INDIAN JOURNAL OF POPULATION AND DEVELOPMENT
ISSN: 2583-4827; Volume 5(2), July 2025: 179-195

Perceived Threat of Climate Change and Climate Anxiety

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Abstract

With climate change and its consequences dominating the 21st century, related anxiety issues and symptoms are on the rise. Past research demonstrates surfacing of disorders such as anxiety, depression, post-traumatic stress disorder (PTSD) and others in relation to climate change (Suzuki and Hanington, 2022). The present study aims to investigate factors that contribute to climate anxiety. It is based on a survey that allowed participants to answer questions about their negative experiences with climate change, their perceived threat of climate change, and a series of questions on climate anxiety, employing a tool developed by Clayton and Karazsia (2020a). The data were analysed using various statistical procedures, notably chi-square, t-test, ANOVA, and logistic regression. Results demonstrate that females experience more climate anxiety than their male counterparts, and that the experience of climate anxiety is the least among older adults (50-64) while those ages 20-34 year experience climate anxiety the most. Level of education and place of residence has not been found to contribute to climate anxiety. The perception of the threat of climate change and experience of negative effects of climate change have a significant impact on climate anxiety. Those who have higher levels of climate anxiety are more likely to take action to prevent climate change and often feel that they should have done more to protect the environment.

Introduction

As a result of global warming, average temperatures are rising over time and disrupting the balance of nature, resulting in erratic and extreme weather conditions. Recent years have witnessed perpetual climatic catastrophes, such as hurricanes, tornadoes, landslides, melting of glaciers, tsunamis, and wildfires. Extreme weather conditions, such as cold waves and heat waves, droughts, excessive precipitation, and floods have become more common today as compared to the past. These long-term shifts in weather patterns and temperatures are termed climate change and pose severe risks not only to human beings but to all other forms of life on the Earth (United Nations, 2023). Climate change can affect health of the people through the availability of safe food and water and increases the spread of diseases (Centers for Diseases Control, n.d.). It can also hurt mental health (Suzuki and Hanington, 2020) and well-being (Clayton, 2020) of the people.

Climate change and climatic catastrophes have led to the emergence of a new phenomenon called climate anxiety. Climate anxiety is characterised by worry, stress or anxiety related to perceived climate change, its threats, and potential effects (Clayton and Karazsia, 2020b). Climate anxiety, also known as eco-anxiety, is the fear of environmental disaster that "can stem from direct experience of extreme weather events and environmental change (e.g. floods, forest fires, hurricanes, drought) or exposure to climate change information through news media and other sources" (Mental Health Commission of Canada, 2023). Individuals respond to experiences of climatic disasters differently which can affect their level of climate anxiety. Those who have higher levels of environmental care or empathy may also demonstrate a higher level of climate anxiety.

Understanding the implications climate anxiety and its determining factors is important when looking at how we plan to address this issue. This paper examines multifaceted variables that determine how and why people are more or less affected by climate anxiety. The study analyses variation in climate anxiety by demographic and social characteristics, place of residence, and past negative experiences with climate change. It also seeks to examine the relationship between perceived imminent threats to climate change and climate anxiety. Finally, the paper examines the relationship between threat perception about climate change and action to sustain the environment.

Literature Review

Climate anxiety is a new and growing domain of knowledge. Research, studies and literature on the topic are sparse, leaving ample space for growth. The focus of this literature review is on the gaps in the current understanding and information on how age, culture, region, climate behaviour, and perceived threat contribute to climate anxiety. As the effects of the climate crisis worsen, the mental health effects of the catastrophe begin to reach crisis levels. Disorders such as anxiety, depression, post-traumatic stress disorder (PTSD) and many more surface as side effects of climate change (Suzuki and Hanington, 2022). According to Clayton (2020), climate change has effects on the wellbeing, emotional state and mental health status of individuals. Climate change also contributes to the increase in physical health issues such as increased risk of stroke, cardiovascular diseases and respiratory illnesses (National Institute of Environmental Health Sciences, 2022). Climate-related anxieties and their empirical relevance are growing, as is the evidence to support their existence (Clayton, 2020).

Previous research shows that those who perceive climate change as an imminent threat are more likely to feel climate anxiety (Dodds, 2021). A recent survey on young adults aged 16-25 years showed astronomical levels of climate-related worries. It found that 59 per cent of participants were very or extremely worried, and 84 per cent were moderately or more worried. Participants reported feelings such as helplessness, guilt and anxiety among others (Hickman et al, 2021). Similarly, research looking at generation (gen) z in relation to climate change shows that gen z is the most affected by the psychological consequences of climate change (Tsevreni et al, 2023). These differences are noticeable when compared to the psychological effects felt by those of the older generation such as baby boomers, the silent generation or the greatest generation (Swim et al, 2022).

A study looking at the predicting factors of climate anxiety rules out gender and income as predictors of climate anxiety, pointing to minimal differences in anxiety levels among men and women, as well as between lower, middle and upper-class folks (Whitmarsh et al, 2022). Further, inconsistent geographical differences are noted when observing climate anxiety across nations, specifically, China, India, Japan, and the United States (Tam et al, 2023).

The psychological responses to climate change show that individual differences can affect the way a person experiences climate anxiety. Specifically, it is stated that both those who care about the environment as well as those who have been affected by some climate-related natural disaster, such as a wildfire or hurricane, are more likely to feel climate anxiety. Susceptibility to climate anxiety has also been found to have some association with individual personality (Clayton, 2020). Due to differences in emotional reactivity, those who score higher on the neuroticism continuum or those who display more signs of emotional instability, irritability, and self-doubt (Cuncic, 2026) are more likely to be affected by anxieties (Dong et al, 2022). This sort of relation could, in theory, be translated in the context of climate change and associated climate anxiety to suggest a link between personality differences and climate anxiety experiences.

Researchers have also considered the perception of threat and the possibility of direct impact in an attempt to understand connections and correlation (Tam et al, 2023). Research looking at the relevance of emotions regarding climate change details this incidence through the sentimental connections one puts on climate-related issues. Wang and others touch upon the association of the “objects of care” with individual emotional response to climate change. He exemplifies his theory through the comparison of climate scientists, students and the general public, stating that enhanced worry is experienced by climate change, essentially justifying their increased affection through their associative identity and worry for the future. Because climate scientists are intrinsically linked to the environment through their passion, career and more, they feel the burden of climate anxiety disproportionately more than everyone else (Wang et al, 2018).

In addition, climate change has both direct and indirect impact on the mental health of children (Burke et al, 2018). As described in earlier studies, significant interactions display outside influence of other variables, such as geographic locations, weaker infrastructure, poor support and inefficient services. In addition, children living in the developing world and those living in certain disadvantaged circumstances in the developed areas are also at an increased risk of climate anxiety (Burke et al, 2018). Culture may also increase the risk of climate anxiety. When looking at the Inuit community in Nunatsiavut, Canada, researchers found a disproportionate effect on climate anxiety. While taking a holistic approach to the issue, aspects such as increased family stress, greater substance use, mental health concerns and increased risk of suicide are all linked to climate change and associated climate anxiety (Cunsolo et al, 2013). Research also demonstrates a positive, linear correlation between suicide rates and climate change. With rising temperatures influencing suicide rates in India, an established link between climate change and mental health issues such as depression and suicidal ideation is clear (Carleton, 2017). With the risk of cluster suicides already prevalent in some groups (Orkin et al, 2013), solutions are direly needed.

To sum up, existing literature shows that the evidence about the effect of such factors as residence of respondents, perceived threat of climate change associated disaster, and environment-related behaviour on climate anxiety associated with climate change are rare if not non-existent. It is in the above context that the present paper adopts a sociodemographic and sociocultural perspective of the factors of climate anxiety associated with climate change. It aims to expand the research related to climate change and its psychological effects, such as climate anxiety.

Methodology

The study is based on a survey that has been designed for the purpose. The participants for the survey were recruited via different social media platforms, specifically, Instagram, Facebook, Snapchat, and WhatsApp considering their age, cultural background, and geographical location. A non-probability sampling method was used, incorporating both convenience and snowball sampling, for recruiting the respondents. Data were collected through a self-administered survey questionnaire using Google Forms that participants completed online. The survey link was shared on different social media platforms. The survey was opened on March 7^{th,} 2024, and within four days, 185 respondents from Canada completed it.

The respondents were asked how they perceived the threat of climate change on a scale of 1 to 10, with 1 being 'no threat' and 10 being the 'biggest threat.' To assess climate anxiety, a preexisting, pretested psychological instrument developed by Clayton and Karazsia (2020a) called the climate anxiety scale (CAS) was used with some modifications to fit the project requirements. Out of the 22 items on the original scale, 13 were retained in the survey. For each of these survey questions, there were five response options – never, rarely, sometimes, often, and almost always. An index of climate anxiety was constructed by assigning the following values to each response option and adding the values for all the 13 questions: Never=0, Rarely=1, Sometimes=2, Often=3, and Almost always=4. This yielded a minimum value of zero and a maximum of 52 on this scale. Various statistical techniques, specifically Chi-square, correlations, t-test, ANOVA, and logistic regressions, were used to analyse data collected from the survey. Furthermore, the index of climate anxiety was divided into two groups for logistic regression analysis – low climate anxiety (less than or equal to the median score) and high climate anxiety (more than the median score). The 'climate change associated threat' has also been categorised into two groups – low threat and high threat. If the score of a respondent was less than the median of the distribution of score across respondents, it was classified as low threat. On the other hand, if the score of a respondent was equal to or more than the median score, it was classified as high threat.

Before the actual collection of the data, researchers prioritised ethical concerns related to the study. The participation in the survey was voluntary, only those were included in the study who consented to participate, confidentiality of the response was ensured throughout the study, anonymity of the respondents was maintained so that there was no harm to the respondents for participating in the survey. The study was approved by the Research Ethics Board of the University (file number 6021802).

Results

A large majority of the study participants were female (79.5 per cent) and Caucasian (85.4 per cent), and more than half (51.1 per cent) lived in the urban areas. Majority of the respondents belonged to the age group 20-34 years (40 per cent), followed by the age group 50-64 years (21.6 per cent). Respondents below 20 years of age constituted 13.5 per cent while respondents aged 65 years and older constituted 5.4 per cent of the study sample. Nearly half of the respondents (50.3 per cent) had at least post-secondary education while 29.7 per cent of the respondents had completed a graduate or post-graduate/professional degree. More than a 28.4 per cent of the respondents reported that either they themselves or someone they knew had been affected considerably by climate change; another 35.5 per cent reported that they or their acquaintances were affected to some extent. There were only around one third of the respondents who reported that either they or their acquaintances were never affected adversely by climate change (Table 1).

Table 1: Characteristics of the study participants.

Participants' characteristics	Frequency	Per cent
Gender		
Male	33	17.8
Female	147	79.5
Other	5	2.7
Age		
Less than 20	25	13.5
20-34	74	40.0
35-49	36	19.5
50-64	40	21.6
65 and above	10	5.4
Education		
High school diploma or less	37	20.0
Some post-secondary (college or university)	93	50.3
Bachelor's degree	42	22.7
Post graduate or professional degree	13	7.0
Ethnicity		
Caucasian/White	158	85.4
Other	27	14.6
Residence		
Rural	90	48.9
Urban	94	51.1
Experience with climate related disaster		
Considerable	52	28.4
Somewhat	65	35.5
Never	66	36.1
N	185	100.0

Note: Information is missing on *residence* for one person and *adversely affected by climate change* for two persons.
Source: Authors

Perceived Threat of Climate Change

Table 2 depicts the perception of the respondents about perceived threat of climate change. A significantly higher proportion of females (46.3 per cent) perceived climate change as a high threat compared to males (27.3 per cent). By age, the proportion of those who considered the threat of climate change as high varied from 37.5 per cent in respondents aged 50-64 years to 52.8 per cent in respondents aged 35-49 years. More educated respondents perceived climate change as a high threat than less educated respondents. For example, 61.5 per cent of those who had a post-graduate or professional degree perceived climate change as a high threat, whereas 37.6 per cent of those who had some post-secondary education had a similar perception. There was hardly any difference in the perception of Caucasians and non-Caucasian respondents. However, a higher proportion of respondents living in the rural areas and respondents who themselves or their acquaintances had experienced adverse effects of climate change perceived climate change a high threat. However, the perception about climate change threat was found to be statistically significantly different between females and males only and not by other characteristics of the respondents.

Table 2: Perceived climate change threat by the background characteristics of the respondents.

Characteristic	Climate change threat		χ^2
	Low	High	(df, 'p')
Gender			
Male	72.7	27.3	3.969
Female	53.7	46.3	(1, 0.046)
Age			
Less than 20	52.0	48.0	2.365
20-34	59.5	40.5	(4, 0.669)
35-49	47.2	52.8	
50-64	62.5	37.5	
65 and above	60.0	40.0	
Education			
High school diploma or less	54.1	45.9	3.403
Some post-secondary (college or university)	62.4	37.6	(3, 0.334)
Bachelor's degree	52.4	47.6	
Post graduate or professional degree	38.5	61.5	
Ethnicity			
Caucasian/White	57.0	43.0	0.019
Other	55.6	44.4	(1, 0.892)
Residence			
Rural	51.1	48.9	2.285
Urban	63.3	36.7	(1, 0.093)
Experience with climate related disaster			
Considerable	51.9	48.1	2.915
Somewhat	52.3	47.7	(2, 0.233)
Never	65.2	34.8	

Sours: Authors

Level of Climate Anxiety

Table 3 shows the degree of climate anxiety by the characteristics of the respondents. One-fifth (20 per cent) of the male respondents reported high level of climate anxiety whereas this proportion was more than 50 per cent in female respondents. There was a statistically significant difference in the mean climate anxiety score of male respondents (11.7) and female respondents (18.3), $t_{.05,173}$=-3.976 ($p < 0.001$) (not shown in table).

Table 3: Level of climate anxiety by characteristics of the respondents

Characteristic	Climate anxiety		χ^2
	Low	High	(df, 'p')
Gender			
Male	80.0	20.0	10.602
Female	48.3	51.7	(1, 0.002)
Age			
Less than 20	56.0	44.0	12.858
20-34	40.0	60.0	(4, 0.012)
35-49	48.6	51.4	
50-64	75.0	25.0	
65 and above	50.0	50.0	
Education			
High school diploma or less	51.4	48.6	1.247
Some post-secondary (college or university)	51.1	48.9	(1, 0.742)
Bachelor's degree	58.5	41.5	
Post graduate or professional degree	41.7	58.3	
Ethnicity			
Caucasian/White	55.5	44.5	4.758
Other	32.0	68.0	(1, 0.029)
Residence			
Rural	55.7	44.3	0.697
Urban	49.5	50.5	(1,0.404)
Negative experience with climate related disaster			
Considerable	40.4	59.6	12.544
Somewhat	45.2	54.8	(2, 0.002)
Never	70.3	29.7	

Source: Authors

The level of climate anxiety varies widely by age. Three-fifths (60 per cent) of the respondents aged 20-34 years experienced high level of climate anxiety while only 25 per cent respondents aged 50-64 years reported high level of climate anxiety and the difference has been found to be statistically significantly different. The ANOVA and LSD (Least Significant Difference) post-hoc test were employed to test the differences in the mean climate anxiety score between respondents of different age groups. The mean climate anxiety score was 16.8 for respondents less than 20 years of age; 20.0 for respondents aged 20-34 years, 18.2 respondents ages 35-49 years; 12.5 for respondents age 50-64 years, and 16.9 for respondents age 65 years and older. There was a statistically significant difference

in the mean climate anxiety score of at least two age groups, $F_{4,175}=5.516$ ($p<0.001$). The results of the post-hoc test showed that the mean climate anxiety score for the age group 50-64 years was significantly lower than all the other age groups. The differences in the mean climate anxiety scores of all the other age groups were statistically insignificant.

The mean anxiety score was not found to be statistically significantly different by the educational status of the respondents ($F=1.203$, $p=0.308$). The mean climate anxiety score was 16.9 for respondents having at the most, high school diploma, 17.6 for respondents having some post-secondary education (college or university), 16.1 for respondents having a bachelor's degree, and 21.3 for respondents having a postgraduate or professional degree.

The level of climate anxiety was found to be significantly lower in Caucasians (44.5 per cent) compared to other respondent groups (68.0 per cent). The mean climate anxiety score for Caucasian respondents was 16.6, and 22.2 for non-Caucasian respondents. The difference is found to be statistically significant ($t_{.05,178}=-3.096$, $p=0.002$).

There was no statistically significant difference in the level of climate anxiety between respondents living in the urban areas as compared to respondents living in rural areas. Around 44.3 per cent of the respondents living in the rural areas reported high level of climate anxiety. This proportion was 50.5 per cent in respondents living in the urban areas. The mean climate anxiety score for rural respondents (16.3) was not found to be statistically significantly different from the mean climate anxiety score for urban respondents ($t_{.05,177}=-1.562$, $p=0.06$).

The negative consequences of climate change on the life experienced either by the respondent or acquaintances of the respondent contributed to increase the level of climate anxiety. Nearly three-fifths (59.6 per cent) of those who themselves or their acquaintances experienced the negative impact of climate change showed higher level of climate anxiety compared to 29.7 per cent of the respondents who did not experience the impact and the difference has been found to be statistically significant. The mean climate anxiety score for those respondents who themselves or their acquaintance experienced high impact of climate change was 18.9 compared to 19.7 among those who experience some impact and 13.6 who experienced no impact and the difference between any two of these mean scores was statistically significantly different ($F=9.944$, $p<0.001$). The post-hoc test confirmed that the mean anxiety score for those who or whose acquaintances were never experienced negative impact of climate change was statistically significantly lower than the mean score of those who or whose acquaintances experienced some experience of negative impact of climate change.

Predictors of Climate Anxiety

The association between the perceived threat of climate change and climate anxiety was examined by using the Spearman rank order correlation coefficient. Respondents were ranked according to the perceived threat of climate change score and climate anxiety score. The rank of the respondents in terms of climate anxiety score is found to be statistically significantly associated with the rank in terms of perceived threat of climate change score ($\rho=0.58$, $p<0.001$) indicating that perception about threat of climate change is directly associated with the level of climate anxiety.

Table 4: Impact of gender, age, ethnicity, climate disaster, and perceived threat of climate change on climate anxiety

Predictor	B	p	Exp (B)
Gender (Ref – Male)			
Female	1.309	0.028	3.702
Age (Ref – Older 65+)			
Young (<35)	0.437	0.598	1.548
Middle age (35-64)	-0.515	0.541	0.598
Ethnicity (Ref – Caucasian)			
Others	-0.510	0.352	0.601
Adverse experience of climate related disaster (Ref – Never)			
Considerable	1.110	0.023	3.034
Somewhat	0.606	0.197	1.833
Perceived threat of climate change (1-10)	0.676	<0.001	1.966

Source: Authors

The binary logistic regression analysis was carried out to examine how selected characteristics of the respondents influence the level of climate anxiety. The predictor variables included in the analysis were age, gender and ethnicity of the respondent, experience about the negative experience related to the climate change, and perceived threat of climate change. The dependent variable in the model was a dichotomous variable which was assigned the value 0 if the climate anxiety score was less than the median and the value 1 if the climate anxiety score was either equal to the median or above the median. The overall model was found to be statistically significant (χ^2= 69.93, df =7, p<0.001. The predictor variables included in the model explained nearly 44.2 per cent of the variation in the level of climate anxiety (Nagelkerke R^2=0.442). Results of the binary logistic regression are shown in Table 4.

The results of the bivariate logistic regression analysis indicate that females have 3.7 times higher odds of experiencing climate anxiety compared to males. Age and ethnicity of the respondents do not have a significant impact on climate anxiety when other predictors are controlled. Those respondents who or whose acquaintances experienced considerable negative impact of climate change were more than three times more likely to have high level of climate anxiety compared to those respondents who or whose acquaintances experienced no negative impact of climate change. However, the odds of experiencing high level of climate anxiety among those who or whose acquaintances experienced some negative impact of climate change relative to those who or whose acquaintances never experienced any negative impact of climate change have not been found to be statistically significantly different from 1 meaning that the odds of having high level of climate anxiety was the same in the two groups of respondents. The perceived threat of climate change is found to be a strong and statistically significant predictor of high level of climate anxiety. For every one unit increase in the perceived threat of climate change, the odds of having high level of climate anxiety nearly doubles (OR=1.97). These findings suggest that females and individuals who or whose acquaintances are considerably affected by climate change, and those who perceive that climate change as a serious threat, are more likely to suffer from high level of climate anxiety.

Perception about Solution

Respondents were asked if they believed that there existed a solution to climate change. Their responses were cross listed with perceived threat to climate change and climate anxiety (Table 5). There was a significant association between perceived threat of climate change and belief in solutions to climate change. Three out of every five respondents who perceived climate change as a high-level threat believed that there were solutions to address it, compared to two out of every five respondents who perceived climate change as a low-level threat. Conversely, 8.8 per cent of the respondents who perceived climate change as a high-level threat and 21 per cent of those who considered it a low threat believed there were no solutions available. It indicates that the perception of threat associated with climate change also instigates the belief in solutions to deal with the potential threat.

Table 5: Belief in the climate change solutions by perceived threat of climate change and climate anxiety

Threat and anxiety	Solution to climate change			χ^2
	Yes	May be	No	(df, 'p')
Perceived threat of climate change				
High	60.0	31.3	8.8	8.620
Low	40.0	39.0	21.0	(1, 0.012)
Climate anxiety				
High	60.5	31.4	8.1	11.138
Low	38.3	39.4	22.3	(1, 0.004)

Source: Authors

The level of climate anxiety also exhibited a similar significant association with solutions to climate change. More than three-fifths (60.5 per cent) of the respondents having high level of climate anxiety believed in solutions to climate change, compared to less than two-fifths (38.3 per cent) of the respondents having low level of climate anxiety. Only 8.1 per cent of the respondents having high level of climate anxiety believed there was no solution to climate change compared to 22.3 per cent of the respondents who had low level of climate anxiety. Putting it another way, high level of climate anxiety could prompt a greater search for information on solutions to climate change.

Actions Taken to Prevent Climate Change

Respondents were also asked about the actions that they had taken as a response to the negative effects of climate change (Table 6). A large majority (82 per cent) of the respondents reported that they often or almost always adopted behaviours that contributed to mitigate the negative effects of climate change, such as using public transport instead of private vehicles and saving instead wasting resources or energy. This proportion was found to be statistically significantly higher in females (84 per cent) compared to males (70 per cent). The level of climate anxiety had also been found to be statistically significantly associated with environment friendly behaviour. Almost all respondents (92 per cent) who often or always experienced high level of climate anxiety reported that they had adopted behaviours that contributed to preventing or retarding the climate change, compared to 72 per cent of those respondents who or whose acquaintances experienced a low level of climate anxiety.

Table 6: Actions taken to prevent climate change.

Characteristic	I try to reduce behaviours that contribute to climate change			I feel guilty if I waste energy or resources			I wish I behaved more sustainably		
	Never/ rarely/ sometime	Often/ almost always	χ^2 (df, 'p')	Never/ rarely/ sometime	Often/ almost always	χ^2 (df, 'p')	Never/ rarely/ sometime	Often/ almost always	χ^2 (df, 'p')
Gender									
Male	30.3	69.7	3.687	62.5	37.5	4.679	66.7	33.3	2.020
Female	15.6	84.4	(1, 0.049)	41.5	58.5	(1, 0.031)	53.1	46.9	(1, 0.155)
Age									
<35	20.2	79.8	0.812	44.9	55.1	0.004	44.4	55.6	9.840
35+	15.1	84.9	(1, 0.367)	45.3	54.7	(1, 0.951)	67.4	32.6	(1, 0.002)
Education									
High school diploma or less	24.3	75.7	4.380	45.9	54.1	0.020	54.1	45.9	1.433
Post-secondary (college or university)	20.4	79.6	(1, 0.113)	45.2	54.8	(2, 0.990)	59.1	40.9	(2, 0.489)
Bachelor's degree and above	9.1	90.9		44.4	55.6		49.1	50.9	
Ethnicity									
Caucasian/White	17.7	82.3	0.010	46.8	53.2	1.346	55.7	44.3	0.138
Other	18.5	81.5	(1, 0.920)	34.6	65.4	(1, 0.246)	51.9	48.1	(1, 0.711)
Level of climate anxiety									
Low	27.7	72.3	13.143	59.6	40.4	19.656	80.9	19.1	50.985
High	7.0	93.0	(1,<0.001)	26.7	73.3	(2, <0.001)	27.9	72.1	(2, <0.001)
Overall	17.8	82.2		45.1	54.9		55.1	44.9	

Note: Age and education have been regrouped in this table to fulfil the requirements of the chi-square test
Source: Authors

More than half of the respondents reported that they often or almost always felt guilty when wasting energy or resources. This proportion was statistically significantly higher in females (58 per cent) than in males (38 per cent). Similarly, 73 per cent of respondents having a high level of climate anxiety felt guilty about wasting energy or resources. This proportion was only 40 per cent among those respondents who had lower level of climate anxiety.

On the other hand, less than half of the respondents (45 per cent) reported that they often or always wished that they would have behaved more sustainably. Such feelings were statistically significantly more common among respondents aged less than 35 years (56 per cent) compared to respondents aged 35 years and older (33 per cent). A substantially higher proportion of respondents having high level of climate anxiety (72 per cent) also often or almost always wished they would have behaved more sustainably compared to respondents with low level of climate anxiety (19 per cent).

Discussion

The present study has aimed to examine the factors that play a significant role in determining who is affected by climate change related anxiety or climate anxiety. The study has revealed that demographic factors like gender and age, perception about climate change related threat and past experience of climate change related disaster have strong association with climate anxiety. The study also suggests that males have significantly lower level of climate anxiety than females. These findings contradict the current literature in which gender is ruled out as a pre-determining factor for climate anxiety (Whitmarsh et al, 2022). This study has also found that persons aged 50-64 years had the lowest level of climate anxiety, whereas persons aged 20-34 years had the highest level of climate anxiety. Past research has also demonstrated similar patterns with the young generation having very high levels of climate-related anxiety in comparison to older generation (Hickman et al, 2021). The gen-z has been identified as the most affected population group generationally from climate change (Tsevreni et al, 2023).

The level of climate anxiety has also been found to be nearly similar in respondents living in rural and urban areas. Previous research shows international differences in climate anxiety, with developing countries suffering the most (Burke et al, 2018). That being said, the integration of both these findings raises the question: "Is geography really the predictor of climate anxiety?" In the present case, circumstantial and environmental factors, such as the isolation of some rural neighbourhoods, or the conditions faced by some low-income or developing countries, and the perpetual impoverishment and pollution of the global south appears to be blamed (Rentschler and Leonova, 2023).

When comparing the climate change related threat perception and its association with climate anxiety, a statistically significant positive relationship has been observed in the present study. These findings lead to the acceptance of the hypothesis that higher perceived threat about the climate change leads to an increase in climate anxiety. Further, significant differences in the level of climate anxiety have also been found between those who or whose acquaintances reported considerable experiences of climate-related disasters and

those who and whose acquaintances had no such experiences. However, no statistically significant difference in the level of climate anxiety has been observed between those who and whose acquaintances somewhat affected from the negative effects of climate change and those who and whose acquaintances were not affected from the negative effects of climate change at all. These results are comparable to those of previous research which suggests that those who perceive climate change as an imminent threat are more likely to have higher levels of climate change related anxiety as compared to those who do not perceive climate change as a threat (Dodds, 2021). Earlier studies have also observed that those who are affected by some climate-related disaster, such as floods, hurricanes, wildfires, and others, are more likely to have higher levels of climate anxiety (Clayton, 2020).

The level of education of has not been found to have any statistically significant effect on the level of climate anxiety, although people having post-graduate or professional education appear to have higher level of climate anxiety than those having lower levels of education. The level of education as a predictor of climate anxiety is a newly researched determinant and there is minimal literature on this relationship. Similarly, research on the extent of environment/climate-related knowledge has also been found to have significant effect on the level of climate anxiety. Environmental scientists have been found to be having disproportionately high level of climate anxiety because of their sheer knowledge about the consequences of climate change (Wang et al, 2018).

Interestingly, the perception about the existence of solutions to the consequences of climate change has been found to be associated with climate anxiety. It appears that those who believe that there exists solutions to the consequences of climate change have higher levels of climate anxiety as compared to those who do not believe in the existence of any such solution. High levels of climate anxiety among those who believe that a solution to consequences of climate change exists may be rooted in their concern about possible solutions not being enacted or implemented. Although the term “solution perception” is rarely used in the climate literacy today leaving no comparatively relevant data, yet it offers an interesting parallel with climate hope. There is evidence to suggest that there exists a positive associate between climate anxiety and climate hope (Sangervo et al, 2022). When people have more hope about possible solutions to the consequences of climate change, their anxiety level rises. Interpretively, this comparison can be deemed as a coping mechanism. When one has anxiety, specifically related to the consequences of climate change, creating hope (false or real) can help one feel temporary symptomatic relief. This association may also be explained through thought presence. When people believe that there is a solution or hope for a particular issue, the idea remains stagnant in their thoughts. Individuals who experience a higher level of climate anxiety are also more likely to adopt measures to prevent adverse consequences of climate change, such as reducing environmentally harmful behaviours. They often feel guilty about wasting resources or energy and express their desire to have done more to sustain the environment.

The field of research related to climate change related anxiety is new and emerging because the anxieties that the people are facing are increasing. The findings of this study could display helpful implications to the field of knowledge, such as gaining a broader understanding of the issue at hand, leading to future treatment plans and coping mechanisms in order to reduce climate change related anxiety in people. The findings of

the present study may also lead to such implications as increased awareness about the anxiety associated with the consequences of climate change leading to behavioural changes, as well as cultural sensitivity and even the recognition of climate anxiety as a real mental health issue under the public health policy. For example, cognitive behavioural therapy (CBT) care programmes may be modified to incorporate this aspect of anxiety for those affected.

There is a need of more studies under diverse social, cultural and economic settings to further elaborate on climate change related anxiety and its determining factors. Research in this area must strive to understand climate anxiety from a multidimensional perspective, looking at both who are the people who are suffering from climate change related anxiety and why are they suffering. Research in the sociological dimensions of climate change related anxiety is not only insightful but is also equally important. Parallel psychological or scientific research may also contribute to the research in climate change related anxiety, projecting its benefits onto more people and more domains. This research may also look into the neural pathways and neurochemical implications of climate change related anxiety, as well as the development of helpful coping mechanisms for symptom mediation.

Conclusions

The present study has examined the role of variables such as age, gender, place of residence, solution perception, experience with climate-related disasters, education levels and perceived threat of climate change as the implicating factors of climate change associated anxiety. All the explanatory factors included in the present analysis have shown some level of significance towards climate change associated anxiety or climate anxiety among the people surveyed. Significant differences in the level of climate change related anxiety have been found between females and males and between young and old population. The study has also found that there exists a relationship between the threat perception related to adverse consequences of climate change and climate anxiety, with those perceiving climate change as a significant threat having the highest level of climate anxiety. Similarly, those who were affected by climate-related disasters have been found to be having higher levels climate anxiety. Lastly, perception about possible solutions of the adverse consequences of climate change has also been found to be associated with the prevalence and magnitude of climate anxiety. People who have higher levels of climate anxiety have been found to be more likely to take some action to reduce climate change related environmental damage and feel guilty about wasting resources. They have also been found to be candid in accepting that they should have contributed more to promote sustainability.

That being said, understanding the implications and affecting factors of the emerging challenge of climate change associated anxiety is all the more important in the context of planning and interventions to address climate change associated anxiety and its management and treatment. Current research demonstrates surfacing of disorders such as anxiety, depression, post-traumatic stress disorder (PTSD), and others in relation to climate change (Suzuki and Hanington, 2022). Previous research has been focused on whether

someone is experiencing climate anxiety or not, as well as the exact ways people are feeling, often incorporating age as the only relational factor. Incorporation of other factors, such as place of residence, ethnicity, perceived threat, and climate-related behaviour, is rare if not non-existent in the previous studies. Examining how climate change associated anxiety is related to various background characteristics of the people in different situations is essential in order to see the progress in this field. Finally, as this area of research is new and emerging, its timeliness is non-negotiable. The relevance of these issues is perpetual as humans have done irreversible damage to earth environment so that the humanity will face lifelong consequences, necessitating climate change associated anxiety treatment, understanding and help.

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