

The impact of climate change on youth depression and mental health

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Youth depression is a major risk factor for suicide, and a leading cause of disability worldwide,^{1–3} hence its impact is both devastating and substantial. Although researchers have suggested several potential causal factors that contribute to the development of youth depression including genetic loading, low socioeconomic status, and adverse life events,² the impact of climate change remains relatively unexplored. In the past three decades, global annual surface temperatures have increased by approximately 0.2°C per decade, giving rise to concerns for planetary and environmental human health.⁴ Furthermore, global scale specific humidity, defined as the ratio of water vapour mass of moist air taken with respect to the total mass of the system, has increased in response to rising temperatures.⁵ These planetary changes are believed to be anthropogenic in origin, and are anticipated to increase in extreme precipitation, tropical cyclones, and heat stress events.⁵ In this Comment, we highlight the potential value of considering climatological variables in the assessment of young people with mental illness.

One position advanced in the literature is that climate change causes extreme heat events, intensification of storms, flooding, and coastal erosion, all of which might disrupt the societal and economic structures that underpin mental health.⁶ Within this framework, individuals in the developing world would be most vulnerable to these direct environmental effects. For example, climate change might alter the quality of soil, preventing agricultural practices that would otherwise supply populations with food.⁷ Ongoing climate change could directly result in the degradation of the physical environment, negatively impact food yields and freshwater supplies, leading to the displacement of populations, and eventual loss of livelihoods.⁷ Therefore, climate change, and its ensuing negative impact on the physical environment could exacerbate poverty, malnutrition, and disease. Each of these factors could, in turn, serve as independent risks for the development of youth depression in young people living in developing nations.

Young individuals with depression and anxiety might be at a disproportionately increased risk for worsening symptoms in the face of changing climate.^{8,9}

Climate change exposes pre-existing psychological vulnerabilities. Individuals with a pre-existing resilience deficit might fail to prepare adequately for extreme events due to the changing climate.¹⁰ By contrast, individuals and communities who are prepared for natural disasters associated with changing climate might experience less collective distress.¹⁰ Therefore, young individuals are believed to be at greater vulnerability to the negative effects of climate change by virtue of their developing coping capacity.

Although few studies evaluating the impact of climate on mental health exist, some suggest that rising temperature might negatively impact mental health. To date, much of the literature has focused on adult mental health. For example, rising temperature and humidity are associated with increases in emergency department visits for mental health concerns.¹¹ One study showed a positive correlation between emergency department visits and mean surface temperatures.¹¹ Increased rates of emergency department visits occurred during summer months and the rate of mental health concerns increased between 5–10% at higher temperatures (ie, 25°C as opposed to 20°C).¹¹ Furthermore, researchers have proposed an association between humidity and temperature with mental health outcomes.^{12,13} Increasing temperature and vapour pressure were associated with a significant increase of high distress.¹² Humidity modulates the effect of temperature on distress.¹² In high temperatures, humidity augmented distress, whereas in low temperatures, humidity mitigated distress.¹² Additionally, only a few studies have endeavoured to evaluate the effects of climate on mental health specifically in youth. For example, a study surveyed Nicaraguan adolescents after Hurricane Mitch in 1998, and its findings revealed severe levels of both post-traumatic stress and depressive reactions.¹⁴ These results extend the work conducted by Norris and colleagues,⁹ who showed that, by contrast with adults, young individuals were both more susceptible to environmental-related trauma and more likely to become depressed if their family members were injured. Taken together, these studies highlight the unique vulnerabilities and comorbidities of adolescents who



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have faced environmental disasters associated with climate change.

Collectively, these findings indicate a significant and nuanced impact of climate on youth mental health across the world. In countries with large land masses, climate measures vary greatly across provinces and regions. Consequently, researchers aiming to characterise the link between climate change and youth depression should account for regional differences in surface temperatures and humidity. Moreover, delineation of possible mediators of climate-induced depression (ie, sex, prior traumatic exposure, and parental injury) could enhance disaster preparedness and lead to strategic deployment of therapeutic interventions.

Youth depression is a burgeoning illness that may be uniquely sensitive to changes in global climate. Young people might be particularly vulnerable to climate-induced depression when faced with parental injury. Although the literature is still developing, several studies now suggest that fluctuations in climate affect both the onset and severity of depression at a population level. We believe that researchers and clinicians treating young people with mental illness should familiarise themselves with the potential ways in which climate change has already impacted mental health outcomes. Finally, researchers should identify ways to fortify the societal structures necessary for mental health that climate change threatens to erode.

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We declare no competing interests.

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