

EFFECTS OF THE GLOBAL ECOLOGICAL CRISIS ON THE MENTAL HEALTH OF CHILDREN AND ADOLESCENTS: AN INTERNATIONAL PERSPECTIVE

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SUMMARY

Climate change has become a global emergency, which mental health effects are increasingly being described and understood. Children and adolescents, especially those in low income countries and minority communities, are particularly vulnerable to experience the worst impacts of climate change now and in the coming decades. Our group of early career mental health clinicians and researchers in nine culturally and socioeconomic different countries across three continents initiated a global, online discussion about the effects of climate change on the mental health of children and adolescents, based on literature and our professional experience. We identified a paucity of research and psychiatric education on the topic, and a need to advance global and local efforts in this direction. We also identified three main domains of mental health impact of climate change: direct, indirect, and through physical conditions. Our work offers a preliminary, up-to-date overview of the consequences of climate change on the mental health of children and adolescents, and provides recommendations to advance policies, public health efforts, research, education, and clinical care in the emerging area of 'Climate Psychiatry'.

Key words: climate psychiatry - pre-traumatic stress disorder - post-traumatic stress disorder

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INTRODUCTION

According to the World Health Organization (WHO), climate change is the greatest threat to global health in the next fifty years (Chalupka et al. 2020). Although all corners of the globe are affected by climate change, it has been stated that certain populations are more vulnerable to its worst effects (Clayton et al. 2017). These include the most marginalized sectors of society, which face deeply-rooted structural, interconnected challenges such as poverty, poor air quality, and higher risk of suffering flooding and other climate disasters (Silveira et al. 2021), in addition to the newer problems brought by COVID-19. Climate change is indeed a growing problem that synergizes with existing disparities in children's health due to poverty and systemic racism (Jessel et al. 2019). Children of racial minorities in low-

income countries and communities are more likely to be exposed to environmental hazards, which effects on mental health have started to be described (World Health Organization 2018).

EFFECTS OF THE GLOBAL ECOLOGICAL CRISIS ON THE MENTAL HEALTH OF CHILDREN AND ADOLESCENTS

An online-based group of mental health clinicians and researchers, initially connected by the Early Career Psychiatrists Section of the World Psychiatric Association, emerged during the COVID-19 pandemic and eventually formed the Global Mental Health Think Tank (Pereira-Sanchez et al. 2020, Pinto da Costa et al. 2020). Some members of the Think Tank started discussing

Table 1. Recommendations on priority measures on climate change and mental health of children

Domains of impact or action	Recommendations on priority measures
<p><i>Direct effects on mental health</i></p> <p>Posttraumatic stress disorder, increased level of stress, increase of anxiety and adjustment disorders after catastrophic events.</p>	<ul style="list-style-type: none"> ▪ Establish community support through mental health primary care centers. ▪ Screen for mental health conditions in schools located in areas most affected by climate change. ▪ Develop virtual clinics able to provide tele- mental health services and apps for early identification and monitoring. ▪ Promote collaboration between mental health providers and colleagues in pediatric primary care centers to educate the latter.
<p><i>Indirect effects on mental health</i></p> <p>Due to political turmoil, forced migration, marital discord, property destruction, risky behaviors (e.g. alcohol abuse).</p>	<ul style="list-style-type: none"> ▪ Establish family therapy programs in areas most affected by climate change. ▪ Develop self-help resources. ▪ Foster resilience and coping strategies in communities. ▪ Implement policies to identify and address the structural socioeconomic factors putting certain populations at higher risk of suffering the worst consequences of climate change.
<p><i>Effects on mental health through physical conditions</i></p> <p>‘Triple burden of malnutrition’ and dehydration, vector diseases.</p>	<ul style="list-style-type: none"> ▪ Integrate mental health screening into birthing centers. ▪ Screen for mental health conditions in people physically injured after climate catastrophes. ▪ Provide long-term mental health monitoring after significant climate changes
<p><i>Education and research in mental health and climate change</i></p> <p>Global scarcity of research and education on climate change and mental health.</p>	<ul style="list-style-type: none"> ▪ Integrate ‘Climate psychiatry’ in global research agendas. ▪ Promote studies on pregnancy and perinatal mental health, especially in areas most affected by climate change. ▪ Integrate ‘Climate psychiatry’ curricula into psychiatric undergraduate and postgraduate education programs. ▪ Develop guidelines for the diagnosis and management of mental health conditions after climate catastrophes.

the implications of climate change on the mental health of children in their countries. Our objective was to share current knowledge on the topic and suggest recommendations for global and local actions from the perspective of early-career mental health clinicians and researchers working across WHO regions in socioeconomically and culturally diverse countries.

In our online, open, non-judgmental space for dialogue on this topic, informed by a review of scientific literature and local data and by the authors’ clinical and research experience, we identified three main domains of climate change-related mental health effects in children: direct, indirect, and those related to physical conditions. In the majority of countries where our group members come from, climate change seems to have a tremendous impact on the general population, in different geographical areas, and threatening public health in multiple ways. However, the paucity of studies on climate change and mental health in most countries should be noted. It has been noted that children are among the most vulnerable populations and are often left behind and exposed to suffering direct and indirect effects of climate change on their mental health; some of the indirect effects seem to be mediated by food insecurity (Ghasemi et al. 2015).

The direct effects of climate change are manifested as mental health conditions. It has been shown that climate change acts on mental health with different timing patterns (e.g., pre and post-traumatic stress disorder). Acute events can act through mechanisms similar to that of traumatic stress, leading to well-known psychopathological reactions. In addition, the consequences of exposure to extreme or prolonged weather-related events can also be delayed, encompassing disorders such as posttraumatic stress, or even intergenerational transmission of stress (Cianconi et al. 2020). Our group members agreed that the possible concerns as changing weathers seem to be a trigger for disorders such as post-traumatic stress and major depressive disorder (Berry et al. 2010).

Regarding the indirect effects of climate change on children’s mental health, the association of natural disasters with political turmoil has been described to jeopardize the mental health of entire generations. Unemployment, addiction, corruption, violence, and crime have been reported to be usual companions of climate change and lead to migration of people from ‘shrinking cities’ (Khavarian-Garmsir et al. 2019). Also, in the majority of the countries where our group members were based it has been observed that warmer weathers are likely to increase aggressive behaviors, while droughts can result in increased levels of stress (Padhy et al. 2015).

In terms of the mental health effects of climate change through physical conditions, our group discussed the 'triple burden of malnutrition': over nutrition, undernutrition, and micronutrient deficiencies. This burden is seen in some of the world areas most affected by climate change (e.g. due to desertification, catastrophic events) and has been reported to be a possible contributor to vulnerability, fatigue, severe mood changes, and a decline in cognitive functioning in their populations (Wright et al. 2017).

Previous literature and our group's perspectives suggest that public perceptions on climate change vary in relation to contextual factors, such as media portrayals, socio-demographic variables, knowledge and education, economic and institutional factors, and personal values, psychology and experience (Antronico et al. 2020). As climate change impacts both the mental and physical health of children, the need to foster resilience and coping strategies is compelling. In our opinion, the role of and attention to mental health are not emphasized as much as physical health is in public health efforts. There is a dire need of population-based epidemiological data on the mental health effects of climate change. We also want to highlight the urgent need to review psychiatric training curricula for residents, early-career, and senior psychiatrists across the world to include 'Climate Psychiatry' and to define and implement research priorities in this area. Our specific recommendations in various domains are summarized on Table 1.

CONCLUSION

The outcomes of our literature-informed, open, global discussion offer an overview of the current, still preliminary understanding of the impact of climate change on the mental health of youth now and in the next few generations. What we know so far should inform not only prospective research, but also current local and global advocacy efforts, public policy, and psychiatric education. It is never too late for mental health clinicians and researchers to read and discuss the available evidence, foster international collaborations, and take concrete steps to ensure that our population's, and in particular our children's, physical and mental health do not have to pay the price of past and current adults' climate neglect and abuse.

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References

1. Antronico L, De Pascale F, Coscarelli R, Gullà G: *Land-slide risk perception, social vulnerability and community resilience: The case study of Maierato (Calabria, southern Italy)*. *Int J Disaster Risk Reduct*. 2020; 46. doi:10.1016/j.ijdr.2020.101529
2. Berry HL, Bowen K, Kjellstrom T: *Climate change and mental health: A causal pathways framework*. *Int J Public Health* 2010; 55. doi:10.1007/s00038-009-0112-0
3. Chalupka S, Anderko L, Pennea E: *Climate Change, Climate Justice, and Children's Mental Health: A Generation at Risk?* *Environ Justice* 2020; 13. doi:10.1089/env.2019.0034
4. Cianconi P, Betrò S & Janiri L: *The Impact of Climate Change on Mental Health: A Systematic Descriptive Review*. *Front Psychiatry* 2020; 11. doi:10.3389/fpsy.2020.00074
5. Clayton S, Manning C, Colledge M, Krygsman K, Speiser M, Cunsolo A, et al.: *Mental Health and our climate change: Impacts, implications and guidance*. American Psychological Association, and ecoAmerica, 2017. <https://www.apa.org/news/press/releases/2017/03/mental-health-climate.pdf>, accessed on 22nd November 2021
6. Ghasemi SR, Reshadat S, Rajabi-Gilan N, Salimi Y, Norouzi M: *The Relationship Between Rural Women's Health-Related Quality of Life and Domestic Violence*. *Zahedan. J Res Med Sci* 2015; 17. doi:10.17795/zjrms978
7. Jessel S, Sawyer S, Hernández D: *Energy, Poverty, and Health in Climate Change: A Comprehensive Review of an Emerging Literature*. *Public Health Front* 2019; 7. doi:10.3389/fpubh.2019.00357
8. Khavarian-Garmsir AR, Pourahmad A, Hataminejad H, Farhoodi R: *Climate change and environmental degradation and the drivers of migration in the context of shrinking cities: A case study of Khuzestan province, Iran*. *Sustain. Cities Soc* 2019; 47. doi:10.1016/J.SCS.2019.101480
9. Padhy SK, Sarkar S, Panigrahi M & Paul S: *Mental health effects of climate change*. *Indian J Occup Environ Med* 2019; 19. doi:10.4103/0019-5278.156997
10. Pereira-Sanchez V, Virani S: *Early Career Psychiatrists Form Global Collaboration to Take on Pandemic*. *Psychiatr News* 2020. doi:10.1176/appi.pn.2020.11a24
11. Pinto da Costa M: *Early career psychiatrists - History, 2020 and beyond*. *World Psychiatry* 2020; 19. doi:10.1002/wps.20712
12. Silveira S, Kornbluh M, Withers MC, Grennan G, Ramathanan V, Mishra J: *Chronic Mental Health Sequelae of Climate Change Extremes: A Case Study of the Deadliest Californian Wildfire*. *Int J Environ Res* 2021; 18. doi:10.3390/ijerph18041487
13. WHO health and climate change survey report: *Tracking global progress 2018*. 2021. <https://apps.who.int/iris/handle/10665/329972>, accessed 22nd November, 2021
14. Wright AM, Talia YR, Aldhalimi A, Broadbridge CL, Jamil et al.: *Kidnapping and Mental Health in Iraqi Refugees: The Role of Resilience*. *J Immigr Minor Health* 2017; 19. doi:10.1007/s10903-015-0340-8