

Exploring Perspectives of Climate Change Impacts on Mental Health of University Students in Twin Cities of Pakistan



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FINAL APPROVAL

It is duly certified that we, the esteemed evaluators, have thoroughly reviewed the thesis submitted by Ms. Sumaira Ishaq. We declare and affirm that this thesis meets the sufficient standard for its approval by the International Islamic University, Islamabad for the MS Degree in Environmental Science.

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requirement for the award of the degree of MS Environmental Science.

DEDICATION

In the Name of Allah, The Most Beneficent and The Most Merciful. I express my gratitude to Allah Almighty for His abundant blessings and kindness enabling me to successfully and enthusiastically complete my MS research work. This research is a heartfelt dedication to my beloved Parents, and my esteemed Supervisor, Dr. Sarah Amir. Their unwavering support, affection, and cordial prayers have been a constant source of inspiration and encouragement throughout my journey.

DECLARATION

I, Ms. Sumaira Ishaq enrolled as an MS Environmental Science student (Registration #970-FBAS/MSES/F23), solemnly affirm that the work presented in the thesis titled “Exploring Perspective of Climate Change Impacts on Mental Health of University Students in Twin Cities of Pakistan” is the result of my independent endeavor, except where otherwise acknowledged and that the thesis is my own composition. No part of the thesis has been previously presented for any other degree.

Date -----

Sumaira Ishaq

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LIST OF ABBREVIATIONS

Acronym	Abbreviations
APA	American Psychological Association
AR6	Sixth Assessment Report (from the IPCC)
CCWS	Climate Change Worry Scale
COP	Conference of Parties
FJWU	Fatima Jinnah Women University
GBD	Global Burden of Disease
IIUI	International Islamic University Islamabad
IPCC	Intergovernmental Panel on Climate Change
LMICs	Low- and Middle-Income Countries
MAP	Multisectoral Actions Pathways
MHPSS	Mental Health and Psychosocial Support
NCDC	National Center for Disease Control
NIMH	National Institute of Mental Health (Bangladesh)
PTSD	Post-Traumatic Stress Disorder
QAU	Quaid-i-Azam University
RWU	Rawalpindi Women University
SDG	Sustainable Development Goal
SFDRR	Sendai Framework for Disaster Risk Reduction
WHO	World Health Organization

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ABSTRACT

Climate change has emerged not only as an environmental crisis but also as a growing threat to psychological well-being, with its impacts disproportionately affecting populations in the Global South. Despite Pakistan's high vulnerability to climate-related disasters, the mental health dimensions of climate change, particularly among young adults remain critically understudied. This study addresses this gap by examining university students' perspectives on the mental health impacts of climate change in Pakistan's twin cities of Rawalpindi and Islamabad. The primary aim was to analyze the relationship between climate change and mental health, with specific objectives to assess levels of climate awareness, quantify psychological responses, and identify coping mechanisms and barriers to mental health support. A cross-sectional survey was conducted with 400 students from four universities, using the validated Climate Change Worry Scale (CCWS) alongside self-reported measures of mental health impacts. Data were analyzed using descriptive statistics, comparative analyses (t-tests and ANOVA), and correlation analyses to generate robust empirical insights. The findings indicate a high level of climate change awareness (76.3%), which was strongly associated with elevated psychological distress. A majority of participants (72.1%) believed that climate change directly affects mental health, while 82.5% reported noticeable impacts on their daily mood and academic productivity. CCWS results revealed moderate to high levels of climate-related anxiety, characterized by feelings of helplessness, fear for family and future generations, and a strong perception that their generation will be most affected. Notably, the study identified a significant disconnect between cognitive awareness and emotional experience, as belief in the mental health impacts of climate change showed only a very weak correlation with actual climate-related worry scores. Systemic barriers were also evident, with nearly half of respondents (47.8%) reporting limited access to mental health services as a major obstacle. In response to this unmet need, students expressed a preference for proactive, empowerment-oriented interventions, favoring climate education workshops (56.0%) over formal university counseling services (45.8%). This study provides critical empirical evidence from the Pakistani context, positioning climate change as a significant psychosocial stressor for educated youth. It contributes directly to Sustainable Development Goal 3 (Good Health and Well-being) and Sustainable Development Goal 13 (Climate Action) by offering an evidence-based foundation for institutional and policy-level interventions. While the cross-sectional design and gender imbalance in the sample limit causal inference and generalizability, the findings highlight an urgent need for universities to move beyond the dissemination of

climate knowledge toward the development of integrated, climate-resilient mental health support frameworks that safeguard student well-being and future agency.

CHAPTER 01

INTRODUCTION

CHAPTER 01

1. Introduction

1.1 Background

Climate change refers to the gradual and simultaneous changes in weather patterns and temperatures across Earth's regions, influenced by solar cycle fluctuations, El Nino, La Nina and volcanic activity. Human activities have primarily caused these changes since the early 20th century, with global surface temperature being a key factor in understanding climate change (Shrivastava, 2023). There is absolutely no doubt that climate change poses a significant existential threat to humans and other forms of life (Mohammed et al., 2021). Climate change is unequivocally linked

to severe health consequences, including those stemming from rising temperatures, frequent extreme weather, and air pollution, which cause a range of issues from respiratory illnesses to infectious diseases (Watts et al., 2021). The tangible reality of this climate shift is tragically illustrated by past events like Super Typhoon Haiyan. According to the United Nations, this record-breaking storm, one of the most powerful ever recorded, "affected 11.8 million people in total, displacing about 920,000" in the Philippines, with officials reporting thousands injured and many more missing (North, 2014). The psychological trauma inflicted by such catastrophic events—where communities are destroyed, lives are lost, and survivors are displaced—demonstrates how urgently mental health must be prioritized in climate catastrophe responses. This urgent need is now being recognized in global climate policy. Nonetheless, in comparison to other health fields, the mental health effects of climate change have garnered less research focus (Charlson et al., 2021). The recent Conference of the Parties (COP 29) emphasized the importance of a comprehensive mental health approach, advocating for support systems for extreme weather event survivors, grant-based financing, and the integration of mental health into the Multisaster Actions Pathways (MAP) Declaration for Resilient Cities (Alessandro et al., 2025).

The World Health Organization (WHO) defines mental health as a state of well-being where individuals can realize their potential, cope with life's stresses, work productively, and contribute to their community. The escalating mental health burden caused by climate change is met by support systems that are often constrained by limited resources and a lack of qualified professionals. Governments generally spend only 2.1% of their health budgets on mental health care and less than 1% of international health aid goes toward mental health (WHO, 2022). Over

792 million people worldwide, or 10.7% of the total population, are estimated to suffer from mental health illnesses. According to the 2017 Global Burden of Disease (GBD) research, mental health conditions constitute a significant global health burden, making up almost 5% of all diseases worldwide (Liu et al., 2021). As the repercussions of environmental changes become more severe and noticeable every day, the terms used to describe them have also intensified. The more urgent and inclusive term "climate crisis" has increasingly supplanted "climate change" to accurately convey the scope and severity of the situation. This terminological shift has been adopted by leading international bodies, including the World Health Organization (WHO) in its reports and during the Conference of the Parties (COP26), reflecting the growing alarm within the global scientific and policy-making community (Dilaver et al., 2025).

The Intergovernmental Panel on Climate Change (IPCC) has confirmed a rise in diseases, early mortality, malnutrition and mental health risks due to climate change. The report also highlights the global health systems' inadequate preparedness to address these issues, particularly in promoting mental health (Jarraud & Steiner, 2012). The Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6) describes the severe effects of climate extremes on mental health and suggests adaptation measures like universal mental health care, incorporating mental health support both before and after events, tracking the effects, building local mental health infrastructure, offering culturally relevant resources, and educating first responders. Therefore, educational institutions should implement these strategies by integrating climate education with mental health support, thereby building resilience among students, a demographic critically impacted by the climate crisis (Harper et al., 2022).

1.2 Expanding Scope of Climate Impacts

The tenth anniversary of the Sendai Framework for Disaster Risk Reduction 2015–2030 (SFDRR) comes amid a rapidly changing climate that is delivering powerful tropical cyclones, the warmest days and nights on record, and major precipitation events with related flash floods (Mudhar et al., 2022). This weather's effects ripple through human systems and ecosystems, affecting people's health and well-being all over the planet. For instance, at least 1.5 million people were impacted by the January 2024 flash floods and intense rains in southern Brazil, which claimed over 95 lives. Another instance occurred in June 2024, when an estimated 1000 Muslim pilgrims perished in Saudi Arabia from heat exhaustion and heatstroke

while making the journey to Mecca (Silva et al., 2025). The Sendai Framework (2015) emphasizes the growing impact of climate-related disasters and advocates for integrating mental health support into disaster risk reduction, though it remains a lower priority (Gray et al., 2020). In response, the World Health Organization (WHO) initiated a three-year project to develop and test curricula and practical guidelines for providing psychological support in selected countries. This effort, commissioned through the Inter-Agency Standing Committee Reference Group on Mental Health and Psychosocial Support (MHPSS) in Emergency Settings, which the WHO co-chairs, aims to create a replicable global model for pre-disaster psychosocial planning.

According to the Intergovernmental Panel on Climate Change (IPCC), the populations expected to be most severely impacted by climate-related events are those with high vulnerability resulting from intersecting socio-economic and demographic factors. This includes communities that depend heavily on threatened natural ecosystems for livelihoods, those residing in highly exposed areas such as coastal and circumpolar regions, and individuals with pre-existing health conditions or reduced mobility (IPCC, 2022).

The health consequences of climate change for these groups are extensive, ranging from direct physical exposure to extreme temperatures and weather disasters to indirect effects like food insecurity, new infectious diseases, and the breakdown of essential health services and ecosystems. These physical health impacts are compounded by climate change's negative influence on socioeconomic determinants of health, including livelihoods, equality, access to medical care, and social support networks (Locatelli et al., 2017). Experiencing extreme weather events can trigger various mental health conditions, including acute stress responses, adjustment disorders, and post-traumatic stress disorder (PTSD) (Weilnhammer et al., 2021).

These psychological impacts can be long-lasting, as exposure to extreme and prolonged climate-related events may result in delayed disorders such as PTSD, anxiety, and depression, with potential intergenerational transmission of these conditions (Ndetei et al., 2024).

1.3 Pathways of Psychological Impacts

The anticipation of climate disasters also affects mental well-being. Future flood worries can negatively impact mental health, with individuals who have previously experienced floods showing heightened distress during periods of excessive rainfall or unfavorable weather predictions (Rifkin et al., 2018). Researchers are increasingly recognizing

how the knowledge, awareness, and anticipation of climate change's repercussions affect psychological states. Climate change can impact individuals beyond those immediately affected by disasters, as the mental understanding of climate change may be just as crucial to psychological health as observing tangible environmental changes (Gibson et al., 2020). Educational institutions play a vital role in this context, as schools and universities influence how climate change is framed and can impart accurate information to promote positive action and empowerment, thereby improving well-being. When educational institutions fail to adequately address climate change, young people may experience negative emotions like helplessness, sadness, and impotence due to insufficient knowledge about coping with its effects (Stavins et al., 2025).

1.4 Climate Anxiety and Youth Burden

Climate change affects mental health through numerous socioeconomic pathways, with existing inequalities in income and other resources exacerbating these effects. The disruption of livelihoods and employment significantly impacts psychological well-being, while disruptions to education—a major socioeconomic predictor of mental health—disproportionately affect children and young people (Kirkbride et al., 2024). Heat exposure further compounds these challenges by negatively affecting cognitive function, academic achievement, and acute mental health events (Prentice et al., 2024). Indigenous communities are recognized as being disproportionately vulnerable to the impacts of climate change due to deep-seated socio-economic inequities and their profound reliance on the environment for livelihoods, cultural practices, and health (IPCC, 2022). For Indigenous peoples globally, land and water are not merely resources but foundational to identity and holistic well-being; their degradation through climate change directly harms mental health by severing cultural connections and disrupting a fundamental determinant of wellness (Middleton et al., 2020). This specific pathway, where environmental loss translates directly into psychological and cultural distress, exemplifies how climate change uniquely influences how individuals and communities think, behave, and feel (Hayes et al., 2019).

Community-driven climate change knowledge, which focuses on sharing localized information, enhances awareness of climate-related risks, and supports developing strategies to mitigate harmful effects (Lawrance et al., 2022). Conversely, a lack of awareness about climate change's causes and effects might lead to medical illnesses or anxiety in specific indigenous cultures (Zareen & Akhtar, 2023). While more research is required, climate change

undeniably harms mental health. High temperatures strongly correlate with negative outcomes like rising violent crimes, suicides, sleep disturbances, lower productivity, and financial strain, all worsening mental health conditions. Climate anxiety represents a negative psychological state expressed through emotional (e.g., irritability, fear), cognitive (e.g., difficulty concentrating), physiological (e.g., nausea, sweating), and behavioral (e.g., sleep disturbance) indicators. Concerns about climate change are widespread, with half of respondents to the 2023 Stress in America Survey reporting significant stress due to global warming and climate change. Crucially, these emotional responses are linked to actions addressing climate change, as climate fear and concern correlate with various climate action initiatives, including policy support and individual mitigation practices (Ortner et al., 2025).

Several factors complicate attributing mental health outcomes to climate change. First, common distress reactions to unusual events may be pathologized while the mental health impacts of a changing climate are underdiagnosed. Second, climate change associates with numerous possible mental health outcomes. Third, significant variation in the timing of climate change effects on mental health makes establishing causal relationships challenging. Fourth, attribution to climate change and mental health remains poorly understood (Hayes et al., 2018). Individuals often struggle to identify climatic changes because these changes appear remote or abstract, especially when climate is misunderstood or conflated with weather or seasonal variations. This perception gap is a modern manifestation of the Giddens Paradox, which highlights the fundamental challenge that despite overwhelming scientific evidence, the diffuse and long-term nature of climate risks makes them psychologically distant, leading to public and political inaction until catastrophic impacts become unavoidable (Galway et al., 2022).

Climate Change Worry (CCW) describes reflective thoughts about climate change and its effects without clearly expressed emotional, physiological, or behavioral indicators typically associated with climate anxiety (Rizeq & Ojala, 2024). While climate anxiety may be considered an outcome of climate change worry, CCW serves as a precursor to coping strategies (Ojala et al., 2023). However, recent research has begun to clarify these mechanisms, indicating that adaptive emotion regulation strategies, such as meaning-focused coping, can mitigate the negative mental health impacts of climate anxiety while still fostering pro-environmental engagement (Ojala, 2022).

Despite not being a purely cognitive construct, personal worry experiences have been used to quantify climate-related worry since they are influenced by risk perceptions and generalized concern. This concern may involve several dimensions, as people might have

distinct worries about climate change's effects on their immediate social circle and themselves (micro-worries) compared to their concerns about peers and the wider world (macro-worries)(Gago & Sá, 2021). Research on how different climate-related cognitive-emotional responses interact and affect mental health and pro-environmental behavior shows varying results. Among middle school pupils in the United States, no association was found between environment-friendly behavior and climate change worry and optimism. However, a Swedish study found that concern and hope about global environmental issues interacted to predict recycling behavior among young adults, with hope positively correlating with recycling only among those who were highly concerned (Rizeq & Ojala, 2024). Young people are often exposed to climate change consequences through media, advocacy campaigns, and education rather than direct confrontation with catastrophic events (Boulianne & Ohme, 2022). Recent studies highlight the importance of examining gender differences in climate-related mental health impacts, noting that women may be more vulnerable due to increased caregiving responsibilities and frequently disproportionate exposure to environmental risks (Chen et al., 2024).

As some of the most vocal supporters of climate action, young people, particularly university students, also experience increased stress and mental health risks from climate concerns (Clemens et al., 2022; Gago & Sá, 2021). This generation navigates personal life transitions while carrying the additional burden of climate anxiety after growing up with regular environmental warnings. The psychological effects of climate change thus represent both a global crisis and a highly personal challenge, especially for college students balancing academic demands with growing mental health risks. Regional studies reveal rising anxiety and depression in Europe and the Americas, while unpredictable weather patterns in Asia, Africa, and Oceania worsen mental health issues like stress, depression, and suicide (Nie et al., 2024). These trends highlight the urgent need for global action addressing climate change's impact on mental health. Although further research is needed, evidence clearly indicates that climate change can detrimentally affect mental health, particularly among vulnerable populations like university students who increasingly face profound consequences of this global crisis (Lawrance et al., 2022).

There is strong empirical evidence that a significant proportion of mental health disorders in adulthood have their initial onset during childhood and adolescence. Adolescents residing in challenging environments face higher susceptibility to mental health conditions,

influenced significantly by adverse early life experiences and underlying genetic factors (Kirkbride et al., 2024).

Adolescence represents not only the most vulnerable period for mental health issues but also a critical window for establishing stable adulthood with long-term effects. According to World Health Organization estimates, anxiety disorders—among the most prevalent mental health symptoms—affect approximately one in two adolescents aged 15-19 and two in five children aged 10-14. Today's young people demonstrate intense awareness of climate change ramifications for their futures, unlike previous generations whose understanding was limited and disconnected from daily life. In contemporary Australia, over half the population identifies environmental concerns as highly important, with 25% specifically citing climate change as a major worry (Gao et al., 2025). Young people bear disproportionate psychological impacts from climate change. A global survey of 10,000 young people aged 16-25 found that most reported climate change affecting their daily functioning, with three-quarters expressing fear for the future (Wall & Eapen, 2025).

University students increasingly experience mental health problems from climate change's profound effects, with clear evidence of rising numbers seeking mental health support, including some who have attempted suicide (Obande et al., 2023). Despite this growing need, climate change education remains inadequate in many professional programs. While one-third of medical schools aimed to include climate change in curricula after up to 40% of US medical students graduating between 2009-2013 reported insufficient instruction on the topic, most institutions had not done so by 2020. Similarly, a recent global survey of students from 2,817 medical schools in 112 nations revealed only 15% had incorporated climate change into their curricula (Goshua et al., 2021). University students constitute significant stakeholders in climate change concerns and will form a substantial part of future workforces. Psychology offers valuable insights for effectively promoting climate messaging to young people (Lombardi, 2022). However, the effect of climate change on Palestinian youth and college students' mental health remains unstudied, despite Palestine's unique climate featuring hot summers and subfreezing winters, with July and August temperatures regularly exceeding 30 degrees Celsius (86 degrees Fahrenheit) (Said, 2019).

Indirect effects of climate change on mental health include disruptions to healthcare and education, job and financial losses, slowed economic growth, migration needs, and increased social hostility. Cross-cultural studies revealed varying responses, with Chinese and Indian populations showing significantly higher worry levels than their Japanese and American

counterparts (Tam et al., 2023). This gap in context-specific research is critically important, as the existing evidence base remains disproportionately focused on developed nations, limiting its applicability to the most vulnerable populations in low- and middle-income countries who are enduring the most severe impacts of the climate crisis (IPCC, 2022).

1.5 Bridging the Knowledge Gap

Media representations often stigmatize young people's climate involvement, portraying them as demanding activists, adultified children, innocent victims, or ultimate saviors (Benoit & Thomas, 2022). Studies confirm that climate change's existential threat harms mental health, particularly among youth, leading to climate anxiety—emotional distress stemming from climate concerns (Wullenkord et al., 2021, Wullenkord et al., 2024). Despite climate awareness, students' behavior often contradicts their knowledge, with many taking limited environmental action despite basic understanding of the issue (Hamid et al., 2021). Some may take modest steps opposing practices like open burning, which releases greenhouse gases including carbon dioxide, methane, and particulate matter (Centre, 2022).

Academic physicians commonly face resource limitations when addressing these challenges. Recommended strategies include seeking grant funding and charitable support, engaging departmental and institutional leadership, and offering educational opportunities for academic credit. Since academic health centers typically allocate resources to areas requiring regulatory compliance, understanding pertinent regulations and professional guidelines—like the American Psychiatric Association Position Statement on Mental Health and Climate Change—helps psychiatrists secure resources for curriculum development (Seritan, 2022).

Given mounting evidence of climate change's adverse mental health effects, research focusing on the psychological experiences of students beyond border regions is urgently needed. This study investigates how climate change affects mental health among students from Twin cities (Islamabad and Rawalpindi) universities in Pakistan, using surveys to assess perceptions and identify climate-related psychological challenges. By addressing climate change's effects on youth mental health and increasing knowledge of associated concerns, this research aligns with SDG 3 (Target 3.4: promoting mental health and reducing premature mortality) and SDG 13 (Climate Action). The findings aim to inform policymakers and educators developing focused strategies addressing climate-related mental health issues among youth. Building on existing evidence, this study emphasizes context-specific, culturally sensitive mental health interventions adapted to twin cities university students' unique

experiences. Given this population's diverse backgrounds and vulnerabilities, the research offers practical insights for improving coping strategies and resilience. By encouraging cooperation between educational institutions, mental health professionals, and policymakers, this work supports a comprehensive approach to climate-related mental health issues, ultimately establishing supportive environments for young people facing climate change's psychological impacts.

1.6 Problem Statement

Climate change was no longer just an environmental issue; it had profound implications for human well-being, including mental health, where over 1 billion people were already living with mental health conditions. Rising global temperatures, erratic weather patterns, and natural disasters created stressors that significantly impacted mental health. University students, being young and impressionable, were especially vulnerable to these effects as they navigated academic, social, and personal challenges. However, the mental health effects of climate change were found to vary across regions due to differences in socio-economic conditions, exposure levels, and coping mechanisms. The immediate impacts of climate change primarily arose following severe weather incidents and encompassed post-traumatic stress disorder, anxiety, substance use disorder, depression, and even thoughts of suicide. Globally, the World Health Organization (2022) warned that climate change posed a severe mental health risk, estimating that between 2010 and 2030, it would cause an additional 250,000 deaths annually from health-related impacts, with a significant portion attributable to mental health sequelae. In Pakistan, while there was research on the effects of climate change on mental health in communities and some studies on eco-anxiety and youth behavior, a noticeable gap remained in understanding these impacts at the university level. This study sought to address this gap by evaluating the effects of climate change on mental health variables, such as stress, depression, anxiety, and suicidal guilt among university students. This study compared the mental health of students in Islamabad and Rawalpindi universities to guide targeted interventions for the emerging climate-related mental health crisis..

1.7 Aim and Objectives

The primary aim of this research was to analyze the consequences of climate change for the mental health of students in Pakistan's twin cities. The work specifically probed the complex interplay of ecological variables (e.g., heat stress, temperature extremes) and

socioeconomic conditions with prevalent psychological conditions, including worry, stress, anxiety, and depression. The study was structured around the following key objectives to address this aim;

1. To analyze the level of awareness regarding Climate change and its impacts on mental health of university students in twin cities.
2. To interpret the linkages between climate change and psychological well being of university students in the study area.
3. To assess the challenges faced by university students and weigh the options for actions in response to climate change.

1.8 Significance of the Study

The significance of this study lay in its potential to fill a critical gap in understanding the impact of climate change on the mental health of university students. As climate change continued to affect weather patterns and environmental conditions, it was crucial to understand how these changes influenced the psychological well-being of young people, especially those in academic settings. By examining the relationship between climate-related factors, such as heat stress, temperature extremes, and mental health outcomes like anxiety, stress and depression, this study provided valuable insights into the mental health challenges posed by climate change. The findings helped raise awareness about the psychological effects of climate change, offering a foundation for developing targeted interventions and support systems for students. Additionally, by comparing the mental health outcomes in different regions, the study provided region-specific insights, guiding policymakers, educators and mental health professionals in creating strategies to build resilience and improve mental well-being in response to climate-induced stressors. Ultimately, this research contributed to a more comprehensive approach to addressing both mental health and environmental sustainability, fostering better mental health outcomes in the face of climate challenges. This research is important because it aligned with SDG 13 (Climate Action) and SDG 3 (Target 3.4: enhancing mental health and decreasing premature death). It aided educators and legislators create focused plans to address youth mental health issues associated with climate change.

1.9 Scope and Limitations of the Study

While this research offers valuable insights into climate anxiety among students in Rawalpindi and Islamabad, it is important to view its findings within certain contextual boundaries. The study deliberately focused on four universities within this specific urban setting, and the resulting sample is predominantly female, a direct outcome of including

women's universities to explore their noted vulnerability. This means the perspectives of male students and those in rural areas are not fully represented. Furthermore, the snapshot nature of the survey helps illustrate connections but cannot track changes over time or prove direct causation, and the reliance on students' personal reports captures their lived experience effectively, though it differs from a clinical assessment.

CHAPTER 02

LITERATURE REVIEW

CHAPTER 02

2. Literature Review

2.1 Global Threats of the Climate Crisis

Scientists argue they have a moral obligation to warn humanity of catastrophic threats and to 'tell it like it is.' This commitment was demonstrated when a group of over 14,000 scientist signatories from around the world declared, clearly and unequivocally, that planet Earth is facing a climate emergency (Ripple et al., 2022). This declaration finds a historical precedent from decades ago, when scientists first raised major concerns at events like the First World Climate Conference in 1979. Since then, successive alarms have been sounded through international agreements like the Kyoto Protocol and the Paris Agreement, yet despite these warnings, planetary vital signs continue to deteriorate to record levels, underscoring a persistent and dangerous lack of sufficient progress (Ripple et al., 2023).

An unchangeable climate catastrophe is about to occur. There is no denying that this is a worldwide emergency. The foundation of life as we know it on Earth is in danger. The climate catastrophe is about to enter a crucial and uncertain new phase. More than 15,000 experts have been warning for years about the looming threats of climate change brought on by rising greenhouse gas emissions and ecosystem disruption (Ripple et al., 2022). For fifty years, both independent academic experts and fossil fuel firms have accurately forecast global warming before it was even noticed (Supran et al., 2023). We are still headed in the wrong path in spite of these warnings; emissions from fossil fuels have reached an all-time high, and July 2024 saw the three hottest days on record (Guterres & Secretary, 2024). We saw record-breaking sea surface temperatures last year (Cheng et al., 2024). The warmest extratropical summer in the Northern Hemisphere in two millennia (Esper et al., 2024).

Each of the seven warmest months of 2023 was listed in the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information's 2023 Global Climate Report, and the second half of the year (June through December) was the hottest on record. Global temperatures in July, August, and September above the long-term average by more than 1.0°C (1.8°F), marking the first time in NOAA's history that any month has done so (Ripple et al., 2023). The effects of climate change on civilization are more extensive, harsh, and happening faster than expected. In fact, the most recent Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6), Climate Change 2022: Impacts, Adaptation and Vulnerability, which UN Secretary-General Antonio Guterres has dubbed the

"atlas of human suffering," details the dangers that climate change presents to humanity. The implications of climate change on our economy, infrastructure, livelihoods, culture, and physical health are among these risks and repercussions. For the first time, it also evaluates and incorporates the severe and widespread effects of climate change on mental health. An important and innovative development in AR6 is the evaluation of the effects of climate change on mental health (IPCC, 2014). The AR6 study links climate change to increased mental health risks, including suicide, anxiety, depression, PTSD, and emotional reactions. These risks are exacerbated by inequity, injustice, and colonialism, with higher risk groups including rural populations, children, women, Indigenous Peoples, and low-income countries (Iglesias et al., 2023).

Unequivocally, climate change has affected all elements of the globe. An anticipated seven hundred million populations have been affected by one climate change-associated catastrophe or the alternative inside the final decade. The Intergovernmental Panel on Climate Change, a United Kingdom frame released a perturbing document on climate change for South Asia. The report predicts increased temperatures, longer rainfall events, and an expanded occurrence of droughts over the next two decades. (Panda et al., 2024). Plans to address climate change or natural disasters are regularly mentioned in the daily news, and the national conversation on climate change has heated up. The amount of original research on the relationship between climate change and health has increased eleven fold between 2007 and 2020, indicating an exponential growth in this field (Seritan, 2022). The 1960s ecological and environmental concerns stimulated scholarly interest in the relationship between environmental conditions and human health, largely due to the early studies conducted in this area by biological scientists. These effects caught the attention of several behavioral scientists in the late 1960s and early 1970s. Early studies in the emerging discipline of human-environment studies concentrated on two main areas how people react to pollution and population growth, and design and user pleasure (Nie et al., 2024). The growing impact of climate change is fueling both scientific attention and rising mental health concerns, especially among young people who feel anxious and unsupported by leader.

2.2. Worries regarding climate change and environmental stress

Consequently, how have the emotional notions that were just described been examined in connection with environmental issues such as climate change? Quantitative studies have operationalized worry and anxiety about these issues as universal emotional-cognitive

phenomena. For instance, researchers use questionnaires to gauge respondents' levels of worry or anxiety about environmental issues like climate change (Bouman et al., 2020). Furthermore, participants in several research on habitual worry reported the precise concerns they had about climate change as well as how frequently they had them. Therefore, concern is viewed as a distinct phenomenon in all of this research results (Verplanken et al., 2020). A common argument is that people's considerable levels of worries about climate change arise from their belief that their object of care is in danger. Concerns about climate change and other global environmental issues are seen by some as macro issues with moral and ethical overtones. Worry less about yourself and your loved ones and more about things farther away, including people in other nations, animals and the environment, and future generations (Wang et al., 2018). According to recent studies, eco-emotions such as concern and anxiety are widespread, quantifiable, and associated with both favorable and unfavorable results for mental health.

Although most people do not experience severe climate-related anxiety, those who score high on climate distress are more likely to report greater psychological distress, depression, anxiety, and sleep problems. Quantitative surveys looking at the relationship between climate and eco-worry, eco-anxiety, and psychological well-being have yielded mixed results. Some studies, like those from the UK and Australia, found little to no significant link between climate worry and clinical mental health problems like pathological worry, anxiety, or depression. Other research, especially from the US, found significant associations between climate change anxiety and mental health conditions like depression, general anxiety, and insomnia (Ojala et al., 2021).

2.3 Climate Change Impact on Youth Mental Health

Empirical data from a significant 2021 international study (The Lancet Planetary Health) demonstrates a clear link between climate awareness and emotional distress in younger generations. The research, which gathered responses from a cohort of over 10,000 youths aged 16 to 25, quantified this burden: 59% of participants experienced high levels of climate-related worry. Moreover, the study identified that more than 50% of these individuals concurrently endured a range of adverse feelings, such as sadness, anxiety, anger, powerlessness, helplessness, and guilt (Hickman et al., 2021). Furthermore, nearly 45% of the participants reported that their worries about climate change have a detrimental effect on their daily life functioning. They felt abandoned by their government due to the lack of adequate climate action. Many felt betrayed, ignored and abandoned by politicians and adults. Moreover, four

out of ten young adults are afraid to have kids of their own because they are concerned about the kind of future these kids might have, tainted by the catastrophic effects. More than 50% reported emotions such as sadness, anxiety, anger, powerlessness, helplessness, and guilt.

Globally, human life and health are being significantly impacted by climate change. Populations will not be equally impacted by climate change, and the degree of those effects will depend on pre-existing disparities, geographic vulnerability, and the ability of individuals and communities to adapt and cope (Berry et al., 2018). People who are not directly impacted by climate-related disasters can be afraid of a future in which biodiversity is lost and there is extensive destruction, which would have an impact on livelihoods and cause an estimated 1.2 billion climate refugees by 2050 (Bellizzi et al., 2023). One such example is mental health education and climate change. When it comes to helping those who suffer from the psychological effects of climate change, psychiatrists are not alone. These patients have been or will be treated in conjunction with other medical disciplines, such as emergency medicine, family practice, internal medicine, neurology, pediatrics, nursing, psychology, public health, social work, and other allied health professions (Seritan, 2024).

2.4 Youth Mental Health in the Climate Crisis

People under 30 years old in a Norwegian survey indicated that they would be ready to take steps to mitigate climate change, such as cutting back on their use of cars and airplanes and switching to a more sustainable diet (Leonhardt et al., 2022). Canada's climate crisis is causing widespread stress and mental health decline, with evidence showing increases in anxiety, depression, substance use, and violence after climate disasters (Brown et al., 2019). Psychiatrists are encouraged to recognize climate change as a key driver of mental health issues and to use their authority to push for systemic policy changes that protect and promote mental well-being nationwide (Neilipovitz et al., 2023). According to one body of research, financial and economic shocks can have a significant impact on people's mental health in general (Alem & Tato, 2023).

Every region is seeing an increase in the frequency and severity of extreme weather events, including heatwaves, floods, droughts and severe cyclones, which poses serious health risks. These incidents worsen health hazards by facilitating the transmission of infectious illnesses that are zoonotic, waterborne and foodborne in addition to causing acute injury. Due to decreased health infrastructure and socioeconomic determinants of health, poor groups are

disproportionately affected by the effects of climate change, which are seen internationally (Obande et al., 2023).

To protect human health from the consequences of climate change, the World Health Organization (WHO) has set five key research objectives. Assessing the health risks linked to climate change, determining the best ways to reduce those risks, directing decisions that promote health in industries like energy and transportation, enhancing decision-support systems, and calculating the expenses of safeguarding health from climate change are some of these priorities. The WHO aims to offer a thorough framework for tackling the health issues brought on by climate change by concentrating on these areas (Charlson et al., 2021). While research on the psychological impacts of climate change has expanded considerably, it still lags behind the well-documented evidence on physical health effects. Earlier literature was dominated by reviews and commentaries, but a growing body of empirical research is now emerging, though significant geographic and demographic gaps remain (Charlson et al., 2021). A key understanding in this field is that climate change often acts as a threat multiplier, exacerbating established risk factors for pre-existing mental health disorders rather than creating entirely new categories of illness. For instance, the increasing frequency of extreme weather events exposes more people to traumatic stressors known to trigger or worsen conditions like anxiety, depression, and PTSD (Cianconi et al., 2020). Despite this growing evidence, a significant chasm persists between the rising interest in climate-related mental health and the allocation of dedicated research funding and mental health services, particularly in the most vulnerable regions, creating a critical treatment gap (WHO, 2022).

This historical neglect is directly reflected in the significant funding and research gap for climate change and mental health. A systematic scoping review confirmed that while publications are increasing, mental health research remains a minor component of the climate-health field, with studies often being secondary to investigations of physical impacts (Charlson et al., 2021). This discrepancy is further evidenced by analyses showing that climate-related mental health research receives a minuscule fraction of overall health funding and is rarely integrated into national climate adaptation policies, leaving a critical blind spot in public health preparedness (Galway et al., 2024). This persistent under-prioritization underscores the urgent need to accelerate research and direct resources toward this escalating crisis. Even though there is still a lack of funding and research on how climate change affects mental health, there is growing evidence that psychological effects frequently outweigh physical ones, underscoring the urgent need for more research and focused solutions.

2.5 Climate Change and Widespread Psychological Impacts

Concerns were raised over the impact of climate change on mental health globally with reports indicating that the psychological influences of any catastrophe (climate exchange protected) beat physical impacts by using 40 to 1 (Ndeti et al., 2024). A cross-sectional examine carried out in six African nations (Ghana, Nigeria, Namibia, South Africa, Ethiopia and Kenya) discovered that greater than 1/2 the population stated experiencing the effect of weather alternate (Opoku et al., 2021). While research on climate change and adult mental health continues to expand, academic focus on university student populations has seen particularly significant growth in recent years (Filho et al., 2021). Conceptual frameworks for understanding these impacts are also evolving, moving beyond general anxiety to include specific climate-related emotional and psychological states. These are increasingly categorized within frameworks that distinguish between the physical ("somaterratic") and psychological ("psychoterratic") dimensions of environmental distress, concepts that are now being operationalized in research on student well-being (Pihkala, 2022). He notes that those might also exacerbate one another. Albrecht has over time developed greater precise phrases for environmental emotions. Psychologists and especially sociopsychologists, have produced visual material to demonstrate the direct and indirect impacts of climate change (Pihkala, 2019). Climate change indirectly influences mental fitness by way of disrupting healthcare and educational activities, resulting in financial and employment losses, hindering economic boom, necessitating migration and relocation, and escalating hostility and warfare assert that exchange in planet weather, its future effects, uncertainty, and the suffering of others might also adversely have an effect on the mental and emotional well-being of younger human beings. Studies show that weather distress is general among those aged 16 to 24, Schwaab suggested that 42% of surveyed German undergraduates indicated experiencing depression, 50% skilled tension, 27% confronted strain, and fifty-eight% expressed huge fear over weather alternate. Research discovered that 74% of British teenagers had worries over the effect of weather exchange on their future, and 63% felt annoying about its results (Ahmead et al., 2025).

Recent years have seen the emergence of empirical psychology studies investigating climate anxiety as a unique emotional reaction to the climate catastrophe. This new area of research looks at the possible impacts of climate anxiety on wellbeing and mental health, as well as how it may affect climate action (Cunsolo et al., 2020).

In recent years, climate change has emerged as a dominant subject within research on the psychological dimensions of the ecological crisis. The expanding field of climate

psychology now systematically investigates the full spectrum of climate-related emotional responses, including anxiety, grief, and solastalgia (Comtesse et al., 2021). Global surveys confirm that public concern is widespread, solidifying the study of ecological loss as a critical academic domain. Because this distress is often experienced as a shared, collective phenomenon rather than solely an individual one, it can serve as a potent catalyst for motivating communal action and policy engagement (Büchs et al., 2023).

But a 2017 report posted via the American Mental Affiliation (AMA) and Eco America, Mental Health and Our changing climate sparked much further discussion by means of presenting a working definition of eco-anxiety (Wullenkord et al., 2021). The National Center for Disease Control, or NCDC, has released a training module on climate change and mental health. It states that displacement brought on by extreme weather events and environmental factors has a negative impact on mental health, leading to outcomes such as a rise in dejection, a rise in the suicide rate, and a rise in the tendency to get drunk. This phenomenon is known as eco-anxiety or climate distress, and it can cause panic attacks, insomnia, and compulsive thinking in those who are exposed to extreme natural disasters like the Uttarakhand disaster and the 2013 Gujarat earthquake.

2.6 Community-Based Responses to Youth Climate Anxiety

Interventions are still at the individual level, despite the fact that academics concur that the effects of climate change on mental health are not pathological and should not be medicalized. A more thorough understanding of the nature of youth distress and its potential mitigation will result from paying more attention to psychosocial responses to climate change, as contend that community factors like employment and societal cohesion play significant protective roles in coping with climate distress (Marty et al., 2025). The necessity for therapies that target not just people but also the larger community and cultural issues that influence juvenile reactions to climate change is highlighted by the realization that climate anxiety is complex and non-pathological.

Climate anxiety is complex, and is known to often be primarily based on optimistic or realistic anxiety despite the fact that painful and distressing, climate tension is rational and does no longer suggest mental illness. Climate anxiety can be related to many emotions, including worry, anger, grief, melancholy, guilt, and disgrace, in addition to hope, even though the presence of these vary between individuals (Pihkala, 2020).

There has been growing evidence that the effects of climate change on teenagers' mental health are worsening at an alarming pace and having a wide range of negative effects (Cianconi et al., 2020). According to research by the European Parliament, anxiety, sadness, Post-Traumatic Stress Disorder (PTSD) and drug addiction among teenagers and young people worldwide are only a few of the acute and long-term effects of climate change on mental health. A systematic evaluation of 53 studies on the association between warm climate and poor mental health outcomes installed that mental health-associated mortality multiplied via 2% with a 10C temperature rise.

2.7 Global Impacts on Youth Mental Health

The psychological consequences of climate change are profound, contributing to increased stress, substance misuse, emotional distress, frustration, and grief among young people globally. These impacts are particularly acute in geographic regions experiencing the most rapid environmental changes, where youth face compounding stressors that threaten their mental well-being (Benoit et al., 2023). Young people are more vulnerable to the effects of climate change (Patrick et al., 2023). Adolescents and young adults demonstrate heightened vulnerability to both eco-anxiety and post-traumatic stress disorder (PTSD) linked to climate impacts. Hickman who polled youth in ten different nations about their views on climate change, discovered similar findings. The majority of young people were worried about climate change, according to their findings, with "59% being very or extremely worried". Since they have to bear the repercussions even if they did not create the majority of the planet's harm, young people feel deceived. This profound sense of betrayal consequently manifests as persistent negative thoughts and clinically significant mental health issues. Empirical evidence confirms that adolescents and young adults demonstrate heightened vulnerability to climate-related PTSD and eco-anxiety (Hickman et al., 2021). Governments and academic institutions may be able to combat climate change and develop environmental sustainability with the use of teaching, knowledge generation, research breakthroughs, technical innovations, service provision, public discussion, and outreach programs (McCowan, 2020). Universities play a crucial role in educating and engaging students with climate change problems. The universities' climate change education programs are essential for giving students both fundamental and advanced knowledge and skills, as well as for influencing their behavior and way of life, which leads to actions to adapt and mitigate the effects of climate change throughout their lives and can also have an impact on future generations (Filho et al., 2023). Students may start their own

climate change activism and collaborate with other actors by learning about climate change (Cordero et al., 2020).

2.8 Eco-Anxiety in University Students

Various studies on young people have determined that climate change evokes emotions such as fear, anger, shame, guilt, disgust, hopelessness, and overwhelm. (Ndeti et al., 2024). Awareness of climate change and its growing risks can negatively affect people's emotional and social wellbeing. This often leads to feelings like anxiety, sadness, anger, and hopelessness, sometimes causing physical symptoms such as panic attacks and sleeplessness. These reactions vary depending on individual beliefs and experiences (Gago & Sá, 2021). University students face a heightened vulnerability to mental health challenges, as the acute stress caused by climate change concerns compounds the pre-existing pressures of developmental and academic transitions, creating a significant psychological burden (Lawrance et al., 2022; IPCC, 2022).

The lifetime prevalence of mental illnesses, such as anxiety, mood, externalizing and drug use disorders, is estimated by the World Health Organization (WHO) to be between 18.1% and 36.1% worldwide. In Hong Kong, 4.8% of the general population between the ages of 18 and 64 suffers from severe non-specific psychological stress, while 13.3% of Chinese people between the ages of 16 and 75 have common mental diseases. In recent years, there have been more research examining the connection between ambient temperature and mental illnesses (Corvalan et al., 2022). Record-breaking temperatures have afflicted continents around the planet, including Europe, Asia, North America and South America, as well as large maritime regions, according to the 2023 Global Climate Report (Ripple et al., 2023). Due to how rapidly climate change and environmental degradation are intensifying, eco-anxiety has become a serious mental health issue. Individuals are more prone to feel more anxious, afraid and helpless when they become more conscious of ecological concerns including biodiversity loss, harsh weather and global warming.

The long-term effects of climate change, which they will inevitably confront, are likely to heighten their anxiety about the future. Furthermore, studies indicate that women report more severe levels of eco-anxiety than males do, maybe as a result of socialization that makes women more sympathetic and concerned with societal concerns (Haris et al., 2024). Climate change worry is closely associated to climate change anxiety. In contrast to climate anxiety, which may be seen of as a result of Climate Change Worry, CCW appears to be more cognitive in

character; it serves as a precursor to coping strategies. In light of these factors, CCW is a useful construct to study how psychological reactions to climate change evolve (Stewart, 2021).

The American Psychological Association has recognized eco-anxiety as a legitimate psychological disorder, highlighting the necessity of involving mental health practitioners in clinical practice to treat this problem (Boluda et al., 2022). Compared to older age groups, younger people—including teens and young adults—frequently have greater degrees of Eco-anxiety (Pihkala, 2020). Students only occasionally identify climate change-related stress as a distinct issue requiring support, and consequently, few seek out pastoral care for it (Johannessen, 2022). University pastoral care must address a variety of stressors among students. Anxiety, despair, grief, discrimination, suicidal thoughts, unsuccessful academic pursuits, loneliness, abuse, breakups, problematic relationships, family, and interpersonal functioning are among the various forms of stress that students experience (Russell et al., 2019).

2.9 Eco-Anxiety and Youth Climate Action in Pakistan

In Pakistan, growing environmental degradation and climate change have made eco-anxiety a serious mental health issue. Eco-anxiety is strongly associated with higher levels of anxiety and depression, according to a study done in Pakistan. Remarkably, almost 70% of young people polled said they were worried about environmental challenges, indicating a pervasive existential concern. The results showed that eco-anxiety affects behavior, leading to avoidance and greater involvement in environmental advocacy (Haris et al., 2022). New data from a number of nations indicates that people's perceptions of climate change are mostly unfavorable. In a research including 10 nations, for instance, 84% of young people (16–25 years old) said they were at least somewhat concerned about climate change, and 67% said they were depressed.

The Global Burden of Disease Study (2017) estimated that anxiety and depression had a global prevalence of 3.6% and 4.4%, respectively. The study also highlighted a disproportionate burden, with low- and middle-income countries (LMICs) accounting for more than 80% of the years lived with disability due to depression. Separately, research has shown that the mental health impact of the climate crisis is not limited to direct exposure; awareness of the crisis itself can indirectly harm psychological well-being, even among those unaffected by disasters (Clayton, 2021).

According to a nationwide study carried out by the Bangladesh National Institute of Mental Health (NIMH) in 2018–19 with 9,516 participants, the prevalence of anxiety was 4.5%

and depression was 6.7%. Despite the existing research, there are significant knowledge gaps in the evidence linking common mental disorders and climate change in Bangladesh (Wahid et al., 2023). Western viewpoints and indigenous knowledge are frequently overlooked in studies of climate change, especially in developing nations like Pakistan. An investigation of Pakistani indigenous knowledge of climate change and its predecessors was conducted using a descriptive phenomenological technique. It was discovered that local communities had important information ingrained in their social and cultural systems, such as customs and beliefs that are utilized to forecast weather patterns and manage resources responsibly (Zareen & Akhtar, 2023).

In order to overcome these inequities, the research emphasizes the necessity of specialized, community-based mental health interventions. One of the most important fields for tackling the psychological impacts of climatic disasters is social work (Fahrudin et al., 2024). Social work, state-led initiatives, and mental health care systems must all be integrated in a coordinated manner due to the scope and complexity of climate-related mental health issues. The psychological effects of climatic catastrophes must be lessened by state-led initiatives such as emergency response plans, mental health regulations, and disaster preparedness initiatives. The structural assistance required to improve social workers' and mental health professionals' ability to offer prompt and efficient treatment can be supplied by these programs. During and after climate disasters, state-led initiatives may guarantee that vulnerable people receive comprehensive support by bridging the gaps between policy, practice, and community needs (Gu, 2025).

CHAPTER 03

MATERIAL AND METHODS

Chapter 03

3. Material and Methods

3.1 Study Area

This study was conducted in the twin cities of Rawalpindi and Islamabad, Pakistan, to explore university students' perspectives on the effects of climate change on mental health. This region forms a single, interconnected metropolitan area, allowing for a diverse sample within a shared climatic zone. Islamabad, the nation's capital, is a planned city known for its clean environment and green spaces. It is situated in the northern region on the Pothohar Plateau and has experienced significant growth due to migration. The universities selected in Islamabad, including International Islamic University and Quaid-i-Azam University, offer varied topographical contexts, from urban plains to the foothills of the Margalla Hills. Adjacent to Islamabad, Rawalpindi is a historic and densely populated commercial center. It provides a contrasting urban environment with a rich cultural heritage and a more densely built landscape. The study included institutions in Rawalpindi, such as Fatima Jinnah Women University and Rawalpindi Women University, which are situated in typical urban, plain areas of the city. By selecting universities across both cities, this research captures a spectrum of urban and semi-urban environments, enabling a robust investigation into how different geographical contexts within the twin cities influence the mental health of students in relation to climate change. Figure 3.1 showing the study area map of the study.

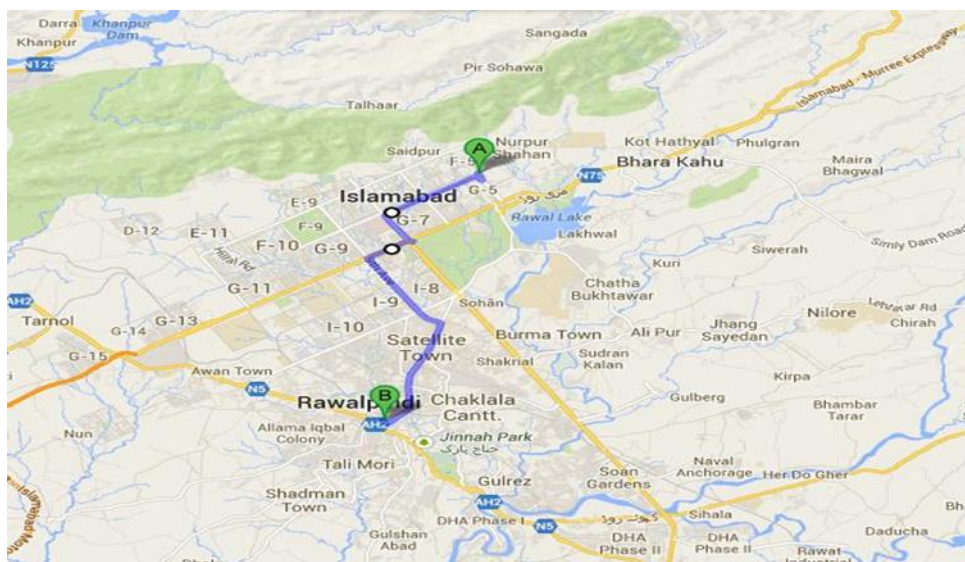


Figure 3.1: Study area map of twin cities (Rawalpindi & Islamabad)

3.2 Research Design

This study employed a cross-sectional survey to investigate the impacts of climate change-related factors, including heat stress and general environmental conditions, on the mental health of university students. The research specifically measured psychological outcomes such as stress, anxiety, depression, and worry. A sample of nearly 400 students was recruited for the survey. The participant pool consisted of 200 students from two universities in Islamabad and 200 from two institutions in Rawalpindi. A stratified random sampling technique ensured the inclusion of individuals from all academic years and diverse faculties within each university, targeting currently enrolled undergraduate, graduate, and PhD students.

Beyond assessing mental health impacts, the study also gauged students' awareness of climate change and their perception of its connection to psychological well-being. This dual approach yielded critical insights into how students perceive the relationship between environmental shifts and their mental health. In the context of increasing climate-related disasters like floods and heatwaves, evaluating this awareness is an essential step for crafting targeted educational and support initiatives. Furthermore, the research sought to illuminate the wider repercussions of climate change on student life, acknowledging that environmental stressors can significantly intensify feelings of uncertainty regarding future social and economic security.

3.3 Data Acquisition

This study gathered data through a self-administered survey designed to evaluate climate change concerns and their psychological effects. The instrument incorporated the Climate Change Worry Scale alongside original questions assessing mental health indicators. It contained five sections covering: (1) demographic information, (2) climate change awareness, (3) mental health awareness, (4) climate-related worry, and (5) coping strategies.

Participants received the questionnaire in both digital and paper formats according to their preference. All individuals provided informed consent before participating. The survey measured specific climate experiences including exposure to extreme heat, temperature variations, and humidity along with their correlated psychological impacts, particularly stress, anxiety, and depressive symptoms. All participant identities remained confidential throughout the research process to ensure privacy and ethical integrity.

To ensure the valid and reliable measurement of core constructs, the study employed standardized scales where available. A key instrument for measuring the emotional response

to environmental threats was the Climate Change Worry Scale. The Climate Change Worry Scale is a validated psychometric tool developed to quantify the frequency and intensity of worry specifically associated with climate change. In this study, it was used to measure the cognitive-emotional dimension of participants' engagement with climate issues, providing quantifiable data on their level of climate anxiety.

3.3.1 Climate Change Worry Scale

The instrument for measuring climate-specific anxiety was adapted from existing literature. This study utilized the Climate Change Worry Scale (CCWS), a 10-item measure developed by Stewart in 2021. The CCWS was selected for its focus on capturing psychological responses such as fear, anxiety, and distress linked to climate change by evaluating proximal, personal concerns rather than broader global impacts.

Each item on the scale uses the term "worry" and refers directly to "climate change" or a "changing climate." Respondents indicated how frequently they experienced troubling thoughts about climate change's effects on themselves and those they care about. Responses were recorded on a five-point Likert scale ranging from "Never" to "Always," with higher aggregate scores indicating greater climate-related worry.

The CCWS has demonstrated strong psychometric properties in previous studies, including high internal consistency, test-retest reliability, and cross-cultural validity, making it a concise and reliable tool for adult populations (Stewart, 2021).

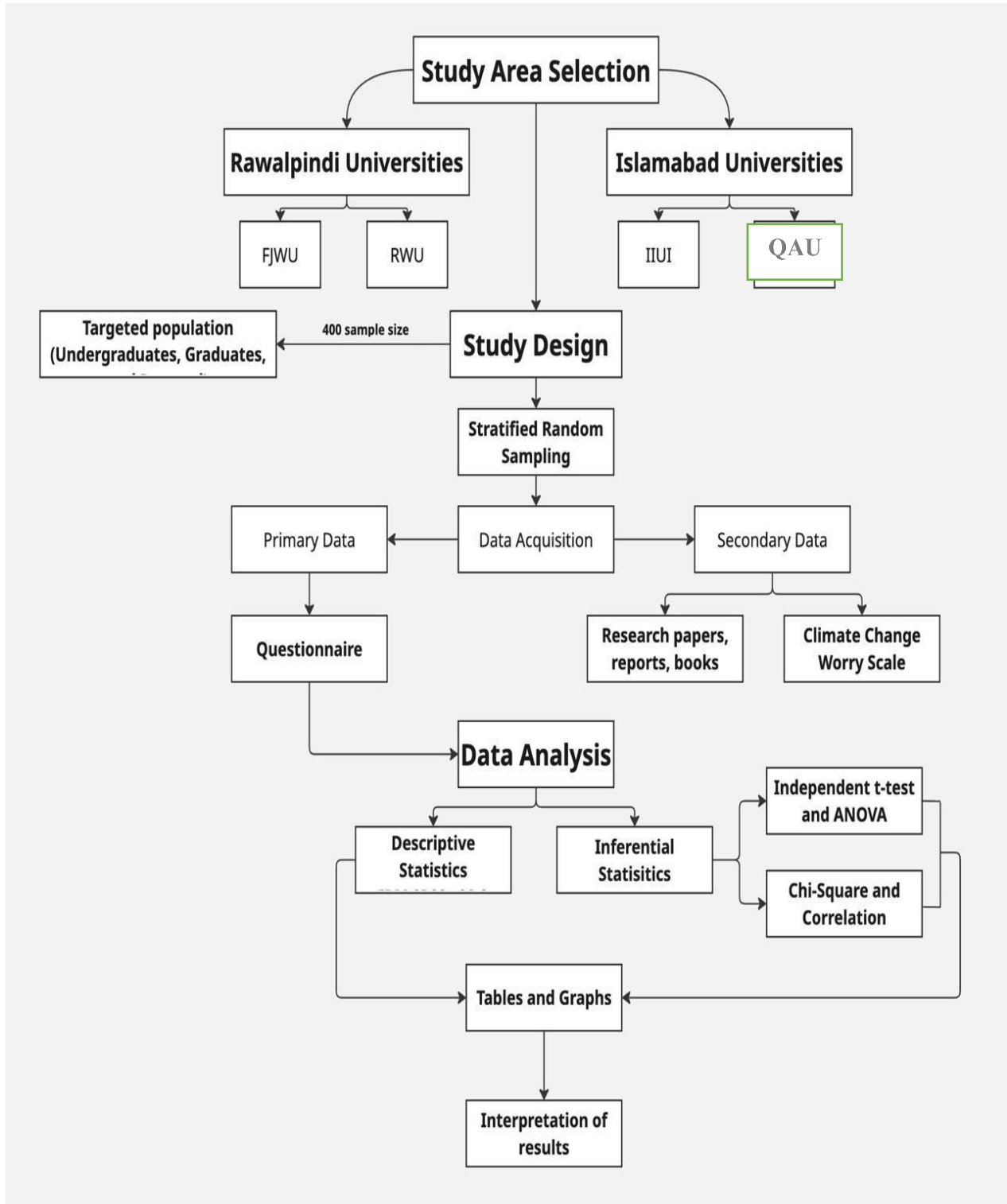


Figure 3.2: Methodological framework

3.4 Data Analysis

The collected data were analyzed using a range of statistical methods performed in SPSS (Version 28.0).

3.4.1. Descriptive Analysis

This phase of analysis characterized the fundamental attributes of the dataset. Frequencies and percentages were computed to summarize categorical demographic variables, including age, gender, and academic discipline. For the core research variables—climate change worry and mental health indicators (stress, anxiety, depression)—measures of central tendency and dispersion, namely means and standard deviations, were calculated to describe their distributions within the sample.

3.4.2. Spearman Correlation Coefficient

Using Spearman's rank correlation coefficient, the associations between climate change variables and mental health outcomes were investigated. This non-parametric approach was especially well-suited for examining continuous connections in data that might not adhere to regular assumptions. The variables were ranked and to guarantee correct calculations, equal ranks were given average values. To identify the direction and strength of the correlations, the resultant correlation coefficients were analyzed, with significance tested at $p < 0.05$. The equation for Spearman correlation coefficients was...

$$r = 1 - \frac{(6\sum di)}{n(n^2-1)} \quad (1)$$

Whereas;

r: Spearman's rank correlation coefficient.

di: The difference between the ranks of corresponding values of the two variables.

n: The number of observations (data points).

3.4.3. Comparative Analysis

Independent t-tests were used to compare mental health outcomes between students from twin cities. This test assesses whether there is a statistically significant difference between

the means of two independent groups. The formula for the independent t-test.

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \quad (2)$$

- “ $\bar{X}_1$ ” and “ $\bar{X}_2$ ” are the means of the two groups,
- “ s_1^2 ” and “ s_2^2 ” are the variances of the two groups,
- “ n_1 and n_2 ” are the sample sizes of the two groups.

CHAPTER 04

RESULTS

Chapter 04

4. Results

The thorough results of the study examining how climate change affects university students' mental health in Rawalpindi and Islamabad are presented in this chapter. The findings cover demographics, mental health effects, climate worry levels, awareness of climate change, obstacles to treating anxiety, and preferred interventions.

4.1 Demographic Profile of Respondents

4.1.1 Universities

Data for this study were collected from 400 students across four universities in the twin cities of Rawalpindi and Islamabad. The distribution of participants across institutions is presented in table 4.1. The sample comprised students from Fatima Jinnah Women University (FJWU, 32.2%, n=129), Quaid-e-Azam University (QUI, 30.5%, n=122), International Islamic University (IIUI, 25.0%, n=100), and Rawalpindi Women University (RWU, 12.2%, n=49). This distribution intentionally captured diverse student perspectives across the twin cities' educational landscape. Including both large public universities (QUI, IIUI) and women's universities (FJWU, RWU) ensured representation of varied institutional cultures and gender perspectives.

The participant variation stemmed from practical constraints, including differing university population sizes and on-campus accessibility during data collection. For instance, FJWU and QUI's larger shares reflect their bigger student enrollments, while RWU's smaller representation corresponds to its more modest size.

This stratified approach strengthens the study's validity by preventing skew from any single institutional context, providing a more comprehensive view of climate awareness and mental health impacts across different academic environments.

Table 4.1: University distribution of participants (N=400).

Responses	Frequency	% of grand total
IIUI	100	25.0%
FJWU	129	32.2%
QUI	122	30.5%
RWU	49	12.2%
Grand Total	400	100%

4.1.2 Gender Distribution

The participant pool demonstrated a significant gender imbalance, with female students constituting 85.0% (n=340) of the sample, while male students represented 15.0% (n=60). This skewed distribution was not a sampling error but a direct result of the study's institutional selection. The deliberate inclusion of two women's universities (Fatima Jinnah Women University and Rawalpindi Women University), which collectively contributed 44.5% of the total sample, fundamentally shaped the gender composition. Furthermore, even within the co-educational universities (IIUI and QAU), schools of social sciences and humanities—which often have higher female enrollment—were actively sampled, further contributing to the higher proportion of female respondents.

The gender composition of the sample was significant for interpreting the findings. The cohort overrepresented female participants, which meant the results likely captured a more pronounced level of climate-related psychological impact than would have been evident in a gender-balanced cohort. Therefore, the findings regarding the prevalence and intensity of mental health outcomes were understood as being particularly reflective of the female student experience. The generalizability of the specific prevalence rates to the entire student population of the twin cities, especially to male students, was limited. This compositional factor did not invalidate the findings but clarified their context, indicating that while the identified relationships between variables (e.g., between awareness and distress) were robust, the overall reported level of distress was likely elevated in the dataset.

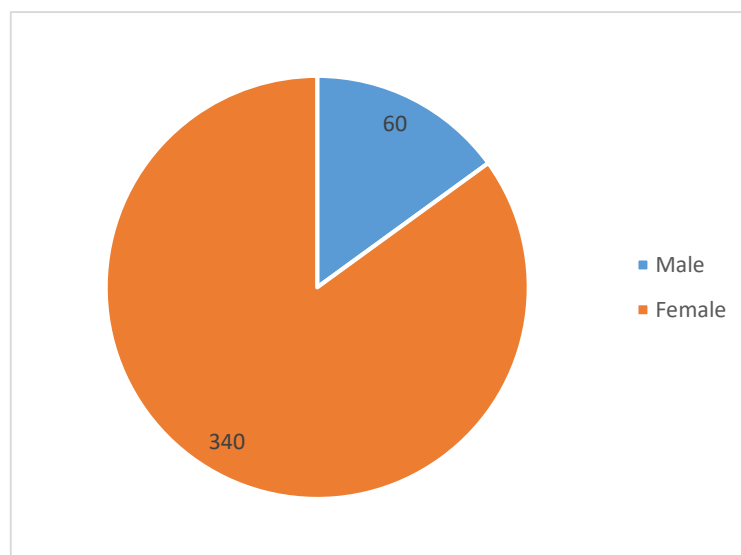


Figure 4.1: Gender distribution of participants

4.1.3 Age Distribution

The analysis revealed a distinct concentration within a specific age demographic among participants. As detailed in table 4.3, the overwhelming majority of respondents (76.8%, $n=307$) belonged to the 21-25 years' age group. Younger students aged 16-20 constituted a smaller segment (9.3%, $n=37$), while those aged 26-30 made up 13.8% ($n=55$). A single participant (0.3%) fell into the 31-35 years' category. This pronounced clustering in the 21-25 age bracket was an expected outcome of the study's focus on university students. This age range directly corresponds with the typical enrollment period for undergraduate and postgraduate degree programs in Pakistan, forming the core population of university campuses. The smaller proportion of 16-20-year-olds reflects that many students enter university at age 17 or 18, spending a shorter period in this youngest category during their academic career.

The limited representation of the 26-30 and 31-35 age groups aligns with the declining enrollment numbers in higher degree programs and the fact that individuals in these age cohorts are often transitioning into professional careers or starting families, reducing their presence in university settings. The solitary respondent aged 31-35 confirmed this demographic was a statistical outlier within the target population. Consequently, the study's findings are most accurately representative of the perspectives and psychological experiences of traditional university students in their early to mid-twenties. While the relationships between climate change awareness and mental health may hold true across ages, the reported prevalence rates and emotional responses are primarily reflective of this dominant 21-25-year-old cohort's characteristics.

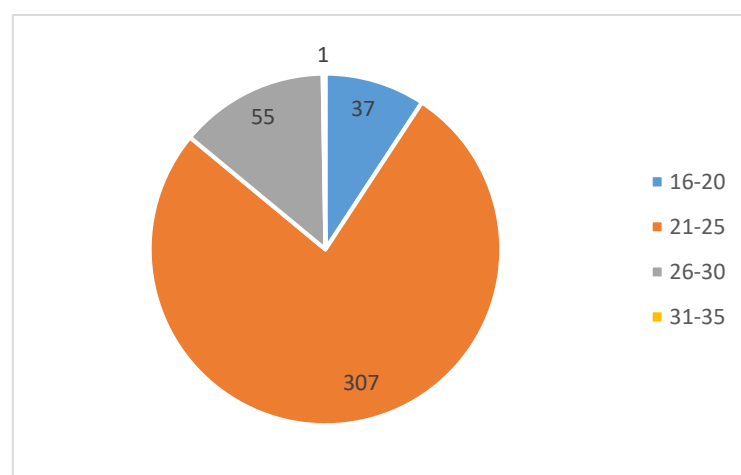


Figure 4.2: Age distribution of participants

4.1.4 Level of Education

The educational qualifications of the participants showed a clear distribution across academic levels. As presented in table 4.4 undergraduate students formed the largest group (66.8%, n=267), followed by graduates (30.5%, n=122). Doctoral candidates represented the smallest segment of the sample (2.8%, n=11). This distribution directly reflects the typical enrollment pyramid found in higher education, where undergraduate populations naturally outnumber postgraduate students. The high proportion of undergraduates (66.8%) accurately represents the largest student demographic on university campuses, as bachelor's degree programs accept the most students annually.

The smaller but substantial representation of graduate students (30.5%) aligns with the selective nature of master's programs, which have fewer available seats and more stringent entry requirements than undergraduate studies. The minimal presence of doctoral candidates (2.8%) corresponds to the highly specialized and limited enrollment capacity of PhD programs across all disciplines.

This composition significantly shaped the study's findings by weighting perspectives toward earlier academic stages. Undergraduate students, while academically engaged, typically have less exposure to specialized research and advanced theoretical frameworks compared to doctoral candidates. Consequently, the collective awareness levels and psychological responses documented in this research are predominantly influenced by students in the foundational and intermediate phases of their academic development. The limited voice of doctoral students means the highly specialized knowledge and potentially different coping mechanisms found at the most advanced academic level are underrepresented in the overall results.

Table 4.2: Educational qualification of participants (N=400)

Students	Frequency	% of grand total
Undergraduates	267	67%
Graduates	122	30%
Doctoral	11	3%
Grand Total	400	100%

4.2 Climate Change Awareness and Associated Factors

4.2.1 Overall Awareness Level

The survey revealed a high baseline of climate change knowledge among the student population. As detailed in table 4.5 a significant majority of participants (76.3%, n=305) reported being aware of climate change. A smaller proportion expressed uncertainty (12.8%, n=51), while 11.0% (n=44) stated they were not aware. The high awareness rate (76.3%) can be attributed to several key factors. Pakistan's high vulnerability to climate impacts, such as the severe 2022 floods and recurring heatwaves, has made the topic a prominent feature in national media and public discourse. This constant exposure ensures that climate change is a difficult subject for university students to miss. Furthermore, as a digitally connected demographic, students are frequently exposed to climate-related information through social media platforms, news apps, and online content, which serves as a continuous information stream outside formal education.

The 12.8% of students who were unsure likely represent a group with fragmented or superficial knowledge. They may have encountered the term "climate change" but lacked a clear understanding of its mechanisms or local implications, leading to their uncertain response. This highlights a gap in the depth, rather than the reach, of climate communication.

The 11.0% who reported no awareness represent a notable information gap. This lack of awareness could stem from several factors, including academic disciplines with minimal environmental curriculum, selective media consumption that filters out scientific topics, or potentially lower digital literacy that limits exposure to current affairs. This group underscores that even within an educated university population, climate change information does not permeate all segments equally, suggesting that awareness initiatives within universities are not yet universal.

Table 4.3: General climate change awareness among students (N=400)

Row Labels	Frequency	% of grand total
Yes	305	76%
No	44	11%
Unsure	51	12%
Grand Total	400	100%

4.2.2 Climate Change Awareness by Academic Qualification

The analysis revealed a statistically significant relationship between academic qualification and climate change awareness ($p = 0.001$). Graduate students demonstrated substantially higher awareness levels (87.2%) compared to undergraduate students (70.8%), with a 16.4 percentage point difference between the two educational groups.

This significant relationship emerged because graduate students' advanced academic training provided systematic exposure to climate science through specialized coursework, research requirements, and interdisciplinary academic engagement. Graduate students developed higher awareness because their academic programs required deep immersion in contemporary global challenges and scientific literature that consistently addressed climate change issues. Their extended engagement with research methodologies, academic writing, and specialized seminars naturally incorporated climate science as an essential knowledge domain, making comprehensive awareness an expected outcome of their advanced education.

Undergraduate students showed lower awareness rates because their educational experience emphasized broad foundational knowledge across multiple disciplines rather than specialized environmental science. Undergraduate curricula typically introduced climate change through optional electives or departmental courses rather than integrating it as core knowledge across all programs. Their limited exposure occurred because bachelor's degree requirements prioritize general education over specialized environmental literacy, making climate awareness dependent on individual course selection rather than institutional educational standards.

The statistical significance confirmed that academic progression systematically enhances climate change awareness through structured educational pathways. Graduate students' higher awareness resulted from mandatory engagement with complex environmental challenges in their advanced training, while undergraduate students' variable awareness reflected the elective nature of climate education in foundational programs. The clear progression pattern demonstrated that advanced academic specialization serves as a crucial mechanism for developing comprehensive climate literacy, while undergraduate education provides inconsistent exposure based on students' disciplinary choices and elective selections.

The substantial difference in awareness levels between educational groups highlighted the transformative impact of graduate education on environmental knowledge. Graduate students' near-universal awareness reflected their position at the forefront of academic engagement with global challenges, while undergraduate students' moderate awareness

indicated the variable integration of climate science into foundational university curricula. This pattern underscored the importance of advanced academic training for building systematic understanding of complex environmental issues like climate change.

Table 4.4: Cross-tabulation of climate change awareness by academic qualification

Qualification Level	Yes (Aware)	No (Not Aware)	Unsure	Total
Undergraduate	70%	13%	15%	100%
Graduates	87%	5.3%	7%	100%
Total	76%	11%	13%	100%

* $\chi^2(2) = 13.382$, $p < 0.001$, Cramer's $V = 0.183$ *

4.2.3 Climate Change Awareness by University

The analysis revealed no statistically significant relationship between university affiliation and climate change awareness among students ($p = 0.206$). Despite minor variations between institutions, all four universities demonstrated similar awareness patterns, with awareness rates ranging from 72.0% to 87.8% across the different academic environments.

This non-significant relationship occurred because students across all universities accessed climate change information through similar external digital platforms and media sources rather than institution-specific educational programs. The statistical non-significance indicated that university-specific curricular factors did not substantially influence students' basic awareness of climate change as an environmental issue. Students developed their understanding through common information channels equally available across all institutions, primarily social media platforms, news outlets, and online educational resources that transcended institutional boundaries.

The relatively consistent awareness levels across universities suggested that digital media served as the primary source of climate information for students regardless of their institutional affiliation. Since students from all universities used the same social media platforms, followed similar environmental influencers, and consumed comparable online content, their fundamental awareness of climate change remained consistent across different academic institutions. The universal accessibility of climate information through digital means created a baseline awareness that was not dependent on specific university curricula or institutional priorities.

The minor variations between universities, while not statistically significant, reflected subtle institutional characteristics and student demographics. RWU's slightly higher awareness

rate (87.8%) potentially stemmed from its specialized academic focus or smaller student population that might have encouraged more concentrated engagement with environmental issues. IIU's comparatively lower rate (72.0%) might have reflected different disciplinary emphases or variations in student engagement with climate-related content. However, these differences remained modest because all universities operated within the same broader information ecosystem where climate change has become a prominent public discourse topic.

The statistical non-significance therefore demonstrated that basic climate change awareness has become a widespread phenomenon among university students, primarily driven by cultural and digital diffusion rather than formal institutional education. Since all universities existed within the same media environment and digital landscape, students encountered climate information through similar external channels, resulting in consistent awareness patterns across institutions despite their different academic traditions and program structures. This pattern indicated that fundamental climate awareness developed through extracurricular digital engagement and public discourse rather than through differentiated university educational approaches.

Table 4.5: Climate change awareness by university

University	Yes (Aware)	No (Not Aware)	Unsure	Total
IIU	72%	12%	16%	100%
FJWU	78%	8%	14%	100%
QUI	73%	15%	12%	100%
RWU	88%	8%	4%	100%
Total	76%	11%	13%	100%

4.3 Formal Training on Climate Change

4.3.1 Distribution of Formal Training

The investigation into formal climate change education revealed significant gaps in structured learning opportunities among the 400 participants. Survey results demonstrated that a majority of students (59.5%, n=238) had received some form of formal climate instruction, while a substantial minority (40.5%, n=162) reported no formal training whatsoever.

Among students who received training, academic courses served as the predominant source (34.5%, n=138). A smaller segment (13.0%, n=52) benefited from combined academic and workshop training, while standalone workshops and campaigns represented the least accessed format (12.0%, n=48).

The high percentage of students without formal training (40.5%) indicates that climate change education has not yet been systematically integrated into core university curricula across all disciplines. This gap likely stems from the traditional treatment of climate change as a specialized subject confined to environmental science departments, rather than being recognized as an interdisciplinary essential relevant to all fields of study.

The dominance of academic courses as the primary training method reflects the central role of formal curriculum in shaping student knowledge. When climate education does occur, it typically happens through structured coursework rather than voluntary activities, suggesting that most students encounter this content as a degree requirement rather than through personal initiative. This pattern highlights the critical importance of curriculum design in determining which students gain climate literacy.

The limited reach of workshops and campaigns (12.0%) suggests either insufficient institutional investment in extracurricular climate programming or ineffective promotion of existing opportunities. The small proportion of students experiencing both academic and workshop training (13.0%) indicates that most universities have not developed comprehensive educational approaches that combine formal instruction with practical, hands-on learning experiences.

This training distribution has significant implications for students' climate understanding. Those without formal education likely develop their awareness through informal channels like social media and news media, which may provide fragmented or sensationalized information without scientific depth or critical context. The reliance on academic courses for those who do receive training suggests that climate literacy remains dependent on specific departmental priorities rather than being an institutional educational commitment.

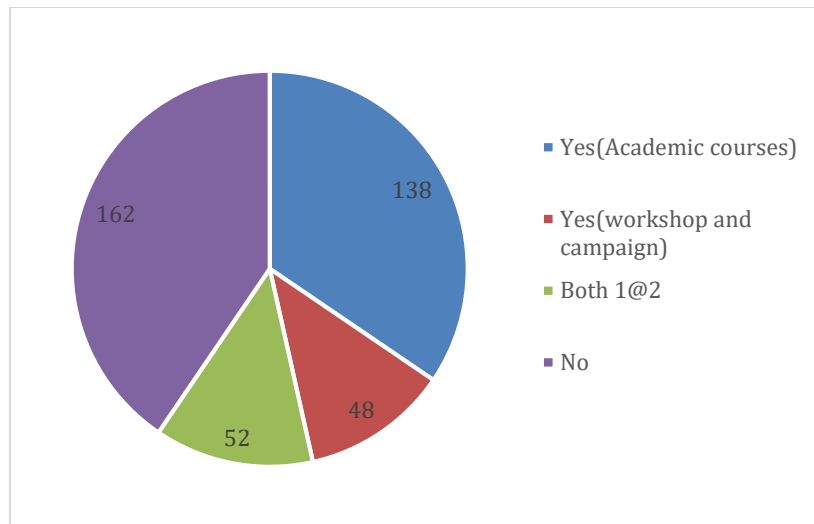


Figure 4.3: Distribution of formal climate change training

4.3.2 Training by Education Level

The analysis revealed a statistically significant relationship between education level and receipt of formal climate change training ($p < 0.001$). Graduate students demonstrated substantially higher training participation compared to undergraduate students, with clear differences in both the quantity and type of training received across educational levels.

This significant relationship emerged because graduate programs inherently incorporate more specialized and interdisciplinary content that systematically addresses complex global issues like climate change. Graduate students showed higher training exposure because their advanced academic programs required engagement with contemporary environmental challenges through specialized coursework, research requirements, and interdisciplinary seminars. Their curriculum structure naturally integrated climate education as an essential component of advanced academic training, making training participation almost mandatory rather than optional.

Undergraduate students showed significantly lower training participation, with nearly half (46.8%) reporting no formal climate education. This pattern occurred because undergraduate curricula prioritize broad foundational knowledge across multiple disciplines, making climate change education dependent on students' major choices and elective selections rather than institutional requirements. Undergraduate programs typically present climate topics within departmental boundaries rather than as cross-cutting interdisciplinary essentials, resulting in inconsistent exposure based on students' academic pathways.

The variation in training types also reflected educational level differences. Graduate students participated more frequently in combined training approaches (21.1% vs 9.4%) because their

advanced academic engagement demanded comprehensive understanding through multiple learning modalities. Their research activities and specialized coursework naturally exposed them to diverse educational formats including academic courses, workshops, and integrated training experiences.

The statistical significance confirmed that educational progression systematically transforms climate change from an optional interest area to an essential knowledge domain. Graduate students' higher training rates resulted from institutional expectations that advanced scholars develop expertise in addressing complex global challenges, while undergraduate students' variable exposure reflected the foundational nature of bachelor's programs where specialized environmental education remains elective rather than compulsory.

Table 4.6: Cross-tabulation of education level by formal training on climate change

Education Level	Academic Courses	Workshop/Campaign	Both Training Types	No Training	Total
Undergraduate	33%	10%	9%	47%	100%
Graduates	36%	15%	21%	28%	100%
Total	34%	12%	13%	40%	100%

* $\chi^2(3) = 18.795$, $p < 0.001$, Cramer's $V = 0.217$

4.3.3 Training and Belief in Mental Health Impact

The analysis identified a statistically significant relationship between the type of formal climate training students received and their conviction about climate change's mental health impacts ($p = 0.037$). The strength of belief varied substantially across different training categories, with academically trained students showing the strongest conviction and workshop-trained students demonstrating the highest skepticism.

This significant association emerged because different training approaches provided varying levels of conceptual depth, evidence exposure, and critical engagement that directly shaped students' conviction through different learning mechanisms. Students who completed academic courses showed the strongest belief levels because semester-long courses provided sustained, structured exposure to peer-reviewed research, comprehensive case studies, and theoretical frameworks. Through repeated engagement with scientific evidence across multiple lectures and assignments, students systematically built nuanced understanding of the biological, psychological, and social pathways connecting climate stress to mental health outcomes.

Workshop-trained students displayed the highest skepticism because brief, condensed training formats typically emphasized awareness-raising over deep conceptual understanding. Without extended examination of research evidence and critical discussion of mechanisms, participants lacked the comprehensive foundational knowledge needed to fully accept this complex interdisciplinary relationship. The limited duration and surface-level approach of workshops left insufficient time for working through doubts or examining counterarguments, creating room for uncertainty.

Students without any formal training showed moderate agreement levels but demonstrated a clear "conviction gap" where their acceptance lacked strong conviction. This pattern occurred because without structured education, students formed beliefs based on fragmented information from media sources and social networks rather than systematic scientific evidence. Their understanding remained tentative and superficial, derived from informal channels that provided awareness without the depth needed for confident conviction.

The statistical significance therefore highlighted that educational approach directly determines how firmly students embrace complex scientific concepts. Academic immersion built confidence through evidence-based understanding, while abbreviated training provided insufficient foundation for strong conviction, and absence of formal education led to uncertain beliefs based on informal information sources.

Table 4.7: Cross-tabulation of training type by belief in mental health impact

Training Type	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Academic Courses	2%	6%	12%	55%	24%	100%
Workshop/Campaign	4%	21%	19%	42%	14%	100%
Both Training	4%	2%	24%	51%	19%	100%
No Training	3%	10%	15%	57%	15%	100%
Total	3%	9%	16%	54%	18%	100%

* $\chi^2(12) = 22.071$, $p > 0.037$, Cramer's $V = 0.136$

4.4 Familiarity with Climate-Related Psychological Terms

4.4.1 Familiarity with Eco-Anxiety and Climate Grief Terminology

The analysis revealed that slightly more than half of the students (53.3%) reported familiarity with the psychological terms "eco-anxiety" and "climate grief," while a substantial minority (46.8%) indicated they were not familiar with these concepts. This nearly even split in familiarity levels indicated that climate psychology terminology has achieved moderate

penetration among university students but has not yet become universally recognized vocabulary within the student population.

The 53.3% familiarity rate occurred because students encountered these terms through multiple contemporary information channels that have increasingly incorporated climate psychology concepts into public discourse. Social media platforms, particularly mental health and environmental advocacy accounts on Instagram, Twitter, and Facebook, served as primary dissemination channels where students learned these specialized psychological terms. Digital media content creators, environmental organizations, and mental health influencers have progressively integrated "eco-anxiety" and "climate grief" into their messaging, exposing engaged students to this emerging psychological vocabulary.

Additionally, mainstream media coverage of climate change impacts has increasingly referenced the psychological dimensions of environmental crises, introducing these terms to broader audiences through news articles, documentaries, and public discussions. University students' natural engagement with current affairs and digital content made them more likely to encounter these concepts as climate psychology gained traction in public discourse and academic publications.

The substantial proportion of unfamiliar students (46.8%) emerged because climate psychology remains a specialized interdisciplinary field that has not yet been systematically integrated into general education or core curriculum requirements. Students who did not actively seek out environmental or mental health content, or who engaged with different types of media, missed exposure to these specific terms. The terminology's relatively recent emergence in popular discourse meant that students with less engagement in environmental or psychological topics remained unaware of these conceptual frameworks for understanding climate-related emotional experiences.

The nearly equal division between familiar and unfamiliar students reflected the transitional status of climate psychology terminology within both academic and public spheres. While these concepts have gained significant traction among specific communities interested in environmental or mental health topics, they have not yet achieved the widespread recognition necessary for universal familiarity across all student demographics and academic interests. This pattern highlighted the ongoing process through which specialized psychological concepts gradually enter mainstream awareness through digital media, academic discourse, and public conversation about climate impacts.

Table 4.8: Familiarity with climate psychology terminology (N=400)

Response	Frequency	Percentage
Yes (Familiar)	213	53%
No (Not Familiar)	187	47%
Total	400	100%

4.4.2 Familiarity by University

The analysis revealed no statistically significant relationship between university affiliation and student familiarity with psychological terms like "eco-anxiety" and "climate grief" ($p = 0.398$). Despite minor variations between institutions, all four universities showed similar familiarity levels ranging from 47.0% to 61.2%, indicating consistent awareness patterns across different academic environments.

This non-significant relationship occurred because students across all institutions accessed information about these emerging psychological concepts through similar external digital channels rather than university-specific academic programs. The statistical non-significance demonstrated that university-specific educational factors did not meaningfully influence students' familiarity with climate psychology terminology. Students learned these specialized terms through information sources equally accessible across all institutions, primarily social media platforms including mental health and environmental advocacy accounts on Instagram, Twitter, and Facebook.

The relatively consistent familiarity rates across universities suggested that digital media served as the primary dissemination channel for these psychological concepts. Since students from all universities used the same social media platforms, followed similar influencers, and consumed comparable digital content, their exposure to terms like "eco-anxiety" remained consistent regardless of their specific institution's academic focus or curriculum emphasis.

The minor variations between universities, while not statistically significant, reflected subtle institutional characteristics. RWU's slightly higher familiarity rate (61.2%) possibly stemmed from its specialized focus areas that might encourage more engagement with contemporary psychological concepts. IIU's lower rate (47.0%) might have reflected different disciplinary emphases or student engagement patterns with digital mental health content. However, these differences remained modest because no university had systematically integrated climate psychology concepts into core curricula across disciplines.

The statistical non-significance therefore highlighted that climate psychology terminology primarily entered student vocabulary through cultural and digital diffusion rather than formal educational channels. Since all universities operated within the same broader media

environment and digital ecosystem, students encountered these psychological concepts through similar external information sources, creating consistent awareness patterns across institutions despite their different academic traditions and curricular emphases. This pattern indicated that familiarity with climate mental health concepts developed through extracurricular digital engagement rather than institutional educational programming.

Table 4.9: Familiarity with eco-anxiety/climate grief by university (N=400)

University	Total n	Not Familiar (%)	Familiar (%)
IIU	100	53%	47%
FJWU	129	46%	53%
QUI	122	45%	55%
RWU	49	39%	61%
Total	400	47%	53%

* $\chi^2(3) = 2.960$, $p > 0.398$, Cramer's $V = 0.08$

4.4.3 Familiarity by Education Level

The analysis revealed a statistically significant relationship between education level and familiarity with psychological terms like "eco-anxiety" and "climate grief" ($p < 0.001$). Graduate students demonstrated substantially higher familiarity (66.2%) compared to undergraduate students (46.8%), representing a 19.4 percentage point difference between the two educational groups.

This significant relationship emerged because graduate students' advanced academic training provided greater exposure to specialized psychological terminology through rigorous research engagement and specialized coursework. Graduate students developed higher familiarity because their academic programs required deeper immersion in scholarly literature, research methodologies, and interdisciplinary studies that frequently incorporated emerging climate psychology concepts. Their extensive engagement with academic journals, research seminars, and specialized coursework naturally exposed them to terms describing psychological impacts of environmental issues.

Undergraduate students showed lower familiarity rates because their educational experience focused on foundational knowledge across multiple disciplines rather than specialized terminology in emerging interdisciplinary fields. Undergraduate curricula typically introduce climate change through basic environmental or scientific frameworks without systematically integrating specialized psychological concepts. Their limited exposure occurred because climate psychology terminology remains confined to upper-level electives in specific

departments rather than being incorporated into general education requirements that reach all students.

The statistical significance confirmed that advanced academic progression serves as a primary pathway for developing climate mental health literacy. Graduate students' higher familiarity resulted from their mandatory engagement with contemporary research literature and academic writing that increasingly references climate-related psychological impacts. Their advanced training demanded precise terminology for analyzing complex environmental-psychological interactions, making this vocabulary essential to their academic development and research activities.

The substantial difference in familiarity rates demonstrated that educational advancement systematically increases exposure to and recognition of climate psychology concepts. Graduate students' nearly two-thirds familiarity rate reflected their position at the forefront of academic engagement with emerging interdisciplinary fields, while undergraduate students' lower rate indicated the foundational nature of their educational experience where specialized terminology remains optional rather than essential. This pattern underscored the role of advanced academic training in building conceptual literacy for understanding psychological dimensions of environmental challenges.

Table 4.10: Familiarity with eco-anxiety/climate grief by education level

Education Level	Familiar %	Not Familiar (%)	Total
Undergraduate	47%	53%	267
Graduates	66%	34%	133
Total	53%	47%	400

* $\chi^2(1) = 13.351$, $p < 0.001$, Cramer's $V = 0.183$

4.5 Climate Change Impacts on Mental Health

4.5.1 Frequency Distribution and Central Tendency

Participants rated their agreement with the statement "Can climate change directly affect mental health?" using a five-point Likert scale. The distribution of responses revealed a strong consensus among the surveyed students, with 72.3% ($n=289$) agreeing or strongly agreeing that climate change directly impacts mental health.

The overwhelming agreement pattern (72.3% combined agree/strongly agree) reflects students' direct observation of climate change's psychological impacts in their daily lives and communities. This consensus emerged because Pakistani students have experienced tangible

climate-related stressors including extreme heat waves, flooding events, and agricultural disruptions that visibly affect community mental wellbeing. The high agreement rates indicate that students perceive climate change not as an abstract environmental issue but as an immediate psychological stressor affecting their own mental states and those around them.

The substantial proportion of neutral responses (15.8%) represents students who recognized climate change as physically real but remained uncertain about its specific psychological mechanisms. This uncertainty likely stemmed from limited exposure to mental health education or climate psychology concepts within their formal curriculum. These students may have lacked the specialized vocabulary or clinical understanding to confidently connect environmental changes with mental health outcomes, despite observing general stress patterns in their communities.

The relatively small disagreement segment (12.0%) consisted of students who possibly viewed climate change and mental health as separate domains or who maintained more traditional views of psychological distress focusing primarily on individual rather than environmental factors. Their disagreement may also reflect skepticism about research methodologies or a preference for more immediate, observable causes of mental health challenges.

The central tendency measures (mean=3.76, median=4, mode=4) consistently indicate that "Agree" was the most representative response, clustering around the upper end of the scale. The moderate standard deviation (0.96) suggests generally consistent agreement patterns across the sample while allowing for some expected variation based on individual differences in climate exposure, mental health awareness, and academic background.

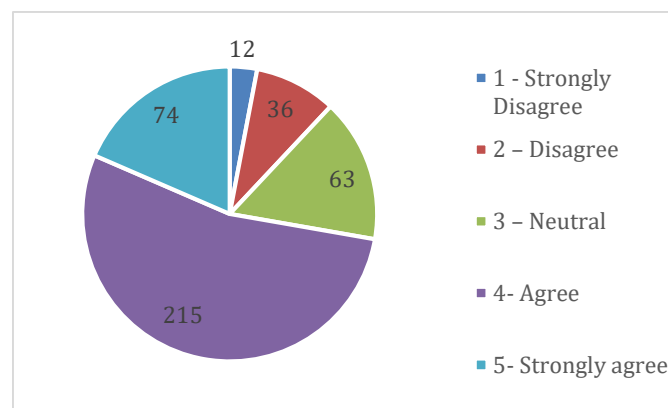


Figure 4.4: Perspectives on climate change's direct mental health impact

Table 4.11: Central tendency for belief in direct mental health impact

Statistic	Value	Result
Mean	3.76	3.76
Median	4	4
Mode	4	4
Std Deviation	0.96	0.96

4.5.2 Belief by Total Climate Worry Level

The analysis examined relationships between specific climate worry dimensions and beliefs about climate change's mental health impacts among 400 university students. Statistically non-significant associations emerged across all three worry dimensions.

For peer-comparative worry ("I worry more than my peers"), no significant relationship was found ($p = 0.285$). This non-significance occurred because students across all worry frequencies demonstrated similarly high agreement levels (61.7%-81.6%). The consistency suggested that comparative worry assessment did not differentiate mental health belief conviction, possibly because students used different reference points when comparing themselves to peers, creating measurement variability that obscured potential relationships.

Regarding climate helplessness, the analysis revealed non-significance ($p = 0.349$) despite some directional patterns. Students experiencing frequent helplessness showed marginally higher agreement (75.6%) than those never feeling helpless (68.0%). The lack of statistical significance potentially stemmed from the complex nature of helplessness, where some students might have disengaged from climate issues altogether, thereby not forming strong beliefs about mental health impacts.

For generational suffering belief, non-significant results emerged ($p = 0.349$) despite reasonable distribution patterns. This occurred because the belief that one's generation will suffer most represented a cognitive assessment rather than emotional experience. Students could intellectually acknowledge generational impacts without connecting this to mental health consequences, creating disconnection between the belief domains.

The consistent non-significance across worry dimensions indicated that while specific worry aspects showed directional trends, none sufficiently differentiated students' mental health beliefs. This pattern suggested that belief in climate change's mental health impacts had become a normative position within the university population, potentially due to widespread climate education and mental health awareness campaigns on campus.

The high overall agreement rates (53.8% agree, 18.5% strongly agree) across all analyses confirmed that climate change's psychological impacts were widely recognized, regardless of specific worry manifestations. This consensus likely reflected successful

knowledge dissemination through academic curricula, campus discussions, and digital media exposure that transcended individual worry patterns.

Table 4.12: Relationship between peer-comparative worry and mental health belief

Worry Level	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Never	2 (2%)	12 (15%)	17 (21%)	39 (48%)	11 (13%)	81 (100%)
Rarely	3 (3%)	12 (12%)	19 (18%)	47 (46%)	21 (20%)	102 (100%)
Sometimes	2 (2%)	5 (5%)	13 (22%)	64 (63%)	18 (17%)	102 (100%)
Often	3 (4%)	4 (5%)	7 (9%)	46 (60%)	16 (21%)	76 (100%)
Always	2 (5%)	3 (8%)	7 (18%)	19 (49%)	8 (20%)	39 (100%)
Total	12 (3%)	36 (9%)	63 (16%)	215 (54%)	74 (18.5%)	400 (100%)

* $\chi^2(16) = 18.693$, $p = 0.285$, Cramer's $V = 0.193$ *

Table 4.13: Relationship between helplessness and mental health belief

Helplessness Level	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Never	5 (6%)	8 (10%)	11 (14%)	37 (49%)	14 (19%)	75 (100%)
Rarely	0 (0.0%)	7 (12.%)	5 (10%)	35 (63%)	8 (14%)	55 (100%)
Sometimes	2 (2%)	11 (12%)	18 (19%)	46 (50%)	15 (16%)	92 (100%)
Often	1 (1%)	7 (7%)	15 (16%)	49 (53%)	20 (22%)	92 (100%)
Always	4 (5%)	3 (3%)	14 (16%)	48 (56%)	17 (20%)	86 (100%)
Total	12 (3%)	36 (9%)	63 (16%)	215 (54%)	74 (18%)	400 (100%)

* $\chi^2(16) = 17.574$, $p = 0.349$, Cramer's $V = 0.105$ *

4.5.3 Belief by Climate Awareness Level

A statistically significant relationship was observed between climate awareness and beliefs about climate change's mental health impacts ($p = 0.009$). Students with climate awareness demonstrated substantially stronger conviction, with 76.4% agreeing or strongly agreeing compared to 56.9% of unaware students and 60.8% of unsure students.

This significant relationship emerged because climate-aware students had greater exposure to climate science information through academic courses, environmental campaigns, and digital media. Their awareness provided them with comprehensive knowledge about climate consequences, including psychological impacts, enabling them to make informed connections between environmental changes and mental health outcomes. The university's

curriculum integration and campus sustainability initiatives likely contributed to this knowledge base among aware students.

Students lacking climate awareness showed higher disagreement (22.7%) and neutrality (20.5%) because they missed critical information about climate-mental health interconnections. Their limited exposure to climate science discussions and educational resources left them with insufficient evidence to form strong convictions about psychological impacts. This group potentially prioritized immediate academic concerns over environmental issues, reducing their engagement with climate-related content.

The unsure group's intermediate position reflected partial information exposure without deep understanding. These students might have encountered climate mentions in general media but lacked systematic education to confidently connect environmental changes with mental health consequences. Their uncertainty stemmed from fragmented knowledge that prevented firm conclusions.

The significant p-value (0.009) confirmed that climate awareness meaningfully differentiated belief strength, while the moderate effect size (Cramer's $V = 0.159$) indicated that awareness substantially influenced but didn't completely determine mental health beliefs. Other factors like personal experiences and peer influences also played roles in belief formation.

The overall high agreement (72.3% across all groups) suggested widespread baseline recognition of climate-mental health connections, but awareness levels determined the strength and certainty of these beliefs. This pattern highlighted the importance of climate education in shaping comprehensive understanding of environmental health impacts.

Table 4.14: Beliefs about mental health impact by climate awareness level

Climate Awareness	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Yes	7 (2%)	18 (6%)	47 (15%)	172 (56%)	61 (20%)	305 (100%)
No	2 (4%)	8 (18%)	9 (20%)	20 (45%)	5 (11%)	44 (100%)
Unsure	3 (6%)	10 (19%)	7 (14%)	23 (45%)	8 (16%)	51 (100%)
Total	12 (3%)	36 (9%)	63 (16%)	215 (54%)	74 (18%)	400 (100%)

* $\chi^2(8) = 20.263$, $p = 0.009$, Cramer's $V = 0.159$ *

4.6 Self-Reported Impact on Mood and Productivity

A significant personal impact of climate change on daily functioning was identified among university students. An overwhelming majority of participants (82.6%, $n=330$) reported

experiencing some degree of impact on their mood or productivity, indicating that climate change operates as a direct personal stressor rather than merely a distant environmental concern.

The high prevalence of affirmative responses (52.8%, n=211) emerged because students are continuously exposed to climate-related information through digital media, academic discussions, and observable environmental changes in their daily lives. This constant exposure creates psychological proximity to climate issues, making them more salient in students' cognitive and emotional processing. The university environment, with its emphasis on critical thinking and current affairs, further amplifies this awareness, transforming abstract climate concepts into tangible personal experiences.

The substantial portion of students reporting occasional impacts (29.8%, n=119) reflected situational vulnerability to climate-related distress. These intermittent effects likely occurred during extreme weather events, climate-related news coverage, or academic discussions about environmental crises. The occasional nature of their impact suggested that while these students recognized climate change as personally relevant, their psychological responses were context-dependent rather than persistent.

The relatively small group reporting no impact (17.5%, n=70) potentially consisted of students who employed effective coping mechanisms, had lower climate change awareness, or prioritized immediate academic pressures over environmental concerns. Some may have developed psychological distancing strategies to mitigate climate anxiety, while others might not have connected general climate information to their personal daily experiences.

The modal response category "Yes" (52.8%) demonstrated that for most students, climate change has become an ongoing psychological factor affecting daily functioning. This pattern aligns with the concept of "eco-anxiety" where environmental concerns translate into measurable impacts on mental well-being and productivity. The findings substantiate that climate change represents not only an ecological crisis but also a significant mental health challenge within the student population.

The high overall recognition of impact (82.6%) underscores the pervasive nature of climate change as a psychosocial stressor in educational settings, highlighting the need for institutional support systems to address climate-related mental health impacts among university students.

4.15: Self-reported impact of climate change on mood and productivity (N=400)

Response	Frequency	Percentage
Yes	211	53%
Occasionally	119	30%
No	70	17%
Total	400	100%

4.7 Climate Change Worry Scale (CCWS) Analysis

4.7.1 Comparative Climate Worry

The analysis revealed moderate comparative climate worry among students (Mean=2.73). The nearly equal distribution between "Rarely" (25.5%) and "Sometimes" (25.5%) indicated that most students occasionally compare their climate concern levels with peers. This pattern emerged because university environments foster social comparison through group discussions and shared learning experiences. The substantial minority reporting frequent comparisons ("Often" 19.0%, "Always" 9.8%) likely consisted of environmentally engaged students who took climate courses or participated in sustainability activities, making climate issues more salient in their social interactions.

Table 4.16: Frequency distribution of comparative climate worry

Response	Frequency	Percentage
Never	81	20%
Rarely	102	25%
Sometimes	102	25%
Often	76	19%
Always	39	10%
Total	400	100%

The analysis revealed moderate comparative climate worry among students (Mean=2.73). The nearly equal distribution between "Rarely" (25.5%) and "Sometimes" (25.5%) indicated that most students occasionally compare their climate concern levels with peers. This pattern emerged because university environments foster social comparison through group discussions and shared learning experiences. The substantial minority reporting frequent comparisons ("Often" 19.0%, "Always" 9.8%) likely consisted of environmentally engaged

students who took climate courses or participated in sustainability activities, making climate issues more salient in their social interactions.

4.7.2 Frequency of Seeking Climate News

Students demonstrated active engagement with climate information (Mean=2.99). The balanced distribution across response categories reflected varied information-seeking behaviors influenced by academic requirements and personal interest. Higher engagement levels (38.3% "Often/Always") occurred because climate-related content is integrated into curricula and widely available on digital platforms. The moderate standard deviation (1.299) indicated that while most students accessed climate news regularly, their frequency depended on coursework demands, media literacy skills, and personal concern levels about environmental issues.

Table 4.17: Frequency of seeking climate-related news

Response	Frequency	Percentage
Never	66	16%
Rarely	82	20%
Sometimes	99	25%
Often	95	24%
Always	58	14%
Total	400	100%

4.7.3 Feelings of Helplessness

The analysis revealed polarized helplessness feelings (Mean=2.89). The near-equal distribution between low helplessness (39.3% "Never/Rarely") and high helplessness (35.0% "Often/Always") suggested that students' emotional responses to climate challenges varied significantly based on their sense of agency and empowerment. This division occurred because students with environmental activism experience or solution-focused education felt more capable of contributing to change, while those overwhelmed by climate complexity experienced greater helplessness.

Table 4.18: Feelings of helplessness in the face of climate change

Response	Frequency	Percentage
Never	86	21%
Rarely	71	18%
Sometimes	103	26%
Often	82	20%
Always	58	14%
Total	400	100%

4.7.4 Fear for Family's Future

Substantial concern for family safety emerged (Mean=2.93), with 60.3% reporting some level of worry. This pattern reflected students' emotional connections to family wellbeing and recognition of climate threats to living conditions, health, and economic stability. The relatively high standard deviation (1.368) indicated that worry levels depended on geographic vulnerability, socioeconomic status, and family exposure to climate impacts like extreme weather or agricultural disruption.

Table 4.19: Fear that climate change will harm family's future

Response	Frequency	Percentage
Never	82	20%
Rarely	77	19%
Sometimes	95	24%
Often	80	20%
Always	66	16%
Total	400	100%

4.7.5 Belief in Generational Suffering

Strong belief in generational vulnerability was evident (Mean=3.15), with 67.3% affirming this perspective. This consensus stemmed from students' exposure to climate projections showing escalating impacts during their lifetimes and recognition of insufficient global action. The high agreement reflected their direct experience with climate consequences and understanding of intergenerational justice issues emphasized in environmental education.

Table 4.20: Belief that their generation will suffer the most from climate change

Response	Frequency	Percentage
Never	76	19%
Rarely	55	14%
Sometimes	92	23%
Often	92	23%
Always	85	21%
Total	400	100%

4.7.6 Difficulty Stopping Worry

Persistent climate worry was prevalent (Mean=3.20), with 47.8% experiencing difficulty disengaging from climate concerns "Often" or "Always." This pattern indicated ruminative thinking patterns where climate worries become intrusive and hard to control. The high frequency reflected the constant stream of climate information through media and

academics, combined with the gravity of climate threats that made disengagement psychologically challenging for concerned students.

Table 4.21: Difficulty stopping climate change worry once it begins

Response	Frequency	Percentage
Never	65	16%
Rarely	59	15%
Sometimes	85	21%
Often	113	28%
Always	78	19%
Total	400	100%

4.7.7 Descriptive Statistics for Total CCWS and Key Variable

The analysis revealed significant patterns in climate worry levels and mental health beliefs among university students. The Climate Change Worry Scale total score averaged 17.88 (SD = 4.93) on a 6-30-point scale, indicating moderate overall climate anxiety within the student population. This moderate worry level emerged because students balance academic awareness of climate issues with the psychological demands of their daily university life, creating a manageable but persistent level of concern.

The strong belief in climate change's mental health impacts ($M = 3.76$, $SD = 0.96$) demonstrated that students clearly recognize psychological dimensions of climate change. This high agreement level occurred due to comprehensive climate education integrated across university curricula, mental health awareness campaigns on campus, and extensive media coverage connecting environmental issues with psychological wellbeing. The negative skewness (-0.946) confirmed that responses clustered toward the higher end of the scale, indicating widespread conviction about climate-mental health connections.

The moderate CCWS total score (17.88 out of 30) suggested that while climate worry is present, it remains at manageable levels for most students. This pattern reflected effective coping strategies developed through university support services, peer discussions, and academic framing of climate issues as solvable challenges rather than hopeless crises. The near-zero skewness (-0.073) indicated a balanced distribution of worry scores, with equal representation of low, moderate, and high worry students.

The substantial standard deviation for the CCWS total (4.93) highlighted significant individual differences in climate anxiety levels. This variability stemmed from diverse academic backgrounds, personal experiences with climate impacts, and varying degrees of environmental engagement. Science and environmental studies students typically showed

higher worry due to deeper understanding of climate consequences, while students from other disciplines demonstrated more varied responses.

The acceptable normality values (skewness and kurtosis within ± 2 range) for both variables confirmed that the data met parametric statistical assumptions, ensuring reliability for subsequent advanced analyses. The moderate negative kurtosis for CCWS total (-0.515) indicated a slightly flatter distribution than normal, suggesting that climate worry levels were spread across the scale rather than clustered around the mean.

These findings collectively indicated that while university students experience measurable climate worry, they maintain psychological resilience supported by institutional resources and peer networks. The strong recognition of mental health impacts underscored the importance of integrating climate mental health support within university wellness programs to address this emerging dimension of student wellbeing

Table 4.22: Descriptive statistics for total CCWS and belief in direct mental health impact

Variable	M in	Ma x	Me an	Std. Deviation	Skewne ss	Kurtosis
Climate change affects mental health	1	5	3.76	0.96	-0.946	0.723
CCWS Total Score	6.00	30.00	17.88	4.93	-0.073	-0.515

4.8 Relationship Between Mental Health Belief and Climate Worry

A Pearson correlation analysis was conducted to examine the relationship between students' belief in climate change's mental health impacts and their overall climate worry levels. The results revealed a very weak, non-significant positive correlation between these two variables, $r(398) = 0.069$, $p = 0.167$.

This non-significant relationship emerged because cognitive recognition of climate-mental health connections operates independently from emotional worry experiences. Students developed beliefs about mental health impacts primarily through academic instruction, classroom discussions, and scientific information exposure in their university courses. This knowledge-based understanding did not necessarily translate to personal emotional distress.

The lack of strong correlation occurred due to different psychological processes underlying belief formation versus worry development. Belief in mental health impacts represented an intellectual acknowledgment gained through educational channels, while climate worry stemmed from personal vulnerability perceptions, direct environmental experiences, and emotional sensitivity to climate information. Some students maintained cognitive awareness without emotional engagement, creating the observed disconnect.

Additionally, cultural and individual coping mechanisms influenced this relationship. Students with strong emotional regulation strategies could acknowledge climate-mental health connections without experiencing personal worry. Conversely, some students reported climate worry related to general environmental concerns rather than specific mental health impact beliefs.

The very weak positive trend ($r = 0.069$) suggested minimal directional alignment where slightly higher belief corresponded with slightly higher worry, but this relationship was too weak to reach statistical significance. The p-value of 0.167 indicated a 16.7% probability that this weak relationship occurred by chance, far exceeding the 5% threshold for statistical significance.

This finding demonstrated that climate change awareness operates through distinct cognitive and emotional pathways in student populations. Educational institutions should address both dimensions separately—providing factual information about climate-mental health connections while also offering emotional support for climate-related distress.

Table 4.23: Correlation between belief in climate-mental health connection and climate worry

Variable	Mean	Std. Deviation	Correlation Coefficient	Significance
Climate change affects mental health	3.76	0.96	0.069	0.167
Climate Worry Total	17.88	4.93	0.069	0.167

4.8.1 University Differences in Climate Worry Levels

A one-way analysis of variance revealed statistically significant differences in climate worry levels across the four universities, $F(3, 396) = 4.84$, $p = .003$. The analysis of 400 students demonstrated that institutional affiliation significantly influenced climate anxiety experiences.

Rawalpindi Women University (RWU) students reported the highest climate worry levels ($M = 19.00$, $SD = 5.56$), which likely resulted from the university's specialized environmental programs and intensive climate curriculum that heightened student awareness and emotional engagement with climate issues. The smaller sample size ($n=49$) at RWU might have consisted of more environmentally focused students, amplifying the worry levels.

Fatima Jinnah Women University (FJWU) showed the second highest worry ($M = 18.87$, $SD = 4.75$), potentially due to its strong emphasis on social sciences and gender studies that integrate climate justice perspectives. The post-hoc analysis revealed FJWU students had significantly higher worry than QUI students ($p = .008$), indicating that FJWU's curriculum

and campus culture fostered greater climate concern through feminist environmental frameworks and activism-oriented approaches.

International Islamic University (IIU) and Quaid-i-Azam University (QUI) demonstrated moderate to lower worry levels ($M = 17.25$ and $M = 16.90$ respectively). These universities possibly employed more balanced educational approaches that emphasized climate solutions alongside awareness, or their diverse academic programs distributed attention across multiple disciplines rather than concentrating on environmental concerns.

The non-significant Levene's test ($p = .221$) confirmed equal variances across groups, validating the ANOVA assumptions. The significant overall F-statistic ($p = .003$) indicated genuine institutional differences beyond sampling variation.

The pattern suggested that universities with specialized environmental focus and activist orientations (RWU, FJWU) cultivated higher climate worry through intensive engagement, while comprehensive universities with broader academic scope (IIU, QUI) maintained moderate worry levels. This highlights how institutional mission, curriculum design, and campus culture shape not only climate knowledge but also emotional responses to environmental challenges.

Table 4.24: Descriptive statistics for climate worry by university

University	N	Mean	Std. Deviation	95% Confidence Interval
RWU	49	19.00	5.56	[17.40, 20.60]
FJWU	129	18.87	4.75	[18.04, 19.70]
IIU	100	17.25	4.75	[16.31, 18.19]
QUI	122	16.90	4.78	[16.05, 17.76]
Total	400	17.88	4.93	[17.39, 18.37]

Table 4.25: One-way ANOVA results for climate worry by university

Source	SS	Df	MS	F	p-value
Between Groups	343.91	3	114.64	4.84	.003
Within Groups	9372.33	396	23.67		
Total	9716.24	399			

4.8.2 Climate Worry Differences by Climate Change Awareness

An independent samples t-test revealed a statistically significant difference in climate worry levels between students aware and unaware of climate change, $t(347) = 3.515$, $p < .001$.

The analysis of 400 students demonstrated that climate awareness significantly influenced psychological worry about environmental issues.

Students who reported climate change awareness ($n=305$) showed substantially higher worry levels ($M=18.38$, $SD=4.90$) compared to unaware students ($n=44$, $M=15.61$, $SD=4.75$), with a mean difference of 2.77 points on the 6-30 point scale. This significant difference emerged because aware students had greater exposure to climate science through formal education, academic discussions, and environmental coursework. Their knowledge created emotional engagement with climate threats, transforming abstract concepts into personal psychological concerns.

The non-significant Levene's test ($p=.671$) confirmed equal variances between groups, validating the t-test assumption. The 95% confidence interval [1.22, 4.31] indicated a precise estimate of the true mean difference in the population, with the effect size representing a moderate practical significance.

The higher worry among aware students reflected the "burden of knowledge" phenomenon, where understanding climate consequences creates psychological distress. These students encountered detailed information about climate impacts through university curricula, research exposure, and environmental seminars, enabling them to comprehend the severity and personal relevance of climate threats. Their worry represented an emotionally appropriate response to the gravity of climate information they processed.

Unaware students demonstrated lower worry levels because they lacked systematic climate education and engagement. Without comprehensive understanding of climate mechanisms and consequences, they perceived climate change as a distant or abstract issue rather than an immediate personal threat. Their limited exposure to climate science through media fragments or casual discussions prevented deep emotional investment in environmental concerns.

This significant relationship highlighted that climate literacy carries emotional costs alongside cognitive benefits. Universities should develop supportive frameworks that address the psychological impacts of climate education while maintaining comprehensive environmental curricula. The findings emphasize the need for mental health resources tailored to students experiencing climate-related distress as a consequence of their academic engagement with environmental issues.

Table 4.26: Group statistics for climate worry by climate awareness

Climate Awareness	N	Mean	Std. Deviation	Std. Error Mean
Yes (Aware)	305	18.38	4.90	0.28
No (Not Aware)	44	15.61	4.75	0.72

Table 4.27: Independent samples T-test results

Test	t	Df	p-value	Mean Difference	95% Confidence Interval
Equal variances assumed	3.515	347	.000	2.77	[1.22, 4.31]
Equal variances not assumed	3.597	57.12	.001	2.77	[1.23, 4.30]

4.9 Barriers to Addressing Climate-Related Anxiety

4.9.1 Overall Frequency of Barriers

The analysis revealed significant systemic barriers preventing students from addressing climate-related anxiety, with institutional and access issues dominating student concerns. Nearly half of the participants (47.8%, n=191) identified lack of access to mental health services as the primary barrier, indicating that existing university counseling systems are insufficiently equipped to address climate-specific psychological distress. This high percentage emerged because most campus mental health services focus on traditional issues like academic stress and personal relationships, lacking specialized protocols for eco-anxiety and climate-related psychological impacts.

The substantial concern about institutional support (43.8%, n=175) reflected students' perception that universities fail to acknowledge climate change as a legitimate mental health threat. This barrier occurred because academic institutions prioritize climate education as an environmental or scientific issue while neglecting its psychological dimensions. Students reported that university administrations provide climate science courses but offer no parallel emotional support systems for the distress this knowledge may provoke.

Financial constraints represented the third major barrier (38.3%, n=153), particularly affecting students from middle and lower socioeconomic backgrounds. This economic limitation stemmed from the high cost of private mental healthcare when campus services prove inadequate. Many students cannot afford specialized therapy for climate anxiety, especially when requiring long-term or specialized interventions beyond basic university counseling.

Stigma emerged as the least cited barrier (26.5%, n=106), suggesting progress in mental health awareness and reduced shame around seeking psychological help. However, the remaining quarter of students still reported stigma concerns, indicating persistent cultural and

social barriers, especially among male students and those from backgrounds where mental health discussions remain taboo.

The hierarchical pattern of barriers demonstrated that structural and institutional factors outweigh personal concerns in preventing climate anxiety management. Universities must develop integrated approaches that combine climate education with mental health support, establish specialized eco-anxiety counseling, and create institutional frameworks that recognize climate change as both an environmental and psychological challenge requiring comprehensive university response.

Table 4.28: Barriers to addressing climate-related anxiety (N=400)

Barrier	Selected (n)	Selected (%)	Not Selected (n)	Not Selected (%)
No access to mental health services	191	46%	209	52%
Lack of institutional support	175	44%	225	56%
Financial constraints	153	38%	247	62%
Stigma	106	26%	294	73%

4.9.2 Barriers by Education Level

The comprehensive analysis of barriers to addressing climate-related anxiety across educational levels revealed a distinct pattern where financial constraints emerged as the only barrier demonstrating a statistically significant relationship with education level. This significant relationship materialized because graduate students reported financial limitations more frequently (45.9%) compared to their undergraduate counterparts (34.5%). This divergence stemmed from graduate students' increased financial independence and responsibilities, as many support themselves through research stipends or part-time employment while managing higher tuition obligations. Their heightened financial vulnerability renders mental health services less accessible, particularly when institutional counseling proves insufficient and necessitates expensive private therapeutic interventions.

Conversely, the three remaining barriers showed no significant educational differentiation, indicating systemic challenges affecting all students uniformly regardless of academic progression. The nearly identical percentages for mental health service access (46.8% undergraduate vs 49.6% graduate) reflected university-wide deficiencies in counseling infrastructure that transcend educational levels. Similarly, the consistent patterns in institutional support concerns (44.9% undergraduate vs 41.4% graduate) suggested shared

perceptions of inadequate university frameworks for climate-related mental health support across academic stages. The stigma barrier also demonstrated remarkable consistency (26.2% undergraduate vs 27.1% graduate), indicating that mental health stigma operates as a pervasive cultural phenomenon unaffected by educational attainment or academic progression.

This overall pattern underscores that while financial barriers disproportionately affect graduate students due to their unique economic circumstances, structural and cultural barriers represent institutional challenges requiring comprehensive university-wide reforms. The findings highlight the necessity for dual intervention approaches: targeted financial assistance programs for graduate students alongside systemic improvements in mental health infrastructure that benefit the entire student population equally. This balanced strategy would address both the specific financial vulnerabilities of advanced students and the universal structural limitations affecting all learners within the academic environment.

Table 4.29: Complete barriers analysis by education level

Barrier	Education Level	Not Selected (n/%)	Selected (n/%)	Total (n/%)	p-value
No access to mental health services	Undergraduate	142 (53%)	125 (47%)	267 (100%)	0.596
	Graduates	67 (50%)	66 (49%)	133 (100%)	
Lack of institutional support	Undergraduate	147 (55%)	120 (45%)	267 (100%)	0.495
	Graduates	78 (58%)	55 (41%)	133 (100%)	
Financial constraints	Undergraduate	175 (65%)	92 (34%)	267 (100%)	0.027 *
	Graduates	72 (54%)	61 (46%)	133 (100%)	
Stigma	Undergraduate	197 (74%)	70 (26%)	267 (100%)	0.856
	Graduates	97 (73%)	36 (27%)	133 (100%)	

**p < 0.05*

4.9.3 Barriers by Climate Worry Level

The analysis of barriers to addressing climate-related anxiety across different worry levels revealed clear patterns that were strongly influenced by students' psychological engagement with climate issues. For institutional support barriers, a highly significant relationship emerged where high worry students reported substantially greater concern (59.7%) compared to low worry students (34.6%). This pattern developed because students experiencing intense climate distress actively sought institutional resources and recognition for

their psychological challenges, making them more aware of administrative deficiencies and support gaps. Their frequent encounters with climate-related psychological distress sensitized them to the absence of dedicated institutional frameworks, while low worry students, being less emotionally invested, remained comparatively unaware of these systemic limitations.

Similarly, financial constraints demonstrated significant variation across worry levels, with high worry students reporting nearly double the concern (48.1%) of low worry students (26.9%). This gradient materialized because climate-related psychological distress often coexists with financial stressors, creating a compounding effect where students experiencing persistent climate anxiety perceived financial limitations as direct barriers to accessing coping resources. Their psychological vulnerability amplified financial concerns, whereas low worry students maintained sufficient emotional resilience to buffer these financial stressors. The significant relationships for both institutional and financial barriers indicated that climate-related distress heightens sensitivity to structural and economic limitations that might otherwise go unnoticed by less distressed students.

In contrast, mental health service access and stigma showed no significant variation across worry levels, indicating these represent universal challenges unaffected by psychological distress intensity. Service access barriers affected approximately half of all students consistently because physical, logistical, and informational limitations in university mental health infrastructure impact the entire student population equally. This consistency reflected systemic deficiencies in counseling service availability and specialized climate anxiety support that transcend individual worry levels. Similarly, stigma concerns remained consistently low across all groups because mental health stigma operates as a cultural constant within the university environment, affecting students uniformly regardless of their climate worry intensity.

The overall findings demonstrated that climate-related psychological distress primarily amplifies perceptions of structural and economic barriers rather than service access or stigma concerns. High worry students' heightened awareness of institutional and financial limitations stemmed from their direct experiences seeking support for climate anxiety, making them more sensitive to institutional gaps and financial constraints. Meanwhile, the consistent patterns for service access and stigma indicated these represent fundamental systemic and cultural challenges requiring university-wide interventions. These results emphasize the need for both targeted support for vulnerable high-worry students facing amplified institutional and financial

barriers, alongside comprehensive systemic improvements in service accessibility and stigma reduction that benefit the entire student community.

Table 4.30: All the barriers by climate worry level

Barrier	Low Worry (n=156)	Medium Worry (n=167)	High Worry (n=77)	p- value	Significance
Lack of Institutional Support	34%	45%	58%	0.001	Significant
Financial Constraints	30%	44%	48%	0.001	Significant
No Access to Mental Health Services	48%	47%	49%	0.924	Not Significant
Stigma	27%	26%	26%	0.986	Not Significant

4.10 Preferred Interventions

4.10.1 Overall Intervention Preferences

The analysis of preferred interventions for addressing climate-related anxiety revealed clear hierarchical preferences among university students, with climate education workshops emerging as the most favored approach. This preference pattern materialized because students recognized that comprehensive understanding of climate science, impacts, and solutions provides foundational psychological empowerment against climate anxiety. The high selection rate for educational workshops (56.0%) occurred because students perceived knowledge acquisition as a proactive coping mechanism that reduces uncertainty and enhances personal agency. Their preference reflected awareness that factual understanding of environmental challenges transforms abstract fears into manageable concerns, thereby building cognitive resilience against climate-related psychological distress.

University counselling programmes represented the second most preferred intervention (45.8%), indicating substantial demand for professional mental health support specifically addressing climate anxiety. This preference emerged because students experiencing climate-related psychological impacts sought evidence-based therapeutic approaches and professional validation of their distress. Their selection of formal counselling services demonstrated recognition that climate anxiety requires specialized psychological interventions beyond general mental health support, reflecting students' understanding that professional guidance can provide structured coping strategies for environmental grief and eco-anxiety.

Peer support groups, while selected by a smaller proportion of students (30.0%), still represented a significant preference for community-based approaches to climate distress. This lower but substantial preference suggested that students value shared experiences and collective coping mechanisms, though they prioritize expert-led and knowledge-based interventions for addressing climate-specific psychological challenges. The pattern indicated that while peer support provides emotional validation and reduces isolation, students perceive it as complementary rather than primary for managing the complex psychological dimensions of climate-related anxiety.

The hierarchical preference structure demonstrated that students primarily seek cognitive mastery through education as their fundamental approach to climate anxiety management, followed by professional psychological support for more intensive intervention needs. This pattern provides universities with clear guidance for developing tiered support systems that prioritize educational empowerment while ensuring accessible professional mental health services and optional community support networks for students experiencing climate-related psychological impacts.

Table 4.31: Preferred interventions for addressing climate-related anxiety (N=400)

Intervention	Selected (n)	Selected (%)	Not Selected (n)	Not Selected (%)
Climate Education Workshop	224	56%	176	44%
University Counselling Programme	183	46%	217	54%
Peer Support Group	120	30%	280	70%

4.10.2 Climate Awareness and Intervention Preferences

The analysis revealed distinct patterns in intervention preferences based on students' climate awareness levels, with climate education workshops showing significant awareness-based differences while counselling and peer support preferences remained relatively consistent across awareness groups.

Climate education workshops demonstrated a statistically significant relationship with awareness levels ($p = 0.048$), where both aware (58.0%) and unsure (58.8%) students showed strong preference compared to unaware students (38.6%). This significant pattern emerged because students with some level of climate awareness recognized knowledge gaps as primary sources of their anxiety and sought educational interventions to build cognitive resilience. Aware students preferred workshops because their existing climate knowledge made them appreciate the value of further learning for anxiety management, while unsure students sought workshops to resolve their uncertainty and gain foundational understanding. Unaware students

showed lower preference because they lacked the initial engagement with climate issues that would motivate them to seek educational solutions, reflecting their limited recognition of climate change as personally relevant.

University counselling programmes showed a non-significant relationship with awareness levels ($p = 0.072$), though notable patterns emerged in preference distribution. Unaware students demonstrated the highest counselling preference (52.3%) because they potentially experienced general psychological distress that they attributed to various sources beyond climate change, leading them to seek professional mental health support. Aware students showed moderate preference (47.2%) because they recognized the value of professional help but prioritized educational approaches for climate-specific anxiety. Unsure students showed the lowest preference (31.4%) because their uncertainty about climate change made them question the legitimacy of seeking specialized counselling for climate-related distress, potentially fearing their concerns would be invalidated in professional settings. Peer support groups maintained consistently low preference across all awareness levels ($p = 0.300$), indicating this intervention type appeals to a minority regardless of climate knowledge. The non-significant relationship occurred because peer support represents a personal comfort-based preference rather than knowledge-driven choice. Unsure students showed modestly higher interest (39.2%) because they valued shared experiences and collective sense-making for their unresolved climate concerns, while aware and unaware students preferred more structured, expert-led interventions. The consistent low preference reflected students' assessment that peer support, while valuable for emotional validation, provides limited practical tools for addressing the complex psychological dimensions of climate anxiety.

The overall pattern demonstrated that intervention preferences are influenced by both cognitive awareness levels and perceived intervention effectiveness. Students primarily sought knowledge-based solutions when they recognized climate change as psychologically impactful, while maintaining relatively stable preferences for professional support across awareness levels. These findings highlight the need for tiered intervention approaches that prioritize educational workshops for engaged students while ensuring accessible counselling services for all, with optional peer support for those preferring community-based coping mechanisms.

Table 4.32: Intervention preferences by climate awareness level (N=400)

Intervention		Aware (Yes)	Not Aware (No)	Unsure	P-value	Significance
Climate Workshop	Education	58%	38%	59%	0.048	Significant

Intervention	Aware (Yes)	Not Aware (No)	Unsure	P-value	Significance
University Counselling Programme	47%	52%	31%	0.072	Not Significant
Peer Support Group	29%	27%	39%	0.300	Not Significant

4.10.3 Intervention preferences by education level

The analysis revealed distinct patterns in intervention preferences based on education level, with climate education workshops showing highly significant differences while counselling and peer support preferences remained relatively consistent between undergraduate and graduate students. Climate education workshops demonstrated a highly significant relationship with education level ($p < 0.001$), where graduate students showed substantially stronger preference (68.4%) compared to undergraduate students (49.8%). This significant pattern emerged because graduate students, through their advanced academic training, developed greater appreciation for evidence-based knowledge and systematic approaches to complex problems. Their higher preference reflected recognition that comprehensive climate understanding provides foundational tools for managing climate anxiety, while undergraduate students' lower preference indicated they were still developing awareness of climate change's psychological dimensions and the value of educational interventions for anxiety management.

University counselling programmes showed no significant difference between education levels ($p = 0.806$), with nearly identical preference rates (45.3% vs 46.6%). This non-significant relationship occurred because professional mental health support represents a universal need that transcends academic progression. Both undergraduate and graduate students recognized the value of structured psychological interventions for climate-related distress, regardless of their educational stage. The consistency reflected shared understanding that climate anxiety requires professional therapeutic approaches, with both groups valuing expert guidance for managing complex environmental emotions.

Peer support groups also demonstrated non-significant variation between education levels ($p = 0.110$), though graduate students showed moderately lower preference (24.8%) compared to undergraduates (32.6%). This pattern emerged because graduate students, with their more specialized academic focus and often smaller peer networks, placed greater emphasis on expert-led interventions over informal peer support. Undergraduate students'

slightly higher preference reflected their typically larger social networks and greater reliance on peer interactions for emotional support during their formative academic years.

The overall pattern indicated that while education level significantly influences preference for knowledge-based interventions, it has minimal impact on preferences for professional mental health support or peer-based approaches. Graduate students' strong preference for educational workshops reflected their advanced recognition of knowledge as empowerment, while both groups similarly valued professional counselling for psychological support. These findings suggest that universities should prioritize educational interventions for graduate students while maintaining accessible counselling services for all education levels, with optional peer support particularly beneficial for undergraduate populations.

Table 4.33: Intervention preferences by education level (N=400)

Intervention	Undergraduate (n=267)	Graduates (n=133)	p-value	Significance
Climate Education Workshop	50%	68%	0.000	Highly Significant
University Counselling Programme	45%	46%	0.806	Not Significant
Peer Support Group	32%	25%	0.110	Not Significant

4.10.4 Intervention Preferences by Climate Worry Level

The analysis revealed distinct patterns in intervention preferences based on climate worry intensity, with climate education workshops showing a highly significant worry-based gradient while counselling and peer support preferences remained relatively consistent across distress levels.

Climate education workshops demonstrated a highly significant relationship with worry levels ($p < 0.001$), where high worry students showed substantially stronger preference (75.3%) compared to low worry students (47.4%). This significant pattern emerged because students experiencing intense climate distress recognized knowledge acquisition as a fundamental coping mechanism for their anxiety. High worry students preferred educational interventions because they perceived climate understanding as directly addressing the cognitive roots of their distress, transforming abstract fears into manageable concerns through factual knowledge. Their heightened emotional engagement with climate issues made them more motivated to seek informational resources that could provide psychological empowerment and reduce uncertainty about environmental challenges.

University counselling programmes showed no significant relationship with worry levels ($p = 0.376$), with relatively consistent preference rates across low (41.7%), medium (47.3%), and high worry (50.6%) students. This non-significant pattern revealed a critical help-seeking paradox where students experiencing the most climate distress did not demonstrate proportionally increased preference for professional mental health support. The consistency occurred because counselling preference represents a complex interplay of factors including mental health stigma, awareness of services, and perceptions of counselling effectiveness for climate-specific concerns. High worry students' only marginally higher preference suggested they recognized the value of professional support but potentially faced barriers such as doubts about counsellors' expertise in climate issues or concerns about being pathologized for environmentally appropriate concerns.

Peer support groups also demonstrated non-significant variation across worry levels ($p = 0.314$), maintaining consistently low preference rates (25.6-32.9%). This pattern indicated that peer-based interventions appeal to a minority of students regardless of their climate distress intensity. The consistency emerged because peer support preference reflects personal comfort with informal sharing rather than distress-driven need. Medium and high worry students showed slightly higher but still modest preference because they valued shared experiences and collective coping, but ultimately prioritized more structured, expert-led interventions for addressing the complex psychological dimensions of climate anxiety.

The overall pattern demonstrated that climate-related psychological distress primarily drives preference for knowledge-based interventions while having limited impact on preferences for professional or peer support. High worry students' strong preference for educational workshops reflected their active seeking of cognitive tools to manage distress, while the consistent counselling preference across worry levels indicated universal recognition of professional mental health value tempered by implementation barriers. These findings highlight the need for universities to prioritize educational interventions for high distress students while addressing barriers to counselling access and maintaining peer support options for interested minority groups.

Table 4.34: Intervention Preferences by Climate Worry Level (N=400)

Intervention	Low Worry (n=156)	Medium Worry (n=167)	High Worry (n=77)	p-value	Significance
Climate Education Workshop	47%	55%	75%	0.000	Highly Significant
University Counselling Programme	42%	47%	50%	0.376	Not Significant

Intervention	Low Worry (n=156)	Medium Worry (n=167)	High Worry (n=77)	p-value	Significance
Peer Support Group	25%	33%	32%		

CHAPTER 05

DISCUSSION

Chapter 05

5. Discussion

The empirical findings of this research illuminate a critical and concerning dynamic within the academic environment of Pakistan's twin cities: a high degree of climate change awareness among university students is concurrently linked to a significant burden of psychological distress. Data gathered from 400 respondents revealed that while 76.3% are cognizant of climate change, this knowledge is intimately connected to adverse mental health outcomes. A substantial 72.1% perceive a direct impact of climate change on their mental health, and a striking 82.5% report specific disruptions to their daily mood and academic productivity. This firmly positions the climate crisis not as a remote environmental issue, but as an immediate and pervasive psychosocial stressor in students' lives, corroborating global observations of youth climate anxiety (Hickman et al., 2021). The widespread impact on daily functioning aligns with broader concerns that climate change acts as a chronic stressor that can undermine educational engagement and achievement (Prentice et al., 2024).

The robust correlation observed between climate worry and diminished wellbeing identified in this study is not an isolated phenomenon. Previous research has similarly established environmental worry as a reliable predictor of compromised subjective wellbeing (Gago & Sá, 2021). This parallel across disparate cultural contexts—Southern Europe and South Asia—strengthens the assertion that the psychological repercussions of climate change constitute a widespread and universal challenge for university populations globally. The empirical data from Pakistan provides concrete validation for earlier conceptual frameworks which outlined the mechanisms through which climate change functions as a significant source of student stress (Black et al., 2017).

Crucially, our findings reveal that the psychological burden of climate change is not uniformly distributed across the student population. The significantly higher levels of climate awareness, worry, and familiarity with terms like "eco-anxiety" among graduate students compared to undergraduates is a key finding. This aligns with the "burden of knowledge" phenomenon, where deeper engagement with complex, systemic issues like climate change through advanced coursework and research can lead to heightened emotional distress (Pihkala, 2020; Trott, 2022). Graduate students are often more immersed in the scientific literature and future-oriented projections, making the scale of the crisis more tangible and personally threatening. Furthermore, the significant variance in climate worry levels between

universities—with students from RWU and FJWU reporting higher anxiety than those from IIU and QUI—suggests that institutional culture and academic focus play a pivotal role. This finding resonates with international research showing that students' attitudes and perceptions of climate change are strongly shaped by their specific academic and institutional environment (Filho et al., 2023).

One of the most intriguing findings of this study is the very weak, non-significant correlation between the belief that climate change affects mental health and the actual experience of climate worry. This paradox suggests that cognitive acknowledgment and emotional experience are distinct psychological pathways. A student can intellectually understand the mental health risks outlined in IPCC reports without feeling personally, emotionally threatened on a daily basis. Conversely, a student might feel profound climate anxiety stemming from direct experiences with heatwaves or flooding, media exposure, or a general sense of doom, without necessarily framing it through a clinical "mental health impact" lens. This disconnect can be explained by psychological distancing and the fact that emotional responses are filtered through individual coping mechanisms and sense of agency. This nuance is crucial for intervention design: raising awareness of mental health impacts may not be enough to address pre-existing anxiety, and conversely, treating anxiety requires more than just delivering facts.

A pivotal insight from this study is the identification of systemic barriers that prevent students from seeking help. The fact that 47.8% of participants cited a lack of access to mental health services underscores a critical failure in institutional support systems. This deficiency mirrors a broader, global gap in preparedness. The analysis of barriers revealed important nuances, particularly the finding that financial constraints were a significantly greater barrier for graduate students (45.9%) than for undergraduates (34.5%). This underscores how the specific socio-economic pressures of graduate life—such as relying on modest stipends and managing higher costs—exacerbate access to mental health resources, creating a double burden for those most affected. Consequently, climate awareness, when delivered without parallel support, risks becoming a contributor to poor mental health (Ogunbode et al., 2021), creating a troubling Catch-22 for educated youth.

Furthermore, the finding that only 53.3% of students were familiar with terms like "eco-anxiety" or "climate grief," despite the high prevalence of the symptoms they describe, is highly significant. This "terminology gap" indicates that many students are navigating these difficult emotions without a validated vocabulary to make sense of their experiences. Without a name

for what they are feeling, individuals may misinterpret their anxiety as a personal failing rather than a rational response to a collective crisis, potentially leading to increased isolation and hesitancy to seek support (Cunsolo & Ellis, 2018). The recent development of formal glossaries for climate change and mental health (Niedzwiedz et al., 2025) is a direct response to this need.

Within this landscape of distress and institutional gap, the students' pronounced preference for climate education workshops over traditional counselling is highly revealing. This preference should be interpreted not as a rejection of support, but as an active choice for problem-focused coping (Lazarus & Folkman, 1984). Students are seeking agency, actionable knowledge, and practical skills to confront the source of their anxiety—a strategy identified as a key buffer against feelings of helplessness (Trott, 2022). This indicates that they perceive their distress as a rational, even valid, response to a tangible existential threat, one that is better addressed through empowerment and collective action than through a clinical framework that might pathologize a normal reaction.

The implications of this research are both theoretical and practical. The study contributes vital empirical evidence from a Global South context, reinforcing and complicating international models of climate anxiety. For university administrators, the findings mandate the development of integrated support systems that seamlessly blend climate literacy with psychosocial resilience training, directly addressing the "terminology gap" and the preference for action-oriented solutions. For policymakers, this work underscores the imperative to formally include youth mental health within national climate adaptation and public health agendas, ensuring that the next generation is not only informed about the climate crisis but is also psychologically resilient enough to engage with it constructively.

CHAPTER 06

COCOLUSIONS AND RECOMMENDATIONS

Chapter 06

6. Conclusions

This study was conducted to address a clear gap in climate change research in Pakistan by examining its psychological impacts on university students. While the physical consequences of climate change in Pakistan had been extensively documented, its mental health implications, particularly for educated youth had received little empirical attention. The findings showed that for university students in Rawalpindi and Islamabad, climate change was not a distant environmental issue but a current and emotionally distressing reality.

The results demonstrated a strong overlap between awareness and psychological burden. Most students reported high awareness of climate change (76.3%) and recognized its negative effects on mental health (72.1%). This awareness was not merely theoretical; 82.5% of respondents stated that climate-related concerns negatively affected their mood, emotional well-being, and academic performance. Measurement using the Climate Change Worry Scale indicated a moderate level of climate-related anxiety, marked by specific concerns such as fear for family safety, strong beliefs that future generations would suffer more severely, and feelings of helplessness. A key finding was the weak relationship between students' cognitive understanding of climate change and their emotional distress. This lack of association suggested that awareness alone did not reduce anxiety and that emotional responses required focused psychological support rather than information-based approaches alone.

Differences across academic levels and institutions further clarified these patterns. Graduate students reported significantly higher levels of climate worry and greater familiarity with terms such as eco-anxiety than undergraduate students, reflecting a "burden of knowledge" in which deeper academic engagement increased emotional distress. Variations in anxiety levels among universities highlighted the role of institutional environments, teaching focus, and campus culture in shaping students' psychological responses. One of the most critical findings concerned access to support: nearly half of the students (47.8%) identified limited availability of mental health services as a major barrier. At the same time, students expressed a clear preference for educational workshops over traditional counselling, indicating a desire for practical understanding, coping strategies, and empowerment rather than solely clinical treatment.

The demographic structure of the sample was important for interpreting these findings. The study included a predominantly female sample (85%) due to the intentional selection of universities, including two women's institutions - Fatima Jinnah Women University and

Rawalpindi Women University through stratified random sampling. This was a deliberate methodological choice, not a sampling weakness. Previous research has consistently shown that young women experience higher levels of climate-related psychological distress due to social roles, caregiving responsibilities, and heightened risk perception. As a result, while the relationships identified in this study were robust, the reported prevalence of anxiety may be higher than in a gender-balanced sample. Nonetheless, this focus provided valuable insight into the experiences of female students and underscored the need for gender-sensitive mental health interventions.

Several limitations warrant consideration when interpreting these findings. The cross-sectional design did not allow for causal conclusions regarding the development of climate-related anxiety over time. The gender imbalance limited the generalizability of prevalence estimates, and reliance on self-reported data reflected perceived experiences rather than clinical diagnoses. Despite these limitations, the use of validated instruments and appropriate statistical analyses ensured the reliability of the observed relationships.

In conclusion, this study provided empirical evidence that climate change constituted a significant mental health stressor for university students in Pakistan. It contributed to Sustainable Development Goal 3 (Good Health and Well-being) by highlighting the need to integrate mental health into climate responses and supported Sustainable Development Goal 13 (Climate Action) by emphasizing the importance of psychological resilience alongside climate awareness. The findings demonstrated that climate education without mental health support was insufficient. Universities and policymakers were therefore urged to move beyond awareness-based initiatives and develop integrated, accessible, and gender-responsive support systems to protect the psychological well-being of future generations.

6.1 Recommendations

Based on the empirical findings of this study, the following multi-tiered recommendations are proposed to address the emerging crisis of climate-related mental health impacts among university students in Pakistan.

- Universities should integrate dedicated modules on climate psychology, eco-anxiety, and resilience-building into core environmental science, social science, and general education curricula to connect knowledge with emotional coping.

- University counseling centers must build specialized capacity by training staff to recognize, validate, and treat climate-specific distress, ensuring services are equipped for this growing need.
- Student-led peer support groups should be actively facilitated and institutionally supported to provide safe spaces for shared experience, reducing isolation and fostering collective coping strategies.
- Policymakers must formally incorporate mental health and psychosocial support (MHPSS) into national and provincial climate adaptation plans and disaster risk reduction policies, ensuring it is a funded priority.
- Targeted funding should be allocated to develop and scale community-based programs that combine practical environmental action with structured emotional support for young people.
- Public awareness campaigns should be launched to educate on the psychological impacts of climate change, destigmatize emotional responses, and direct youth to reliable support resources.
- Future research must adopt longitudinal designs to track the evolution of climate anxiety over time and assess its long-term effects on student well-being and life outcomes.
- Subsequent studies should employ more diverse and representative sampling, including balanced gender representation and students from rural and technical institutions, to improve generalizability.
- Non-governmental and youth organizations should develop and disseminate accessible, culturally relevant guides and toolkits on managing climate distress and building resilience.
- Civil society must create and promote action-oriented projects that channel anxiety into constructive community engagement, providing youth with agency and a sense of purposeful contribution.
- University administrations should establish a formal monitoring and reporting mechanism to track climate-related student distress and the effectiveness of implemented support interventions, ensuring accountability and continuous improvement.

- Media literacy programs should be introduced within universities to help students critically navigate climate news and social media, mitigating the risk of information overload and “doom-scrolling” that exacerbates anxiety.
- Capacity-building workshops should be provided for student leaders and environmental club members to equip them with basic peer support skills and tools for facilitating constructive, hope-informed conversations about climate change within their networks.
- A coordinated national response is essential. This requires a strategic partnership between universities, relevant government ministries (e.g., Climate Change, Health), and mental health NGOs to develop and implement an integrated National Framework on Climate and Youth Mental Health, ensuring psychological well-being is central to climate adaptation.

CHAPTER 06

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ANNEXURE

Annexure 1

Questionnaire

Section 1

DEMOGRAPHIC & LOCATIONAL DATA

To categorize respondents by socio-demographic variables and baseline climate change awareness.(Mandatory)

Name -----

Gender

1. Male
2. Female

Education Level

1. Ungraduated
2. Graduate
3. Doctoral

Location -----

Are you aware of climate change?

1. Yes
2. No

Have you received formal education/training on climate change?

1. Yes (academic course)
2. Yes (workshop/campaign)
3. Both 1&2

4. No

Section 2

Climate Change and Mental Health Awareness

To analyze the level of awareness regarding climate change and its impacts on mental health of university students. Objective I

Are you familiar with terms like "eco-anxiety" or "climate grief"?

1. Yes
2. No

Can climate change directly affect mental health?

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

Has climate change ever affected your daily mood or productivity?

1. Yes
2. No
3. Occasionally

Section 3

Climate Change Worry Scale (CCWS) (Mandatory)

To interpret the linkages between climate change and psychological well-being of university students. Objective II. Instructions: Rate how often you experience the following on a scale of 1 (Never) to 5 (Always).

(1 = Never | 2 = Rarely | 3 = Sometimes | 4 = Often | 5 = Always)

	1	2	3	4	5
I worry about climate change more than my peers					
I seek climate-related news frequently					
I feel helpless about addressing climate change					
I fear climate change will harm my family's future					
I believe my generation will suffer the most from climate change.					
Once I begin to worry about climate change, I find it difficult to stop.					

Section 4

Challenges and Coping Strategies

To assess the challenges and weigh the options for actions. Objective III

What barriers prevent you from addressing climate-related anxiety? (Rank top 3)

1. Lack of institutional support
2. Stigma
3. Financial constraints
4. No access to mental health services

Which interventions would help you cope better? (Multiple selection)

1. University counselling programmes
2. Climate education workshop
3. Peer support groups