

Climate Change Anxiety Symptoms in the Kurdistan Region of Iraq

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Abstract Objectives: Climate change anxiety, or eco-anxiety, is an emerging mental health concern worldwide, particularly in regions heavily impacted by environmental and socio-political challenges. This study aimed to explore the prevalence, correlates and underlying dimensions of climate change anxiety among residents of the Kurdistan Region of Iraq (KRI). **Method:** This cross-sectional study was conducted online from July 2nd to September 29th, 2024, across three main governorates of the KRI: Erbil, Sulaymaniyah and Duhok, using convenience sampling. The questionnaire included two parts: demographic data and the Hogg Eco-Anxiety Scale (HEAS). Statistical analyses, including Chi-square tests, Principal Component Analysis (PCA) and Pearson correlation, were conducted using IBM SPSS Version 26. A p-value of less than 0.05 was considered statistically significant. **Results:** A total of 385 participants were enrolled in the study. Eco-anxiety levels were categorized as mild (38%), moderate (43%) and severe (19%). Significant associations were observed between eco-anxiety levels and type of residence ($p = 0.021$) and city of residence ($p = 0.006$). PCA identified four dimensions of eco-anxiety, explaining 80.613% of the variance. Strong correlations were found between the dimensions of the HEAS, with the highest correlation observed between behavioral symptoms and anxiety about personal impact ($r = 0.854$, $p < 0.01$). **Conclusions:** The study highlights that most participants experienced moderate levels of eco-anxiety. It is recommended that healthcare providers and policymakers prioritize strategies to address eco-anxiety and its impacts, particularly in urban areas and among vulnerable populations in the Kurdistan Region of Iraq.

Key Words Climate change anxiety, eco-anxiety, hogg eco-anxiety scale, mental health and climate change, sociodemographic factors, regional vulnerability to climate change, mental health impact

INTRODUCTION

Climate change has emerged as one of the greatest global challenges of the 21st century, with far-reaching impacts on the environment, economy and human well-being [1]. The rising awareness of climate change and its potential consequences has led to a new phenomenon known as climate change anxiety or eco-anxiety [2,3]. Climate change anxiety is the chronic fear of environmental doom, accompanied by feelings of helplessness, hopelessness and grief related to the climate crisis [4]. This anxiety is a reasonable response to the existential threat that climate change presents, compounded

by the inadequate global response to mitigate its effects. Recent studies document the rising prevalence of climate change anxiety across diverse populations worldwide. One global survey of 10,000 young people aged 16-25 years from 10 countries reported that 59% were very or extremely worried about climate change, while 84% were at least moderately concerned [5-7]. Another study involving 27,000 people across 26 countries found that 48% experienced a great deal of worry about climate change [8].

In a multinational study, Clayton and Karazsia [9] found that 17-27% of their US sample reported climate anxiety

significant enough to impact their daily functioning. In contrast, regions such as India and China reported higher levels of climate anxiety compared to Western nations like the USA and Japan, reflecting regional variations in vulnerability and perception [10]. Additionally, younger individuals, particularly those in their twenties, tend to report higher levels of anxiety about climate change, while older populations exhibit heightened concern in countries like China [11]. This underscores the importance of sociodemographic factors in shaping responses to climate change anxiety.

The psychological effects of climate change are not the same for everyone and are often worse for vulnerable people and areas most affected by climate-related disasters [12]. The Kurdistan Region of Iraq is one such area, exposed to considerable risks from climate change due to its semi-arid climate, water scarcity and dependence on agriculture [13]. The KRI has experienced rising temperatures, declining rainfall and an increasing frequency and severity of droughts and heatwaves over the past couple of decades [14]. These climatic impacts have resulted in crop failures, livestock losses and forced migration, all of which have undermined the livelihood and food security of rural communities. Moreover, air pollution is another critical concern in the KRI, with Erbil's PM_{2.5} levels reaching 162 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), which is 1620% higher than the WHO's recommended limit of 10 $\mu\text{g}/\text{m}^3$ [15]. This pollution stems from vehicles, industrial activity, dust storms and private electricity generators, all of which contribute to heightened stress and anxiety related to climate change.

These vulnerabilities are further compounded by the fact that the KRI is rooted in a history of conflict, political instability and economic challenges that have eroded its adaptive capacity and resilience to climate change [16,17]. The region has suffered from decades of war, displacement and human rights abuses, leading to trauma, poverty and social fragmentation, among other issues [18]. Such pre-existing stressors can increase psychological distress related to climate change and reduce the resources available for coping with or adapting to it [19]. The International Organization for Migration has emphasized the importance of assessing mental health in response to climate change impacts in the KRI [20], particularly given the region's lack of data on climate anxiety and related psychological effects.

Despite the growing recognition of climate change anxiety as a mental health concern, there remains a dearth of research on its prevalence, correlates and consequences within the KRI context. Most studies on climate change anxiety have been conducted in Western countries, with relatively little research exploring the experiences of communities in the Global South, including the Middle East. This gap in the literature is concerning, given the high level of vulnerability of the KRI to climate change and the fact that climate anxiety might exacerbate existing mental health challenges in this region.

Moreover, the socio-cultural and context-specific aspects that shape the experience and expression of climate change anxiety in the KRI remain largely unexplored.

The KRI possesses a unique cultural heritage, religious beliefs and social norms that may influence individuals' perceptions, interpretations and responses to the risks of climate change [21]. For instance, cultural narratives tied to resilience and environmental stewardship rooted in the dominant Islamic faith emphasize the role of humans as vicegerents on earth and the principle of environmental conservation [22]. However, certain beliefs, such as fatalism and the perception that environmental disasters are an act of divine will, might contribute to passive attitudes toward climate change. Additionally, socio-political challenges in the region, including economic instability and limited public awareness of environmental issues, may further influence how individuals experience and respond to climate anxiety. Therefore, the present study aims to explore the prevalence and correlates of climate anxiety symptoms in a large, representative sample of the KRI population.

Research Question

How are the anxiety levels associated with climate change symptoms distributed among individuals in the Kurdistan Region of Iraq?

METHODS

Study Design, Setting, Period and Sampling

This online cross-sectional study was conducted across three main governorates of the Kurdistan Region of Iraq (KRI): Erbil, Sulaymaniyah and Duhok. Data were collected from participants between the 2nd of July and the 29th of September 2024 using a convenience sampling method. While convenience sampling may introduce potential bias, this method was chosen due to its practicality in accessing a diverse sample quickly and efficiently in a resource-limited setting. Additionally, the selected study period coincided with significant public discussions about climate change, ensuring heightened participant engagement and relevance of the data collected. Furthermore, we acknowledge that the cross-sectional design limits causal inference, but it provides valuable insights into the prevalence and correlates of climate change anxiety within this region.

Sample Size

To calculate the required sample size for this study, we used the parameters of a 5% margin of error, a 95% confidence interval and a population proportion of 50%. Based on the total population of the Kurdistan Region of Iraq (6,556,752), the required sample size was determined to be 385 participants. The sample size was proportionally distributed across the three governorates: Erbil ($n = 172$), Sulaymaniyah ($n = 138$) and Duhok ($n = 76$), reflecting their population proportions.

Inclusion/Exclusion

The inclusion criteria for this study were individuals aged 13 years or older, residents of Erbil, Sulaymaniyah, or Duhok, proficient in Kurdish or Arabic and willing to provide informed consent. Exclusion criteria included individuals unable to complete the survey due to physical or mental incapacity.

Study Tools and Data Collection

The questionnaire used in this study was divided into two main parts. The first part gathered demographic data, including age, gender, educational level, occupation, type of residence, ownership status and city of residence. The second part consisted of the Hogg Eco-Anxiety Scale (HEAS), which included 13 items designed to assess climate change anxiety across four dimensions: affective symptoms, rumination, behavioral symptoms and anxiety about personal impact. The questionnaire was translated into Kurdish using the forward-backward translation method to ensure both accuracy and cultural relevance. To further enhance validity, the translation process included consultation with local psychiatrists specializing in mental health to ensure that the scale's items were culturally appropriate and linguistically accessible. We also conducted a pilot test with a small sample to identify potential language or cultural barriers and made adjustments accordingly. Data collection was conducted through an online survey distributed via social media platforms, including Facebook, WhatsApp and Twitter, as well as email lists. To minimize the impact of internet access inequality, we ensured the survey was compatible with mobile devices and encouraged sharing among diverse networks to reach participants from various socioeconomic backgrounds. Participants were given 10-15 minutes to complete the questionnaire.

Pilot Study

The study questionnaire, which contained 13 items in the Hogg Eco-Anxiety Scale (HEAS), was initially tested with a group of 32 participants. The pilot testing was conducted between the 1st of May 2024 and the 1st of June 2024 to assess the internal consistency and reliability of the questionnaire items before their application in the main study. The internal consistency of the items was calculated using Cronbach's alpha [23], resulting in an overall score of 0.82, indicating a very good level of reliability. For content validity, the questionnaire was reviewed and validated by a panel of psychiatrists. Data from the pilot study were excluded from the final analysis.

Measures

Sociodemographic Characteristics

Some explanatory variables were measured during the study, including age, gender, marital status, number of children, educational level, employment status, type of residence, living situation, annual household income, duration of

chemotherapy treatment, duration of suffering from cancer and any physical complications of chemotherapy.

Hogg Eco-Anxiety Scale

The second section of the questionnaire consisted of the Hogg Eco-Anxiety Scale (HEAS); a validated instrument designed to assess eco-anxiety [9]. The scale includes 13 items grouped into four dimensions: affective symptoms, rumination, behavioral symptoms and anxiety about personal impact. Each item was rated on a four-point Likert scale ranging from 0 (Not at all) to 3 (Almost all the time), with a total possible score of 39. The severity of eco-anxiety was categorized as mild (0-13), moderate (14-26), or severe (27-39). The internal consistency of the HEAS, assessed during the pilot study, showed a Cronbach's alpha of 0.82 [23], indicating very good reliability.

Ethical Approval and Inform Consent

This study adhered to the guidelines of the Institutional Research Ethics Board and the Declaration of Helsinki. Ethical approval was granted by the Common Ethics Committee of Hawler Medical University on the 27th of June 2024, with the code number Sc.E.C.8B. Before filling the online survey, participants were asked to provide informed consent, ensuring their participation was voluntary and based on a clear understanding of the study's purpose and procedures.

Statistical Analysis

Data were summarized using descriptive statistics, where qualitative variables were presented as frequencies and percentages and quantitative variables with a normal distribution were summarized as means and standard deviations. The relationship between demographic variables and levels of eco-anxiety was analyzed using the Chi-square test. Principal Component Analysis (PCA) was performed to identify factor loadings for the dimensions of the HEAS, including affective symptoms, behavioral symptoms, rumination and anxiety about personal impact. This method helped reduce the data into core components, allowing us to better understand the structure of eco-anxiety and identify the most influential factors contributing to it. By identifying these key dimensions, the study provides actionable insights that can guide tailored mental health interventions to address the specific aspects of eco-anxiety experienced in the region. Pearson's correlation coefficient was used to examine the relationships among the dimensions of eco-anxiety. Data analysis was performed using IBM SPSS Version 26 (IBM SPSS Statistics, Armonk, NY), with significance levels considered at $p < 0.05$.

RESULTS

Demographic Characteristics

A total of 385 participants were included in the analysis, with a mean age of 29.50 ± 13.91 years. The age distribution

Table 1: Demographic Characteristics of Participants

Variables	Characteristics n=385	F	%
Age (year)	Under 18	63	16.3
	18-25	105	27.2
	26-35	109	28.2
	36-50	63	16.3
	Over 50	46	11.9
	Mean±SD	29.50±13.91	
Gender	Male	160	41.5
	Female	226	58.5
	Not able (read and write)	44	11.4
Education Level	Basic school	29	7.5
	High school	70	18.1
	College/University	190	49.2
	Graduate/Postgraduate	19	4.9
	Others	34	8.8
Occupation	Employed full time	66	17.1
	Employed part time	102	26.4
	Sel-employed	73	18.9
	Student	76	19.7
	Unemployed	69	17.9
Residence	Urban	249	64.5
	Suburban	104	26.9
	Rural	33	8.5
Type of residence	Single family house	263	68.1
	Apartment or condominium	72	18.7
	Townhouse or new house	51	13.2
Ownership Status	Own with mortgage	125	32.4
	Rent	160	41.5
	Living with family/friends	101	26.2
City	Erbil	173	44.8
	Sulaymaniyah	136	35.2
	Duhok	77	19.9

F: Frequency, %: Percentage, SD: Standard deviation

showed that 16.3% (63) were under 18 years, 27.2% (105) were aged 18-25 years, 28.2% (109) were aged 26-35 years, 16.3% (63) were aged 36-50 years and 11.9% (46) were over 50 years. Gender distribution revealed that 41.5% (160) were male and 58.5% (226) were female. Regarding education level, 11.4% (44) were not able to read or write, 7.5% (29) had a basic school education, 18.1% (70) completed high school, 49.2% (190) held a college or university degree, 4.9% (19) were graduate/postgraduate and 8.8% (34) had other qualifications. In terms of occupation, 17.1% (66) were employed full-time, 26.4% (102) were employed part-time, 18.9% (73) were self-employed, 19.7% (76) were students and 17.9% (69) were unemployed. Most participants (64.5%, 249) resided in urban areas, while 26.9% (104) lived in suburban areas and 8.5% (33) in rural areas. The type of residence was predominantly single-family houses (68.1%, 263), followed by apartments or condominiums (18.7%, 72) and townhouses or new houses (13.2%, 51). Regarding ownership status, 32.4% (125) owned their home with a mortgage, 41.5% (160) rented and 26.2% (101) lived with family or friends. Finally, the participants were distributed among the three cities, with 44.8% (173) from Erbil, 35.2% (136) from Sulaymaniyah and 19.9% (77) from Duhok. (Table 1).

DISTRIBUTION OF ECO-ANXIETY LEVELS

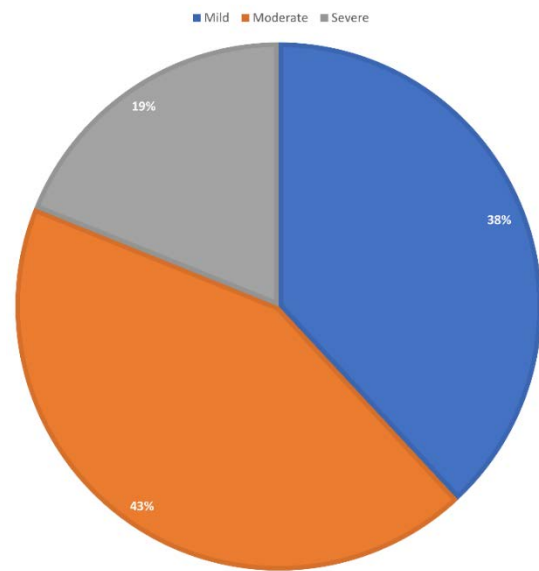


Figure 1: Eco-anxiety levels

Eco-anxiety Items

The distribution of eco-anxiety levels among participants revealed that 38% experienced mild eco-anxiety, 43% moderate eco-anxiety and 19% severe eco-anxiety. For a clearer visual presentation, refer to Figure 1.

Association Between Demographic Characteristics and Eco-Anxiety Levels

The Chi-square analysis revealed no significant associations between gender and eco-anxiety levels ($p = 0.64$), although females reported slightly higher levels of mild and moderate anxiety compared to males. Age showed no significant relationship ($p = 0.118$), but severe anxiety was more common in participants aged over 50 years (20.5 percent). Education level was not significantly associated ($p = 0.227$), though participants with college or university education reported the highest levels of severe anxiety (60.3 percent). Type of residence was significantly associated with eco-anxiety levels ($p = 0.021$), with participants living in apartments reporting higher levels of severe anxiety (26.0 percent) compared to those in single-family houses (61.6 percent). Additionally, city of residence showed a significant association ($p = 0.006$), with residents of Erbil experiencing higher severe anxiety (58.9 percent) compared to Sulaymaniyah (19.2 percent) and Duhok (21.9 percent). For more details, refer to Table 2.

Principal Component Analysis of the Hogg Eco-Anxiety Scale

The Principal Component Analysis (PCA) revealed four components explaining a total variance of 80.613 percent, with affective symptoms contributing 23.655 percent,

Table 2: Association Between Hogg Eco-Anxiety Levels and Demographic Characteristics

		Hogg Level			Chi-square	p-value
		Mild	Moderate	Severe		
Gender						
Male	N	57	70	33	0.893	0.64
	%	38.8%	42.2%	45.2%		
Female	N	90	96	40		
	%	61.2%	57.8%	54.8%		
Age						
Under 18	N	25	33	5	12.813	0.118
	%	17.0%	19.9%	6.8%		
18-25	N	40	47	18		
	%	27.2%	28.3%	24.7%		
26-35	N	45	43	21		
	%	30.6%	25.9%	28.8%		
36-50	N	21	28	14		
	%	14.3%	16.9%	19.2%		
Over 50	N	16	15	15		
	%	10.9%	9.0%	20.5%		
Education Level						
Not able (read and write)	N	18	18	8	12.947	0.227
	%	12.2%	10.8%	11.0%		
Basic school	N	11	17	1		
	%	7.5%	10.2%	1.4%		
High school	N	30	31	9		
	%	20.4%	18.7%	12.3%		
College/University	N	68	78	44		
	%	46.3%	47.0%	60.3%		
Graduate/Postgraduate	N	10	5	4		
	%	6.8%	3.0%	5.5%		
Others	N	10	17	7		
	%	6.8%	10.2%	9.6%		
Occupation						
Employed full time	N	23	27	16	10.182	0.252
	%	15.6%	16.3%	21.9%		
Employed part time	N	44	43	15		
	%	29.9%	25.9%	20.5%		
Sel-employed	N	25	28	20		
	%	17.0%	16.9%	27.4%		
Student	N	31	37	8		
	%	21.1%	22.3%	11.0%		
Unemployed	N	24	31	14		
	%	16.3%	18.7%	19.2%		
Residence						
Urban	N	98	101	50	6.453	0.167
	%	66.7%	60.8%	68.5%		
Suburban	N	36	54	14		
	%	24.5%	32.5%	19.2%		
Rural	N	13	11	9		
	%	8.8%	6.6%	12.3%		
Type of residence						
Single family house	N	110	108	45	11.557	0.021
	%	74.8%	65.1%	61.6%		
Apartment or condominium	N	15	38	19		
	%	10.2%	22.9%	26.0%		
Townhouse or new house	N	22	20	9		
	%	15.0%	12.0%	12.3%		
Ownership Status						
Own with mortgage	N	40	60	25	8.237	0.083
	%	27.2%	36.1%	34.2%		
Rent	N	58	67	35		
	%	39.5%	40.4%	47.9%		
Living with family/friends	N	49	39	13		
	%	33.3%	23.5%	17.8%		
City						
Erbil	N	58	72	43	14.583	0.006
	%	39.5%	43.4%	58.9%		
Sulaymaniyah	N	65	57	14		
	%	44.2%	34.3%	19.2%		
Duhok	N	24	37	16		
	%	16.3%	22.3%	21.9%		

N: Number, %: Percentage; chi-square was used to determine the relationship between anxiety levels and demographic data and statistical significance was set at $p < 0.05$

Table 3: Factor Loadings from Principal Component Analysis of the 13-Item Hogg Eco-Anxiety Scale

	Component				Communality
	Affective Symptoms	Behavioral Symptoms	Rumination	Anxiety About Personal Impact	
Not being able to stop or control worrying	0.796				0.841
Worrying too much	0.740				0.807
Feeling nervous, anxious or on edge	0.716				0.781
Feeling afraid	0.569				0.725
Difficulty working and/or studying		0.805			0.795
Difficulty enjoying social situations with family and friends		0.769			0.818
Difficulty sleeping		0.722			0.791
Unable to stop thinking about past events related to climate change			0.724		0.846
Unable to stop thinking about future climate change			0.686		0.864
Unable to stop thinking about climate change			0.670		0.830
Feeling anxious about your personal responsibility to help address climate change				0.754	0.854
Feeling anxious that your personal behaviors will do little to help fix climate change				0.746	0.805
Feeling anxious about the impact of your personal behaviors on climate change				0.498	0.723
Total Variance Explained	23.655	21.591	18.411	16.956	80.613
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.				0.951	
Bartlett's Test of Sphericity	Chi-Square (p-value)			4161.738 (<0.05)	

The Kaiser-Meyer-Olkin (KMO) test was used to measure sampling adequacy and Bartlett's test of sphericity was used to assess the suitability of the data for factor analysis. Statistical significance was set at $p < 0.05$

Table 4: Pearson Correlation Coefficients Among Dimensions of the Hogg Eco-Anxiety Scale

Pearson Correlation	Rumination	Behavioral symptoms	Anxiety about personal impact
Affective Symptoms	0.743**	0.768**	0.767**
Rumination		0.822**	0.815**
Behavioral Symptoms			0.854**

** : Correlation is significant at the 0.01 level (2-tailed), Significance was set at $p < 0.05$. Pearson Correlation was used

behavioral symptoms 21.591 percent, rumination 18.411 percent and anxiety about personal impact 16.956 percent. Key items loaded strongly onto their respective components, such as "Not being able to stop or control worrying" (loading = 0.796) under affective symptoms and "Difficulty working and/or studying" (loading = 0.805) under behavioral symptoms. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was excellent at 0.951 and Bartlett's Test of Sphericity was significant (Chi-Square = 4161.738, $p < 0.05$), confirming the appropriateness of the PCA. For more details, refer to Table 3.

Correlation Among Dimensions of the Hogg Eco-Anxiety Scale

Pearson correlation analysis demonstrated strong positive correlations among the four dimensions of the Hogg Eco-Anxiety Scale. Affective symptoms were significantly correlated with rumination ($r = 0.743$), behavioral symptoms ($r = 0.768$) and anxiety about personal impact ($r = 0.767$). Similarly, rumination showed significant correlations with behavioral symptoms ($r = 0.822$) and anxiety about personal impact ($r = 0.815$). Behavioral symptoms also had a strong positive correlation with anxiety about personal impact ($r = 0.854$). All correlations were significant at the 0.01 level (2-tailed) (Table 4).

DISCUSSION

The present study aimed to explore the prevalence and correlates of climate anxiety symptoms in a large, representative sample of the KRI population. Overall, the

results revealed that most participants experienced moderate levels of eco-anxiety, highlighting the widespread psychological impact of climate change in this region.

Climate change poses a significant threat to mental health, with increasing reports of eco-anxiety and related psychological distress worldwide [24]. In the KRI, the unique socio-political context and environmental challenges make it crucial to understand the prevalence and factors associated with eco-anxiety. However, there is a lack of research on this topic in the region. Given the importance of addressing the mental health implications of climate change, we aimed to bridge this gap by conducting a comprehensive study on eco-anxiety in the KRI population. The diverse demographic profile of our study participants, spanning different age groups, genders, educational levels, occupations and residential areas, provides a representative snapshot of the KRI population. This broad representation aligns with the global recognition of the pervasive nature of eco-anxiety, which affects individuals from various backgrounds [25,26]. Moreover, the inclusion of participants from urban, suburban and rural areas enhances our understanding of how eco-anxiety may differ across living environments.

Our findings indicate that the majority of participants experienced moderate levels of eco-anxiety, with a smaller proportion reporting severe levels. These results are consistent with previous studies conducted in other countries, which have identified a high prevalence of eco-anxiety among the general population [24,27]. The congruence between these findings and global patterns suggests that eco-anxiety is a shared human experience, but the specific

dynamics within the KRI highlight the interplay of local cultural and environmental factors. Interestingly, our study did not find significant associations between eco-anxiety levels and demographic variables such as gender, age and education level. This lack of strong demographic correlates contrasts with some previous studies that have reported higher levels of eco-anxiety among females, younger individuals and those with higher educational attainment [28,29]. However, the slight tendencies observed in our data—such as higher levels of mild and moderate anxiety among females and severe anxiety among older participants—indicate the need for further nuanced exploration of these trends.

The significant association between residence type and eco-anxiety levels in our study is a noteworthy finding. Apartment dwellers reported higher levels of severe anxiety compared to those living in single-family houses. This difference may be attributed to various factors, such as limited access to green spaces, reduced sense of control over living environments and heightened exposure to urban stressors in apartment settings [30]. Furthermore, the higher prevalence of eco-anxiety among urban residents underscores the psychological strain of urbanization in the face of climate change, pointing to the importance of integrating mental health considerations into urban planning. In particular, prioritizing access to green spaces, reducing urban pollution and incorporating climate-resilient designs into cities could help alleviate eco-anxiety and improve residents' overall well-being.

The regional variations in eco-anxiety levels observed in our study, with participants from Erbil reporting higher prevalence of severe anxiety compared to those in Sulaymaniyah and Duhok, suggest the presence of localized factors influencing the psychological response to climate change. These variations highlight the need for region-specific interventions that address the unique environmental and socio-economic conditions of each governorate. Developing tailored public awareness campaigns and mental health programs that reflect local needs and cultural contexts is critical for reducing eco-anxiety across the region.

The dimensions of eco-anxiety identified through the Principal Component Analysis in our study provide valuable insights into the psychological manifestations of climate change concern. The four dimensions— affective symptoms, rumination, behavioral symptoms and anxiety about personal impact—collectively explain a substantial portion of the variance in eco-anxiety levels. These findings align with previous research that has highlighted the multifaceted nature of eco-anxiety, encompassing emotional, cognitive and behavioral components [26]. The strong correlations among these dimensions, particularly between behavioral symptoms and anxiety about personal impact, underscore the interconnected nature of individuals' emotional responses and their perceptions of personal agency in addressing climate change.

While our study provides valuable insights into the prevalence and correlates of eco-anxiety in the KRI

population, it is important to acknowledge its limitations. The cross-sectional design limits our ability to establish causal relationships between the studied variables and eco-anxiety levels. Additionally, the self-reported nature of the data may be subject to response biases. Future research should adopt longitudinal designs and incorporate objective measures to capture the dynamic and evolving nature of eco-anxiety over time. Exploring the causal pathways between environmental stressors and eco-anxiety could provide deeper insights into the underlying mechanisms. Moreover, qualitative studies could provide a deeper understanding of the lived experiences and coping strategies of individuals grappling with eco-anxiety in the KRI context. Such research would further enrich our understanding of this pressing issue and inform more targeted and effective interventions. In addition, interdisciplinary approaches that combine psychological, environmental and socio-political perspectives could offer actionable recommendations for addressing eco-anxiety and fostering resilience in vulnerable communities.

CONCLUSION

The study indicates that a majority of participants reported moderate levels of eco-anxiety, underscoring the necessity for healthcare providers and policymakers to formulate targeted interventions aimed at addressing eco-anxiety and its psychological repercussions, particularly within urban environments and among vulnerable populations in the Kurdistan Region of Iraq. Policymakers should integrate mental health considerations into environmental and urban planning policies, prioritize access to green spaces and launch public awareness campaigns to mitigate eco-anxiety. Additionally, healthcare systems should develop culturally tailored mental health programs to support individuals affected by eco-anxiety. Future research should prioritize the examination of the long-term effects of eco-anxiety and the exploration of culturally relevant strategies to alleviate its impact on mental health. Longitudinal studies and intervention trials are particularly needed to better understand the evolving nature of eco-anxiety and to evaluate the effectiveness of targeted interventions in reducing its psychological burden.

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