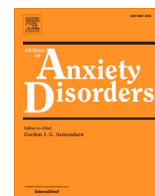




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Anxiety disorders, climate change, and the challenges ahead: Introduction to the special issue

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ABSTRACT

Climate change involves (1) increases in the prevalence of extreme weather events (e.g., wildfires, floods, hurricanes), (2) more gradual climatic changes (e.g., rising sea levels, desertification), and (3) increased risks of pandemics and other widespread disease outbreaks. Anxiety evoked by the threat of climate change can be either adaptive or maladaptive. Adaptive anxiety can motivate climate activism, such as efforts to reduce one's carbon footprint. Maladaptive anxiety can take the form of anxious passivity, where the person feels anxious but incapable of addressing the problem of climate change, and may take the form of an anxiety disorder triggered or exacerbated by climatic stressors. Such stressors may involve exposure to extreme weather events or may involve exposure to other stressors such as forced migration due to rising sea levels or desertification. Three types of interventions are needed to address the various types of climate-related anxiety: (1) programs that motivate people to overcome anxious passivity and thereby take action to mitigate the effects of climate change, (2) treatment programs that address anxiety associated with exposure to climatic stressors, and (3) programs that build resilience at an individual and community level, to help people better cope with the challenges ahead.

1. Introduction

At no point in human history have we faced such an array of both familiar and unfamiliar risks, interacting in a hyperconnected, rapidly changing world. New risks and correlations are emerging. Decades-old projections about climate change have come true much sooner than expected. With that come changes in the intensity and frequency of hazards. Risk really is systemic, and requires concerted and urgent effort to reduce it in integrated and innovative ways. (United Nations Office for Disaster Risk Reduction, 2019, p. iii)

The Anthropocene, which is our current geological epoch, is a period during which human activity is the dominant influence on climate and the environment. The Anthropocene is an epoch that will be filled with climate-related existential threats. The goal of the special issue for the *Journal of Anxiety Disorders* is to focus on anxiety-related problems arising from climate change. Despite its immense importance, remarkably little attention has been devoted to the issue. The articles in this peer-reviewed special issue (Chen, Bagrodia, Pfeffer, Meli, & Bonanno, 2020; Clayton, 2020; Gibson, Barnett, Haslam, & Kaplan, 2020; Hrabok, Delorme, & Agyapong, 2020; Mah, Chapman, Markowitz, & Lickel, 2020) were authored by a diverse group of internationally recognized experts from various fields of mental health and the behavioral sciences

who have explored the various issues involved in the understanding, assessment, and management of anxiety-related problems arising in the context of climate change.

This special issue was organized many months before the current COVID-19 pandemic and, understandably, the papers in this special issue do not discuss in any detail the intersection between pandemics and climate change. Nevertheless, there are many important ways in which climate change and pandemics are interrelated, and understanding the COVID-19 pandemic can prepare us for the challenges of climate change that lie ahead. The purpose of this introductory essay is to examine the essential conclusions of the papers in this special issue and to extrapolate these conclusions to issues concerning the relationship between climate change and current and future pandemics. Some readers will regard the COVID-19 pandemic and climate change as unrelated phenomena, but as we will see, disease outbreaks and climate change are closely interconnected in many ways. The lessons learned from COVID-19 might prepare us for better dealing with anxiety disorders and other clinical problems during the forthcoming adverse events due to climate change. The present article begins with a summary of climate change-related stressors, psychological reactions, and vulnerable groups. This is followed by an analysis of the intersection between climate change and pandemics. The article concludes with a discussion

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of how we might prepare for the challenges ahead.

2. Stressors associated with climate change

Climate change will bring an increase in the frequency and severity of extreme weather events and other climatic adversities. For example, Atlantic hurricanes along the east coast of the United States are becoming more frequent, stronger, wetter, and slower moving over populated coastlines (Shultz, Fugate, & Galea, 2020). In her essay in this special issue, Clayton (2020) observed that climate change is as much a psychological problem as an environmental issue. Clayton documented and dissected the many different types of stressors linked to climate change. These include hazardous and potentially traumatic occurrences such as extreme weather events; for example, floods, mudslides, wildfires and associated air pollution, heatwaves, and hurricanes. These are rapidly evolving, typically discrete but recurrent events, entailing the loss of property, possessions, along with threats to lives of oneself or loved ones. Additional stressors include crowding in shelters, disruptions to work and schooling, and potential difficulties accessing medical care (Clayton, 2020). Both wildfires and heatwaves can lead to increases in interpersonal violence, including intimate partner violence (Parkinson, 2019; Sanz-Barbero et al., 2018; Zhang, 2016). Thus, extreme weather events can entail a range of severe stressors.

Other types of climate-change stressors are more insidious, evolving over years or decades. Examples include rising sea levels, droughts, and desertification, all of which can ruin crops, create food and water shortages, and cause people to lose their jobs and homes. These climate-change stressors can also lead to forced migration and placement in refugee camps, along with the stressors involved when communities are displaced in this way (e.g., intergroup conflicts over resources such as food, land, and living space). As noted by Mah et al. (2020) in this special issue, stressors such as rising sea levels can also lead to the loss or damage to places of cultural importance such as places of worship. People who are strongly attached to their possessions, homes, or areas of residence may find it especially difficult to evacuate during extreme weather events. In the case of wildfires, this can result in injury or death when people refuse to evacuate (Conaway, 2016). Climate change-related forced migration will become a growing problem in the coming years, as coastal towns are flooded and other regions become uninhabitable due to heat and desertification (Robinson, Dilkina, & Moreno-Cruz, 2020).

Clayton (2020) observed that stressors can be directly experienced or encountered vicariously through news or social media. Research by Gibson et al. (2020) in this special issue illustrates the distinction between direct and indirect impacts. In studying the effects of climate change on the Pacific Island nation of Tuvalu, Gibson et al. observed that the residents were anxious about both the direct, local environmental impacts of climate change on their island nation, and also by news reports about global climate change and its future threats.

3. Psychological impacts of climate change

Clayton (2020) further observed that climate-related anxiety may be an appropriate reaction to a realistic threat, or it may be excessive and disproportionate. The distinction is important. Appropriate levels of anxiety can serve as a motivator, providing an impetus for people to take action to address climate threats, such as by finding ways of reducing their carbon footprint. Unfortunately, however, as noted by Hrabok et al. (2020) in this special issue, some people experiencing appropriate levels of anxiety may lapse into helplessness and despair if they believe that their personal or collective acts are insufficient to deal with the challenge of climate change.

Excessive anxiety—that is, anxiety that is highly disproportionate given the level of threat—can be severe and debilitating, meriting clinical attention. Hrabok et al. (2020), in this special issue, described in detail the psychological impacts of extreme environmental events,

which include posttraumatic stress disorder (PTSD), anxiety disorders, mood disorders, substance-used disorders, and other clinical problems. High levels of anxiety and other disorders are likely to occur for victims of forced migration (Jannesari, Hatch, & Oram, 2020). The psychological impact of climate change is likely to be complex and varied, as people try to cope with a mix of acute and chronic stressors. Anxiety is one of a range of responses to climate change, in addition to depression, grief, and anger. Denial of the threat of climate change is another psychological reaction to this existential threat.

Little is known about whether clinically significant climate-related anxiety is always part of some DSM-5 disorder or where it could form some other kind of syndrome. Research into COVID-19-related anxiety revealed evidence of a COVID Stress Syndrome, not readily characterized by DSM-5, consisting of worries about personal health, worry about the socioeconomic impact of the pandemic, xenophobia, traumatic stress symptoms (e.g., nightmares and intrusive thoughts about COVID-19), and COVID-19-related compulsive checking and reassurance-seeking (Taylor et al., 2020). Something similar could be true of climate-related anxiety; it may be part of a broader syndrome of worry, checking, and intrusive thoughts, rather than neatly fitting into an existing DSM-5 diagnostic category. Further research is needed to investigate this issue.

4. Vulnerable groups

Several of the contributors to this special issue describe how climate-related stressors have a greater impact on some demographic groups than others. Clayton (2020) observed that younger people, compared to older adults, tend to report greater climate-related anxiety, most likely because younger people, unlike older adults, will be most likely to live through the climatic adversities in the decades to come. Climate-related anxiety also tends to be greater in people who deeply care for the environment (Clayton, 2020). Levels of climate anxiety are likely to increase over time as increasingly more people are directly impacted.

People in poverty, indigenous peoples, children, and people living in precarious circumstances (e.g., in areas prone to droughts or wildfires, or regions vulnerable to rising sea levels) are among the at-risk groups for experiencing severe effects of climate change (Clayton, 2020; Gibson et al., 2020; Hrabok et al., 2020). Living in communities where there is a lack of social support or a lack of other stress buffers is also likely to be a risk factor for anxiety-related pathology when climate-related stressors such as floods occur.

People with pre-existing mental health problems, such as pre-existing anxiety disorders, may be strongly affected by the stressors of climate change. Although this remains to be fully investigated, research suggests that the stressors associated with pandemics (which may be climate-related), can worsen emotional problems for people with pre-existing anxiety or mood disorders (Asmundson et al., 2020). Climate change entails many uncertainties, such as uncertainties about whether one's home will be destroyed in a wildfire, or uncertainties about one's safety and livelihood in cases of forced migration. Accordingly, people who have a great deal of difficulty tolerating uncertainty will find climate change to be particularly stressful. The intolerance of uncertainty is a personality trait that is a vulnerability factor for a variety of types of anxiety-related pathology (Rosser, 2019). Other personality traits that might provide to be vulnerability factors for climate-related anxiety are likely to be many of the same traits that are vulnerability factors for pandemic-related anxiety. These include negative emotionality (neuroticism), the tendency to overestimate threat, and anxiety sensitivity (fear of arousal-related sensations) (Taylor, 2019). People with high scores on these traits may be at particular risk for developing anxiety disorders as a result of climate-related stressors. The various types of vulnerabilities to climate-related anxiety can be cumulative in their effects, and so it is essential to develop and refine interventions to protect at-risk groups.

5. The relationship between climate change and pandemics

Future pandemics are inevitable (Taylor, 2019). While there is no evidence that the COVID-19 pandemic was climate-related (Wyns, 2020), climate change and pandemics are linked in many ways. Climate change facilitates the spreading of many kinds of infectious disease; for example, outbreaks of tropical diseases in temperate climates. This can occur, for example, when regions become warmer and wetter, thereby providing suitable habitats for disease vectors such as mosquitos and birds. It has been predicted that the outbreaks of numerous kinds of disease may become more prevalent as a result of climate change, including influenza, dengue, cholera, and malaria (Chowdhury, Nur, Hassan, von Seidlein, & Dunachie, 2017; Curseu, Popa, Sirbu, & Stoian, 2010; Hertig, 2019; Watts et al., 2019). Some outbreaks have the potential of becoming the next pandemic.

Extreme weather events such as wildfires and hurricanes typically require people to evacuate their homes and relocate to shelters. During a pandemic, this makes it difficult to implement social distancing, meaning that some people may refuse to evacuate (thereby increasing the risk of trauma or death), while other people may choose to relocate to shelters (thereby increasing the risk of infection). This was a concern during the recent wildfires and hurricanes in the United States, which occurred during the COVID-19 pandemic (Salas, Shultz, & Solomon, 2020; Shultz et al., 2020). Extreme heat poses additional challenges to COVID-19 mitigation efforts. For example, wearing a face mask is uncomfortable in high heat and humidity and may exacerbate risks for heat-related illnesses; conversely, not wearing a mask increases the likelihood of spreading COVID-19 (Salas et al., 2020). Extreme weather events such as wildfires can increase air pollution. This can exacerbate respiratory diseases. Indeed, during COVID-19, exposure to air pollution appears to have increased mortality in patients infected with SARS-CoV2 (Wu, Nethery, Sabath, Brauns, & Dominici, 2020).

In summary, the co-occurrence of pandemics or other disease outbreaks during climate-related stressors, such as extreme weather events, will seriously compound the stressors that people may experience, thereby increasing the risk for anxiety disorders and related clinical conditions such as PTSD. Coping with combined extreme weather events (e.g., wildfires, hurricanes) and pandemics will involve (1) improved communication about dual need to evacuate and to engage in socially distancing, (2) improved evacuation shelters that make possible both social distancing and hygiene precautions, and (3) learning from each storm to refine operations (Shultz et al., 2020).

6. Meeting the challenges ahead

6.1. Countering anxious passivity and defeatism

Timely action, forethought, and trust in science are key to dealing with climate emergencies (Manzanedo & Manning, 2020). This means mitigating realistic anxiety by scientifically-based climate activism rather than denying, dismissing, or discounting the threat of climate change. One of the challenges is to find ways of countering anxious passivity and defeatism, in which people are distressed about climate change but feel helpless about their ability to do anything about it, which can lead them to deny, dismiss, or trivialize the climate problem as a means of coping with climate anxiety. Several of the articles in this special issue touch on this important topic. For example, Mah et al. (2020) offer recommendations about how to structure communication to the public in order to promote adaptive coping with climate change and to minimize the odds that people will dismiss fear-evoking messages about the threat of climate change. This involves tailoring the message to both the type of climate stressors and the type of recipients of the messages (e.g., the recipient's coping style).

In an indirect way, the COVID-19 pandemic may provide people with incentives to take action against climate change. During this pandemic, in which large numbers of people were in self-isolating "lockdown",

there were notable reductions in air pollution, at least temporarily (Tollefson, 2020). These effects were rapid and dramatic, and provide a clear example of how we can have a positive impact on the environment by reducing our carbon footprint. This provides an example of how we can learn from the COVID-19 pandemic in order to cope with the challenges of climate change. Communities should be reminded of these effects in order to motivate people of taking action to reduce their carbon emissions. This may be a potent antidote to anxious passivity and defeatist attitudes.

6.2. Promoting resilience

Chen et al. (2020), in this special issue, remind us that most people are resilient in response to climate disasters and that enduring levels of distress have been observed only in a minority of people. Nevertheless, even if 10–15 % of people developed severe anxiety or other disorders, as estimated from research on various kinds of natural disasters (e.g., Galatzer-Levy, Huang, & Bonanno, 2018), that could overwhelm the healthcare system. Understanding the process of adaptation, as reviewed by Chen et al., may eventually lead to important new insights about how to strengthen resilience at both an individual and population level. Mah et al. (2020) delineated the different types of resilience that are needed to cope with adverse climatic events, including resilience at the levels of the individual and community levels. Mah et al. propose that resilience arises from a combination of adaptive emotion-focused and problem-focused coping.

6.3. Developing individual resilience

At an individual level, adaptive coping with climate change stress involves helping people to manage their emotional responses, deal with practical immediate problems, and prepare to mitigate future hazards. Various types of programs have been developed to improve a person's hardiness or resilience to stress. For climate-related stressors, these may be important in reducing the risk of anxiety disorders and related clinical conditions such as PTSD. Such programs can be made available to people who don't have psychological disorders but may be at risk for such disorders, such as having environmental, occupational, or psychological risk factors.

Regarding occupational risk factors, there are encouraging but preliminary studies that stress-management and related programs that can improve the resilience among first-responders (Wild, El-Salahi, & Esposti, 2020). There are encouraging findings that the risk of developing anxiety disorders can be reduced by targeting psychological risk factors such as the person's level of anxiety sensitivity (e.g., Knapp et al., 2020). However, the efficacy of such programs in reducing the risk of anxiety disorders has yet to be firmly established.

Several other anxiety prevention programs have been developed, for either children or adults, in various formats including face-to-face and internet-based interventions. These cognitive-behavioral programs might be useful in building resilience in people who are at risk of exposure to climate-related environmental stressors. Unfortunately, however, the results so far have been disappointing. Such prevention studies have been evaluated in several recent meta-analyses and found to have weak or small effects in reducing the risk of anxiety or mood disorders (Caldwell et al., 2019; Deady et al., 2017; Moreno-Peral et al., 2017). Clearly, much work needs to be done to improve anxiety prevention programs, although from a public health perspective even small effects can be of some value in improving the lives of people.

6.4. Fostering community resilience

Community resilience refers to the ability of communities to cope with external stressors, and is influenced by social capital (e.g., social networks), infrastructure, and vulnerabilities (Mah et al., 2020). Strong community resilience involves cooperation, altruism, strong leadership,

solid social networks, and the necessary resources. Building community resiliency may entail partnerships between health authorities and schools and community organizations to reduce mental health stigma and facilitate the accessibility and delivery of mental health services (Newnham, Titov, & McEvoy, 2020). The COVID-19 pandemic, along with previous pandemics, has shown that communities can rapidly come together to support one another (Barzilay et al., 2020; Taylor, 2019), although the persistence of such altruism may wane over time. To cope with climate change, we need to find ways to develop enduring altruism and other forms of social support within communities, in order to buffer the effects of the stressors associated with climate change. As noted by Hrabok et al. (2020), multiple strategies will be necessary for communities to prepare for and cope with climate-related stressors, including enhanced access to medical and psychological services, inter-agency cooperation, and ensuring that practical resources are available in the event of disasters (e.g., shelters, food, clean drinking water).

6.5. Improving psychological first-aid

The COVID-19 pandemic should serve as a wake-up call for governments, communities, and individuals to ensure that healthcare systems are better prepared to meet the challenges of the future, many of which will be climate-related. Pandemics, just like climate change disasters, are mass events requiring large-scale psychological interventions. We will need to re-think the way in which mental health services, such as the treatment of anxiety and traumatic stress disorders, are delivered in the future. The luxury of a one-to-one consultation may become a thing of the past as the need for large-scale interventions become necessary.

COVID-19 has forced practitioners to move to online formats, and researchers and service providers have begun developing and implementing online platforms for providing mental health advice and services on a large scale. Those platforms should not be dismantled once the COVID-19 pandemic has passed, because they will be vital for addressing climate-related mental health problems in the years ahead. Challenges in implementing such platforms for climate-related catastrophes need to be carefully considered. Access to personal computers may not be feasible during climate disasters, but hopefully, people will have access to their cellular phones, which may prove to be an important way of connecting to mental health services and resources. Regardless of the availability of digital resources, screen-and-treat approaches, implemented on a mass scale, will be important for identifying and triaging people with clinically significant psychological problems, such as climate-related anxiety disorders or other clinical conditions such as PTSD, so that they can receive empirically supported interventions.

Declaration of Competing Interest

The author declares no conflicts of interest.

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