

The Double Whammy Effect of Climate Change: The Environmental and Mental Health Manifestations. A Call to Action by the Global Alliance for Mental Health Advocates (GAMHA)

Fatimah Lateef^{1*}, George N Christodoulou², Porsche Poh³, Ingrid Daniels⁴, Gabriel Lungu⁵ and Ellen Lee⁶

¹Senior Consultant, Dept of Emergency Medicine, Singapore General Hospital Professor, Duke NUS Graduate Medical School, Yong Loo Lin School of Medicine, National University of Singapore and Lee Kong Chian Medical School, Nanyang Technological University, Singapore

²Professor Emeritus of Psychiatry, Athens University President, Society of Preventive Psychiatry Honorary President, Hellenic Psychiatric Association Past President, World Federation for Mental Health and International College of Psychosomatic Medicine, Singapore

³Executive Director, Silver Ribbon, Singapore

⁴CEO, Cape Mental Health Honorary Senior Lecturer, Div of Intellectual Disability, Dept of Psychiatry and Mental Health University of Cape Town, South Africa, Immediate Past President, World Federation of Mental Health, Singapore

⁵Mental Health Officer/ Nursing Officer Ministry of health HQ Ndeke House, Lusaka, Singapore

⁶President, Silver Ribbon, Singapore

***Corresponding author:** Fatimah Lateef, Senior Consultant, Dept of Emergency Medicine, Singapore General Hospital Professor, Duke NUS Graduate Medical School, Yong Loo Lin School of Medicine, National University of Singapore and Lee Kong Chian Medical School, Nanyang Technological University, Singapore

ARTICLE INFO

Received: 📅 January 29, 2024

Published: 📅 February 07, 2024

Citation: Fatimah Lateef, George N Christodoulou, Porsche Poh, Ingrid Daniels, Gabriel Lungu and Ellen Lee. The Double Whammy Effect of Climate Change: The Environmental and Mental Health Manifestations. A Call to Action by the Global Alliance for Mental Health Advocates (GAMHA). Biomed J Sci & Tech Res 54(5)-2024. BJSTR. MS.ID.008620.

ABSTRACT

Mental health (MH) refers to the state of well-being where every person realizes their potential, is able to cope with the usual stresses of life, work productively and even contribute to the wellbeing of their community. It is an all-encompassing term that reflects positive wellbeing, where one can flourish and be resilient to adversities.

Climate Change (CC) refers to the change in the state of the climate that is identifiable by the changes in the mean and variability of the climate, that persist for an extended period of time, usually decades or longer. This refers to weather-related variables such as surface and atmospheric temperatures, humidity, wind, precipitation and also sea levels. The range of human activities today is certainly increasing the amount of greenhouse gases emission very rapidly, causing the elevation of global temperatures. There is a complex relationship between CC and mental wellbeing. There still exist gaps in our understanding of the link between the two, but based on the current literature of evidence, it is time to take action and not allow any further delays. CC can have physical effects as well as MH effects on those affected. The effects can be direct and overt or indirect and more" hidden, especially in terms of the psychological impact. Global Alliance for Mental Health Advocates (GAMHA) is a special global project initiated by Silver Ribbon (Singapore) and Lundbeck, with a vision to make MH a global priority. GAMHA members feel strongly about CC and its link to mental health and are putting forward this 'Call to Action' for countries to adopt.

Keywords: Climate Change; Mental Health; Greenhouse Gases; Post-Traumatic Stress Disorder; Global

Abbreviations: CC: Climate Change; MH: Mental health; GAMHA: Global Alliance for Mental Health Advocates; OECD: Organization for Economic Cooperation and Development; PTSD: Post-Traumatic Stress Syndrome

Introduction

Mental health (MH) refers to the state of wellbeing where every person realizes their potential, can cope with the usual stresses of life, work productively and even contribute to their community. It is an all-encompassing term that reflects positive wellbeing, where one can flourish and be resilient to adversities. Good MH is thus a fundamental prerequisite for people to lead meaningful and fulfilling lives. People who go through changes in thoughts, emotions and behavior that result in significant distress, which affect their daily activities in life, are likely to have a diagnosis of a mental illness. Depression is the leading cause of mental health disability worldwide [1-3]. Globally, MH is now being given priority at both the national and international levels due to the large unmet needs and treatment gaps. Diagnosis and treatment of mental illness lags that of physical illness. Today, individuals, patients, families, leaders, governments and even academics are coming together more frequently to look at MH from a 'whole community' or a 'whole nation' approach. With these, more gaps and deficiencies are coming to light. The strengths and weaknesses in different countries' MH systems and pathways are also surfacing, as people look deeper into these issues [2,4]. In 2018, a group of OECD (Organization for Economic Cooperation and Development) countries, convened MH experts who came up with 6 key principles of MH performance as a guide. These principles state that a high performing MH system [1].

1. Must focus on individuals who are experiencing mental ill-health.
2. Has accessible and high-quality MH services
3. Takes a multi-sectoral and integrated approach to mental wellness.
4. Has strong leadership with good governance and
5. Is future focused and innovative: Whilst these principles are generic and do provide some leeway to nations in planning their MH systems, it is not and should not be considered in isolation. Countries must look at this from the broader picture approach. One critical and developing area is the link between MH and Climate Change. The two seem to be a pressing combination for most countries today [1-3].

Climate Change (CC) refers to the change in the state of the climate that is identifiable by the changes in the mean and variability of the climate, that persist for an extended period of time, usually decades or longer. This refers to weather-related variables such as surface and atmospheric temperatures, humidity, wind, precipitation, and sea levels. The range of human activities today is certainly increasing the amount of greenhouse gases emission very rapidly, causing the elevation of global temperatures. Activities such as burning fossil fuels, development in manufacturing, transportation and changes to the agriculture landscape can impact physical, biological, and human systems

from the increased greenhouse gas emissions. This forms a significant basis of CC [5-8]. CC can manifest as an increase in incidence of heat waves, heavy rainfall, and extremely high sea levels. CC rainfall, Bal crisis, an environmental threat and if not tended to, its effect continues to be perpetuated. CC is the resultant effect of combinations of both natural and man-made processes and their effects [6,7]. Whilst both MH and CC issues have been around for some time, the interlink between the two as well as the understanding of the impact of CC on MH and wellbeing is only more recently recognized.

There is a complex relationship between CC and mental wellbeing. Though a dire issue for all of humanity, countries are only starting to take more concrete action now. There still exist gaps in our understanding of the link between the two, but based on the current literature of evidence, it is time to take action and not allow any further delays. Evidence is increasingly showing that CC does have both direct as well as indirect effects on MH and psychosocial wellbeing. The direct effects include climate anxiety and exacerbation of existing MH problems because of CC patterns and manifestations [7,9-11]. The indirect effects on mental wellbeing, though more subtle in linkage, can be even more catastrophic [8,11].

The Climate Change-Mental Health Link

Whilst the physical health effects of CC are more overt and easily recognizable, the effects on MH are more invisible. This poses concerns because psychological trauma and MH manifestations from such events and disasters exceed those of physical injury by a ratio of 40:1. [12] The current evidence suggests that CC has a multi-pronged effect on MH [12,13]. A variety of new stimuli can arise from CC and its exposure. The extreme weather and temperature changes (rain, cold, heat), hurricanes, strong winds, storms, floods, pollution, and even potential infections can bring on a variety of manifestations in different individuals [6,9,14]. Whilst someone who has no MH issues may be able to adjust more readily to these stimuli and adapt, those with MH problems can find it more challenging and may require time, support, and greater understanding to negotiate the external environmental stressors. CC and its exposure can:

1. Make those vulnerable to developing MH issues manifest symptoms for the first time.
2. Exacerbate existing MH conditions with these triggers. This can lead to relapse of a previously controlled MH condition in patients.
3. This leads to a second MH condition in those who already have an MH diagnosis.

An example would be someone who has been diagnosed with anxiety disorder with previous panic attacks, who experiences a CC stressor such as a hurricane and loses his property and family, may now have signs and symptoms of depression/ or secondary depression. At times it may be challenging to decide whether the manifesta-

tion is that of a second/ new MH diagnosis or it could be a secondary symptom of an existing MH diagnosis in that person. In such cases, counselling, treatment and observations by a trained psychiatrist or counsellor over a period may enable the differentiation between the two. MH and physical health are closely linked, therefore major threats to physical health will certainly have an impact on MH. CC can also threaten MH either directly or indirectly, through its effect on physical health and wellbeing [14-16]. Vulnerable groups are at higher risk of developing MH and psycho-social manifestations with CC [3, 6]. Some examples of these include the elderly and pediatric population, lower income and lower socio-economic status groups, indigenous people living very close to nature, those living near or on the “ring of fire” and people with multiple chronic illnesses, as well as those with pre-existing MH conditions and disabilities. People and communities facing social inequalities, especially those with already existing mental illnesses and living in poorer countries are more likely to be affected by CC.

This is also the group which is less likely to have proper and sustainable access to treatment and resources to mitigate the emotional impact they experience. In fact, they may be caught in a vicious cycle where the impact of CC on their MH can further drive social and

health inequalities. Thus, the challenging issue of having to break this vicious cycle to prevent its perpetuation [3,13,16]. CC issues have also been seen to be associated with increased distress and MH issues across people of all age-groups. There, however, does seem to be some preponderance amongst the young [17-21]. The range of emotional responses across this spectrum is also broad, with a variety of thoughts and feelings which may affect their daily lives (known as “climate anxiety”) [10,13,15]. In general, most people who are concerned about the issue of CC strive to find out more, do more and play their part to save Mother Earth. This is what would be expected of a normal response from people, on a topic concerning them and their families (Figure 1). However, if there are exaggerated and inappropriate responses Figure 1, these could be the manifestation of a MH issue or mental illness. For some of these individuals, it can impact their ability to live well, work, go to school, sleep, and even have fun (Figure 1). The schematic diagram in Figure 2 summarizes how CC can affect people psychologically, socially, and economically; whereby there is inter-dependence between these various elements and factors. Taking the example of a natural disaster which may arise more frequently because of CC, the immediate effect on persons affected would be shocked, fear, sadness and a sense of loss from the trauma.

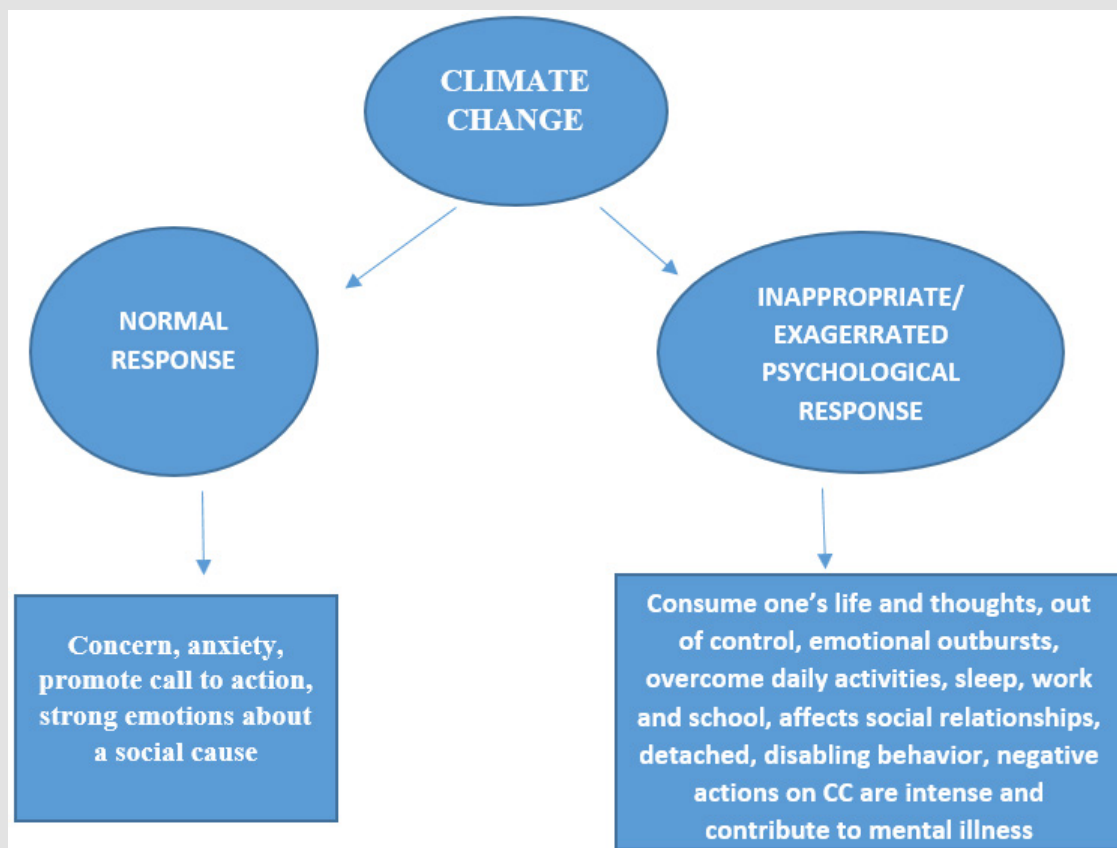


Figure 1: The Effects of Climate Change on People's Mental State.

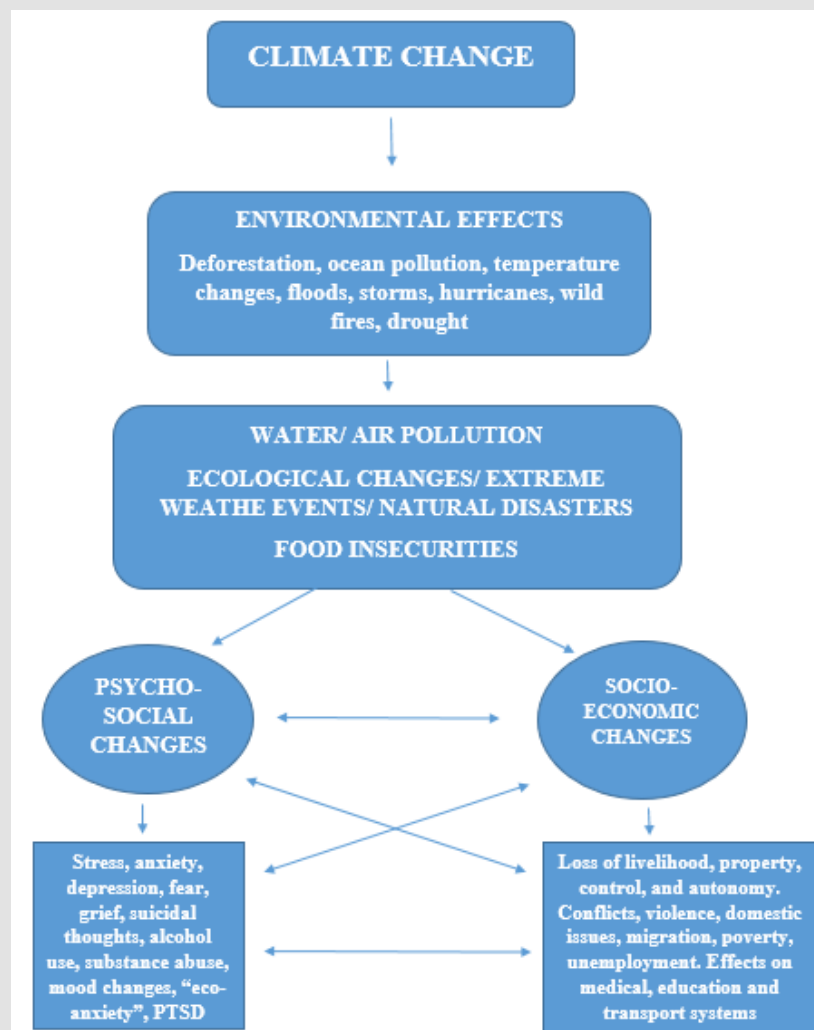


Figure 2: How Climate Change can affect People Psychologically, Socially and Economically.

This type of response can be seen in general amongst those affected. There would be loss of property, belongings, families, loved ones and even their livelihood. Some may even sustain personal injuries. Following the acute phase, with help, recovery and restoration of life towards normality, many would be able to adapt and move on, but a small number will continue to be affected significantly, will continue to have strong negative emotions, experience terror and long-lasting fear and Post-Traumatic Stress Syndrome (PTSD). People with MH conditions tend to fall in the latter category, especially if their physical, social and emotional reserves are low to start off with (Figure 2) [12,16,22,23]. Another example of the effects of CC on mood and behavior can be seen with changes in temperature. As temperature increases, it has been noted to be linked to higher levels of aggression, arousal, negative and hostile thinking as well as risk of suicide. Increased temperatures may affect people's ability to think clearly, may reduce their attention span and self-regulation capabilities [24]. Heat waves and very high ambient temperatures have also been seen to be

associated with negative societal outcomes, which can influence MH. Some of these include conflicts, societal violence, sleep disturbance and lowered economic inputs [24-27]. Air and noise pollution which comes with modernization and development of industries have been linked to poorer mental health. These contribute towards the effect of CC as well. There are reports of increased depression, anxiety, psychosis, schizophrenia and even incidence of suicide [28,29] (Figure 2).

Socio-economic disruption from CC, including migration and refugee status, also has negative impact on MH (Figure 2). Forced displacements following CC related disasters have also been linked to depression, anxiety, and PTSD. If the displacement is for a longer period, it may lead to higher rates of mental illnesses. Even communicable diseases, demonstrated clearly with the recent Covid 19 pandemic, can affect mental wellbeing. CC will likely continue to increase the risks of infectious diseases emergence, profile, and the spread [29]. Today, all countries are affected by the effects of climate change to varying degrees. It really depends on everyone to reach some level of

realization that actions and interventions are needed from now. As the world faces multiple challenges currently, including the war between Ukraine and Russia as well as between Palestine and Israel, it is easy for the issue of CC to be overshadowed and thus take a back seat. More recent crisis such as the Black storm in Hong Kong, which caused severe flooding in the territory and significant damages, had the impact of loss of property and loss of workdays calculated, but the acute and lasting effect on mental health and wellness, the stresses and anxiety amongst the affected populace may not have been addressed adequately. It is time to count the negative mental health effects after each disaster and crisis, linked to CC.

The Effects of Climate Change on Children's Mental Health

CC does have effect on children and their mental wellbeing. Children would be considered as one of the vulnerable groups [6,11,17,19,20]. They are dependent on their families and others for support, and thus may be helpless in a multitude of situations and circumstances. This is also why social support networks are very important for children and young people. When exposed to extreme weather conditions or events, they may respond with anxiety, fear, sleep and play disturbance and have PTSD. With any climate change induced disasters displacement can affect their "Place Identity" and create attachment problems, especially for the younger children. Emotional stressors can affect their cognitive development and even predispose them to develop MH conditions in later life [30,31]. If we consider heat related stress, children are sensitive to extremes of temperature due to their small bodies, larger surface areas and less well-developed thermo-regulation. Some of these impacts can be long term or permanent. Extremes of temperature may affect their physical growth, psychological development, education, and school schedules and even their future livelihood, employment, and life [15,17,19,31-34].

Conclusion

MH represents an integral pillar in the United Nations Sustainable Development Goals. The World health Organization has acknowledged that "There is No Health Without Mental Health" [1] As we become more aware of the possible and potential link between CC and MH and with more evidence being churned out, we cannot run away from the need to do our part and take action together. 'Climate Anxiety' appears to be a real phenomenon. CC has already been observed and documented to be negatively affecting MH and wellbeing of people around the world. Those who already have a mental illness diagnosed are more vulnerable to the effects of CC on both fronts, physical and psychological wellness. People who are affected should be provided with help, counselling and be pointed to coping resources appropriately.

Global Alliance for Mental Health Advocates (GAMHA) [35] is a special global project initiated by Silver Ribbon (Singapore) and Lund-

beck, with a vision to make MH a global priority. GAMHA connects MH advocates and stakeholders from across the globe to discuss, network, share best practices and ideas as well as knowledge pertaining to the spectrum of MH issues. GAMHA members feel strongly about CC and its link to mental health and are putting forward this 'Call to Action' for countries to adopt.

GAMHA's "Call to Action" Proposes That all Countries Should

1. Enhance the level of public education to create awareness and better understanding of Climate Change, mental health and wellness, their potential interdependence. This should be associated with increased community participation and engagement.
2. Mainstream environmental protection practices, with mental health considerations (where relevant) into policies and national strategies. Where possible to also integrate CC and key MH issues into their national strategic plans
3. Realize that CC with its effect on MH can affect all age-groups, which will have bearing on the provision of health services, as well as in crafting health policies. It is important to emphasize the need to diagnose and manage climate-related anxiety and distress amongst the younger generation, especially as they represent the future of our countries and our planet.
4. Collaborate with regional neighbors and the international community in climate preservation efforts and global MH initiatives (which should be customized to meet local needs)
5. Where possible, to focus and contribute towards fact finding and future research that is required to understand further the interplay between Climate Change and Mental Health in their population and the different subgroups.
6. Review and strengthen the MH training for healthcare providers, with the appropriate customization, targeting the relevant age-groups.
7. Provide adequate support and community-based care as well as rehabilitation for affected segments of the population.
8. Engage the local media to play a more central and positive role, especially pertaining to managing, headlining and narratives construction in relation to climate change and mental health.
9. Introduce the topic of MH effects of CC in medical school curriculum at the undergraduate, postgraduate, and continuing medical education levels. This will help create greater awareness and steer these graduates towards doing more research as relevant at the local, regional, and even global levels.
10. Highlight the link between the prevention of illness and health promotion, especially with reference to mental health.

References

- (2018) Mental health: Strengthening our response. World Health Organization Geneva.
- Bajbouj M, Tam Ta TM, Hassan G, Eric Hahn (2022) Editorial: The Nine Grand Challenges in Global mental health. *Front in psychiatry* 12: 822299.
- James SL, Abate D, Abate KH (2018) Global, regional and national incidence and prevalence with years living with disability for 354 diseases, for 195 countries and territories, 1990-2017. A systematic analysis for the Global Burden of Disease Study 2017. *The Lancet* 10: 392(10159): 1789-1858.
- Ingle HE, Mikulewicz M (2020) Mental health and climate change: tackling invisible injustice. *Lancet planet health* 4: e128-e130.
- (2018) Global warming of 1.5 degrees. Summary for policymakers. Geneva: Intergovernmental panel on Climate Change.
- Andrew Okem, Vincent Möller, Bardhyl Rama, Marlies Craig, Andrés Alegría, et al. (2022) Climate Change 2022, Impacts, Adaptation and Vulnerabilities. IPCC.
- Benny HL, Bowen K, Kjellstrom T (2010) Climate change and mental health: a causal pathways framework. *Int J Public health* 55: 123-132.
- Myers N (2002) Environmental refugees: a growing phenomenon of the 21st century. *Philos Trans Biol Sci* 357(1420): 609-613.
- Bourque F, Willox AC (2014) Climate change: the next challenge for public mental health. *Int Rev of Psychiatry* 26: 415-422.
- Evans GW (2019) Projected behavioral impacts on global climate change. *Annu Rev Psychol* 70: 449-474.
- Saladino V, Algeri D, Auremma V (2020) The psychological and social impact of Covid 19: new perspectives on wellbeing. *Front Psychol* 11: 577684.
- Hayes K, Blashki G, Wiseman J, S Burke, L Reifels (2018) Climate change and mental health: risks, impacts and priority actions. *Int J Mental Health Systems* 12(10): 28.
- Clayton S (2021) Climate change and mental health. *Clin Environ Health Rep* 8: 1-6.
- Clayton S, Karzsia BT (2020) Development and validation of a measure of climate change anxiety. *J Environ Psychol* 69: 101434.
- Verplanken B, Marks E, Dobvimir AI (2020) On the nature of eco-anxiety: how constructive or unconstructive is habitual worry about global warming. *J Environ Psychol* 72: 101528.
- Clayton S (2020) Climate anxiety: psychological response to climate change. *J Anxiety Disorders* 74: 102263.
- Varma P, Junge M, Meaklim H, Melinda L Jackson (2021) Younger people are more vulnerable to stress, anxiety, and depression during Covid 19 pandemic. A global cross-sectoral survey. *Prog Neuropsychopharmacology Biol Psychiatry* 109: 110236.
- Clanconi P, Petro S, Janiti L (2020) The impact of climate change on mental health: systematic descriptive review. *Front Psychiatry* 11: 74.
- Hickman C, Marks E, Pihkala P, Catriona Mellor, Lise van Susteren, et al. (2021) Climate anxiety in children and younger people and their beliefs about government responses to climate change: a global survey. *Lancet Planet Health* 5: e863-e873.
- Vergunst F, Berry HC (2021) Climate change and children's mental health: a developmental perspective. *Clin Psychol* 10(4): 767-785.
- Lowe SR, Manove EE, Rhodes JE (2013) Posttraumatic stress and post-traumatic growth amongst lower income mothers who survived Hurricane Katrina. *J of Casualty and Children Psychol* 81(50): 877-889.
- Boscarino J, Horman S, Adams R, Charles R Figley, Ramon Solhkhah (2014) Mental health outcomes amongst the vulnerable after Hurricane Sandy. *Am J of Disaster Med* 9: 107-120.
- Palinkas L, Wong M (2020) Global climate change and mental health. *Curr Opinion in Psychol* 32: 12-16.
- Kim Y, Kim H, Gasparinn A, Michelle L Bell, Masahiro Hashizume, et al. (2019) Suicide and ambient temperatures: a multi-country, multicity study. *Environ Health Perspect* 127(11): 117007.
- Burke M, Hsiang SM, Miguel E (2015) Global on linear effect of temperature on economic production. *Nature* 527(7577): 235-239.
- Tiihonen J, Halonen P, Tiihone L, Hannu Kautiainen, Markus Storvik, et al. (2017) The association of ambient temperatures and violent crim. *Sci Rep* 28: 7.
- Lohmus M (2018) Possible biological mechanisms linking mental health and heat: a contemplative review. *Int J Environ Res Public health* 15(7): 1515.
- Clark C, Paunovic K (2018) WHO Environmental Noise Guidelines for European Region: a systematic review on environmental noise and quality of life, wellbeing and mental health. *Int J Environ Res Public health* 15(11): 2400.
- Braithwaite I, Zhong S, Kirkbride JB, David P J Osborn, Joseph F Hayes (2019) Air pollution (particulate matter) exposure and association with depression, anxiety, bipolar, psychoses and suicide risks: a systematic review and meta-analysis. *Environ health prospect* 127(12): 126002.
- Dillman-Hasson N (2021) The nature buffer: The missing link in climate change and mental health research. *J Environ Stand Sci* 11: 696-701.
- Searle K, Gow K (2010) Do concerns about climate change lead to distress? *Int J of Climate Change Strategies and management* 2: 362-379.
- Bokszczanin A (2008) Parental support, family conflict and overprotectiveness: predicting PTSD symptom level in adolescents 28 months after a natural disaster. *Anxiety Stress Coping* 21(40): 325-335.
- Wasserstein SB, LaGreca AM (1998) Hurricane Andrew Parent Conflict as a moderator of children's adjustment. *Hisp J Behave Sci* 20(20): 212-224.
- Kar N, Bastia BK (2006) PTSD, depression, and generalized anxiety disorder in adolescents after a natural disaster: a study of comorbidity. *Clin Fr Epidemiol Ment Health* 2: 17.
- Lateef F, Tan CC, Christodoulou GN, Chia Siok Hoon, Ellen Lee Geck Hoon, et al. (2020) The runway will be long. Psychological and mental health issues with the Covid 19 pandemic. *J Mental Health Subs Abuse* 1(1): 111.

ISSN: 2574-1241

DOI: [10.26717/BJSTR.2024.54.008620](https://doi.org/10.26717/BJSTR.2024.54.008620)

Fatimah Lateef. Biomed J Sci & Tech Res



This work is licensed under Creative Commons Attribution 4.0 License

Submission Link: <https://biomedres.us/submit-manuscript.php>



Assets of Publishing with us

- Global archiving of articles
- Immediate, unrestricted online access
- Rigorous Peer Review Process
- Authors Retain Copyrights
- Unique DOI for all articles

<https://biomedres.us/>