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The Impact of Climate Change on Mental Health in India

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Abstract

India, a land bathed in ancient wisdom and diverse ecosystems, now faces a formidable foe – climate change. This looming threat not only jeopardizes the environment but also casts a long shadow on the mental well-being of its people. This research delves into this precarious intersection, investigating the multi-faceted impacts of climate change on mental health in India through a blend of primary research via survey of 100 respondents from different cities and secondary sources such as reports, government data etc. The findings of this research serve as a clarion call for action. Policy changes at national, state, and local levels are necessary to effectively address the mental health toll of climate change. The study reveals that the majority of respondents are going through sleep disturbances due to climate change. It also indicates that they are very oftenly feel anxious and stressed about climate change in India. Investing in climate-resilient mental health systems, raising public awareness, and integrating mental health support into climate change adaptation strategies are critical steps forward. This is not merely a call for action; it is a plea for proactive care and support for millions battling the invisible scars of a changing climate.

Keywords: Mental health, Climate change, Environment, Sustainability

Introduction

Global Research has also proven that the detrimental effects of climate change are due to human anthropogenic activities such as industrialisation, enhanced metropolitan area and associated pollution. This has led to an increase in the number of extreme weather events and disasters such as drought, food scarcity and floods. The effect has mainly been focused on the impact of such events on the physical health such as severe infringement of reproductive rights of the women. Extreme weather events and disasters have chronic effects on mental health, such as eco-anxiety and chronic or severe mental health disorders. Recent research has also shown a proportional relationship between temperature rise and aggressive behaviour. A recent study from Australia has also suggested a relationship between heat waves and increased rates of mental disorders.

Climate Change is a global health burden, and this leads to an enormous liability and is vulnerable to poor quality of life and even premature mortality. This decline in mental health conditions would also lead to losses of the economic system as this would lead to loss of skills, productivity, and unemployment. This would also exaggerate the social evils such as marginalisation, deprivation, which results in social isolation and suicide. This is especially true and relevant in a country like India that has a large, marginalised population and disaster-prone and ecologically fragile areas. Based on the index of ranking nations that are susceptible to the impact of climate change, India has been ranked 7th due to the presence of a massive population and dependence on climate variability. For example, Sundarbans is a hotspot for floods and storms and highly vulnerable to sea level rise and saline intrusion. The mental health effects of impacts of climate change is dependent on the local, cultural and social features of the community.

Six years since the cyclone Ockhi of 2017, the survivors of the coastal communities have still been suffering from mental health issues. Mental health professionals believe that the mental suffering among people is prevalent among those who have suffered significant losses post the disaster and might be experiencing recurring flashbacks, insomnia and negative thought patterns, enduring depression and posttraumatic stress which requires significant intervention and advanced forms of medical treatment.

The abundance of research supporting the many effects of climate change on mental health and emotional well-being justifies the need for greater attention to be placed on this subject in public policy. Public discussion. These effects are presently considered as "hidden expenses," not taken into consideration in policy and planning. To effectively address the impacts of climate change on mental health, it is necessary to take decisive action in the following areas: addressing the underlying causes of climate change, proactively addressing anticipated mental health impacts while fostering resilience, mitigating and responding to the existing impacts on mental health and emotional well-being, and implementing evidence-based interventions for policy and practice to innovate in response to these challenges. This document presents a comprehensive collection of suggestions to promote increased understanding, consciousness, and engagement.

Literature review

A global problem, that surpasses every border and differences to threaten the environment, Climate change is a term commonly used interchangeably with global warming. While global warming defines the ongoing increase in the temperature of the globe- making it warmer, climate change on the other hand talks about the previous long-term changes in Earth's climate and weather patterns. Such changes were natural- involving the changes in Sun's activities or large volcanic eruptions. But, after the 1800s, these changes are caused by the destructive activities of human force- particularly burning fossil fuels, deforestation, and various agricultural and industrial practices. Burning of fossil fuels releases greenhouse gas emissions that act as a blanket wrapped around the Earth, trapping the heat and raising the temperatures. Deserts are expanding, forest fires are becoming more common, and increased warming in the Arctic region has contributed to permafrost, and glacier melting, leading to a rise in seawater levels. Rising temperatures are fueling more powerful hurricanes, floods, and heatwaves, while mountains, coral reefs, and the Arctic are experiencing rapid transformations, displacing and endangering countless species. Not only animals, climate change has threatened human lives in uncountable ways. It has affected humans' ability to grow food and live safely. Sea-level rise and saltwater intrusion have advanced to the case where whole communities had to relocate, and protracted droughts are putting people at risk of famine.

Research reports by the UN emphasize the fact that Climate change isn't just an environmental threat, it's a health crisis. 3.6 billion people already live in vulnerable areas, and by 2050, climate change could claim an additional 250,000 lives each year. From malnutrition and heatstroke to malaria and diarrhea, climate change is taking a deadly toll on billions. Healthcare costs are projected to surge, with estimates reaching \$4 billion annually by 2030. Millions face a daily struggle for necessities due to climate change. 2 billion lack safe drinking water, leaving them vulnerable to illness. Foodborne diseases sicken 600 million annually, with children under 5 disproportionately affected. Climate change is making these problems worse, increasing the risks of waterborne and foodborne illnesses. Hunger is another growing threat, with 770 million facing it in 2020, primarily in Africa and Asia. Climate change disrupts food production, reducing availability, quality, and diversity, further worsening food insecurity.

Not only climate change is expected to affect physical health, but it also jeopardizes mental health, something not discussed as widely as it should be in the mainstream media. Climate change has a three-fold effect. In this case, we are concerned with the effects that mental health had before the event took place, how the person responded to it during the event, and what the consequences were afterward. Climate change affects a person's mental health even before the event has taken place. An increase in eco-anxiety has been noted. Eco-anxiety refers to a chronic, unwavering fear of impending ecological and environmental damage or disaster. The term, coined by Glenn Albrecht, is regarded as a rational response to climate change and can have a permanent impact, if not treated well. This term gained high media attention after 2017 when Swedish environmental activist Greta Thunberg discussed her eco-anxiety publicly[4]. Some people choose to not have children, after experiencing much anxiety and distress related to the future of climate change. Those affected by

climate change events showed signs ranging from distress, and loss of appetite to sleeplessness and panic attacks. The National Wildlife Federation has estimated that 200 million Americans will eventually experience emotional distress as a result of the effects of climate change (NWF 2011). Victims, obviously experience distress when facing a climatic disaster- like floods, droughts, forest fires, etc. but, someone experiencing climatic alteration for the first time may go through a period of extended sadness that can be termed as solastalgia. Solastalgia is a word that describes a type of emotional or existential distress caused by environmental change. It is a combination of the Latin word *sōlācium* (comfort) and the Greek root *-algia* (pain, suffering, grief). Solastalgia is a form of homesickness that occurs when someone is at home but the environment has been altered and feels unfamiliar. It can include nostalgia, anxiety, stress, and worry. The term is specifically used to describe change caused by chronic change agents like climate change or mining. Solastalgia is not considered a disease, but rather a set of psychological disorders that occur in a native population following destructive changes in their territory. Some types of natural disasters that may lead to solastalgia include drought, Forest fire, Flooding, Clearcutting (tree removal), Mining, Smog, and Extreme weather. The ripple effects of climate-related events extend beyond the immediate crisis. While shock and grief are natural first responses, these can evolve into longer-term mental health struggles like depression, despair, and PTSD. Individuals grapple with the lasting changes and losses, leaving them vulnerable to psychological trauma.

Research done by Joydeep Majumdar, Indranil Saha, Amit Chakraborti on the topic of Climate Change, Disasters, and Mental Health of Adolescents, delves into the issue of mental health of adolescents with reference to India. The study states that there is considerable evidence that states that the mental illnesses of adulthood start during childhood and adolescence. A study on the mental health after effects of the Tsunami in the Andaman and Nicobar Islands reported a PTSD prevalence among the 10.8% among the surviving adolescents and a study on the cyclone-hit Odisha reported a prevalence of 26.9% for PTSD prevalence of 26.9% among the surviving adolescence and 12% for generalised anxiety disorders among school-going adolescents. These are higher than those observed in the mental health landscape in general. In the community-based settings, the recognition of mental health has not been in the light. A pilot study was carried out in an adolescent clinic in the Canning I Block of the Sundarbans, West Bengal in India and the study aimed to tackle the frequent disaster conditions among the adolescents. The authors did extensive research on the adolescents in the age-group between 18 and 19 years with the aim of finding the burden of common mental health disorders for availing qualitative mental health services. The paper on Impacts of Climate Change on Public Health in India: Future Research Directions (January 2011) describes how climate change and associated increases in climate variability will likely further exacerbate global health disparities. More research is needed, particularly in developing countries, to accurately predict the anticipated impacts and inform effective interventions. Building on the information presented at the 2009 Joint Indo-U.S. Workshop on Climate Change and Health in Goa, India, we reviewed relevant literature and data, addressed gaps in knowledge, and identified priorities and strategies for future research in India. The scope of the problem in India is enormous, based on the potential for climate change and variability to

exacerbate endemic malaria, dengue, yellow fever, cholera, and chikungunya, as well as chronic diseases, particularly among the millions of people who already experience poor sanitation, pollution, malnutrition, and a shortage of drinking water. A universal theme of the recommendations developed was the importance of improving the surveillance, monitoring, and integration of meteorological, environmental, geospatial, and health data while working in parallel to implement adaptation strategies. A research paper on Indigenous irrigation in South Bihar: A case of congruence of boundaries, by N. Pant (1998) was conducted in two rural communities of Southern Bihar, India. Bihar is the third most populous state in India, with 88.7% of the population living in rural areas (GoI, 2011). The description of the two communities, selected from two South Bihar districts (Gaya and Jehanabad) to collect information about the changing climate. The Gaya and Jehanabad districts receive an annual rainfall of 1,034 and 1,033 mm, respectively, and are prone to drought and heat waves (National Innovations on Climate Resilient Agriculture, 2013a, 2013b). No literature is yet available on the study of economic loss based on the mental health factor of climate change. The availability of literature on the study of the mental milieu of adolescents on rehabilitation and physical and mental health consequences is scarce in nature.

Objectives

The objectives of this study are:

1. To identify the key climate-related factors contributing to mental health issues
2. To examine the existing evidence on the prevalence of depression, anxiety, substance abuse, and suicidal ideation in relation to climate change exposure.
3. To assess public awareness and understanding of the link between climate change and mental health in India.

Methodology

A blend of both primary and secondary research are incorporated in this study. As a part of primary study, we have collected 100 responses through a survey of respondents residing in different states of India. We have used JASP for analysing the data. As a part of secondary study, we have used various research articles, government data and newspaper articles.

Hypothesis

Having established the link between climate change and mental health challenges in India, this research delves deeper to explore specific factors that might influence individual well-being. The following hypotheses are proposed to investigate the potential mitigating role of community engagement and education in the face of these challenges:

H0a There is no significant difference in the levels of negative mental health outcomes (e.g., anxiety, depression, stress) between individuals who are exposed to climate change and those who are not exposed in India.

H1a Individuals who are exposed to climate change (experienced extreme weather events, aware of the impact, perceive personal impact) report higher levels of negative mental health outcomes compared to those who are not exposed.

H0b Community engagement and activism related to climate change do not contribute to increased feelings of control and reduced anxiety.

H1b: Community engagement and activism related to climate change contribute to increased feelings of control and reduced anxiety.

H0c: Education and awareness programs focusing on the mental health impacts of climate change do not have a significant positive impact on attitudes and coping mechanisms.

H1c: Education and awareness programs focusing on the mental health impacts of climate change lead to more positive attitudes and coping mechanisms.

Climate change and mental health

Climate change poses a multifaceted threat to mental health in India, exacerbating existing vulnerabilities and contributing to a range of psychological distress among its populace. Rising temperatures, escalating sea levels, and episodic droughts are among the prominent manifestations of climate change that have far-reaching implications for mental well-being. The rising temperatures across India intensify heatwaves, leading to heat-related illnesses and exacerbating pre-existing mental health conditions. Studies by Patz et al. (2014) underscore the detrimental impact of heatwaves on mental health, with prolonged exposure increasing stress, anxiety, and agitation among individuals. Moreover, rising temperatures amplify the risk of dehydration and heatstroke, further compromising physical and psychological resilience.

The threat of rising sea levels looms large over coastal communities in India, triggering displacement and upheaval that engender profound psychological distress. Displacement disrupts social networks, erodes cultural ties, and undermines community cohesion, exacerbating feelings of isolation and dislocation (McMichael et al., 2018). The loss of land and livelihoods perpetuates a cycle of economic uncertainty and social upheaval, heightening the risk of violence, aggression, and intra-community conflicts. Agricultural conditions, exacerbated by climate change-induced variability in rainfall patterns and water scarcity, pose significant challenges to mental health in India. Farmers, who comprise a substantial portion of the Indian workforce, face mounting pressures due to crop failures, financial losses, and dwindling resources (Nagendra et al., 2018). Weakened agricultural infrastructure and diminishing yields engender financial stress, exacerbating familial tensions and relationship conflicts. The erosion of traditional coping mechanisms and social support networks amplifies feelings of despair and hopelessness, contributing to a rise in rates of suicide and substance use among agricultural communities. Furthermore, the specter of episodic drought looms large over vast swathes of India, perpetuating cycles of food insecurity, malnutrition, and poverty. Drought-induced scarcity exacerbates socio-economic disparities, deepening the vulnerability of marginalized communities to mental health

disorders (Clayton et al., 2017). The strain on water resources heightens competition and conflict, fueling inter-community tensions and exacerbating psychosocial stressors. The intertwining dynamics of climate change and mental health in India underscore the urgent need for holistic approaches that address the intersecting challenges of environmental degradation, socio-economic disparities, and psychosocial well-being. By prioritizing climate-resilient infrastructure, promoting sustainable livelihoods, and strengthening mental health support systems, policymakers, healthcare practitioners, and civil society can collectively mitigate the adverse impacts of climate change on mental health, fostering resilience, and promoting holistic well-being across Indian communities.

Climate related factors contributing to mental health effects

Eco-Anxiety: the American Psychiatric Association (APA) recognises climate change as a growing threat to mental health. With the sixth mass extinction underway and rampant increase in the heat waves and rising sea levels leads to people feeling extremely anxious. This chronic fear of environmental doom is called eco-anxiety which is due to a number of factors at play, such as the current and projected climate impacts, the uncertainty of location, extensive consumption of news related to climate disasters and policy gaps in the measures of the government. There can be the impact of both the direct and indirect impact of climate change. The survivors of the climate-related disaster might possibly experience in the chronic or severe mental health disasters related to stress, post-traumatic stress disorder, anxiety and even suicidal tendencies. Based on the index of ranking nations that are susceptible to the impact of climate change, India has been ranked 7th due to the presence of a massive population and dependence on climate variability. For example, Sundarban is a hotspot for floods and storms and highly vulnerable to sea level rise and saline intrusion. The mental health effects of impacts of climate change is dependent on the local, cultural and social features of the community.

Global temperatures are expected to increase, leading to increased exposure to heat and a correlation between aggressive behavior and temperatures. Heat waves have been linked to mental and behavioral disorders, including mood disorders, anxiety disorders, dementia, and anxiety-related disorders. Extreme heat exposure can lead to physical and psychological exhaustion, and occupational heat stress is associated with greater psychological distress among workers.

Climate-related disasters, such as floods, hurricanes, and bushfires, are often associated with stress-related psychiatric disorders, such as posttraumatic stress disorder (PTSD), acute stress reaction, and adjustment disorder. These disorders can subside over time with rehabilitation and treatment. Climate change-related disasters are likely to impact a greater proportion of the population, particularly in small rural communities.

Droughts are also expected to exacerbate due to climate change, leading to increased floods and prolonged droughts. Crop failures due to unexpected droughts have been linked to suicide attempts in farmers, leading to economic hardships, malnutrition, and increased risks of infections. Prolonged droughts can also lead to migration and acculturation stress, further contributing to suicide attempts.

Health care for farmers is crucial, as much of the world population relies on them for their food supply. Efforts are needed to provide help when needed, especially in rural areas where healthcare facilities are concentrated in urban areas.

Climate change is expected to significantly impact agricultural societies, leading to economic hardships and increased mental health problems. Rising sea levels, desiccation, and flooding can encroach on agricultural land, making work less productive and hampering agricultural support industries. Long-duration droughts can also lead to depression and demoralization, particularly in adolescents. Social capital, which combines social cohesion and community participation, is strained under economic pressure, affecting wellbeing and potentially causing mental health problems. Women are more likely to be affected by reduced social capital, especially when they migrate for employment or other reasons. Economic constraints can also negatively impact healthcare seeking, particularly for mental health, as the ability of society to provide treatment may be reduced during periods of economic hardships. Climate change is also linked to migration and acculturation stress, which can lead to psychiatric disorders. Mental health is closely linked to physical health, with poor physical health leading to poor quality of life and psychological distress. Chronic physical diseases, such as cardiovascular, respiratory, gastrointestinal, and renal problems, are likely to affect mental health due to strain on coping. Climate change also leads to decrement in arable land, leading to food shortages and malnutrition, particularly among children in developing countries.

Existing evidence on the prevalence of depression, anxiety, etc. in relation to climate change exposure

The impact of climate change on mental health, particularly in the context of India, is a critical area of concern that has garnered increasing attention in recent years. Existing evidence sheds light on the prevalence of depression, anxiety, and other psychological disorders in relation to climate change exposure, highlighting the multifaceted nature of this issue. Numerous studies have underscored the correlation between environmental degradation, extreme weather events, and adverse mental health outcomes. For instance, research by Berry et al. (2010) suggests that individuals exposed to natural disasters such as floods and cyclones are more susceptible to experiencing heightened levels of anxiety and depression. The frequency and intensity of such extreme weather events in India have escalated in recent years, exacerbating stressors on mental well-being. Moreover, the prolonged exposure to heatwaves, which have become more frequent and severe due to climate change, has been linked to increased psychological distress among vulnerable populations in India (Patz et al., 2014). The agricultural sector, which forms the backbone of the Indian economy, is particularly susceptible to the impacts of climate change, leading to livelihood insecurities and economic stressors that contribute to mental health challenges (Nagendra et al., 2018). Additionally, the displacement of communities due to rising sea levels, erratic rainfall patterns, and land degradation further exacerbates psychosocial stressors, heightening the risk of mental health disorders (McMichael et al., 2018). Furthermore, the interplay between climate change and existing social inequalities magnifies the mental health

burden, with marginalized communities bearing the brunt of environmental degradation. The lack of access to basic resources, inadequate healthcare infrastructure, and limited adaptive capacities exacerbate the vulnerability of disadvantaged populations, amplifying their susceptibility to mental health disorders in the face of climate-related adversities. Notably, the psychological impacts of climate change extend beyond direct environmental exposure to encompass existential concerns, eco-anxiety, and feelings of powerlessness in the face of ecological crises (Clayton et al., 2017). Mental wellbeing issues related with climate alter incorporate higher rates of uneasiness and PTSD, rest clutter, expanded enslavement, misery and self-destructive ideation (Bourque F et. al., 2014 & Palinkas LA et. al.,2020) . The indications can hold on from months to a long time (Schwartz RM et al., 2017). The hazard components for creating these issues incorporate the size of the climate catastrophe, female sexual orientation, more youthful age, moo financial status, less instruction, misfortune or damage of a adored one, minority or ethnic status, migrant bunches, innate individuals, family flimsiness, pre-existing mental wellbeing issues and insufficient social back(Bourque F et al, 2014, Palinkas LA et. al., 2020, Schwartz RM et. al., 2017, Hayes K et. al., 2018, Trombley J et. al., 2017, Gamble JL et. al., 2009 and Rataj E et. al., 2016). Populations of low/middle-income nations are influenced more due to their expanded presentation to intense climate occasions and need to get to wellbeing and bolster services (Schwartz RM et al., 2017 & Rataj E et. al., 2016). Extraordinary warm occasions and longer periods of expanded temperature are connected to higher rates of forcefulness and criminal conduct, causing higher rates of physical violence and wrongdoings (Stevenes HR et. al., 2019), as well as expanded rates of anxiety, mood swings and suicide (Gao J et al., 2008 & Hansen A et. al.,2019). One of the foremost helpless bunches to climate alter are children since of their juvenile thermoregulatory capacities, natural affectability, limited adaptive reactions, existential concerns almost the long run the reality that they will be confronted by the climate situation for numerous a long time to come, and reliance on pushed adults (Burke SEL et. al., 2016 & Hrabok M et. al., 2018).

The pervasive nature of these psychosocial stressors underscores the urgent need for comprehensive mitigation and adaptation strategies that integrate mental health considerations into climate change policies and interventions.

Assess public awareness and understanding of the link between climate change and mental health in India.

“Without Mental Health, there can be no true physical health, " rightly declared the first Director-General of the World Health Organization (WHO), 1954 Dr. Brock Chisholm. Mental health is a major rising concern worldwide, as it nearly claims 8 million lives each year, contributing to 14.3% of deaths. There is a likelihood that the burden of mental disorders has been underestimated due to a lack of appreciation of how mental illness interacts with other health problems. Priorities must be set based on the burden of health problems and inequalities must be addressed regarding determinants and solutions. Mental health services must be improved and investment in mental health services must be increased. It must be given the same priority as physical health and more research must be conducted to understand the determinants of mental illness. Mental health

policies must be implemented to promote mental health and prevent mental disorders. Progress of mental health awareness has been slow in middle and low-income groups, with barriers including the existing public-health priorities and their influence on funding; challenges to the delivery of mental health care in primary-care settings; the low numbers of those trained in mental health care; and the lack of mental health perspective in public health leadership.

India is a lower middle-income country and home to 140+ crore people, more than any country worldwide. Approximately 200 million Indians may suffer from depression in their lifetime, according to a 2015 study by the World Health Organization, accounting for 1 in every 5 Indians. Only 10-12% of people suffering from mental illness seek professional help due to stigma and lack of awareness. In India, mental health disorders have a high prevalence, impacting a considerable proportion of the population. Epidemiological studies report prevalence rates for psychiatric disorders varying from 9.5 to 370 per 1000 people in India. Conditions such as depression, anxiety disorders, bipolar disorder, schizophrenia, and substance use disorders are commonly observed mental health disorders in India. According to “A Comprehensive Analysis of Mental Health Problems in India and the Role of Mental Asylums”, depression is the most common mental health disorder, characterized by loss of interest, persistent sadness, hopelessness, fatigue, negativity, suicidal thoughts, sleep disturbances, and difficulty in focus. 3.5% of the deaths in India are attributable to mental health.

Substance abuse is also a rising concern contributing to mental health disorders. Various associated problems like financial difficulties, family problems, legal issues, or relationship issues have significantly contributed to mental health disorders like mood swings, anxiety, psychosis, or cognitive disorders, further leading to substance abuse. The stigma associated with mental illness in Indian society leads to discrimination and social exclusion for people suffering from mental illness. A lack of awareness and misconceptions often contribute to the stigma surrounding mental illness. There is a profound impact of gender inequalities on mental health in India. Women in India face special challenges due to societal norms and they are more likely to suffer from mental health problems. Stress, anxiety, and depression among women can be caused by factors such as domestic violence, sexual abuse, unequal power dynamics, limited access to education and employment opportunities, and societal expectations. As a result of the intersection of gender with other factors, such as socioeconomic status and caste, mental health disparities are exacerbated.

In India, the shadow of stigma associated with mental illness stretches beyond public spaces and deeply into families. This ingrained bias creates a chilling silence around mental health issues, leading to a lack of understanding and support for individuals struggling within. This, in turn, significantly hinders their ability to seek help, trapping them in a cycle of isolation and suffering. Adding to this challenge are stark socioeconomic disparities that play a crucial role in both developing and exacerbating mental health problems. Limited access to quality healthcare, including mental health services and essential social support systems, leaves many vulnerable. Stressful living conditions, financial instability, and limited opportunities further magnify psychological distress, increasing the risk of mental health struggles.

Furthermore, cultural beliefs can act as double-edged swords. While offering solace and community, some traditions may inadvertently stigmatize mental illness. This discourages open discussions, promoting harmful practices or ineffective remedies instead of evidence-based care. This perpetuates the cycle of misunderstanding and prevents individuals from accessing the support they desperately need. Therefore, to truly understand public awareness about mental health in India, one must acknowledge the intertwined factors of family stigma, socioeconomic disparities, and cultural beliefs. Only by addressing these interconnected issues can we create a society where seeking help for mental health is not seen as a shame, but as a sign of strength and resilience.

Furthermore, “The Live Love Laugh Foundation (TLLLF) 2018 National Survey Report: How India Perceives Mental Health”, explains awareness as the knowledge about mental health, its disorders, and treatment methods. The study took place across eight cities in India over a span of 5 five months and involved 3,556 respondents. The TLLLF study reveals some interesting truths about how people in India view mental health:

- Half the population links "being healthy" with having a healthy mind: This shows a basic understanding of the connection between mental and physical health.
- Most people seem aware of mental illness: Over 80% could list names or symptoms of different conditions.
- Many believe in seeking professional help: 92% think people with mental health issues should see a doctor.
- There's hope for recovery: 63% believe people with severe problems can fully recover.

However, challenges remain:

- Descriptions sometimes focus on severe cases: Terms like "talking to themselves" or "cleaning too much" might not represent the full spectrum of mental illness.
- Stigma persists: Nearly half used offensive terms like "retard" or "crazy," highlighting negative attitudes.
- Personal connections are low: Only 17% knew someone with mental illness, and only 2% admitted to having one themselves. This suggests underreporting or reluctance to disclose.
- Treatment views may be limited: While many endorse doctors, 70% believe in medication, neglecting other therapeutic approaches.

Overall, India shows some awareness of mental health, but stigma and a disconnect from personal experiences hinder progress. Building understanding and acceptance, while promoting diverse treatment options, is crucial for better mental health in India.

Climate change, just like mental health, is a worldwide problem, which unites the world, regardless of borders and regions. Talking about the role of government, India's National Action Plan on Climate Change includes the following goals:

- Reducing emissions intensity by 45% by 2030 compared to 2005.

- Achieving 50% of cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030.
- Protecting, restoring, and enhancing India's green cover.
- Increasing forest cover on 5 million hectares of land.

Surveys done for public awareness about climate change in India paint a mixed picture. According to a survey by Mint and Development Intelligence Unit, 95% of Indians have noticed changes in weather patterns over the last 20 years. However, a 2021 World Risk Poll found that 18% of Indians believe climate change is not a threat, and 20% are unsure. A 2022 Yale Program on Climate Change survey found that 57% of Indians believe global warming is caused by human activities, while 31% believe it is caused by natural changes. The statistics signify that awareness is high, but understanding needs improvement. While personal experiences raise awareness, bridging the gap between scientific understanding and individual responsibility is crucial. Various communication strategies are essential, addressing misconceptions, tailoring messages to local contexts and concerns, and using trusted channels are key to fostering engagement on the part of the government of India.

Climate change and mental health foster a strong connection. The 2023 Intergovernmental Panel on Climate Change (IPCC) stated that there is very high confidence that rising global temperatures will lead to an increase in mental health hazards. According to a study conducted by Lancet, Nearly half of kids in a huge study (45%) said worries about climate change hurt their daily lives. Another study linked bad feelings about climate change to trouble sleeping and poorer mental health. These findings paint a concerning picture for young people as for them, Climate anxiety is not just a feeling, it impacts daily life. This could mean trouble in school, relationships, or everyday activities. The Worries about the planet's future are impacting young people's well-being. This can lead to sleep problems and other mental health struggles.

It's important to remember that these young people are inheriting a complex climate situation. Talking about climate change and its impact on mental health is important. Open communication and support can help young people cope.

Climate change is now leading to more violent and extreme weather changes. Extreme weather events, a stark consequence of climate change, are not just physical threats. Witnessing and experiencing injury, death, and devastation unleashes a mental health crisis too. Witnessing the trauma can lead to higher levels of stress, anxiety, and depression, even triggering PTSD or substance abuse. Beyond the immediate shock, the socioeconomic fallout amplifies the crisis. Unemployment, homelessness, and food insecurity – all fueled by climate disasters – further chip away at mental well-being. While communities in India show astounding resilience, the rising frequency and intensity of extreme weather events put that resilience to the test. The temperature rise caused by climate change has had a detrimental impact on mental health. Studies show that hospitalizations for psychiatric disorders and emergency psychiatric visits tend to increase during heatwaves. Rates of suicides have also been shown to be higher during heatwaves and are expected to increase with rising temperatures, although evidence on the link between heat and suicide

remains mixed. A hypothesis claims that heat waves cause disturbances in sleep, and increase irritability, stress, and more negative emotions. The development of mental health problems as young people transition into adulthood has also been linked to exposure to air pollution during childhood and adolescence. It has been suggested that air pollution impairs the normal development of the central nervous system.

Climate change is also linked with a rise in infectious diseases like dengue, malaria, etc. This is due to the increase in global temperature, causing a rise in the population of pathogens, due to favorable breeding environments. Physical and mental well-being are deeply intertwined. When infectious diseases surge, it's not just our bodies that suffer. The fear of hospitalization, the burden of living with chronic illness, and the constant vigilance against further infection can take a toll on our mental state. Stress, anxiety, and even depression become unwelcome companions, further complicating recovery. The picture worsens for those battling neglected tropical diseases or other stigmatized conditions, where discrimination adds another layer of pain.

While this is one side of the coin, some experiences do not have a clinical diagnosis but are given some new terms. These feelings include solastalgia (the inability to find solace in a familiar landscape due to environmental degradation) , ecological grief(the sense of loss emerging from experiencing environmental degradation), and climate anxiety(a feeling of anxiety in the face of climate change). This research has investigated the complex and multifaceted link between mental health and climate change by assessing public awareness of mental health, climate change, and the link between the both. By examining the impacts of extreme weather events, rising sea levels, and other environmental changes on individuals and communities, we have shed light on the growing burden of mental health challenges attributed to climate change.

Furthermore, the discussions on public awareness, particularly in India, regarding mental health and climate change highlight the need for greater education, improved communication strategies, and targeted interventions to address existing societal stigma and knowledge gaps.

Data Analysis and Interpretation

Hypothesis 1

H0a There is no significant difference in the levels of negative mental health outcomes (e.g., anxiety, depression, stress) between individuals who are exposed to climate change and those who are not exposed in India.

H1a Individuals who are exposed to climate change (experienced extreme weather events, aware of the impact, perceive personal impact) report higher levels of negative mental health outcomes compared to those who are not exposed.

Contingency Tables

| | | In what ways do you believe climate change directly influences your mental well-being? | | | | | | | | | | | | | | | | |
|----------------------------|----------------|--|------|------|-------|------|------|------|------|------|------|------|-------|------|-------|-------|-------|--------|
| Exposure to climate change | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Total |
| 0 | Count | 7.00 | 0.00 | 1.00 | 13.00 | 1.00 | 1.00 | 7.00 | 4.00 | 3.00 | 1.00 | 2.00 | 11.00 | 0.00 | 13.00 | 11.00 | | 82.000 |
| | Expected count | 5.62 | 0.80 | 0.80 | 12.05 | 0.80 | 0.80 | 6.43 | 4.82 | 2.41 | 2.41 | 1.60 | 10.45 | 0.80 | 9.647 | 12.05 | 10.45 | |
| 1 | Count | 0.00 | 1.00 | 0.00 | 2.000 | 0.00 | 0.00 | 1.00 | 2.00 | 0.00 | 2.00 | 0.00 | 2.000 | 1.00 | 5.000 | 2.000 | 2.000 | 20.000 |
| | Expected count | 1.37 | 0.19 | 0.19 | 2.941 | 0.19 | 0.19 | 1.56 | 1.17 | 0.58 | 0.58 | 0.39 | 2.549 | 0.19 | 2.353 | 2.941 | 2.549 | 20.000 |
| Total | Count | 7.00 | 1.00 | 1.00 | 15.00 | 1.00 | 1.00 | 8.00 | 6.00 | 3.00 | 3.00 | 2.00 | 13.00 | 1.00 | 12.00 | 15.00 | 13.00 | 102.00 |
| | Expected count | 7.00 | 1.00 | 1.00 | 15.00 | 1.00 | 1.00 | 8.00 | 6.00 | 3.00 | 3.00 | 2.00 | 13.00 | 1.00 | 12.00 | 15.00 | 13.00 | 102.00 |

Chi-Squared Tests

| | Value | df | p |
|----------------|-------|----|-------|
| X ² | 21.8 | 15 | 0.113 |
| N | 102 | | |

The chi-square statistic (χ^2) is 21.8, with 15 degrees of freedom (df) and a p-value of 0.113. Since the p-value (0.113) is greater than 0.05, we fail to reject the null hypothesis of independence between the variables. In other words, there is not enough evidence to conclude that the two variables are related.

Hypothesis 2

H2a Community engagement and activism related to climate change do not contribute to increased feelings of control and reduced anxiety.

H2b: Community engagement and activism related to climate change contribute to increased feelings of control and reduced anxiety.

Contingency Tables

| | | In what ways do you believe climate change directly influences your mental well-being? | | | | | | | | | | | | | | | | |
|----------------------------------|-------|--|------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|------|-------|-------|-------|-------|
| community engagement and support | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Total |
| 0 | Count | 0.00 | 0.00 | 0.000 | 1.000 | 0.000 | 0.000 | 0.000 | 1.000 | 0.000 | 0.00 | 0.00 | 0.000 | 0.00 | 1.000 | 1.000 | 0.000 | 4.000 |

| | | | | | | | | | | | | | | | | | | |
|-------|----------------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|--------|-------|--------|--------|--------|---------|
| | Expected count | 0.275 | 0.039 | 0.039 | 0.588 | 0.039 | 0.039 | 0.314 | 0.235 | 0.118 | 0.118 | 0.078 | 0.510 | 0.039 | 0.471 | 0.588 | 0.510 | 4.000 |
| | Count | 3.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 2.000 | 1.000 | 0.000 | 0.000 | 3.000 | 0.000 | 3.000 | 1.000 | 2.000 | 15.000 |
| 1 | Expected count | 1.029 | 0.147 | 0.147 | 2.206 | 0.147 | 0.147 | 1.176 | 0.882 | 0.441 | 0.441 | 0.294 | 1.912 | 0.147 | 1.765 | 2.206 | 1.912 | 15.000 |
| | Count | 1.000 | 1.000 | 0.000 | 6.000 | 0.000 | 0.000 | 4.000 | 0.000 | 2.000 | 3.000 | 2.000 | 4.000 | 1.000 | 5.000 | 7.000 | 5.000 | 41.000 |
| 2 | Expected count | 2.814 | 0.402 | 0.402 | 6.029 | 0.402 | 0.402 | 3.216 | 2.412 | 1.206 | 1.206 | 0.804 | 5.225 | 0.402 | 4.824 | 6.029 | 5.225 | 41.000 |
| | Count | 2.000 | 0.000 | 1.000 | 6.000 | 1.000 | 1.000 | 3.000 | 2.000 | 0.000 | 0.000 | 0.000 | 4.000 | 0.000 | 1.000 | 6.000 | 4.000 | 31.000 |
| 3 | Expected count | 2.127 | 0.304 | 0.304 | 4.559 | 0.304 | 0.304 | 2.431 | 1.824 | 0.912 | 0.912 | 0.608 | 3.951 | 0.304 | 3.647 | 4.559 | 3.951 | 31.000 |
| | Count | 1.000 | 0.000 | 0.000 | 2.000 | 0.000 | 0.000 | 1.000 | 1.000 | 0.000 | 0.000 | 0.000 | 2.000 | 0.000 | 2.000 | 0.000 | 2.000 | 11.000 |
| 4 | Expected count | 0.755 | 0.108 | 0.108 | 1.618 | 0.108 | 0.108 | 0.863 | 0.647 | 0.324 | 0.324 | 0.216 | 1.402 | 0.108 | 1.294 | 1.618 | 1.402 | 11.000 |
| | Count | 7.000 | 1.000 | 1.000 | 15.000 | 1.000 | 1.000 | 8.000 | 6.000 | 3.000 | 3.000 | 2.000 | 13.000 | 1.000 | 12.000 | 15.000 | 13.000 | 102.000 |
| Total | Expected count | 7.000 | 1.000 | 1.000 | 15.000 | 1.000 | 1.000 | 8.000 | 6.000 | 3.000 | 3.000 | 2.000 | 13.000 | 1.000 | 12.000 | 15.000 | 13.000 | 102.000 |
| | Count | 7.000 | 1.000 | 1.000 | 15.000 | 1.000 | 1.000 | 8.000 | 6.000 | 3.000 | 3.000 | 2.000 | 13.000 | 1.000 | 12.000 | 15.000 | 13.000 | 102.000 |

Chi-Squared Tests

| | Value | df | p |
|----------------|-------|----|-------|
| X ² | 45.97 | 60 | 0.909 |
| N | 102 | | |

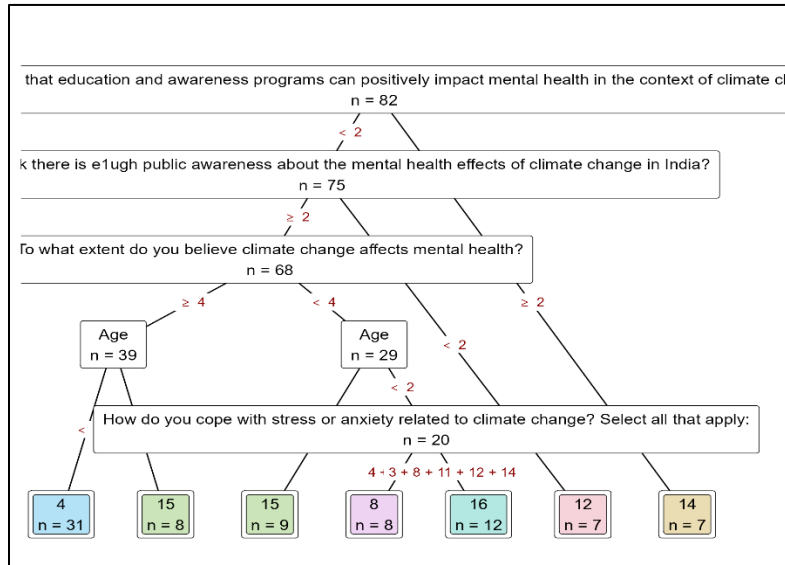
The chi-square statistic (X^2) is 45.97. The degrees of freedom (df) is 60. The p-value (p) is 0.909 and the sample size (N) is 102. Since the p-value (0.909) is greater than the significance level (usually set at 0.05). This means that we fail to reject the null hypothesis of no association between the variables. In other words, there is not enough evidence to conclude that the two variables are related.

Hypothesis 3

H0c: Education and awareness programs focusing on the mental health impacts of climate change do not have a significant positive impact on attitudes and coping mechanisms.

H1c: Education and awareness programs focusing on the mental health impacts of climate change lead to more positive attitudes and coping mechanisms.

Decision Tree Plot



There is a high level of public awareness about the mental health effects of climate change in India. 82% of respondents indicated that they were aware of the issue. Many respondents (68%) believe that climate change has a significant impact on mental health. The most common ways people cope with stress or anxiety related to climate change include spending time in nature, talking to friends and family, and seeking professional help. Therefore, we accept the alternative hypothesis and conclude that the two variables are related.

Mitigation

Climate change is likely to impact human mental health in various ways, and it is crucial to take steps to reduce global warming and develop measures to deal with the challenges posed through adaptation. Mitigation of greenhouse gases involves less reliance on fossil fuels, developing and using alternate efficient power sources, and reducing encroachment on green cover. Inter-sectoral and international collaboration is needed to implement policies for reducing greenhouse gas emissions. Developing countries like India have developed policies to challenge the impact of climate change, such as the National Action Plan on Climate Change (NAPCC), which focuses on eight missions aimed at mitigating the process or reducing the impact of climate change. Adequate treatment facilities for managing mental health problems should be undertaken, especially during natural disasters when the vulnerability to stress is acute. Promoting positive mental health, such as human resilience and coping strategies like yoga, can help mitigate psychological distress due to climate change.

Reducing suicide fatalities due to secondary consequences of climate change may involve debt-abolition or economic support for farmers. Providing subsidies and guaranteed income during drought seasons can lead to less economic and psychological stress on farmers. A coherent,

implementable, and effective response to climate change concerns can be best refined with systematic evidence accumulated over time.

Conclusion

Numerous effects of climate change on mental health are anticipated. Through a variety of mediators, climate change-related events such as floods, droughts, rising sea levels, and higher ambient temperatures can lead to an increase in psychological distress. Economic pressure, the stress of migration and acculturation, a decline in social capital, and traumatic experiences are a few of these mediators. In the future, reasonable answers to the challenge of climate change would be to work toward expanding access to mental health care and gradually reducing climate change.

Recommendations

Firstly, there is a need for structured and analytical research in the domain of adolescent mental health in disaster prone and ecologically vulnerable areas. The preservation of the mental health of the vulnerable population is very integral for sustainable development of the community as a whole. Some policy measures that can be taken such as strengthening the primary health care and referral systems supplemented with efficient and fast transportation linkages, in the event of natural disasters. Secondly, more CSR activities in the region should be encouraged. Thirdly, the Basic Occupational Health Services (BOHS) must be incorporated at the primary healthcare level to address the physical and psychological concerns of the occupational groups in the region, especially the most vulnerable region. The telepsychiatry through the traditional “hub-and-spoke” model would help in online management with counselling and online training on parenting skills. Secondly, It will be critical for India to invest in improvements in information infrastructure that are innovative and that promote interdisciplinary collaborations while embarking on adaptation strategies. This will require collaborative efforts across diverse institutions in India and the multilateral institutions including the United Nations. The issue of mental health due to climate change should be integrated into the global health governance framework. In this aspect, India as a representative of the Global South can play an integral role in bringing to the table, the divide between the Global South and the Global North with regard to climate change. Lastly, a data-driven strategy should be framed to map India's diverse climates and populations to understand the specifics of the increased mental health vulnerabilities.

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