generation dread: Finding purpose in an age of climate crisis. Alfred A Knopf Canada.
94. Bechard E (2021) Parenting in a changing climate: Tools for cultivating resilience, taking action, and practicing hope in the face of climate change. Citrine Publishing.
95. Cripps E (2017) Do parents have a special duty to mitigate climate change? *Polit Philos Econ*. 16(3):308-325.
96. Cripps E (2023) Parenting on earth: A philosopher's guide to doing right by your kids and everyone else. MIT Press.
97. Read R (2021) Parents for a future: How loving our children can prevent climate collapse. UAE Publishing Project.
98. Shugarman H (2020) How to talk to your kids about climate change: Turning angst into action. New Society Publishers.
99. Jones E (2020) Moral injury in a context of trauma. *B J Psych*. 216(3):127-128.
100. Williamson V, Murphy D, Phelps A, Forbes D, Greenberg N (2021) Moral injury: The effect on mental health and implications for treatment. *Lancet Psychiat*. 8(6):453-455.
101. Henson C, Truchot D, Canevello A (2021) What promotes post traumatic growth? A systematic review. *Eur J Trauma Dissociation*. 5(4):100195.
102. Tedeschi RG, Calhoun LG (1996) The posttraumatic growth inventory: Measuring the positive legacy of trauma. *J Trauma Stress*. 9(3):455-472.
103. Tedeschi RG, Moore BA (2021) Posttraumatic growth as an integrative therapeutic philosophy. *J Psychother Integr*. 31(2):180-194.
104. Bryant A (2019) Climate Cafe International. *Climate Mind*.
105. Climate Cafes (2022).
106. Good grief network: 10 steps to personal resilience and empowerment in a chaotic climate. Good Grief Network.
107. Bratman GN, Anderson CB, Berman MG, Cochran B, de Vries S, et al. (2019) Nature and mental health: An ecosystem service perspective. *Science Advances*. 5(7):eaax0903.
108. Fyfe JAL, Hazlehurst MF, Perrins SP, Bratman GN, Thomas R, et al. (2021) Nature and children's health: A systematic review. *Pediatrics*. 148(4):e2020049155.
109. Jimenez MP, DeVille NV, Elliott EG, Schiff JE, Wilt GE, et al. (2021) Associations between nature exposure and health: A review of the evidence. *Int J Environ Res Public Health*. 18(9):4790.