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Impact of climate change on young adults

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Abstract

Climate change has become a global concern with far-reaching consequences, including effects on mental well-being (Youth Climate Action Report ,2021). It Impacts the overall population but It has a great potential of having psychological and emotional effects on adults as there is more exposure of adults to external climate. As the climate crisis intensifies, individuals are increasingly exposed to extreme weather events, environmental degradation, and the uncertainty surrounding the future. These factors can contribute to a range of mental health challenges, including anxiety, depression, and stress. The purpose of the study is to examine the impact of climate change on 157 young adults aged 18-29 years by employing purposive sampling technique. The study employs three main measurement tools, Climate Change Anxiety Scale (CCAS) , Patient Health Questionnaire 9(PHQ), and Environmental Identity Scale (EIS). Appropriate statistical analysis was used to analyse the data using SPSS Software (26th Version). The findings will provide insights into the psychological, functional, and experiential consequences of climate change on young adults and contribute to a better understanding of these impacts. The findings revealed a strong positive correlation between direct encounters with climate-related events, perceptions of climate change as a threat, and functional and emotional impairments that have a negative impact on mental health. Additionally, there was a favourable correlation found between mental health symptoms and behavioural engagement in climate-related activities.

Keywords: Climate change, environment , young adults , mental health

One of the most important worldwide issues of the twenty-first century is climate change, which has profound effects on social, economic, and environmental systems. The Earth's climate system is undergoing unprecedented changes due to human activity, specifically the burning of fossil fuels and deforestation, as reported with increasing certainty by the Intergovernmental Panel on Climate Change (IPCC). As a result, there are now serious risks to both current and future generations due to the increased frequency and severity of extreme weather events, increasing sea levels, and ecological changes (Edenhofer & Seyboth, 2013) .

Amidst the many facets of climate change's effects, focus is growing on how these factors affect people's mental health and general wellbeing. The awareness of these psychological effects has spurred researchers and professionals to investigate the complex connection between climate change and mental health, especially in vulnerable groups like young adults.

Study was conducted for the comprehensive analysis of the impacts of global climate change on mental health, focusing on three categories of climate-related events: acute events (e.g., hurricanes, floods, wildfires), subacute or long-term changes (including drought and heat stress), and existential threats from long-lasting changes (such as rising temperatures and sea levels). The review explores both direct consequences (such as heat stress) and indirect consequences (including economic loss, displacement, and alienation) of climate change on mental health. It underscores the necessity for targeted interventions and policy measures to address these multifaceted challenges (Palinkas & Wong, 2020).

The Youth Climate Action Report (2021) states that climate change is not only an environmental phenomenon but also a significant determinant of psychological and emotional discomfort, highlighting the growing concern about climate-related mental health issues. According to the survey, people—especially young adults between the ages of 18 -29 years are more vulnerable to extreme weather, environmental degradation, and a general sense of unpredictability as the climate crisis worsens. These pressures can then lead to a variety of mental health issues, from widespread stress and emotional upheaval to elevated levels of anxiety and depression (Watts et al., 2021).

Significant psychological effects of climate change are demonstrated by striking figures that highlight the severity of the damage to mental health. Studies reveal a significant increase in stress and anxiety levels linked to climate-related worries. For instance, a study that appeared in the Lancet Planetary Health journal found that for every 1°C increase in global temperatures, there is a corresponding 2% increase in mental health-related ER visits in the United States. Comparably, research from the American Psychological Association (APA) indicates that an astounding 72% of Americans report feeling stressed out in one way or another as a result of climate change, with nearly 30% experiencing extremely high

levels of stress. Furthermore, the World Health Organization (WHO) projects a startling increase in mortality linked to climate change, projecting an extra 250,000 deaths each year between 2030 and 2050,mostly related to heat stress, diarrhoea, malaria, and malnutrition—all of which are linked to mental health issues including depression and anxiety (Vecellio et al., 2023).

Furthermore, there is evidence linking climate change to an increased incidence of depression, especially following natural disasters that are made worse by climate-related variables. Research that has been published in the Proceedings of the National Academy of Sciences (PNAS) indicates that those who are directly affected by such events may experience long-lasting psychological effects, such as depression and post-traumatic stress disorder (PTSD). Interestingly, Australian research indicates that people who experience climate-related disasters like floods and bushfires have far higher rates of depression symptoms than people who do not experience these kinds of events.

Another study conducted in Hanoi sought to address this gap, employing a mixed-methods approach with 1,444 participants from both non-slum and slum areas. Results reveal a notable awareness of climate change and its health effects among respondents, with approximately one-third reporting increased family illnesses during recent summers and winters compared to five years ago. Hot weather symptoms include headaches and fatigue, while cold weather brings coughs, fevers, and respiratory ailments. Additionally, cardiovascular diseases and emerging infectious diseases like dengue were reported, underscoring the diverse health risks associated with climate change in the region (Toàn et al., 2014) .

Methodology

Aim

Assessing the impact of climate change on mental health of young adults .

Sample

The Present study was conducted on 157 young adults within the age range of 18-29 years .

Inclusion Criteria

Inclusion criteria for assessing the impact of climate change on young professionals aged 18-35 should be defined to ensure that the study captures the desired population.

- Include individuals within the specified age range of 18-29 years to focus on the target group of young adults .
- Include individuals residing in regions or countries that are relevant to the study's research scope or where climate change impacts are of interest.
- Include individuals who provide informed consent to participate in the study, ensuring that they understand the purpose of the research, its procedures, and any potential risks or benefits associated with their participation.

Exclusion Criteria :

Depending on the specific research objectives and study Design there are some exclusion criteria that needs to be considered ,

- Excluded the age outside the specified age range of 18-29 years in order to maintain the target group .
- Excluded the individuals who had severe mental health conditions , or any other factors that may significantly impact their ability to comprehend or respond to the assessment accurately .

Design

A quantitative research design was employed to assess the impact of climate change on young adults. The Climate Change Anxiety Scale (CCAS), a validated instrument, was administered to measure climate change anxiety among the participants. The scale encompassed dimensions related to cognitive-emotional impairment, functional impairment, personal experience of climate change, and behavioural engagement.

The Revised Environmental Identity (EID) Scale with 24 items is a tool proposed by Clayton in 2021 and aims to measure individual differences in a stable sense of interdependence and connectedness with nature.

The Patient Health Questionnaire with 9 items was developed by Robert L. Spitzer, Dr. Janet B.W.Williams and Dr. Kurt Kroenka assesses anxiety and depressive symptoms in the previous 2 weeks through a likert scale of 0- Not at all and 3 (nearly every day).

Sampling

The purposive sampling technique was used because there was an inclusion criteria for selecting the sample .

Measures

Climate Change Anxiety Scale (Clayton and Karazsia 2020)

A 22-item scale that assesses people's emotional reactions to climate change is called the Climate Change Anxiety Scale. The United States has verified the scale. The test has successfully shown construct validity of the scale is 0.89. Reliability

estimates indicated that CCAS had good to excellent internal consistency (α = .90; ωt = .91) and good test-retest reliability (r = .87).

The Environmental Identity Scale (Clayton,2021)
A 24 items is a tool proposed by Clayton in 2021 and aims to measure individual differences in a stable sense of interdependence and connectedness with nature. Literature reports high reliability and validity . The test has a test retest reliability of 0.92 and Construct Validity of 0.83 .

The Patient Health Questionnaire (Robert L. Spitzer, Dr. Janet B.W.Williams and Dr. Kurt Kroenka ,2001).
It is a 9 item questionnaire of multipurpose instruments for screening, diagnosing, monitoring and measuring the severity of depression The PHQ-9 incorporates DSM-IV depression diagnostic criteria with other leading major depressive symptoms into a brief self-report tool through a likert scale of 0- Not at all and 3(nearly every day). Major Depressive Disorder was identified with 88% sensitivity and 88% specificity in PHQ-9 values greater than 10. The tool's validity and reliability have shown that its psychometric qualities are sound.

Statistical Technique
Data from 157 young adults were gathered via an online questionnaire. Descriptive and correlational analyses were performed to explore the impact of climate change on these individuals. Statistical analysis utilised SPSS 26th Version.

Procedure
The study employed a purposive sample strategy to identify individuals who ranged in age from 18 to 29.The study recruited participants from several online platforms and communities that are recognized for drawing in young individuals with an interest in environmental concerns and climate change. An online survey was created to gather demographic data and evaluate factors pertaining to the effects of climate change on mental health. Validated measures were included in the questionnaire, including the Environmental Identity Scale (EIS) to measure one's connection to nature, the Patient Health Questionnaire 9 (PHQ-9) to measure symptoms of depression, and the Climate Change Anxiety Scale (CCAS). Informed consent was given to participants, and confidentiality and anonymity were guaranteed.To increase response rates, data was gathered over a predetermined time period, and non-respondents received reminders.
The demographic details of the participants, such as age, gender, educational background, and place of residence, were compiled using descriptive analysis. Descriptive statistics, including mean, standard deviation, and frequency distributions, were computed for each scale (CCAS, PHQ-9, and EIS) in order to comprehend the response distribution. To investigate the connections between the variables, correlational analysis was performed. To evaluate the direction and degree of relationships between environmental identity, depressive symptoms, and anxiety related to climate change, Pearson correlation coefficients were computed.
The data was analysed using IBM SPSS Statistics software (version 26) for statistical purposes.

Results

(Table 1.1)(Descriptive Analysis of each scale) (The Author).

	CCAS	Behavioural Engagement	Personal experience to CC	Functional Impairment	Emotional Impairment	EIS	Place Identity	Biopheric identity	Global Identity	PHQ
Mean	71.4	23.5	15.4	10.1	22.4	123	30.0	29.8	62.9	11.8
Median	78.0	26.0	17.0	11.0	23.0	126	31.0	31.0	65.0	13.0
Standard Deviation	15.7	7.58	4.97	2.57	3.54	19.6	6.19	6.84	12.3	5.96

Table 1.2 (***Correlational Analysis of each scale used) (*** **The Author)**

	1	2	3	4	5	6	7	8	9	10
CCAS	-									
Behavioural Engagement	0.941**	-								
Personal Experience to CC	0.917**	0.870**	-							
Functional Impairment	0.811**	0.673*	0.701**	-						

Emotional Impairment	0.547*	0.322*	0.292*	0.449*	-					
EIS	0.428*	0.298*	0.327	0.409	0.504*	-				
Place Identity	0.542*	0.415*	0.433*	0.480*	0.561*	0.808**	-			
Biopheric Identity	0.080	0.081	0.083	0.092	-0.004	0.476	0.056	-		
Global Identity	0.366	0.222	0.258	0.361	0.524*	0.926**	0.756*	0.176	-	
PHQ	0.387	0.422*	0.337	0.299	0.123	0.049	0.059	0.070	0.009	-

***P<0.05 , **P<0.01**

Discussion

The aim of the study is to assess the Impact of Climate Change on the mental health of young adults. In the study the data was collected from 157 participants using purposive sampling . It is important to examine the complex relationships that exist between mental health and climate change, as described in the previous research reviews. Our investigation includes a thorough analysis of the direct and indirect effects of climate-related events on mental health, emphasising the complex issues and avenues for intervention.

The descriptive analysis of the data showed in (Table 1.1) that the mean of CCAS was 71.4 with a standard deviation of 15.7 , the mean of the subscale behavioural engagement was 23.5 with a standard deviation of 7.58 , the mean of the third subscale personal experience to climate change was 15.4 with a stand deviation of 4.97 , the mean of the third scale functional impairment was 22.4 with a Standard deviation was 15.7 . For the Environmental Identity Scale (Clayton , 2021) the mean was 123 and standard deviation was 19.6 . The mean for the subscale Place Identity was 30.0 with a standard deviation of 6.19 , the mean of the second subscale Biospheric Identity was 29.8 with a standard deviation of 6.84 , the mean of the third subscale global identity was 62.9 with a standard deviation of 12.3. For the Patient Health Questionnaire the mean was 11.8 with a standard deviation of 5.96 .

After finding the descriptive Analysis Correlational Analysis (Table 1.2) was found using the IBM SPSS (26th Version) Software . The correlation between Climate Change and Behavioural Engagement is found to be very strong, that is 0.937 which shows a substantial positive correlation between behavioural involvement and climate change. This implies that engagement in behaviours associated with addressing or responding to climate change increases along with concerns about climate change. Stated differently, the association implies that behavioural involvement is impacted by climate change. The similar findings were found in a research that was conducted to examine the impact of climate change beliefs on energy conservation behaviour which included 3005 Chinese teenagers, who discovered that the participants' attitudes toward climate change had a favourable impact on their energy-saving practices. More specifically, there was a positive correlation found between increased energy-conservation actions and awareness of climate change, comprehending its causes, and perception of its risks. Concerns about the environment also had a moderating effect on this relationship. The results emphasise how crucial it is to raise environmental knowledge and provide kids with correct perspectives of climate change in order to encourage sustainable behaviours (Han et al., 2022) .

The correlation between Climate Change and Personal Experience to climate change has been found to be 0.913 which suggests a very strong relationship .This implies that people who believe that climate change is a serious problem are probably the ones who have firsthand experience with it, such as having seen extreme weather or environmental changes.The correlation between Behavioural Engagement and Personal Experience to climate change has also been found to be 0.828 which suggest a strong relationship. It implies that the likelihood of people acting to address or respond to climate change is far higher among those who have personal experience with it. The findings have been supported by similar studies like A study was conducted to examine the ways in which individual experiences with climate-related events impact opinions about the severity of climate change and participation in environmentally friendly activities. The results showed that firsthand experiences and perceptions of the severity of climate change, as well as participation in mitigation behaviours, were strongly positively correlated. These findings imply that real behavioural change may be sparked by personal experiences, which play a key influence in influencing attitudes and actions about climate change (Sambrook et al., 2021) .

Climate change and functional impairment have a moderately to strongly positive connection that is 0.753. This shows that functional impairment, such as challenges with everyday activities or psychological anguish, is more common in people who believe that climate change is having a substantial influence.Comparably, behavioural engagement and functional impairment have a correlation of 0.753, which also points to a moderate to high positive association. This implies that those who actively participate in actions to combat climate change may also suffer from functional impairment, maybe as a result of the pressures or stress involved in doing so.A moderately positive association is indicated by the correlation of 0.642 between functional impairment and personal experience with climate change. This implies that those who have personally experienced the effects of climate change may be more susceptible to functional

impairment, maybe as a result of the events' direct effects or the psychological discomfort they cause. Similar findings have been found in a systematic review to understand the relationships between climate change beliefs, perceptions, and mental health outcomes across a range of studies .It was found that attitudes and ideas regarding climate change are linked to negative consequences for mental health, such as functional impairment. People who thought that climate change posed a serious threat also reported having more mental health problems. Mental health issues were also associated with firsthand encounters with climate-related events, underscoring the importance of taking mental health into account when developing climate change policies and conversations (Clayton et. al. , 2017).

There is a moderately positive relationship of 0.519 between emotional impairment and climatic change. This shows that emotional impairment, such as increased stress or worry, is somewhat more common in people who consider climate change to be a serious problem.The association between behavioural engagement and emotional impairment is weakly positive, as indicated by the correlation of 0.347. This shows that, although the association is not as significant as it is with views of climate change, people who engage in more acts related to addressing climate change may experience a minor increase in emotional impairment.The association between emotional and functional impairment is moderately positive, as indicated by the correlation of 0.414. This illustrates the connection between these two categories of impairment by indicating that those who have functional impairment—difficulties performing daily tasks—are somewhat more likely to also have emotional impairment.

There is a weak positive association between environmental identification scale and climate change, as indicated by the correlation of 0.298. This implies that people who consider climate change to be a serious problem can feel a little more connected to their surroundings . A weak positive link is also indicated by the correlation of 0.298 between the environmental identity scale and behavioural engagement. This implies that those with slightly stronger environmental identities may also be more involved in behaviours connected to tackling climate change.A weak positive link is indicated by the correlation of 0.284 between the environmental identification scale and personal experience with climate change. This implies that those who have personally experienced climate-related occurrences might identify with their surroundings a little more strongly.A weak positive link is indicated by the correlation of 0.317 between the environmental identity scale and functional disability. This implies that those who are functionally impaired might also identify more strongly with their environment. A moderately positive association is indicated by the correlation value of 0.366 between the environmental identity scale and emotional impairment. This implies that there is a small increase in the likelihood of a stronger sense of identity with one's surroundings among people who suffer from emotional impairment, such as increased stress or worry.

The favourable association between place identity and climatic change is indicated by the correlation of 0.542. This implies that people who think that climate change is a big deal could also identify fairly strongly with their location or environment.There is a moderately favourable correlation of 0.415 between place identity and behavioural involvement. This shows that people with fairly strong place identities—a sense of attachment or belonging to their surroundings—may also be more involved in behaviours relevant to mitigating climate change.A moderately good association is indicated by the correlation value of 0.433 between place identification and personal experience with climate change. This implies that those who have personally witnessed climate-related catastrophes could likewise have a very strong identification with their place or surroundings.The somewhat favourable association between place identity and functional impairment is indicated by the correlation of 0.480. This implies that people who are functionally impaired may also have a somewhat strong place identity, which may signal that they are still attached to or connected to their surroundings even though they are impaired.

There is a high positive association between place identity and emotional disability, as indicated by the correlation of 0.561. This implies that those who suffer from emotional impairment, like elevated stress or anxiety, could strongly identify with their location or surroundings and turn to them for comfort or support.Finally, there is a high positive link between place identity and environmental identity scale, as indicated by the correlation value of 0.808. This implies that those who have a strong sense of identity with their surroundings probably also have a strong identification with their place or surroundings, highlighting the interconnectedness of environmental and place identities.

There is a moderately favourable correlation 0.387 between the Patient Health Questionnaire (PHQ) and climate change. According to the PHQ, people who believe that climate change is a serious problem may also be more psychologically distressed or exhibit indicators of mental health problems.A moderately good link is also indicated by the behavioural engagement and PHQ's correlation of 0.422. This shows that higher levels of psychological distress or symptoms, as measured by the PHQ, may be experienced by those who engage in more acts connected to addressing climate change.There is a moderately positive correlation of 0.337between the PHQ and personal experience with climate change. This implies that increased degrees of psychological distress or symptoms, as determined by the PHQ, may also be experienced by people who have direct experience with climate-related occurrences.

There is a weak positive link between functional impairment and the PHQ, as indicated by the correlation of 0.299. This implies that people who are functionally impaired might also have slightly elevated psychological distress or symptoms, as determined by the PHQ. Similar findings were found in a study that was conducted in order to examine the review of literature on the connection between mental health outcomes and climate change, particularly psychological discomfort as assessed by instruments like the Patient Health Questionnaire (PHQ). Consistent evidence of a favourable correlation

between personal experiences, perceptions of climate change, and mental health problems was discovered during the review. According to the PHQ, people who experienced climate-related events firsthand or who saw climate change as a serious threat expressed higher levels of psychological distress. The analysis also emphasised how behavioural engagement in attempts to mitigate or adapt to climate change influences mental health outcomes. (Middleton et al., 2020) Based on the findings of the research there are potential implications , limitations and future directions that are significantly essential to recognise . The findings of the research show how important it is for decision-makers to give mental health issues top priority when developing strategies and policies related to climate change. Plans for climate adaptation and mitigation that incorporate mental health support systems can improve community resilience and well-being in the face of environmental difficulties.The psychological effects of climate change should be acknowledged by medical professionals and practitioners, and primary healthcare facilities should offer mental health screening and support services. Individuals' mental health can be negatively impacted by climate-related discomfort, although it can be lessened with targeted interventions. It is essential to involve communities in initiatives to increase resilience to climate change. Community-based treatments that strengthen social networks, encourage environmental conservation, and offer coping strategies can help people more effectively manage the psychological strains brought on by climate change.

There are certain limitations that are observed like the study's sample size and demographic makeup may be its main constraints. To ensure the generalizability of the findings across other demographics and circumstances, larger and more diverse samples are required.The study's cross-sectional design makes it more difficult to determine the causes of the many factors. To investigate the temporal dynamics of the relationships between behavioural responses, mental health consequences, and perceptions of climate change, longitudinal studies are required. It is important to take into account the validity and reliability of the measuring instruments used to evaluate behavioural involvement, mental health indicators, and perceptions of climate change. It is imperative to guarantee the resilience of measurement tools in order to precisely capture the constructions being studied.

The future implications based on the findings of the research can be of a longitudinal research to monitor how behavioural responses to climate change and mental health outcomes vary over time. Research with a longitudinal design can yield important information about the course of mental health effects and guide the creation of focused therapies.

The creation and assessment of evidence-based therapies is necessary to address psychological discomfort associated with climate change. Adverse effects of climate change on mental health can be lessened with the support of psychoeducational programs, community resilience-building initiatives, and mental health support services catered to the needs of varied communities.Addressing the intricate interactions between mental health and climate change requires cooperation between researchers, legislators, medical practitioners, and community stakeholders. Multidisciplinary methods can stimulate creative thinking and improve the efficacy of interventions meant to support mental health resilience to face environmental challenges.

Conclusion

In conclusion, this study has illuminated the complex interplay of behavioural reactions, mental health consequences, and views of climate change. According to the research, those who believe that climate change poses a serious threat, have personal experience with climate-related disasters, or display emotional or functional impairments are more likely to suffer negative consequences on their mental health. Furthermore, It was found that behavioural participation in activities connected to climate change was positively correlated with mental health symptoms.The significance of including mental health concerns into climate change policy and interventions is emphasised by these findings. Targeted approaches are essential for managing psychological suffering associated with climate change, such as psychoeducational programs and community resilience-building projects. To demonstrate causal linkages, however, future research may address constraints like the cross-sectional design. The research essentially adds to the understanding of the consequences of climate change on mental health by highlighting the necessity of taking proactive steps to support communities and individuals confronting environmental problems and to foster resilience in the face of uncertainty .

Type of Manuscript : Original Research Article

Conflict of Interest

I declare that I have no competing interests or conflicts of interest , financial or otherwise , related to this research paper and its findings .

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