



Climate Change and Mental Health in Bhutan

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ABSTRACT

Bhutan remains a largely non-industrialized country, making minimal contributions to global warming and climate change. Yet, the country suffers from the clutches of the adverse effects of climate change. Among them, the impact of climate change on mental health including psychological distress, acute stress disorder, post-traumatic stress disorder, major depressive disorder and anxiety disorder is well known. In this article, we aim to describe the various mental health issues that the country is facing or is likely to face in the future as a result of climate change.

Keywords: *Bhutan; Climate Change; Mental Health*

INTRODUCTION

Bhutan is a small landlocked country in South Asia. It lies in the Eastern Himalayan ecosystem, with its summits ranging from 160 to 7,000 meters above sea level. As of 2018, 1.6% of the land cover was represented by glaciers, and forest coverage stood at 72.3%¹. Gross National Happiness (GNH) is the philosophy that Bhutan adopts to guide its developmental activities. Environmental conservation is one of the pillars of GNH. This sacred duty is enshrined in the country's Constitution, making it a mandate of both the state and the people to strive for the same².

The long-term significant change in the average patterns of weather across the Earth's local, regional, and global climates is defined as climate change. The global surface temperature is a key indicator of the Earth's overall health³. Global warming is a consequence of human activities through the greenhouse effect, which alters the composition of the atmosphere. Some of the events associated with global warming include extreme heat, extreme snow, droughts, wildfires, winter storms, thunderstorms, and climate change-related water disasters (flooding, hurricanes)⁴. These events affect human health in diverse ways including death, disability, and neglected mental health.

Although mental health problems pose a significant burden worldwide, they are the most neglected of all human health conditions^{5,6}. Common mental health conditions associated with adverse climate change include psychological distress, acute stress disorder, post-traumatic stress disorder (PTSD), major depressive disorder, anxiety disorders, complicated grief, survivor guilt, substance use, suicidal ideation, and suicide^{5,7,8}. It may also precipitate chronic mental health conditions like schizophrenia,

bipolar disorders, and addictions in vulnerable individuals. It has been reported that increased psychiatric hospital admissions and reduced effectiveness of certain psychotropic medications are associated with climate change⁹. Climate change crisis events also disrupt the delivery of mental health services to people living with mental health issues⁵.

Although there are few studies on the impact of climate change on physical health in Bhutan, to the best of our knowledge, there are no studies about climate change and mental health in the country. In this article, we provide a brief account of climate change and mental health in Bhutan.

CONSEQUENCES OF CLIMATE CHANGE AND MENTAL HEALTH

Bhutan has been experiencing several environmental hazards such as frequent forest fires, flooding, increasing human-wildlife conflict, and roadblocks, especially in rural areas.

Floods

The most significant climate-related hazard in Bhutan is considered to be flooding because of the highly vulnerable agricultural lands located along monsoon rains, and glacial lake outbursts¹. Exposure to floods can take lives, destroy properties, displace people, and increase the susceptibility to stress-related disorders such as acute stress disorder and PTSD, mood disorders such as depression, and anxiety disorders such as panic disorders^{4,5}. Cianconi et al. reported that amongst flood victims, 36% had been diagnosed with PTSD, 20% with depression, and 28.3% with anxiety³. Displacement due to flooding is a risk factor for delusional disorder, which is a very difficult disorder to treat. Furthermore, flooding is associated with an increase in the risk of substance use, suicide, behavioural issues in children and domestic violence¹⁰.

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Heat Waves

The current median probability of a heat wave in Bhutan of 2% is projected to increase to 20% - 36% by the 2090s¹. Heat waves have been associated with heat stress, which in turn has been associated with mood, anxiety and psychotic disorders, increased anger, hostility, violence and criminal activities^{4,5,7,8}. Suicide rates have been on an increase in low to high-income countries, with an approximate 1% increase in the number of suicides for each 1-degree Celsius rise in temperature⁵. Heat waves during pregnancy results in preterm deliveries, low birth weight and neurodevelopmental disorders in children and adolescents¹¹.

Forest fires

Winters in Bhutan are characterised by long, dry spells and strong winds, which increases the risk of forest fires due to the presence of dry bushes, fuel wood and high day time temperatures¹. PTSD, psychosomatic illness, alcohol use, physiological hyperarousal, chronic dissociation, depression, disorganised thinking, and behavioural problems are some of the consequences of forest fires⁴. Nearly half (42%) of the population exposed to Australian bushfires were classified as being potential psychiatric cases after a year of fire¹². Similarly, amongst the population exposed to Californian wildfires, 33% had symptoms of major depression and almost a quarter had symptoms of PTSD¹².

Forests in Bhutan have been impacted by climate change, with industrialisation and urbanisation increasing forest land use and threatening protected forest areas¹. Green areas are known to maintain low temperatures, improve air quality, and reduce people's stress levels⁴. Exposure to green areas and parks are associated with slower cognitive decline in the older population. In children, it is associated with improved attention and focussing abilities, improved behaviour and emotional development, and positive structural changes in the brain⁴.

Drought

Drought is another climate change hazard that Bhutan remains vulnerable to¹. About 43.5% of Bhutanese people depend on agriculture for their livelihoods¹³. These population are victims of psychological distress, adjustment issues, anxiety disorders, depression, and suicide when faced with drought and crop failures⁴.

Air Pollution

Air pollution and noise pollution are attributable to climate change. The major carbon emitters in Bhutan are energy-related emissions from manufacturing industries, aviation and transport industries, residential sectors, and agriculture². The rapid urbanisation of cities is associated with poor air quality, consequences of which include increased severity of mood disorders, anxiety, psychosis, schizophrenia, suicide, and worsened mental well-being^{1,5}.

Physical Health

Climate change impacts physical health by causing an increase in diarrhoeal illness and outbreak of viral infections². Such physical

illnesses not only exacerbate chronic mental health conditions but also remains a potential risk factor for mental health conditions⁵.

MENTAL HEALTH SERVICES IN BHUTAN

The Department of Psychiatry at the Jigme Dorji Wangchuck National Referral Hospital (JDWRH) is the only unit that provides specialised mental health services to the people of Bhutan. The major clinical services provided include outpatient consultations with psychiatrists, pharmacotherapies, psychotherapies, behavioural therapies, inpatient admission, electroconvulsive therapy, and child and adolescent psychiatric services. The department comprises of 4 psychiatrists, nurses, counsellors, occupational therapists, and speech therapists. Besides one child and adolescent psychiatrist, the multidisciplinary team lacks subspecialized psychiatrists, nurses, or counsellors¹⁴. There are no psychologists or social workers. The rest of the country has clinical counsellors in half of the 20 districts. Patients are referred to JDWRH for psychiatrist's consultation by medical officers working in other hospitals, clinical counsellors and some are self-referred.

Mental health conditions are on a steady rise in Bhutan. The annual health bulletin 2023 reported a twofold rise in caseloads from 2018 to 2022 (5067 cases vs. 11038 cases)¹⁵. Similarly, the annual report of JDWRH reported an almost 4-fold increase in mental health conditions from 2017-2022¹⁴. The increase in mental health conditions could be attributed to the COVID-19 pandemic, climate-related events, increased awareness and advocacy on mental health, increased rural-urban migration, emigration, societal fragmentation with increased rates of divorce, crime, violence, and increased drug and alcohol use.

CURRENT SCENARIO IN BHUTAN

So far, there are no studies examining the effects of climate change on mental health conditions in Bhutan. However, this does not imply the absence of mental health issues related to climate change in the country. As shown in Table 1, the psychiatric outpatient department of JDWRH has seen a 3.5-fold increase in the number of new cases from 2017 to 2022^{14,16-19}. Notably, anxiety disorders which includes, anxiety disorders, acute stress disorders, PTSD, and adjustment disorders – conditions closely linked to climate change related events - have increased alarmingly (4-fold) over the years. Despite the frequent occurrence of natural disasters in Bhutan, there has never been an evaluation of their effects on the mental health of those affected although it is established that these events undeniably pose a threat to the mental well-being of survivors²⁰.

It is crucial to generate data through proper recording and reporting of mental health issues related to climate change. Such data can be used to plan for the provision of mental health services and psychological first aid during crises. Furthermore, following up with survivors of climate change-related incidents can help in the early detection and treatment of sequelae resulting from these adversities.

Table 1. Trend of mental health conditions seen at the psychiatric outpatient department at JDWRH from 2017 – 2022^{14,16-19}

Diagnoses	2017	2018	2019	2020	2022
Alcohol use disorder	190	172	172	415	469
Substance use disorder	28	83	68	183	279
Anxiety disorder	234	259	251	529	915
Depression	159	195	187	337	482
Bipolar disorder	17	50	48	74	81
Psychosis	22	48	43	50	78
Somatoform disorder	49	50	59	73	100
Intellectual disability	2	5	5	15	48
Dementia	7	11	13	19	45
Total	708	873	846	1695	2497

N.B. Data from 2021 is not available

WAY FORWARD

Climate change, largely driven by industrialized countries, has widespread negative consequences, including mental health issues, which disproportionately affect developing countries. While climate change and global warming has attracted enormous attention worldwide as a man-made threat, merely recognizing these threats is not adequate. Appropriate measures must be taken to reduce human suffering, including mental health conditions. One avenue for intervention is getting the wealthier, industrialized countries to help affected countries with financial aid and intellectual expertise to develop and implement policies to mitigate and prevent climate change related mental health issues.

CONCLUSION

At the time of writing this paper, Bhutan lacks a health policy regarding climate change with a specific elaborate focus on mental health issues. Since the effects of climate change are already being felt in the country, it is the correct time for Bhutan to formulate climate change resilience policies inclusive of mental health issues. By integrating the expertise of mental health professionals into climate change policy-making, policies can become more comprehensive.

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AUTHORS CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

BC: Concept, Design, manuscript writing, editing and review.

DZ: Concept, Design, manuscript writing, editing and review

DG: Data collection, Design, manuscript writing, editing and review

Authors agree to be accountable for all respects of the work in ensuring that questions related to the accuracy and integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

None

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