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SMOG AND MENTAL HEALTH IN PAKISTAN

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Abstract
This article examines the adverse effects of smog on the mental health of residents in Pakistan. Evidence suggests that extreme weather conditions can harm individuals both physically and mentally, leading to increased risks of depression and post-traumatic stress disorder (PTSD) (Hayes et al., 2018). Gradual climatic changes, such as rising temperatures, increasing particulate matter (PM2.5 and PM10), and declining air quality, also contribute to deteriorating mental health outcomes (World Health Organization [WHO], 2021). Smog, a recurring issue in Pakistan, affects large segments of the population, necessitating research to quantify its impacts and develop effective mitigation and treatment strategies.
Keywords: Smog, mental health, particulate matter, climate anxiety, solastalgia, extreme weather.

Mental Health Impacts of Climate-Driven Disasters

Climate change is expected to intensify extreme weather events, including floods, droughts, wildfires, and storms. Research indicates that these disasters significantly impact mental health, with depression and PTSD being the most common psychological consequences (Fritze et al., 2008). For example, studies show that **20–30% of hurricane survivors** experience PTSD and depression, while similar rates are observed among individuals affected by floods and wildfires (Galea et al., 2005).

Droughts, though slower in onset, have severe mental health implications. In agricultural communities, prolonged drought conditions contribute to **higher suicide rates**, particularly among farmers facing economic strain and the psychological toll of losing their livelihoods. A study in Australia found that **each 1% decrease in farm income due to drought corresponded to a 3–5% increase in suicide rates among farmers** (Hanigan et al., 2012).

Vulnerable populations—such as women, first responders, and individuals with limited financial resources—are disproportionately affected by these climate-related stressors. However, **strong social support networks** have been shown to mitigate some of these adverse effects (Berry et al., 2010).

Gradual Environmental Changes

Gradual climate shifts, such as rising temperatures and worsening air quality, impact a broader population than acute disasters. Studies indicate that **extreme heat is linked to higher rates of**

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aggression, violence, suicide, and reduced overall well-being (Burke et al., 2018). A 2021 study published in *Nature Climate Change* found that **each 1°C increase in temperature correlates with a 0.7% rise in suicide rates** (Carleton, 2017). Additionally, heatwaves are associated with a **10–15% increase in mental health-related hospital admissions**, particularly among those with pre-existing conditions (Mora et al., 2017).

Air pollution, exacerbated by fossil fuel combustion and rising ozone levels, contributes to **psychological distress, increased risk of psychotic episodes, and long-term cognitive decline** (Braithwaite et al., 2019). Research from *JAMA Psychiatry* suggests that **exposure to high levels of air pollution increases the likelihood of developing depression by 13% and schizophrenia by 7%** (Newbury et al., 2019). Poor air quality also discourages outdoor activities, further diminishing both physical and mental health (WHO, 2021).

Indirect Impacts

The indirect effects of climate change—such as **food insecurity, economic instability, and forced migration**—significantly contribute to psychological stress. The **World Food Programme (WFP)** estimates that climate change could push **122 million more people into extreme poverty by 2030**, exacerbating food shortages and malnutrition-related anxiety (WFP, 2022). Agricultural disruptions due to shifting rainfall patterns and rising temperatures increase stress among farmers and laborers, with studies linking **economic hardship in agriculture to a 5% increase in suicide rates in affected communities** (Helm et al., 2021).

Involuntary migration due to rising sea levels, desertification, and extreme weather events further amplifies mental health challenges. The **United Nations High Commissioner for Refugees (UNHCR)** projects that **over 200 million people may be displaced by climate change by 2050**, leading to psychological trauma linked to displacement, cultural loss, and adjustment difficulties (UNHCR, 2021). Additionally, climate-related conflicts over dwindling resources escalate stress and anxiety, particularly in politically unstable regions (Reuveny, 2007).

Inequities in Vulnerability

The mental health consequences of climate change are **unevenly distributed**, disproportionately affecting **low-income communities, indigenous groups, and geographically vulnerable regions**. Coastal and drought-prone areas face heightened risks due to sea-level rise and prolonged dry spells (Hanna & McIver, 2018). Economically disadvantaged populations often lack the resources to relocate or adapt, leading to **chronic stress and poorer mental health outcomes** (Clayton et al., 2017).

Women, children, and individuals with pre-existing mental health conditions are particularly vulnerable. According to the **WHO**, women are **twice as likely as men to develop PTSD** following climate-related disasters, partly due to caregiving responsibilities and social vulnerabilities (WHO, 2021). Indigenous communities face **unique psychological burdens**, as climate change disrupts their deep cultural and spiritual connections to the land (Cunsolo & Ellis, 2018). However, their **traditional ecological knowledge** serves as a resilience resource, offering adaptive strategies for coping with environmental shifts (Ford et al., 2020).

Perceptual Impacts and Climate Anxiety

An emerging concern is **climate anxiety**—psychological distress stemming from awareness of climate change and its potential consequences. Terms such as **solastalgia (distress from environmental change), ecological grief, and eco-anxiety** describe emotional responses to environmental degradation (Albrecht et al., 2007).

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A **2021 global survey** of **10,000 young people across 10 countries** found that **67% were "very" or "extremely" worried about climate change**, and **45% said climate anxiety negatively affected their daily lives** (Hickman et al., 2021). Symptoms include **difficulty concentrating, social withdrawal, and climate-related nightmares**. While these concerns are valid, they emphasize the need for mental health professionals to integrate climate-related anxieties into therapeutic interventions (Pihkala, 2020).

Recent studies have highlighted the significant impact of smog on mental health in Pakistan, particularly in urban centers like Lahore. Rahim (2024) conducted a qualitative study exploring the psychological and emotional effects of smog on Lahore's residents, revealing increased anxiety, stress, and depressive symptoms during high pollution periods.

Similarly, Majeed et al. (2023) examined the psychological impact of air pollution on undergraduate students in Lahore, finding a positive correlation between elevated pollution levels and heightened psychological distress among students.

These findings underscore the urgent need for comprehensive research to quantify smog's mental health impacts in Pakistan and to develop effective mitigation and treatment strategies.

Conclusions

Climate change presents **a significant and growing threat to mental health** through both direct and indirect pathways. While **social support and mental health services** are critical in mitigating these effects, informal mechanisms—such as **engagement in climate activism**—also provide psychological relief (Ojala, 2012).

Further research is needed to quantify **the prevalence of climate-related mental health disorders**, identify **high-risk populations**, and develop **targeted interventions**. Strengthening **global resilience** will be essential to ensuring that individuals and communities can adapt to a rapidly changing world.

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