IMPACT OF CLIMATE ON HEALTH: A SURVEY BASED STUDY

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I. ABSTRACT

Climate change, characterized by a long-term alteration in global or regional weather patterns, poses a significant threat to human health. The change in the climate poses a multifaceted risk to human health. The interplay of rising temperatures, extreme weather events, and altered environmental conditions come with a variety of health problems, such as heat-related sickness, exacerbated respiratory and cardiovascular diseases, altered patterns of infectious diseases, disrupted food and water security, and mental health issues. This paper addresses the complex interrelationship between climate change and human health, examining the different influencesof climate change on numerous aspects of well-being. Examining both short-term and longterm impacts, it offers a thorough review of the direct and implied effects of climate change on psychological and physical health. In this research, the random sampling method is used and the survey is conducted on the university population. The data reveals that most of the population surveyed faced numerous physical and psychological health issues. Allergies, heat strokes, colds, asthma, and rashes are the common issues that the majority of the surveyed population go through. The change in the climate also harms the mental health of the sample. People have a lot of trouble concentrating and attending classes. According to research ability to socialize and perform well in academics is also decreased in certain weather conditions. The surveyed population also suggested some ways that they use to mitigate the impact of climate on their health. Awareness, yoga, exercise, staying hydrated, and social support are the most suggested or used ways to fight back against climate change on their levels. This paper also provides insight into the various issues and ways to mitigate them.

KEYWORDS

Climate change, Health, Mental health, skin issues, respiratory health, social support

INTRODUCTION

One of the most important issues of our day-to-day life is the changing climate. Climate change is deemed "the greatest threat to global health in the 21st century" by the World Health Organisation (WHO). The intricate relationship between climate and health has gained significant attention over the past few decades as the effects of a changing climate become more pronounced. The effect of climate change on health is a complicated and complex topic that encompasses a huge range of environmental, social, and biological factors. This research paper aims to provide a comprehensive analysis of the intricate interplay between climate and health, exploring various aspects and dimensions of this critical issue.

The long-term changes in Earth's temperature, precipitation, and atmospheric conditions are referred to as climate change. Global warming is mostly caused by human activities such as deforestation, burning of fossil fuels, and industrial operations that emit greenhouse gases into the atmosphere. Heatwaves, floods, droughts, and storms are among the extreme weather occurrences that we are facing increasingly frequently. Human health is impacted both directly and indirectly by these climate changes.

The following health issues will be covered in the research paper:

- Heat-related illnesses and deaths
- Respiratory illnesses, such as asthma and chronic obstructive pulmonary disease (COPD)
- Cardiovascular diseases, such as heart disease and stroke
- Malnutrition
- Waterborne diseases, such as cholera and typhoid
- Vector-borne diseases, such as malaria, dengue fever, and Zika • Mental health problems, such as stress, anxiety, and depression

The paper will discuss the following for each health issue:

- The prevalence of the issue
- The health dangers related with climate change
- The populations most vulnerable to the health risks
- Adaptation and mitigation strategies

The paper will also discuss the following cross-cutting issues:

- The role of social determinants of health in the result of climate on health
- The need for equity and justice in climate change modification and mitigation
- The importance of intersectoral collaboration in addressing the health impacts of climate change.

The impact of climate on health is a multifaceted concept that encompasses various dimensions:

1. Direct Health Impacts: Heat-related ailments, such as heatstroke and fatigue, can be lethal when temperatures are high. Warmer weather can also cause pre-existing medical illnesses to worse, such as respiratory and cardiovascular ailments. On the other hand, cold weather can also pose health risks, especially to vulnerable populations, as it increases the likelihood of hypothermia and other cold-related ailments.
2. Vector-Borne Diseases: The geographical distribution and actions of disease-carrying vectors, such as lice and mosquitoes, can shift due to climate change. Thus, the spread of illnesses like Lyme disease, dengue fever, and malaria is impacted. The geographic range of these vectors can be expanded by changes in temperature and precipitation patterns, which raises the possibility of spreading diseases to previously unaffected areas.
3. Food and Water Security: Water supply and food production are both affected by climate change. Water scarcity, decreased agricultural output, and crop failures can all result from extreme weather occurrences. These challenges can result in food insecurity and malnutrition, leading to a variety of health issues, especially in vulnerable populations, such as children and the old people.
4. Air Quality: Climate changes can impact air quality, with higher temperatures contributing to the formation of ground-level ozone and particulate matter. Poor air quality is associated with respiratory diseases like asthma and bronchitis, and it can worsen cardiovascular conditions. Increased wildfire activity, often exacerbated by climate change, can also result in smoke and ash pollution that further deteriorates air quality.
5. Mental Health: The psychological impacts of climate change are increasingly recognized. Extreme weather events, displacement due to flooding or wildfires, and the uncertainty of a changing climate can lead to stress, anxiety, and depression. These mental health issues can have a profound impact on individuals and communities.

6. Vulnerable Populations:

Children: Children are at more risk of the health impacts of climate change because their bodies are still developing. They are also more likely to live in poverty and have less reach to resources to help them cope with climate change.

Older adults: Older adults are also more exposed to the health impacts of climate change. They are more likely to have chronic health conditions that make them more susceptible to heat stress and other climate-related health problems. People with disabilities: People with disabilities are more likely to need assistance evacuating during extreme weather events and accessing healthcare services. They may also be more vulnerable to the health impacts of air pollution.

Low-income communities: Low-income communities are more likely to live in areas that are more vulnerable to extreme weather events and air pollution. They may also have less access to resources to fight with the health impacts of climate change.

7. Resilience and Adaptation: Building resilience and adapting to climate change is crucial for reducing its impact on health. This includes improving healthcare infrastructure, enhancing disaster preparedness, and implementing public health policies to address the specific health risks associated with climate change.

Understanding the multifaceted relationship between climate and health is essential for policymakers, healthcare professionals, and individuals to make informed decisions and take proactive actions to protect public health in the face of ongoing climate change. This research paper aims to contribute to this understanding and provide a comprehensive overview of the impact of climate on health, serving as a valuable resource for those seeking to address this critical global issue.

LITERATURE REVIEW

Climate change and its impact on health

Environmental change is the drawn-out change in the climate circumstances of a particular area. Human exercises like deforestation and farming reason environmental change, multiplying ozone-depleting substances (Bhardwaj,2023). Rising ocean levels, demolishing air quality, increasing specific outrageous climate occasions, and warming temperatures are only a couple of the impacts of environmental change. Our food, drinking water, air, and encompassing weather conditions are being influenced by these impacts, which represent a well-being risk. Human well-being might be influenced by various outrageous environmental change-related conditions, including diminished admittance to clean water and food, decayed scaffolds and streets, correspondence disturbances, obstructed admittance to drug stores and

medical services offices, and an expansion in stomach and digestive ailments. Climate change and mental health

(Hayes and others, 2018) There are several direct, indirect, and systemic pathways linking climate change to mental health, with the most vulnerable groups bearing a disproportionate amount of the effects. Positive psychosocial outcomes as well as mental health problems and disorders can result from climate change's influence on mental health. The opportunities to attribute mental health to climate change support both climate mitigation and mental health action as well as psychosocial resilience, even though the timing and causes associated with the effects of climate change on mental health can vary, causing it difficult to establish the myriad links between climate change and mental health.

Climate change and respiratory health

This study investigated the threat that climate change is posing to the respiratory health of people. The health risks posed by climate change are comparable to those posed by cigarette smoking. The earth has already warmed significantly due to increased concentrations of greenhouse gases, particularly CO2, in the atmosphere. These gases have caused more frequent and intense heat waves, temperature variability, air pollution, forest fires, droughts, and floods, all of which put people's respiratory health at risk (Bernstein A et al., 2013). Due to these changes in the environment and air quality, patients with common chronic lung illnesses such as asthma, COPD, and other major lung diseases have much higher rates of respiratory morbidity and death. Similar to their role with tobacco, physicians play a critical role in addressing climate change by informing their patients about the serious but treatable risks associated with it.

Climate change and skin diseases

The implications of climate change on human health are really multidisciplinary, affecting almost all medical specialties now or in the future. Dermatology is not exempt from these dangers. (Rosenberg and Silva, 2020). The prevalence and frequency of determalogic disorders, especially those linked to infectious etiologies, sun exposure, environmental irritants, and aquatic transmission, will be impacted by the manner in which our planet's climate is changing. Climates that facilitate the spread of microbes are already changing the prevalence of infectious skin diseases (viral, fungal, and vector-borne), with a tendency toward expanding the regional distributions of cases (Coates et al., 2019, Kaffenberger et al., 2017). For instance, research has revealed clear correlations between the weather and the occurrence and severity of hand, foot, and mouth disease, an enteroviral-associated skin condition (Coates et al., 2019, Stewart et al. 2013, Liu et al. 2015). The increased geographic range and incidence of fungal skin

infections, such coccidioidomycosis, are mostly caused by warmer average temperatures and changing windstorm patterns (Benedict and Park, 2014, Kaffenberger et al., 2017, Marsden-Haug et al., 2013).

Association between Social support and health outcomes

The aim of this research was to investigate the impact of social support on health outcomes and the link between social support and health outcome factors. The results suggested that people with higher levels of social support may also exhibit more positive behaviors and role functions related to their health, as well as psychosocial adjustment, life adjustment, coping strategies, health beliefs, and behaviors that promote their health, well-being, and sense of selfactualization. Higher levels of social support could have prevented sadness, role load, stress, and physical and psychological signs and reactions in the affected persons. (Wang et al., 2003). Social support, as demonstrated by Cohen's study, significantly influenced self- actualization and quality of life; however, it had only minor effects on physical symptoms and responses, depression, role burden, coping behavior, and behavior linked to health promotion; and on health status, psychologic symptoms and responses, role function and behavior, psychosocial adjustment, adjustment of life, stress, health belief, and well-being.

The effect of summer heat on academic performance

This study looked into how summer heat affected students' academic performance. The test results from five distinct cohorts were merged with daily temperature data at the city level for this study. They discovered that the summer heat had a detrimental effect on kids' exam scores. Specifically, for every extra summer day with a maximum temperature above 34 °C, test scores for math and English decreased by 0.0042 and 0.0064 standard deviations, respectively, as comparison to days with a maximum temperature between 28 and 30 °C. On the reading test results, no discernible impacts were discovered. In order to investigate if the summer temperature the next year would have an impact on the test results this year, this article ran a placebo test and found no evidence of this kind. Furthermore, these impacts did not vary according to gender, although they were stronger in comparatively colder cities. Finally, the summer of the previous year had a detrimental impact on the test results of the current year.

Side effects of seasons on health

Seasonal changes are the period of year when an adult is afflicted twice on average, while children can be impacted up to four times. This is associated with heightened exposure to and viral transmission of several respiratory pathogens as well as allergens such as pollen. The human body's metabolism adapts to changing weather conditions at the same time. Elevated body temperatures have the potential to cause heat stress and impact the body's defense and immune systems. The weather has a big impact on youngsters, individuals with immunocompromised immune systems, and those with chronic illnesses, according to Dr. Rohini Kelkar, a specialist at Metropolis Healthcare Ltd. and a senior consultant in clinical microbiology. This article discusses ways to keep healthy as the seasons change as well as the potentially harmful repercussions of doing so.

OBJECTIVES

- To assess public perception and awareness levels regarding the health risks posed by climate change
- To examine the relationship between climate and the incidence of climate-sensitive diseases. o To explore the demographic differences in vulnerability and adaptive capacity to the health effects of climate change.
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METHOD

Sampling technique

The participants in this study were chosen using random sampling. Each member of the target population had an equal chance of being included in the study because of the random sampling technique. To ensure the representation of a range of demographics and viewpoints, a sample frame was constructed, and participants were chosen at random from it.

Sample population

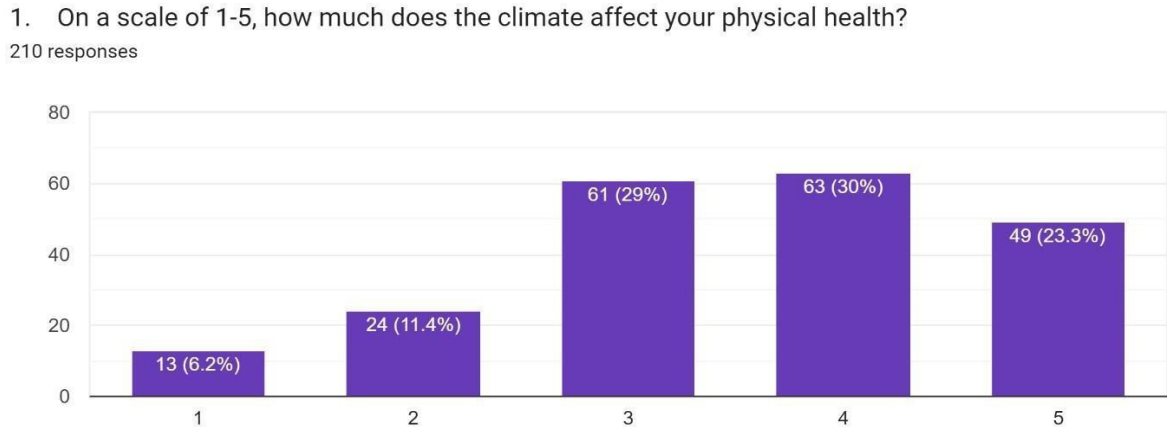
The total number of students at Lovely Professional University is 30,000 approx. Using a random sampling formula and keeping a margin of error at 6.75% number of the people to be surveyed was calculated. A total of 210 individuals were surveyed for this research.

DATA COLLECTION

A systematic survey was created to collect data on attitudes, experiences, and concerns about how climate change is affecting health. With both closed-ended and open-ended questions, the questionnaire allowed for both qualitative insights into participants' viewpoints and quantitative analysis of certain factors. The questionnaire was distributed to participants in the form of google form. To preserve confidentiality, participants were chosen using a systematic random selection technique from the target population, which comprised people of various ages and regions.

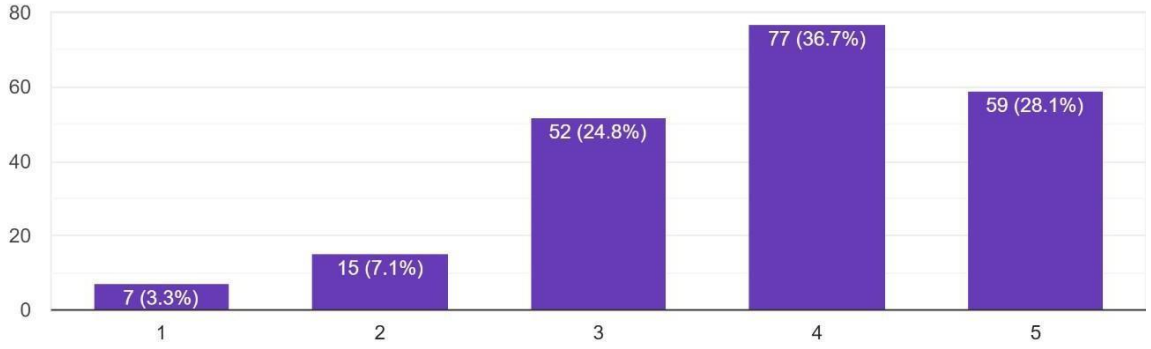
Using statistical software, quantitative information from closed-ended questions was examined to provide descriptive statistics like percentages and frequencies. Thematic analysis was used to find common themes and patterns in the qualitative data collected via open-ended question

RESULT



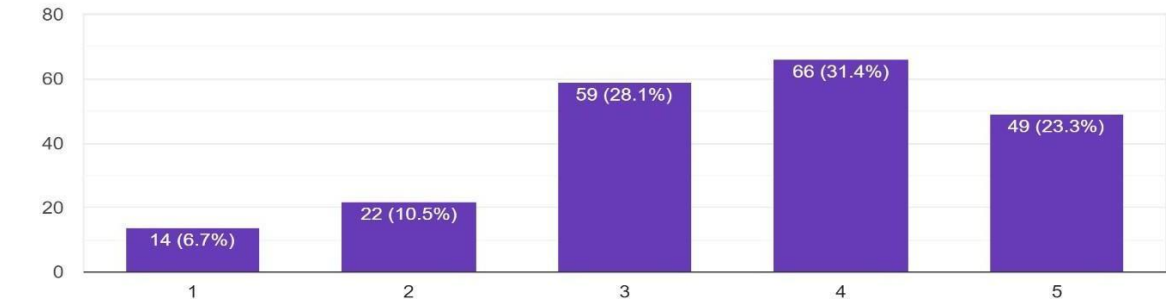
The results of the research show that on the scale of 1-5 over 29% of the responders agreed that the climate moderately affects their physical health. Whereas 53.3% responders agreed that the climate extremely to very extremely affected their physical health and only 17.6 % responded that climate has very negligible to negligible effect on their physical health.

2. On a scale of 1-5, how much does the climate affect your mood and emotional well-being?
210 responses



Moving ahead in our study, 24.8% responders agreed that climate moderately affects their mood and well being. When in fact 64.8% agreed that climate extremely affects their mood and well being and only 10.4% responders have very negligible to negligible affects of the same.

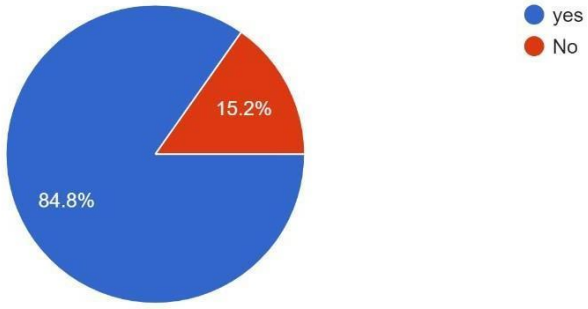
3. How concerned are you about the mental health effects of climate change on your health?
210 responses



During Covid-19 Indian society more opened on mental health and further in our study we wanted to know how much people are concerned about the mental health effects of climate change on health. The study finds that 28.1% of responders are moderately concerned, 54.7% of responders are very extremely to extremely concerned and only 17.2% of responders are very less to less concerned about the same.

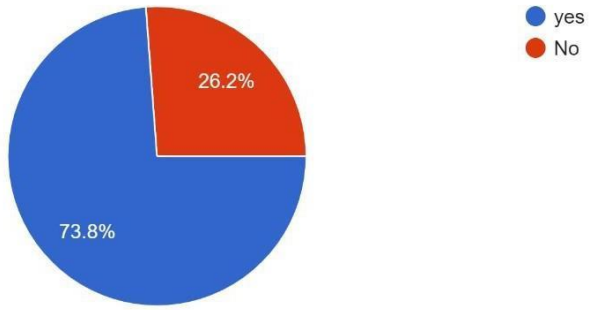
4. Have you ever experienced climate-related health issues such as heat strokes, colds, or allergies?

210 responses



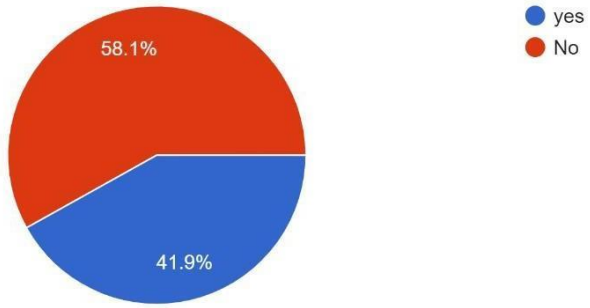
5. Do you feel more stressed or anxious during certain weather conditions?

210 responses

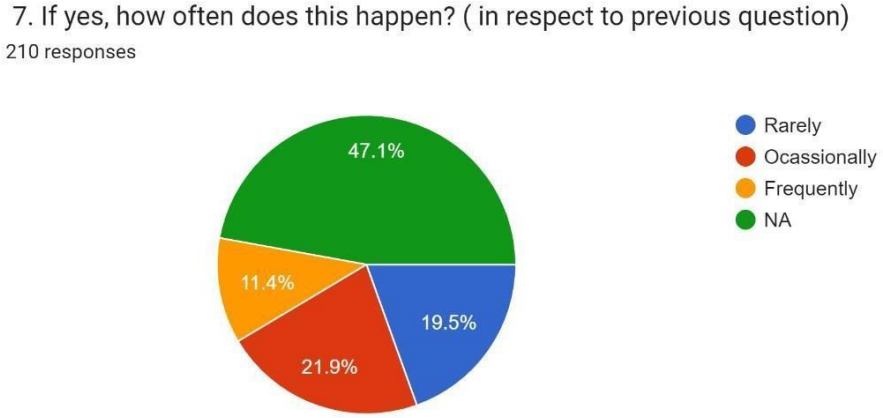


6. Have you ever experienced respiratory issues (like asthma attacks, or shortness of breath) due to changes in weather or air quality?

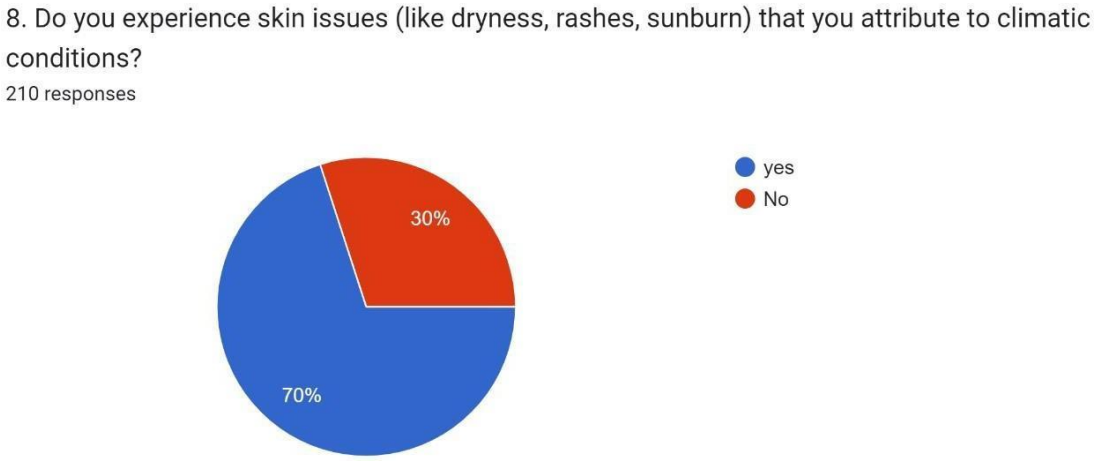
210 responses



Further in our study, 84.8% responders experienced climate-related health issues such as heat strokes, colds or allergies and only 15.2% responders have not experienced this. 73.8% responders felt more stressed or anxious during certain weather conditions while 26.2% responders have not felt the same. 41.9% responders experienced respiratory issues (like asthma attacks, or shortness of breath) due to change in weather or air quality, Whereas 58.1% responders have not experienced it.

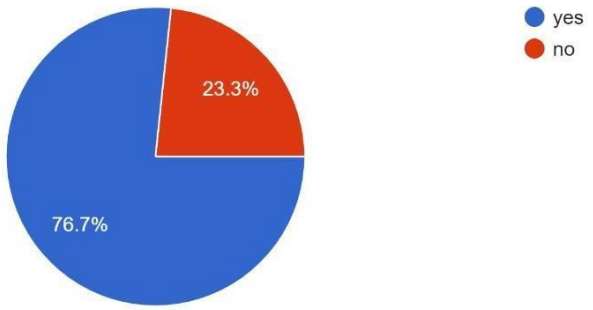


Out of 41.9% responders, 11.4% responders experienced it frequently, 21.9% responders experienced it occasionally and 19.5% responders experienced it rarely.



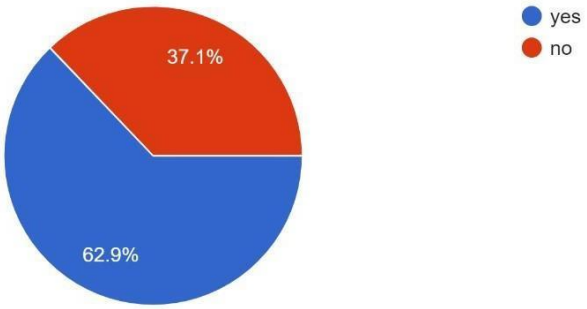
70% of responders experienced skin issues whereas 30% of responders have not.

10. Do climatic conditions influence your willingness to socialize or participate in outdoor activities?
210 responses



76.7% agreed climatic conditions influence willingness to socialize or participate in outdoor activities.

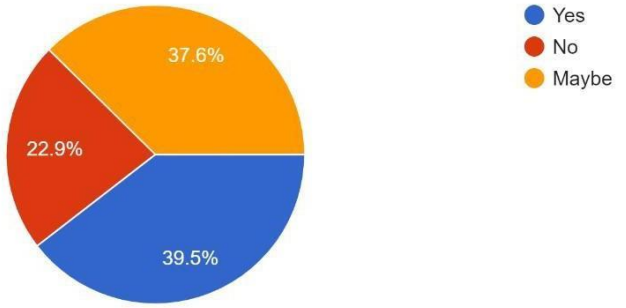
11. Do you believe climatic conditions (e.g., extreme heat, cold) affect your academic performance?
210 responses



62.9% of responders believe climatic conditions affects academic performance.

13. Do you think climate change could have long-term effects on your health?

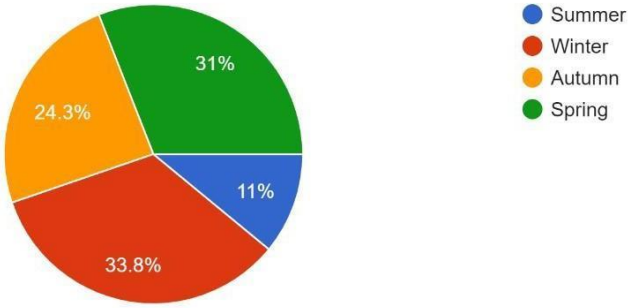
210 responses



39.5% of responders agreed that climate change could have long-term effects on health, 37.6% are not not sure and 22.9% don't agree with the same.

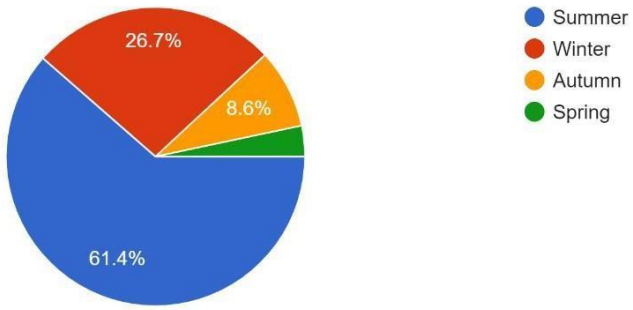
14. Which season do you feel has the most positive impact on your health?

210 responses



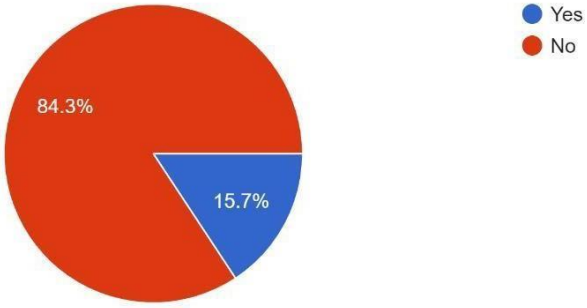
31% of responders feels that spring season, has the most positive impact on their health. Whereas for 24.3% it's autumn season, For 33.8% it's winter season and for 11% it's summer season.

15. Which season do you feel has the most negative impact on your health?
210 responses



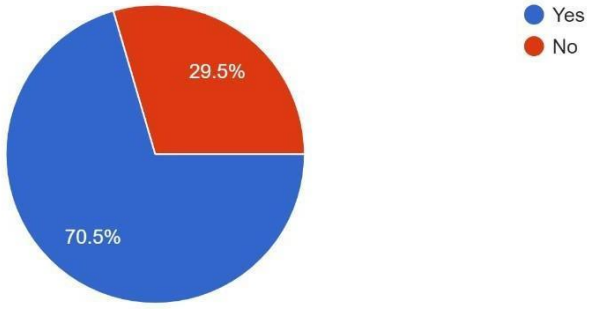
61.4% of responders feel summer season has the most negative impact on their health and for 26.7% it's winter season.

16. Have you sought professional help or counseling for any climate-related mental issues?
210 responses



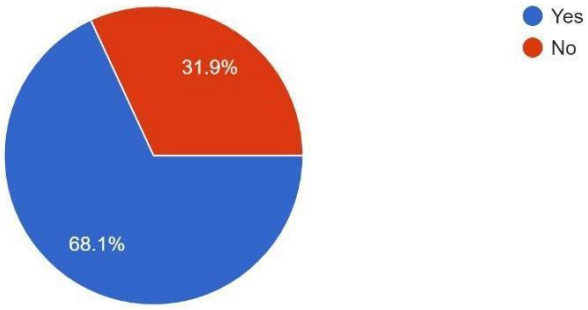
Moreover 84.3% responders have not sought professional help or counselling for any climaterelated mental issues.

17. Do you take any measures to mitigate the impact of climate on your health? (e.g., using air purifiers, staying hydrated)
210 responses



70.5% responders takes measures to mitigate the impact of climate on their health and

18. Have you made any lifestyle changes to adapt to climatic conditions? (e.g., diet, exercise)
210 responses



even 68.1% have made lifestyle changes to adapt to climatic conditions.

DISCUSSION

The conducted study shows that most of the people's physical health is affected by Climate change extremely. The reason for this could be worsening air quality that causes severe respiratory diseases, extereme high temperature that results in heatwaves and skin related issues like sunburn and dryness. Degrading air quality can negatively impact mental health to be specific depression and anxiety. Storms and floods are becoming more common and extreme weather occurrences due to climate change. Individuals who experience these may be exposed to potentially traumatic experiences, such as seeing someone seriously hurt or killed. Many will experience increased anguish as a result, and some people may experience more severe mental

health issues like depression, substance abuse disorders, or post-traumatic stress disorder. All these leads to awareness among people about climate change and it's effects on mental health and hence the outcome shows that the concern about the mental health effects of climate change on health is high. The majority of the people have even sought professional help or counselling for climte-related mental issues.

Nearly all the people experienced climate-related health issues such as heat strokes because of increase in temperature and high humidity. Especially during Summer Season when the temperature is at peak people try to stay indoors and rarely go out in afternoons. So climate change also affects participation in outdoor activities. Almost everyone faces acute skin-issues like sunburn and rashes. All this adds to how summer season negatively affects people's health. Individuals faces respiratory issues because of degrading air quality that causes shortness of breath and this happens almost with half of the studied individuals. Some even believes that climate change could have long-term effects on health.

A lot of student's academic performance is getting hampered because of extreme heat and cold. Students can't concentrate in overheated classrooms that's too warm or shivering in one that's too cold.

Some believe the winter season has the most positive impact on health this could be because the temperature is cooler, so no heatwaves. It also helps people sleep better and it can improve moods. Cooler temperature boosts the brain and people can think more clearly. This is because winter requires less glucose to function. The chilly weather could turn out beneficial to your heart when you are getting ready for winter outdoor workouts. Exercise is an enjoyable and hard exercise when done in chilly weather. To make up for this and maintain the body's proper temperature, the heart pumps more blood that is oxygenated.

A large portion of the surveyed population shared the ways that they use to mitigate the effect of the climate. Visiting a dermatologist or a doctor, applying sunscreen of specific SPF, using moisturizer, wearing full clothes covering their body, and drinking a lot of water were some of the most common ways used to avoid heat strokes or sunburns. People also pointed out that social support has a positive role in modifying the impact of climate change. Taking advice from the parents, and having family and friends around in illness cast a positive shadow and help the individual to recover smoothly. To cope with the stress of climate change participants showed a greater interest in yoga and meditation. They also recommended working out in the gym, following one’s hobbies such as listening to music, playing any instrument, cleaning, etc.

Eating a healthy and balanced diet, engaging in self-care activities, and having an adequate amount of sleep are the most used methods to cope with the stress of climate change.

CONCLUSION

This study conducted in-depth research, revealing the various ways in which environmental change has a significant influence on people's well-being. There is no doubt the major connection between climate change and human health, which affects social, psychological, and physical facets of existence. The findings unambiguously show the serious harm that climate change causes to physical health. The body's ability to maintain equilibrium is greatly impacted by the signs of a changing environment, which can include anything from an increase in illnesses linked to heat to the exacerbation of respiratory conditions like asthma and COPD. Temperature variations in temperature can have a number of detrimental impacts, such as skin disorders, respiratory problems, and even poor performance in school.

An aspect that is frequently overlooked but equally important is how climate change affects mental health. Mental health is threatened by the stress, worry, and despair brought on by harsh weather and unpredictability in the environment. However, the study highlights a positive aspect: people's increased awareness and proactive steps taken to lessen negative consequences. The propensity to modify one's lifestyle or seek help from professionals highlights an increasing awareness of the impact of climate change on mental health.

All things taken into account, the study reveals the complex picture of how climate change affects health—one of interlinked vulnerabilities, resilience, and the necessity of group action. To proactive solve these issues, it demands a coordinated effort from everyone involved, including individuals, healthcare providers, and government. It is critical to understand and mitigate the health effects of climate change to protect the health of present and future generations.

The many implications of climate change on health are being brought to light by this study, which emphasizes the need for comprehensive, inclusive efforts to lessen these effects, build resilience, and clear the path for a healthier, more environmentally conscious future.

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