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Elevating mental health disparities and building psychosocial resilience among BIPOC children and youth to broaden the climate and health discourse

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Introduction

Rarely has mankind witnessed co-occurring crises wound the country and world, while simultaneously unearthing deeply rooted social and racial injustices. The short- and long-term health implications of climate change, COVID-19, and the movement for social justice need immediate action to address all aspects of harm, particularly for children and youth.

Climate-related health threats are felt unequally, particularly for children, and they are compounded by decades of racist polluting. In the field of public health, the guiding principle is that health and equity must be the north star for all actions. When air pollution is cleaned up, communities are afforded a basic human need: the right to breathe clean air. When communities who bear a disproportionate risk are prioritized in climate action and investment, including children and families of color living in low wealth communities, the needle moves closer to achieving justice for past wrongs and advancing health equity.

As humans, our problems do not exist in the singular. The changing climate continues to pile on to already devastating challenges and further widens health gaps across the country. The crux of the tragedy is not that climate change and COVID-19 are happening at the same time, however, but rather that the same people and communities hardest hit by COVID-19 are also those hardest hit by climate change. BIPOC community members – those who are Black or Indigenous people of color – are bearing the brunt of these convergent crises. For instance, in December 2020 the Centers for Disease Control and Prevention found that COVID-19 mortality among American Indian/Alaska Native people was almost 2 times higher than that of White people across 14 states.[1] Another study confirmed that American Indian/Alaska Native people tested positive for COVID-19 three and a half times the rate of White people during the summer of 2020.[2]

Climate change is often perceived as a boutique problem observed by the upper and middle classes when the truth remains that those who contribute least to our growing climate problem are often the ones who suffer the most. Globally, the richest 10% of the population account for more than half of total carbon dioxide emissions, and the richest 1% produce twice that of the poorest half of humanity.[3] In the U.S. – where the average net worth of White families is nearly 10 times greater than that of their Black counterparts – pollution burdens fall along racial lines: while White populations experience 17% less air pollution exposure than is caused by their consumption, Black and Latinx communities experience 56% and 63% excess pollution exposure, respectively.[4] This disparity is by

design, with years of racist housing policy situating BIPOC communities in neighborhoods that are also home to dense concrete structures, major truck routes, and industrial waste management sites, all of which also contribute to heat production and capture – and, subsequently, climate change. Because of this, formerly redlined neighborhoods are hotter than their non-redlined counterparts by up to 13 degrees F.[5] As a result, while extreme heat kills more Americans every year than any other weather-related disaster, Black, Latinx, and Native communities are consistently hardest hit,[6] and the convergence of increased temperatures and pollution has led to disproportionate rates of severe asthma for these same populations.[7]

On the global scale, researchers looked at natural disasters brought on or worsened by climate change globally and found that from January 1980 to July 2013, 2.52 million deaths were due to disasters with an astonishing 51% co-located in 49 of the least developed countries (LDCs).[8] The World Health Organization estimates that much of today's disease burden in developing countries can be attributed to climate change, of which 88% of climate-related diseases and illnesses will occur in children under the age of 5.[9] Moreover, roughly half a billion children around the world live in areas with extremely high levels of flood occurrence and another 160 million live in areas at risk of severe drought. Because of the risk associated with them, flood and drought zones often overlap with areas of high poverty; as a result, low-income children and families are on track to face some of the most immediate dangers of climate change.[10]

The growing mental health burden of the physical impacts of climate change cannot be underestimated. Because of the very real harm it can cause individuals, communities, and the systems in which they operate, climate change can cause immense stress and anxiety, intensifying existing concerns or resulting in novel clinical diagnoses. In fact, given the enormity of this harm, even the threat of climate change can have an adverse effect on mental health. As the ecological crisis has gained a profound presence on the world stage in recent years, the prevalence of eco-anxiety has intensified and been brought to the attention of scientists, educators, and the public. Most famously defined by the American Psychological Association (APA) and ecoAmerica as “a chronic fear of environmental doom,” eco-anxiety has manifested in a variety of emotions and led to an array of psychological and mental states.[11] People across the globe are becoming increasingly anxious about their future and that of the planet. The uncertain implications of climatic changes in the future have induced a pre-traumatic stress

disorder, as described by Psychiatrist Dr. Lise Van Susteren.[12] Because the occurrence of environmental disasters has significantly heightened over the past several years, more and more individuals are fearing environmental changes as a threat to the well-being of humanity and all life on Earth.[8]

For children – especially BIPOC children – both the physical and mental health repercussions are of even greater concern given their reliance on the adults and structures around them and their heightened susceptibility to pollutants and toxins.[13] According to the APA's Taskforce on the Interface between Psychology and Global Climate Change, the psychosocial impacts of climate change – the psychological and social impacts that moderate one's ability to build resiliency[14] – are often subtle at first because symptoms gradually build with cumulative exposure. Because of this, the adverse effects of climate change may not be immediately evident in children if not properly understood and, as a result, there is a risk that children who experience climate-related trauma or toxic stress will go untreated and carry their suffering into adulthood.[15]

Methods

This paper examines the published literature on 3 discrete subjects: eco-anxiety, climate change and natural disasters as adverse childhood experiences, and displacement after an environmental disaster. In order to understand how the research landscape has changed over the last several years, articles published between 2000 and 2020 for post-disaster displacement and climate-related adverse childhood experiences (ACEs) were considered, and with review for the topic of eco-anxiety beginning with its first appearance in the literature in 2018.

For each subject, a set of search terms was developed that aimed to synthesize the field and encompass common alternate phrasings for key terminology. For climate-related ACEs, one general query was initially applied – <adverse impact> + <climate event> + <population> – composed of interchangeable terms. In this instance, <adverse impact> included mental health, trauma, toxic stress, and adverse childhood experience; <climate event> included climate change, natural disaster, hurricane, wildfire, flood, drought, and tsunami; and <population> included children, students, adolescents, and youth. For displacement after an environmental disaster, the general query included mental health, trauma, PTSD; natural disaster, post-disaster, floods; and children, adolescents, students and youth, respectively.

Various databases were searched using the queries described above, including PubMed, ProQuest, NCBI, JSTOR, AJPH, and ERIC for articles in health and environmental journals, as well as relevant pieces in the gray literature for these same fields. In reviewing the articles, a second layer of screening was applied. Articles focused on adult populations were excluded from the final findings, and all remaining pieces were screened for references to BIPOC children and youth.

In addition to conducting a literature scan, leading public health, climate change, and mental health experts, and children's environmental health advocates were asked to respond to a six-question survey (Table 1) to gain further insights of this emerging topic and the gaps. Using Google Forms, the survey instrument was administered via email to 12 subject matter experts for the purpose of this article. The open-ended response survey inquired about barriers to accessing mental health services for BIPOC children and youth, barriers to psychosocial resilience among children and youth during and after a climate event, confirmation of the gaps in the literature, and recommendations for building psychosocial resilience in the lives of BIPOC children and youth. The survey was open for two and half weeks, and the team sent reminder emails to complete the survey. In total, 7 responses were received via the Google Form survey instrument. After the survey closed, the research team coded the responses based on recurring themes for each question. Themes that occurred fewer than 2 times were not coded and are not discussed in the results.

Table 1. Climate Change and Psychosocial Resilience Among Children and Youth Survey Questions

1: How would you characterize the barriers faced by BIPOC children and youth with regards to psychosocial resilience during or after a climate event?
2: What are the barriers to accessing mental health services for BIPOC children and youth? Are these barriers heightened by climate events?
3: What recommendations do you have for building psychosocial resilience in children and youth on the national, state, or local level? At what age should this work begin? Please provide your perspective in regards to practices and programs.
4: In our scan of peer-reviewed and gray literature from the past ten years, we found limited research on eco-anxiety among children and youth pre-dating 2018, as well as limited overall research centered on BIPOC children and youth that addressed eco-anxiety, access to mental health

services, and disparate outcomes in the wake of natural disasters. Does this reflect your understanding of the research landscape? Do you see additional gaps in the research?
5: We're interested in exploring the role that policy plays – at all levels and across sectors – in building psychosocial resilience in the lives of BIPOC children and youth. What existing policies create barriers to psychosocial resilience for this community? What new or emerging policies would serve instead to strengthen psychosocial resilience?
6: Please list any organizations or researchers you know are involved in this work.

Results

Literature Review

Eco-anxiety. Scholarly research on eco-anxiety has only emerged in recent years, and few studies have documented this rapidly growing phenomenon among children, young people, and university students.[16,17] A recent study conducted in British Columbia revealed that youth who have directly experienced environmental disasters in their lifetime share increased feelings of worry surrounding the implications of global climatic changes.[9] After experiencing smoky conditions at the end of summer near his home in British Columbia, 19-year old Bryan Buraga stated that he is "worried this indicates the start of a new pattern and it will affect the way of life and increased health problems for people… Those experiences of going out to enjoy nature, I'm worried I won't be able to share that with my kids."[9] Buraga is the former director of Kids for Climate Action, a Vancouver-based youth group established in 2010 that advocates for stronger government action on climate change, and an active leader in climate activism among Canadian youth.[9] His knowledge of the ecological crisis is extensive. Other young individuals that share a sense of eco-anxiety towards the unpredictable state of our planet and humanity may not have received the same degree of education as Buraga. Still, a resounding roar of concern has come from younger generations in recent years that requires greater attention from mental health professionals, educators, parents, and public health practitioners and researchers.[7]

A national survey on "climate anxiety" and "climate emotions" conducted in Finland in 2019 illustrated that over 33% of the teen and young-adult segment of the population (15- to 30-year-olds) recognized some form of climate anxiety in themselves.[7] The survey concluded that

"Young people are in many ways open to ethical concern about global problems… and it should be studied how the media-shaped reality and the integration of social media in the lives of youth shape the dynamics between locally and globally felt threats."[7] Young people are experiencing wildfire smoke blanket their communities, natural disasters rip through their homes, and polluted smog lay over their cities. If they are not directly experiencing it, they are watching it destroy communities and lives through the media. Children and youth are anxious to grow up in a world whose future is far from promising. As stated by 16-year-old Claire Dooley, who experienced wildfires in her Vancouver community during the summer of 2018, "I think in today's world of climate change, it's terrifying to be growing up in it… I have 2 years until I graduate and it's really hard to try and follow my dreams when I don't know what the world will look like… We have such a big obligation to the world around us, we can't even be kids anymore."[9]

ACEs and Chronic Mental Health Concerns. Direct discussion of climate change as an ACE was largely missing from the literature reviewed, although several studies documented the acute and chronic mental health impacts associated with ACEs in children who experienced natural disasters. Of these, most centered on post-traumatic stress.[18-32] Fewer consider internalizing problems such as depression,[33-38] behavioral concerns,[39-41] and changes to neural processes.[42,43] Further, few publications documented long-term mental health impacts, including sleep disturbances and anxiety, for children that can persist for years following a disaster.[29,35,44] Similarly, many publications considered the role of disaster-induced ACEs as risk factors for adverse mental health outcomes without specifically using ACEs terminology. For children with severe or persistent post-traumatic stress symptoms, studies typically connected these outcomes to disaster-related experiences such as loss of important belongings,[34] displacement,[35] loss of family members, and fear of death,[29] as well as both pre- and post-disaster parental distress.[30,39,45,46] Additional publications documented an increase in child abuse following natural disasters.[47,48]

In their review of the literature, Mohammadinia et al. noted that few studies of children in disaster settings focus on their resiliency and their capacity to recover, addressing instead their vulnerability.[49] Where discussions of resiliency occurred, studies pointed to social support as a leading protective factor while simultaneously naming the capacity of natural disasters to disrupt the critical social structures that children rely on in their homes, schools, and communities.[37,45] There was an emphasis on the role of caregivers, with at least one study speculating that caregiver

trauma history – and, therefore, experience with coping and adaptation – could increase child resiliency against post-traumatic stress symptoms, although additional research was called for.[29] At the same time, the ability of caregivers and other adults to protect children from adverse effects may decrease in cases of extended emergencies or prolonged periods of recovery, so reliance solely on caregiver resiliency was insufficient to ensure positive outcomes for children.[50]

Notably absent in the literature was a discussion of the interplay between racism and climate change. In instances where broad disparate outcomes associated with climate change were noted, discussion largely centered on gender and economic status, with more frequent or severe adverse outcomes reported for girls[25,24,25,29,51] and children living in poverty,[34,38] often with an emphasis on children in low- and lower-middle-income countries.[52] Where race was explicitly named, notably within studies conducted after Hurricane Katrina, it was largely considered to have an insignificant impact on mental health outcomes[30,38] with the review turning up just 1 article in which disparate mental health outcomes for Black and White youth were explored.[53] In contrast, research focusing on adult outcomes in the aftermath of Hurricane Katrina more regularly documented disparate rates of post-traumatic stress symptoms and depression among Black survivors.[54,55]

Displacement after an Environmental Disaster. Displacement is one of many consequences of disasters that force people to leave their homes because of the unavoidable impacts of an immediate and foreseeable natural hazard. In many cases, people lack resources and resilience to withstand the impacts of that hazard, which results in their displacement.[56] According to the Internal Displacement Monitoring Centre, there have been more than 1 million disaster-related displacements annually since 2016 in the U.S.[57] Many people experience temporary and long-term displacement from their homes. For example, at the time Hurricane Katrina hit New Orleans in 2005, displacing about 1.2 million people, more than 80% of households left their homes for over 2 weeks. By 2009, more than 38,000 families reported that they still had not returned to their original home.[58] Even a year after the hurricane, approximately 110,000 children under the age of 18 had not returned to the city.[59]

Children may be particularly vulnerable when exposed to the risks associated with displacement because of their physical, psychological, and emotional immaturity, and reliance on adults for their personal security both at the time of moving and in its aftermath.[60] Some studies have documented the mental health impacts that children experience after a natural disaster event.[36, 61-69] However, few have focused on the mental

health consequences of post-disaster displacement in children.[58,70-72] Experiencing displacement can cause serious mental health problems in children. [58] One study found that a significantly higher percentage of children displaced in southern Thailand as a result of the December 2004 tsunami reported symptoms of PTSD compared with those who had not been displaced from unaffected villages in the same area--13% vs 6%, respectively.[73]

Children who are displaced after a disaster also can experience challenges in school performance. Displaced school-aged children tend to have higher dropout rates, receive lower grades and lower testing scores, and suffer from other mental health or behavioral problems.[64,71] After Hurricane Katrina, more than 372,000 of public and private school students in Louisiana and Mississippi were displaced.[74] One study held discussions with school district social work counselors from Mobile and Baldwin counties in Alabama and revealed that some Hurricane Katrina-displaced students seemed to have lost their ability to concentrate on assignments and manifested symptoms of clinical depression. Based on discussions with local school personnel and displaced students and families, the study also determined that the lack of reliable access to transportation resources and unstable housing problems experienced by evacuated families and displaced children led to attendance problems and negatively impacted academic performance.[75] In addition, due to the limited counseling staff available in Mobile and Baldwin County schools, only a few displaced students who were experiencing prolonged sadness, extreme nervousness, withdrawal, emotional outbursts, and preoccupation with the storm's impact on their relatives, homes, or their former schools, as well as other signs of negative psychosocial impacts received treatment.[75] Another study found that approximately 3 years after Hurricane Katrina, "over one third of children from households displaced or greatly affected by the disaster were at least 1 year behind in age for their grade, which represented twice the pre-Katrina average for the region of New Orleans."[58]

Expert Interviews

Survey respondents (n=7) highlighted structural racism, access to educational supports and other social determinants of health (including jobs, housing, and salutogenic infrastructure), and increased likelihood of experiencing climate change impacts more directly as barriers facing

BIPOC children and youth with regards to psychosocial resilience during and after a climate event (Table 2).

Barriers to mental health services. Lack of health insurance; lack of health providers, especially those for BIPOC youth and children; and stigma were cited when respondents were asked about barriers to access mental health services for BIPOC children and youth. Additionally, the above listed barriers heightened by climate events include limited access to mental health services after an event due to such factors as limited transportation or availability of telemedicine services, and trauma resulting from the climate event.

Recommendations for building resilience. Many respondents noted the need for preschool education, building curricula related to climate change and/or psychosocial resilience, and the importance of involving youth in climate change response to build psychosocial resilience in children and youth. Moreover, respondents emphasized the importance of supporting parents and caregivers, and building psychosocial support training for providers.

State of the research. Respondents agreed with the assessment of the literature and confirmed that more research is needed on this topic. To further advance the research and support of BIPOC children and youth, respondents suggested a stronger focus on building personal and psychosocial-spiritual resilience among BIPOCs; working with community violence researchers to gain understanding of potential correlation with anxiety of violence to anxiety of ecological disaster; and targeting attention to areas (e.g., schools, early learning facilities, youth serving organizations, etc.) where children spend much of their time.

The fifth question inquired about existing policies that create barriers to psychosocial resilience for BIPOC children and youth as well as emerging policies to strengthen psychosocial resilience. The responses varied and themes were difficult to capture. However, many of the suggested policies to strengthen psychosocial resilience centered on an intersectional approach to addressing the social determinants of health, from employment, to housing, to poverty. Moreover, respondents called for equity and environmental justice, pointing to systemic racism as a driver for existing barriers to psychosocial resilience for BIPOC children and youth.

Table 2: Common Themes of Survey Responses

Barriers to Psychosocial Resilience	• Structural racism • Access to educational supports and other social determinants of health (including jobs, housing, and salutogenic infrastructure) • Increased likelihood of experiencing climate change impacts more directly as barriers facing BIPOC children and youth
Barriers to Mental Health Services	• Lack of health insurance • Lack of providers, especially for BIPOC youth and children • Stigma
Recommendations for Building Resilience	• Need for preschool education • Building curricula related to climate Change and/or psychosocial resilience • The importance of involving youth in climate change response
State of the Research	More research needed to further advance research and support of BIPOC children and youth, including: • Stronger focus on building personal and psychosocial-spiritual resilience among BIPOCs • Working with community violence researchers to gain understanding of potential correlation with anxiety of violence to anxiety of ecological disaster • Targeted attention to areas (eg, schools, early learning facilities, youth serving organizations, etc.) where children spend much of their time

Discussion

The phenomenon of eco-anxiety is rapidly expanding among children and youth, and research in this area is emerging. Globally, young people have a range of worries about the future of the planet they inhabit. Their feelings, which manifest from directly experiencing or observing climate-related events such as wildfires, are likely to persist and expand given the increased frequency of climate and extreme weather events.

Recognizing the novelty of the term eco-anxiety, this review examined the extent to which established areas of children's mental health, trauma, and stress are being used to talk about effects of climate change on the mental health of children and youth.

Despite general acknowledgement that the disruption caused by displacement due to extreme weather events is traumatic for children, very little discussion of this was found in the literature. This finding is not surprising given the traditional understanding of ACEs as recurrent or prolonged trauma at home. In the landmark CDC-Kaiser Permanente ACE Study, adverse experiences were restricted to abuse and household dysfunction, including domestic violence, divorce or separation, and parental incarceration or mental illness.[76] Despite this, there is a growing understanding that ACEs – and accompanying toxic stress – exist beyond home instability. In their "ACEs Pair," the Building Community Resilience collaborative at the Redstone Center posits "ACE" as an acronym for both "adverse childhood experiences" and "adverse community experiences," the latter of which includes disruption to the social determinants of health, including housing instability, lack of economic mobility, and community violence.[77] Others, such as California Surgeon General Nadine Burke Harris, have incorporated other forms of interpersonal psychological violence into ACE screening tools, including discrimination based on race, sexual orientation, nationality, disability, or religion.[78] Recently, the International Transformational Resilience Coalition expanded their understanding of ACEs to include "adverse climate experiences" such as hurricanes, wildfires, and floods given their impact on the mental well-being of children.[79]

Another notable gap in the literature has to do with the intersection of racism and climate change. While disparate impacts of climate change on communities (and therefore youth) of color are well understood, very few studies explicitly name race as an indicator. The review found only one study that explored disparate mental health outcomes for Black and White youth.[69] Further, the few existing studies were done among ethnically homogeneous populations (that is, White children and parents

after Hurricane Sandy and Black children after Hurricane Katrina), limiting the ability to discuss disparate impacts. This is an area ripe for new research, especially as many of the survey respondents highlighted structural racism as a key driver of psychosocial resilience in BIPOC children and youth.

While some studies documented the impact of natural disasters on children's mental health, very few focused on the mental health consequences of post-disaster displacement in children. Displacement is incredibly disruptive for children and youth because it can disconnect them from social support networks. Thus, schools often buffer the impact of displacement. However, the capacity of schools to meet the mental health needs of displaced children is often limited. One study found a scarcity of mental health providers for displaced students in a particular school district. This lack of mental health counselors reduced the school systems' ability to identify, diagnose, and treat the immediate and delayed psychological, stress-related problems.[75]

Further, most post-disaster studies rely on parental reports of their children's stress-related symptoms and responses.[27] Parents typically underestimate children's post-disaster distress symptoms, and their ratings for their children are largely influenced by the parent's own distress levels. This may be especially true for lower-income communities and communities of color who are preoccupied with survival and meeting basic needs. As one survey respondent acknowledged, "Eco-anxiety in children of color may not rise to the level of day-to-day concerns in many communities of color due to the nature of the chronic adversities faced, including high unemployment, failing schools, community violence, racism, and discrimination."

Lastly, the authors acknowledge that children's advocacy groups, such as the American Academy of Pediatrics and the Climate Psychology Alliance, are developing and promoting resources for building climate resilience among children and youth.[80,81] Although groups representing psychologists and other mental health professionals have created trainings, tools, and other resources for addressing eco-anxiety, most of these efforts are focused on adults.[82,83] There are opportunities to develop new and to tailor existing efforts to address the unique mental health challenges that climate change poses for BIPOC children.

Conclusion

The rise in eco-anxiety among children and youth mimics the rise in general mental concerns among this population, which are likely exacerbated by the COVID-19 pandemic. Climate change, COVID-19, and structural racism have been referred to as co-occurring crises or syndemic, which are characterized "by biological and social interactions between conditions and states, interactions that increase a person's susceptibility to harm or worsen their health outcomes."[84] As indicated by the experts interviewed, the issues of eco-anxiety and climate anxiety and mental health impacts of displacement after climate events are symptomatic of greater societal problems largely driven by structural racism. These complex matters must be approached with community-driven policy and systems solutions that are grounded in principles of equity and justice. For children and youth, addressing these mental health impacts must be a part of a comprehensive strategy to advance equity across the social determinants of health, such as housing, education, and access to health (including mental health) services and providers.

The findings from this review also reveal many opportunities for further research on this topic. Future research should examine the specific impacts of climate events on the mental health of children and youth, especially those from low-income and BIPOC communities who are most vulnerable. Such research could also examine the extent to which stigma about mental health concerns influences parents underreporting of children's stress symptoms and effective strategies for addressing this stigma. Inclusion of climate and extreme weather events in mental health and well-being assessment tools, such as ACEs screening, is another area for further exploration that has implications for children and youth-serving agencies, organizations, and mental and behavioral health services. Finally, practice-based research should examine the impacts of cross-sector approaches, such as health in all policies, on building psychosocial resilience among children and youth. Expanding research on eco-anxiety, especially among BIPIC children and youth, provides the foundation for the development and promotion of evidence-based policy recommendations to galvanize systems-level change.

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