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The Psychological Impact Of Climate Change Worry: Evidence From Uttarakhand, India

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Abstract
Climate change is increasingly recognized as a source of psychological distress, yet its impact on general well-being remains underexplored in vulnerable populations in the Global South. This study examined the relationship between climate change worry (CCW) and psychological general well-being (PGWB) among 430 adults across the state of Uttarakhand, India. Participants completed the Climate Change Worry Scale and the Psychological General Well-Being Index. Results indicated moderate-to-high levels of climate change worry and a significant negative association with general well-being. Regression analyses further demonstrated that elevated climate change worry predicted lower psychological well-being, highlighting the detrimental impact of environmental concern on mental health. These findings underscore the importance of addressing climate-related worry in public health strategies and suggest avenues for future research on the psychological consequences of climate change in high-risk regions.
Keywords: *Climate change, Global South, Psychological Well-Being, Uttarakhand, Climate change worry, Uttarakhand*

1. INTRODUCTION

1.1 Background

Climate change and mental health are two of the most significant challenges we face, yet there is little discussion on how these two interact and the common factors that contribute to both crises. According to reports from the World Health Organization (WHO, 2022) and the Intergovernmental Panel on Climate Change (IPCC, 2022), rising global temperatures are expected to have severe and catastrophic effects on humans. Studies show links between extreme heat and increased morbidity and mortality, serious cardiovascular issues, aggression, and rising suicide rates (Pailler et al., 2018), and the IPCC further predicts a global temperature increase of more than 1.5° C. Moving towards the mental health effects, although the detrimental impact of climate change on physical health has been acknowledged for a considerable period. Meta-analytic evidence demonstrates that such distress is linked to diminished subjective well-being, sleep disturbances, and subclinical depression (Whitmarsh et al., 2022). These associations, however, are not uniform, as trait anxiety amplifies the translation of environmental concerns into somatic symptoms (Obradovich et al., 2022). This moderated pathway remains insufficiently examined in the Global South, where the mental health implications are only beginning to be systematically investigated.

Climate change worsens psychological well-being by increasing anxiety, depression, cognitive difficulties, and a sense of loss of control. Taking the case of India, this negative impact affects the social and economic landscape as psychological distress and depression are linked to low labor force participation and may cause a substantial burden on households that rely on labor work and agriculture for sustenance (Lund et al., 2011). The economic concerns due to poor mental well-being, therefore, are a serious issue in India (Patel, Araya, DeLima, Ludermir & Todd, 1999; Ravi & Engler, 2015). Combined with its vulnerability to climate change, it is important to understand how people respond to this ongoing climate crisis.

The traits and conditions of a society, system, or asset that render it vulnerable to the negative consequences of a hazard are referred to as vulnerability. Inadequate infrastructure design, inadequate asset protection, low public awareness, limited official recognition of risks, and a lack of effective preparedness or environmental management measures are just a few of the physical, social, economic, and environmental factors that contribute to it. Vulnerability is dynamic, changing over time and among communities. In Uttarakhand, it can be seen that there are various problems, including frequent natural

calamities, weak ecosystems, unregulated urbanization, and reliance on natural resources, which make the area more vulnerable. These circumstances not only subject the region to physical risks but also increase the likelihood of mental health effects, including trauma, stress, and eco-anxiety, resulting from climate change and its cascading consequences.

There has also been a visible surge in policy briefs and reviews on mental health concerning climate change over the last few years, which reflects an increasing awareness of this significant problem (Liu et al., 2020; WHO, 2022; Charlson et al., 2021; Lawrence et al., 2021), and the relationship between climate change and mental health remains multifaceted and works through multiple pathways. Another way that climate change affects society is by raising the rate of natural disasters. Natural disasters significantly contribute to mental health and can have immediate as well as long-term psychological consequences. After a disaster, numerous individuals experience acute reactions to stress, including anxiety and PTSD (Heanoy and Brown, 2024; Molua, 2024). The disturbance in customary livelihoods, social coherence, and cultural displacement leads to increased fear, hopelessness, and existential insecurity among the affected groups. Uttarakhand can be considered a very sensitive state regarding the severe effects of climate change. The state of Uttarakhand experiences a series of environmental threats, including flash flooding, landslides, and glacial lake outbursts (GLOF), fuelled by unpredictable weather patterns and accelerating glacial retreat as a result of temperature rise.

1.2 Overview of the present study

Despite rising concerns regarding climate change and eco-anxiety across the Global South (Zhang & Sriram, 2025), there is no discussion of how climate change impacts psychological well-being. Literature shows that although climate change plays the role of a risk modifier, intensifying environmental and socioeconomic pressures, data supports that intense weather phenomena and natural disasters, including hurricanes and floods, can contribute negatively to mental health as well as negative community health outcomes, such as increased localized incidence of PTSD, depression, and anxiety, alcohol abuse, domestic violence, and suicide (Bourque and Cunsolo Willox, 2014; Palinkas and Wong, 2020; Cianconi et al., 2020; Doherty and Clayton, 2011; Morgansteiin and Ursano, 2020).

Further, certain communities may be particularly at risk if their livelihoods or basic physical needs are threatened (Hayes & Poland, 2018; Morrissey & Reser, 2007; Usher et al., 2019). In the case of Uttarakhand, the region's livelihood is closely linked to climate-sensitive practices, as 71% of its people depend on rainfed agriculture through terrace farming on hill slopes (Das, 2021). Climate change influences some crops' cropping seasons and cultivation zones, making some fields fallow. This exacerbates existing pressures on farming, including a decrease in land per person, a lack of irrigation infrastructure, and crop damage by animals. Also, young people have a declining interest in farming because of irregular rainfall patterns, diminishing agricultural yields, and resource shortages that threaten food security and economic stability, and force many people to move from the hills to the plains. (Das, 2021; Blocher et al., 2021).

Due to this migration, a startling number of villages are now vacant; according to a 2018 survey, 734 communities have been abandoned since 2011. This loss of home and harm to personal space, which forces displacement, has profound psychological impacts and manifests in various mental health problems such as emotional distress, anxiety, depression, and post-traumatic stress disorder (PTSD) (Doherty & Lykins, 2024; Kanwal et al., 2024). When we consider the majority of the population in Uttarakhand, the majority depend on agricultural practices, making them highly vulnerable to the severe negative effects of climate change. Coupled with inadequate access to mental health services, the psychological impacts can be extremely severe (Oliveria et al., 2024). It can be observed that the interlinked impacts of climate change and mental health are entwined very strongly within the socio-economic and ecological structure of the region. When referring to the catastrophic natural disasters the state has experienced, one can clearly see that the emotional reaction towards such a magnitude of destruction brings about grief and fear (Kumar et al., 2013). Thus, recurring natural disasters, alterations in agricultural activities, and forced displacement point to the widespread influence of climate change on both the environment and human well-being.

We hypothesize that (a) residents of climate-exposed Uttarakhand report elevated climate-change worry, and (b) such worry predicts poorer psychological general well-being. Through the analysis of these hypotheses, this study aims to deepen our understanding of the psychological impact of climate change and provide essential information for developing comprehensive strategies that promote people's mental well-being and environmental resilience. Knowing the shared causes of the double threat of climate

change and mental health, and creating common solutions that promote the well-being of people as well as the planet, will enable policymakers, leaders in the health sector, and mental health professionals to design systems and communities that are resilient to the persistent stresses of climate change.

2. METHODOLOGY

2.1 Aim

To examine the impact of climate change worry on the psychological general well-being among the people of Uttarakhand, India

2.2 Objectives

1. To identify the level of climate change worry among the people of Uttarakhand, India.
2. To understand how climate change worry impacts the psychological general well-being of people in Uttarakhand, India.

2.3 Hypothesis

H1: There will be a significant level of climate change worry among the people of Uttarakhand, India.
H2: Climate change worry will have a significantly negative impact on the psychological general well-being of the people in Uttarakhand, India.

2.4 Sampling technique

Purposive Sampling Method
Sample size: n=430

2.5 Method of data collection

Survey method through a questionnaire.

2.6 Statistics

Descriptive Statistics: Mean, standard deviation (SD),
Inferential Statistics: Pearson's Correlation, Simple Linear Regression

2.7 Inclusion criteria

1. Adults aged 30 years and above
2. Individuals who are permanent residents of Uttarakhand
3. Individuals who can read and comprehend either Hindi or English.

2.8 Exclusion Criteria

1. Individuals who are not residents of Uttarakhand
2. Individuals who were below the age of 30 years

2.9 Tools

Climate Change Worry Scale is a self-report measure for assessing the level of ruminating thoughts that people experience about climate change. The scale consists of ten items (e.g., "I worry about climate change more than other people"; "I worry that I might not be able to cope with climate change"), with a five-point Likert scale from 1 ("never") to 5 ("always"), and a possible range from 10 to 50 (Stewart, 2021). There are no reverse-scored items. A higher score, calculated by summing all the items, indicates a higher level of worry experienced due to climate change. The scale was developed to assess proximal worry about climate change rather than social or global impacts. The items in the test were found to be internally consistent, constituted a single factor, and were appropriate for both men and women. Also, there is support for the convergent and divergent validity of the CCWS through its pattern of correlations with several established clinical and weather-related measures.

The Psychological General Well-Being Index is a measure of the level of subjective psychological well-being. In detail, it assesses self-representations of intrapersonal affective or emotional states reflecting a sense of subjective well-being or distress and thus captures what we could call a subjective perception of well-being. Consisting of 22 standardized items (6 items for the short form), the tool produces a single measure of psychological well-being. The full measure also provides subscales to assess the following domains: anxiety, depression, positive well-being, self-control, general health, and vitality. For this study, the subscales for Anxiety and General Health were used separately along with the complete scale.

3 RESULTS

TABLE 1. *Climate change worry among the people of Uttarakhand*

		Mean	Std. Deviation	Skewness	Kurtosis	Std. Error
Climate-change worry	*n=430*	33.6442	6.30694	-0.223	-0.915	-0.304

TABLE 2. *Relationship between Climate Change Worry and Psychological General Well-Being*

		Climate change worry	Psychological general well-being
Climate-change worry	Pearson Correlation	1	-.354**
	Sig. (2-tailed)		.000
Psychological general well-being	Pearson Correlation	-.354**	1
	Sig. (2-tailed)	.000	

TABLE 3. *Predictive Influence of Climate Change Worry on Psychological General Well-Being*

Predictor	B	SE B	β	t	p
Constant	65.184	1.869	—	34.877	<.001
CCWT	–0.427	0.055	–0.354	–7.824	<.001

A total of 430 participants (287 men, 143 women) completed the survey. The Climate Change Worry (CCW) scores in the sample of 430 participants ranged from a minimum of 17 to a maximum of 45. The mean score for CCW was 33.64, with a standard deviation of 6.31, indicating a moderate level of concern regarding climate change across the sample. The distribution suggests that most participants experienced a moderate degree of worry, with some variation in the intensity of concern.

Pearson's correlation analysis revealed a significant negative relationship between climate change worry and psychological general well-being, $r(428) = -0.354$, $p < .001$, suggesting that higher levels of climate change worry were associated with lower levels of general well-being. This indicates that psychological well-being tends to decrease as climate change worry increases, and vice versa. In other words, individuals who report higher levels of worry about climate change tend to experience lower levels of psychological well-being.

To examine the predictive influence of climate change worry on general well-being, a simple linear regression was conducted. The regression model was significant, $F(1, 428) = 61.21$, $p < .001$, explaining 12.5% of the variance in PGWB ($R^2 = 0.125$, Adjusted $R^2 = 0.123$). Examination of the regression coefficients showed that CCWT was a significant negative predictor of PGWB, with an unstandardized coefficient $B = -0.427$ (SE = 0.055) and a standardized coefficient $\beta = -0.354$, $t = -7.824$, $p < .001$. These findings suggest that for every one-unit increase in climate change worry, there is an associated decrease of approximately 0.43 units in psychological well-being, highlighting the meaningful and detrimental effect of elevated climate change concern on individuals' mental health. Overall, the results provide evidence that higher levels of climate change worry are consistently linked to lower general well-being among adults in Uttarakhand, underscoring the psychological burden of environmental concerns in this context.

4. DISCUSSION

Regarding the issue of climate change, it is undeniable that natural occurrences have caused the current Himalayan tragedy; however, the speed of these changes is enhanced by human activities. Talking about the different man-made drivers, there is a wealth of scientific data showing that the Himalayan watersheds have seen long-term, unparalleled deforestation (Kumar & Chopra, 2009). Environmental deterioration

is occurring as a result of power projects, and it is most likely that no ecological or environmental audit is being conducted.

Additionally, a variety of land-use activities, including agriculture, urbanization, and human settlements, have caused forests to be diverted (NSE, 2006). Large-scale infrastructural development has occurred and is still being completed, including the construction of roads and hydropower. According to scientific research, the Indian Himalayas' overall forest cover will drop from 84.9 percent (of its 1970 value) in 2000 to no more than 52.8 percent in 2100 if current rates of deforestation continue, making Uttarakhand the most disaster-prone state in India because of rising deforestation, excessive tourism, and over-exploitation of natural resources (Kumar, 2013). The premise that Uttarakhand is experiencing a climate crisis is supported by the considerable correlation between higher degrees of climate change worry and worse psychological well-being,

With no participants falling into the low category, the descriptive statistics showed that the sample had a moderate level of concern about climate change. This suggests that the populace is widely concerned about climate change, which is probably affected by Uttarakhand's environmental vulnerabilities, which include regular natural disasters like landslides and flash floods. These results concur with global trends that indicate a rise in climate change-related psychological distress, particularly among regions that are significantly affected by it (Clayton and Karazia, 2020). Such findings prove the necessity of community-based resilience-building interventions and mental health interventions geared towards treating climate change anxiety in vulnerable populations. Climate change concern and psychological well-being were moderately negatively correlated. PGBT deteriorates as CCW increases, showing that individuals who are highly concerned about climate change tend to experience poor mental health outcomes. This study lends support to the growing body of research signalling the psychological impacts of eco-anxiety, including existential fear, terror, and hopelessness (Whitmarsh et al., 2022).

Although CCW is a significant predictor of psychological well-being, other elements, including coping strategies, social support, and individual resilience, may also be essential, according to the statistical significance and moderate strength of the correlation (-0.497). These results highlight the significance of tackling the psychological effects as well as the underlying reasons for climate change anxiety through all-encompassing treatments that involve community education, mental health support, and policy-level climate action.

Future studies should concentrate on other psychological aspects, such as eco-anxiety and mood disorders that may affect their resilience and day-to-day functioning, which are linked to excessive concern about climate change. Cultural practices also play a determining role in the impact of climate change, as Uttarakhand is a place of spiritual and cultural practices. Therefore, future studies should also investigate culturally aware approaches that build social support networks, and community leaders should concentrate on developing initiatives that support sustainable resource management, economic stability, and the reduction of the psychological effects of climate change. To guide more successful, evidence-based initiatives, longitudinal research could shed more light on how concerns about climate change alter shifts and their long-term consequences on psychological well-being across genders.

7. Declarations

7.1 Ethical considerations

7.1.1 Approval statement: The study was approved by the Departmental Ethics Committee, Department of Applied Psychology, Manav Rachna International Institute of Research and Studies (MRIIRS), in accordance with the institutional guidelines and regulations for research involving human participants. Written informed consent was obtained from all participants before data collection, and their anonymity and confidentiality were ensured throughout the study.

7.1.2 Consent to participate: All participants provided informed, written consent before participation. They were given a clear explanation of the study's purpose, procedures, interview topics, and expected duration, and were informed that participation was voluntary. Participants were told they could decline to answer any question and could withdraw at any time without penalty; those who withdrew had the option to have their data removed. Permission was obtained to audio-record interviews; participants were informed that recordings and transcripts would be anonymised, that quotes used in the manuscript would be pseudonymised, and that identifying information would be removed to protect confidentiality.

7.1.3 Anonymous Data Usage: All data used in this study were anonymized to ensure participant confidentiality. Personal identifiers such as names, exact locations, and other potentially identifying

details were removed or replaced with pseudonyms during transcription. Quotations included in the manuscript are presented in a way that preserves participants' voices while protecting their identity. Data are stored securely on password-protected devices and are accessible only to the research team. The anonymized data are used solely for academic and research purposes and will not be shared publicly in a manner that could reveal participant identities.

7.2 Conflict of interest: All authors declare no conflicts of interest.

Informed Consent Statement: All participants involved in this study, titled "The Psychological Impact of Climate Change Worry: Evidence from Uttarakhand, India," provided informed consent before their participation. The purpose of the study, procedures, and participants' rights were clearly explained in the questionnaire, and participants voluntarily agreed to take part by responding to the consent question. Participation was entirely voluntary, and participants had the right to withdraw at any time without any consequences. All responses were collected anonymously and kept strictly confidential to ensure the privacy and security of the data.

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