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The Impact of Climate Change on Mental Health

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During the start of medical school in August 2020, the scorching heat in Washington D.C. and the COVID-19 restrictions limited the spaces we were able to escape to when feeling overwhelmed by classes or the pandemic. Moving to the city made it difficult for us to escape the mental health strains from social isolation and online school, as we were no longer able to step outside to be greeted by the clean air and green grass of our hometowns. As challenging as our transitions to the city were, we could not imagine what it must be like for the patient population in the area. We pondered what it was like for our patients who were unable to access green spaces, whether that be due to distance, safety, transportation, or other reasons. We wondered how patients' mental health may be affected by both climate change and indoor restrictions.

During our clinical rotations, we have heard patients speak on how they utilize nature to improve their mental health in the same ways that we did prior to moving to the city. Although spending time outside seems to improve mental well-being, we have noticed how increasingly difficult it is to use nature as a mental health resource in crowded cities such as Washington, D.C. In many areas of D.C., there are not enough green spaces to accommodate the number of people in the community. During the summer, with average temperatures of 89°F (which has risen from 83°F in 2010), it is far too hot to safely or enjoyably spend time outdoors. By the end of the century, there is a predicted 5.7°C increase in heat wave amplitude and a more than 2 fold increase in the frequency and duration of heat waves.⁷ In other instances, weather advisories

warn against spending time outdoors due to dangerous levels of pollution. We believe that climate change is a threat to the mental health benefits of nature and the outdoors.

We urge others to recognize how spending time outdoors improves mental health and how climate change threatens these benefits. Climate change is deemed this century's greatest threat to global health and civil society. Its effects on ecosystems, health, and other biochemical processes have been well documented in the growing body of literature.^{1,2,3} Rising temperatures increase the frequency of extreme weather events such as tornadoes, floods, and heatwaves.

These natural disasters lead to injuries, acute health issues such as heat strokes, and even death. Although these natural disasters may seem to only affect physical health, we encourage readers to consider climate change as a factor that affects all parts of life, including mental health.

Natural disasters, including floods, droughts, and heat waves, have been linked to poor mental health outcomes.⁴ Heat waves and subsequent heat stress are associated with anxiety, increased suicide rates, violence, and other mood disorders.⁴ The risk of death from a heat wave is three times more likely in those with mental illnesses. Moreover, floods have been identified as a cause of PTSD.⁴ Food insecurity as a result of droughts has been strongly correlated with suicidality in addition to anxiety and depression.⁴ It is evident that rising temperatures and natural disasters can negatively impact mental health.

Furthermore, the effects of climate change highlight racial and social disparities within health outcomes. Communities of color are at higher risk for developing poor health outcomes as a result of environmental exposures such as air pollution, contaminated water, and high temperatures.⁵ We cannot understand the climate crisis without addressing how communities of color bear the brunt of climate change. Given that a higher proportion of communities of color are negatively affected by climate change and increasingly frequent natural disasters compared to

white communities, climate change should be considered an environmental injustice.⁵ This is a critical association to understand as people of color in the United States are faced with injustices due to both systemic and environmental racism, the two of which are intertwined. Therefore, people of color may be at a higher risk for mental health challenges as a result of natural disasters and other climate change-related events. There is a clear connection between rising temperatures and mental health conditions that need to be addressed by clinicians. Moving forward, we urge the readers to consider how climate change and subsequent natural disasters negatively impact the mental health of many individuals, a disproportionate number of whom may be people of color.

We have illustrated how natural disasters and rising temperatures have negative effects on mental health. On the contrary, the environment provides many benefits to our mental health and well-being. It has been shown that living close to greenspaces and spending more time in these spaces decreases rates of depression and aggressive behavior while improving overall mental well-being.⁶ While we recognize that time in nature is not necessarily an adequate alternative to interventions such as medications or therapy, time spent outdoors can be an incredibly valuable tool in improving mental health. Even so, many patients may be hesitant to utilize medications or therapy or may be unable to access these interventions due to high costs or lack of insurance coverage for these services. Spending time outdoors is an affordable and low-risk option to improve mental health. Utilizing this one tool, along with other strategies, can have a profoundly positive impact on our patients' overall well-being.

This op-ed presents a call to action to consider climate health and climate change when understanding mental health struggles. Oftentimes, climate change is considered when discussing more commonly associated health conditions with warmer temperatures, such as respiratory

diseases and air pollution, heat exposure, and heart disease, or rising temperatures and the spread of infectious diseases. While these are important associations to understand, we urge you to consider climate change as inseparable from mental health. With this in mind, we can utilize the environment and all it has to offer to optimize both our own and our patients' mental health.

The authors have no conflicts to report

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