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Climate-related distress in individuals with mental disorders in Germany: Results from a cross-sectional study

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ABSTRACT

Background: Climate anxiety describes emotional responses such as worry or distress related to climate change. While it is common and linked to mental health in the general population, little is known about its relevance for individuals with pre-existing mental disorders.

Methods: A nationwide cross-sectional online survey was conducted in Germany between March and July 2025 among adults with at least one self-reported mental disorder. Participants provided socio-demographic and clinical information and completed four items assessing dimensions of climate-related distress: general concern, perceived impact on mental well-being, perceived effects of climatic events on psychological symptoms, and interference with everyday functioning. Group differences were examined using non-parametric tests, and associations with age were analyzed using Spearman correlations with Bonferroni correction.

Results: The sample included 427 participants (mean age 36.5 years; 73% female). Reported climate-related distress levels were relatively low across all dimensions within this sample, with minimal interference with daily functioning. Gender differences were found only for perceived effects of climatic events on psychological symptoms, with women reporting higher impact. Associations with age were weak and not significant after correction. Exploratory analyses indicated some variation across diagnostic groups, but most differences were small and did not remain significant after correction.

Discussion: Climate-related distress among individuals with mental disorders appears present but generally modest and rarely functionally impairing. Weak and inconsistent associations with sociodemographic and diagnostic factors suggest that climate-related distress is not strongly structured by specific diagnoses, supporting its consideration within broader clinical and psychological contexts.

1. Introduction

Climate change is increasingly recognized not only as an environmental and economic challenge but also as a significant psychological

stressor (Clayton, 2020; Cosh et al., 2024). In conceptual work on climate emotions, these constructs can be situated within a broader taxonomy of climate-related affective states (Pihkala, 2022). These emotions encompass a broad range of negative responses, including

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anxiety, fear, grief, anger, guilt and distress related to environmental degradation and its anticipated consequences (Pihkala, 2022). However, several positive emotions related to climate change, such as optimism, hope and empowerment have also been investigated. Importantly, the taxonomy emphasizes that these emotions frequently co-occur in characteristic combinations. As a result, studies may capture partially overlapping constructs depending on whether they focus on threat based symptoms, loss based emotions, moral emotions, or broader distress experiences (Pihkala, 2022). Within this framework, climate anxiety (also termed eco-anxiety) has emerged as one of the most widely studied constructs and typically refers to persistent worry or fear related to climate change and its impacts (Clayton et al., 2021). Importantly, climate anxiety does not necessarily constitute a mental disorder; rather, it is commonly understood as a spectrum of emotional reactions that can range from adaptive concern to more impairing forms of distress that interfere with daily functioning (Taylor, 2020; Clayton, 2021). In the present study, we focus on selected dimensions of climate-related distress, including general concern, perceived impact on mental well-being, effects on psychological symptoms, and interference with daily functioning. These dimensions must be understood as part of the broader construct of climate anxiety.

In the general population, recent quantitative syntheses indicate that climate anxiety is widespread and meaningfully related to mental health. One recently published meta-analysis of 60 studies involving more than 65,000 participants reported a moderate pooled level of climate anxiety, with higher scores among women and significant variation by country and assessment tool (Gallè et al., 2025). Similarly, a systematic review of 87 studies found that eco-distress was positively associated with anxiety, depressive symptoms, and general psychological distress (Gebhardt et al., 2025). Observational data from Germany further suggest that while overall levels of climate anxiety were reported to be relatively low, higher levels are observed among younger adults and are associated with factors such as coronavirus anxiety and fear of war (Hajek and König, 2022).

Among children and young people, climate-related emotional distress appears particularly prominent. An international survey of more than 10,000 adolescents and young adults across ten countries found that most respondents reported high levels of worry and negative emotions about climate change, with nearly half experiencing interference in daily functioning (Hickman et al., 2021). Climate anxiety was also linked to negative evaluations of government responses and feelings of betrayal (Hickman et al., 2021). Complementing these findings, a systematic review focusing on adolescents concluded that climate anxiety is a common response to climate change awareness and is frequently accompanied by emotions such as fear, sadness, anger, and hopelessness, although the evidence base remains largely descriptive and geographically concentrated in Western countries (Mondal et al., 2024). One systematic review synthesizing the results of 15 qualitative studies further indicates that climate anxiety encompasses diverse concerns, including worries about future generations, environmental collapse, loss of livelihood, and perceived institutional inaction, and is often accompanied by feelings of helplessness as well as varied coping and meaning making strategies (Soutar and Wand, 2022).

Beyond the general population, climate-related mental health impacts have also been documented in vulnerable groups. A systematic review of 32 studies found that exposure to climate change events, primarily acute weather events, was associated with poorer mental health outcomes among individuals with low socioeconomic status, minoritized ethnic or racial backgrounds, Indigenous populations, and housing insecure individuals (Mahmood et al., 2025). In parallel, a further systematic review including 35 studies and more than 45,000 participants found that climate anxiety correlated with indicators of psychological distress, including symptoms of anxiety, depression, and stress (Cosh et al., 2024). Similarly, a review of studies on climate change awareness and mental health reported that higher awareness was consistently associated with poorer mental health outcomes,

including depression, anxiety, substance use, and suicidal thoughts (Gianfredi et al., 2024). At the same time, some studies have highlighted potentially adaptive aspects of climate-related concern, such as increased engagement in pro environmental behavior, underscoring the complexity of climate anxiety (Sangervo et al., 2022; Schwartz et al., 2022; Whitmarsh et al., 2022; Ojala, 2023).

A growing body of research has also examined sociodemographic correlates of climate anxiety. However, results are heterogeneous with some studies reporting higher levels among women (Sangervo et al., 2022; Clayton et al., 2023; Niedzwiedz and Katikireddi, 2023; Gallè et al., 2025; Kricorian et al., 2025) and younger individuals (Whitmarsh et al., 2022; Kricorian et al., 2025), whereas others find no differences or even opposite patterns regarding one or both factors (Clayton et al., 2023; Niedzwiedz and Katikireddi, 2023; Gallè et al., 2025). Results regarding educational level are similarly inconsistent (Sangervo et al., 2022; Niedzwiedz and Katikireddi, 2023; Kricorian et al., 2025). Overall, sociodemographic effects tend to be small and vary depending on how climate anxiety is operationalized and the population studied, suggesting that such patterns may not generalize uniformly across contexts.

Despite the growing interest in climate anxiety, surprisingly little is known about how it manifests in individuals with pre-existing mental disorders. This represents a critical gap in the literature, as people with mental health conditions may differ from the general population in their emotional processing, stress reactivity, and vulnerability to additional stressors (Clayton, 2021; Cuijpers et al., 2023). Furthermore, many previous studies have focused primarily on general worry or concern about climate change, while fewer have examined multiple dimensions of climate anxiety, such as perceived impacts on mental well-being, psychological symptoms, or everyday functioning.

Against this background, the present pilot study seeks to characterize climate anxiety-related responses in individuals with mental disorders and to explore how different aspects of climate-related distress are experienced in this population. Specifically, we focus on selected dimensions, including general concern, perceived impact on mental well-being, effects on psychological symptoms, and potential interference with daily functioning. By situating these findings within the existing literature on climate anxiety in the general population, the study aims to clarify whether and how climate-related distress may differ in clinical contexts.

2. Methods

2.1. Study design and participants

This study is part of a nationwide cross-sectional survey conducted in Germany and registered in the German Clinical Trials Register (DRKS00036057) that included several research dimensions. Data were collected between March and July 2025 using an anonymous online questionnaire. Participants were adults aged 18 years or older who reported at least one diagnosed mental disorder and had sufficient German language proficiency to complete the survey. Participation was voluntary and no personally identifiable information was collected.

Recruitment was carried out across Germany using multiple strategies to reach individuals with mental disorders. Flyers and posters were distributed in psychiatric hospitals as well as in outpatient offices of registered psychiatrists. In addition, advertisements were placed in public transportation systems in several major German cities, including Hamburg, Cologne, Berlin, and Munich for a period of 8 weeks. These combined approaches were intended to ensure broad geographic coverage and access to both inpatient and outpatient clinical populations. The study was approved by the Ethics Committee of the Medical Faculty of the Ludwig Maximilian University of Munich and Augsburg (Ref. 24-0009). All procedures were conducted in accordance with the Declaration of Helsinki.

2.2. Outcome measures

Participants provided sociodemographic information, including age, gender, and educational level. In this study, gender was defined as participants' self-identified gender, as reported by the participants, and no data on biological sex were collected. Clinical characteristics were as a consequence of the study design assessed via self-report without external validation, including the presence of one or more mental disorders. Multiple diagnoses could be reported. Climate-related distress was assessed using four self-developed single items capturing different dimensions of climate-related distress: (1) general concern about climate change, (2) perceived impact of climate change on mental well-being, (3) perceived influence of climatic events (e.g., floods, storms, extreme heat, drought) on psychological symptoms, and (4) perceived interference of climate-related concerns with everyday functioning (e.g., going to work, meeting friends). It should be noted that the items do not constitute a validated scale and should be interpreted as assessing specific aspects of climate-related distress rather than a unified construct. We decided not to include a validate scale such as the Climate Anxiety Scale (Wullenkord et al., 2021) to keep the questionnaire short and to account for the nature of the study (anonymous online study). All items were rated on 5-point Likert scales, with lower values indicating higher concern or stronger perceived impact. These items were not adapted from a specific validated instrument. However, they overlap conceptually with key domains commonly assessed in existing measures of climate anxiety (e.g., cognitive-emotional responses and functional impairment). They were chosen to reduce participant burden in a broader clinical survey while covering both general and clinically salient aspects of climate-related anxiety. Response options coded as "no answer" or "not answered" were treated as missing values. Beyond the variables analyzed in the present paper, the broader survey included additional domains related to mental health and treatment experiences. These encompassed attitudes toward the discontinuation of psychotropic medication, experiences with psychiatric and psychotherapeutic treatment, substance use patterns, perceived stigma related to mental illness, and health literacy. These measures were collected as part of the overall study design but were not included in the analyses reported here.

2.3. Statistical analyses

Descriptive statistics were calculated for all variables. Given the ordinal measurement level of the climate-related distress items and non-normal distributions, nonparametric statistical methods were applied. To further examine the coherence of the four items, inter-item associations were analyzed using Spearman's rank correlations. Differences in climate-related distress between groups were examined using Mann-Whitney U tests for comparisons involving two groups and Kruskal-Wallis tests for comparisons involving more than two groups. Effect sizes (r and epsilon-squared) were calculated for non-parametric tests. Associations between age (measured in years as a continuous variable) and climate-related distress items (ordinal single item measures rated on five-point Likert scales) were analyzed using Spearman's rank-order correlation coefficients. To control for inflated Type I error due to multiple testing, Bonferroni corrections were applied separately for each family of analyses, defined as the four items of climate-related distress tested within each set of comparisons (gender, educational level, and age). Accordingly, the adjusted significance threshold was set at $\alpha = 0.0125$ (0.05 divided by four tests). In addition to the bivariate analyses, exploratory multivariable linear regression analyses were conducted for each climate-related distress item. Age, gender, and selected diagnostic categories (affective disorders, schizophrenia, and developmental disorders) were included as predictors. All statistical tests were two-tailed. Statistical analyses were conducted using SPSS (version 31.0).

3. Results

A total of 516 participants completed the overall survey. Due to missing responses on items regarding climate-related distress and exclusion of nine participants identifying as non-binary because of the very small subgroup size, analyses related to climate-related distress were based on 427 participants. Inter-item correlations were moderate to high (Spearman's $\rho = 0.370 - 0.666$, all $p < .001$), indicating that the items capture related but not identical dimensions of climate-related distress (see Supplementary Table 1). The mean age of the sample was 36.46 years ($SD = 12.60$). Most participants identified as women (72.6 %), and the majority reported having completed a Bachelor's degree or higher level of education (53.4 %). Participants reported between one and five concurrent mental disorder diagnoses, most commonly affective disorders (83.6 %), neurotic, stress-related and somatoform disorders (35.8 %), developmental disorders (15.2 %), and personality disorders (13.3 %). See Table 1 for descriptive data.

Overall, participants within this sample reported scores indicating generally low levels of climate-related distress across all assessed dimensions, although responses varied across items. Mean scores ranged from 2.10 ($SD = 1.15$) for general concern about climate change to 3.96 ($SD = 1.14$) for interference of climate-related concerns with everyday functioning. Median scores indicated predominantly neutral to low concern levels across items, suggesting that climate-related distress was generally present but not highly pronounced in this clinical sample.

Gender differences in climate-related distress were examined using Mann-Whitney U tests. No significant gender differences were found for general concern about climate change, perceived impact on mental well-being, or interference with everyday functioning (all $p > .05$). A significant difference emerged for the perceived influence of climatic events on psychological symptoms, with women participants reporting higher perceived impact than men participants ($U = 14,740.00$, $Z = -3.07$, $p = .002$, $r = 0.15$). This result remained statistically significant after Bonferroni correction for multiple testing. No significant gender

Table 1
Sociodemographic and clinical characteristics of sample.

	N	M	SD
Age (in years)	427	36.46	12.60
Gender	N	%	
Male	117	27.4	
Female	310	72.6	
Number of concurrent diagnoses			
1	206	48.2	
2	144	33.7	
3	52	12.2	
4	20	4.7	
5	5	1.2	
Mental disorders			
Schizophrenia	39	9.1	
Affective disorders	357	83.6	
Neurotic, stress-related and somatoform disorders	153	35.8	
Personality disorders	57	13.3	
Behavioral problems	38	8.9	
Developmental disorders	65	15.2	
Substance use disorder	29	6.8	
Other disorders	5	1.2	
Duration of illness			
< 5 years	85	19.9	
5–10 years	123	28.8	
> 10 years	219	51.3	
Education			
Lower secondary education	33	7.7	
Upper secondary education	99	23.2	
Higher education	228	53.4	
Vocational education	67	15.7	

N = number of participants; M = mean; SD = standard deviation. Percentages are based on the total sample size. Multiple responses were possible for mental disorders.

differences were observed for the remaining climate-related distress items. See Table 2 for descriptive data and test statistics.

Differences in climate-related distress across educational levels were examined using Kruskal–Wallis tests. No statistically significant differences were found for any of the climate-related distress items (all $p \geq .05$). This pattern remained unchanged after correction for multiple testing, indicating that climate-related distress did not differ meaningfully by educational attainment in this clinical sample. See Table 3 descriptive data and test statistics.

Correlations between age (treated as a continuous variable) and each climate-related distress item were assessed separately using Spearman’s rank-order correlations. Subtle positive correlations were observed between age and three climate-related distress items, namely general concern, perceived impact on mental well-being, and perceived influence of climatic events on psychological symptoms. Given that higher scores reflected lower levels of concern or perceived impact, this pattern indicates that younger participants tended to report slightly higher levels of climate anxiety. Correlation coefficients ranged from $r = 0.10$ to $r = 0.11$ (all $p < .05$). This pattern did not remain significant after correction for multiple testing, See Table 4 for descriptive data and test statistics.

Exploratory analyses indicated some differences in climate-related distress across diagnostic groups. Given that lower scores indicate greater concern or perceived impact, participants with schizophrenia reported lower levels of climate-related distress across general concern and perceived impacts on mental well-being and psychological symptoms compared with those without schizophrenia ($U = 9345.50 - 9650.50, Z = 2.55 - 2.93, p = .010 - 0.003, r = 0.12 - 0.13$), whereas no difference was observed for interference with everyday functioning ($p = .953$). Participants with affective disorders showed higher levels of climate-related distress across all assessed dimensions ($U = 9742.00 - 10,568.00, Z = -3.017 - -2.176, p = .030 - 0.003, r = 0.11 - 0.15$), although none of these effects remained statistically significant after Bonferroni correction. In contrast, participants with developmental disorders consistently reported significantly higher climate-related distress across several dimensions, with differences in perceived impacts on mental well-being ($Z = -3.228, p = .001, r = 0.16$), psychological symptoms ($Z = -3.507, p < .001, r = 0.17$), and everyday functioning ($Z = -4.024, p < .001, r = 0.20$). See Supplementary Table 2 for descriptive data and test statistics.

To further examine the combined influence of sociodemographic and clinical variables, exploratory multivariable regression analyses were conducted (see Supplementary Table 3 for complete model information). Multicollinearity diagnostics indicated no evidence of problematic collinearity (all VIFs < 2). Across models, the proportion of explained variance was small ($R^2 = 0.053 - 0.068$), and only small and inconsistent

associations were observed. Developmental disorders emerged as the most consistent predictor, showing higher levels of climate-related distress across multiple dimensions (e.g., item 4: $B = -0.60, \beta = -.19, p < .001$; item 3: $B = -0.50, \beta = -.15, p = .002$). Other variables showed no stable pattern of associations, with effects varying across outcomes (e.g., gender was associated with item 3: $B = -0.33, \beta = -.12, p = .011$, but not with other dimensions). Overall, the multivariable analyses did not substantially alter the pattern observed in the bivariate analyses.

4. Discussion

The present pilot study provides to the best of our knowledge the first quantitative evaluation of climate-related distress in individuals with mental disorders. Overall, participants reported relatively low levels of climate-related distress, with particularly low levels of interference in everyday functioning. This pattern fits with parts of the general population literature showing that, although climate change is widely recognized as a serious threat, average levels of climate-related distress are often moderate or low in many adult samples (Hajek and König, 2022; Gallè et al., 2025). At the same time, other studies, particularly those focusing on adolescents and young adults, report substantially higher levels of worry, emotional distress, and functional impact, indicating that climate anxiety varies widely across age groups and socio-cultural contexts (Hickman et al., 2021; Mondal et al., 2024; Gallè et al., 2025; Kühner et al., 2025).

One possible explanation for the comparatively lower functional impact reported in the present clinical sample is that individuals with mental disorders may often be preoccupied with more immediate and personal stressors. Recent population research indicates that abstract and global threats such as climate change tend to have weaker effects on mental health when more proximal stressors such as loneliness or financial strain are taken into account (Ogunbode et al., 2025). This suggests that, for people already coping with psychiatric symptoms, climate-related concerns may be less prominent in the context of more immediate psychological challenges.

At the same time, climate-related distress was not absent in the present sample. Participants did report general concern about climate change and perceived links between climatic events and their psychological symptoms, indicating that environmental stressors may co-occur with existing vulnerabilities. This interpretation is supported by recent clinical evidence showing that climate change anxiety covaries with psychiatric symptom severity (Mohamed et al., 2025b). A recent comparative study of individuals with bipolar disorder and major depression found that climate anxiety was markedly higher in clinical groups than in healthy controls. Further, both climate anxiety and psychiatric symptom severity exhibited pronounced seasonal variation,

Table 2
Gender differences in climate anxiety.

	Total			Female			Male			U	Z	p	r
	N	M ± SD	Mdn	N	M ± SD	Mdn	N	M ± SD	Mdn				
Climate anxiety													
How concerned are you about climate change in general?	427	2.10 ± 1.15	2.00	310	2.03 ± 1.31	2.00	117	2.28 ± 1.31	2.00	16,617.50	-1.422	.155	.07
Does climate change generally affect your mental well-being?	427	3.15 ± 1.51	3.00	310	3.11 ± 1.13	3.00	117	3.26 ± 1.21	3.00	16,917.00	-1.105	.269	.05
Do you feel that climatic events (e.g., floods, storms, extreme heat, drought) affect your psychological symptoms?	427	3.26 ± 1.20	3.00	310	3.15 ± 1.16	3.00	117	3.56 ± 1.28	4.00	14,740.00	-3.068	.002*	.15
Do your concerns about climate change affect your ability to cope with everyday life (e.g., going to work, meeting friends, etc.)?	427	3.96 ± 1.14	4.00	310	3.95 ± 1.21	4.00	117	3.97 ± 1.20	4.00	17,624.50	-0.475	.635	.02

Climate anxiety items were rated on 5-point Likert scales. For all items, lower scores indicate higher levels of concern or stronger impairment (1 = very concerned / very strong, 5 = not concerned / not at all). N = number of participants; M = mean; SD = standard deviation; Mdn = median. Group differences were tested using Mann–Whitney U tests. Z denotes the standardized test statistic.

* $p < .05$, Bonferroni-adjusted to $\alpha = 0.0125$.

Table 3
Climate anxiety across education levels.

	LSE			USE			HE			VE			H	df	p	ε ²
	N	M ± SD	Mdn	N	M ± SD	Mdn	N	M ± SD	Mdn	N	M ± SD	Mdn				
Climate anxiety																
How concerned are you about climate change in general?	33	2.45 ± 1.30	2.00	99	2.17 ± 1.29	2.00	228	1.95 ± 1.03	2.00	67	2.30 ± 1.18	2.00	7.822	3	.050	.01
Does climate change generally affect your mental well-being?	33	3.15 ± 1.30	3.00	99	3.12 ± 1.21	3.00	228	3.12 ± 1.10	3.00	67	3.30 ± 1.17	3.00	1.351	3	.717	.00
Do you feel that climatic events (e.g., floods, storms, extreme heat, drought) affect your psychological symptoms?	33	2.94 ± 1.30	3.00	99	3.17 ± 1.25	3.00	228	3.33 ± 1.15	3.00	67	3.33 ± 1.25	4.00	3.271	3	.352	.00
Do your concerns about climate change affect your ability to cope with everyday life (e.g., going to work, meeting friends, etc.)?	33	3.52 ± 1.33	3.00	99	3.81 ± 1.23	4.00	228	4.06 ± 1.06	4.00	67	4.04 ± 1.09	4.00	6.401	3	.094	.01

LSE = lower secondary education; USE = upper secondary education; HE = higher education; VE = vocational education. Climate anxiety items were rated on 5-point Likert scales (1 = very concerned / very strong, 5 = not concerned / not at all). N = number of participants; M = mean; SD = standard deviation; Mdn = median. Group differences across education levels were tested using Kruskal–Wallis tests. H denotes the Kruskal–Wallis test statistic, and p values are two-tailed.

Table 4
Spearman’s rank-order correlations between age (continuous) and individual climate anxiety items.

	Age		
	N	r	p
Climate anxiety			
How concerned are you about climate change in general?	427	.109	.025
Does climate change generally affect your mental well-being?	427	.100	.039
Do you feel that climatic events (e.g., floods, storms, extreme heat, drought) affect your psychological symptoms?	427	.107	.027
Do your concerns about climate change affect your ability to cope with everyday life (e.g., going to work, meeting friends, etc.)?	427	.085	.081

N = number of participants. r denotes Spearman’s rank correlation coefficient. Climate anxiety items were rated on 5-point Likert scales (1 = very concerned / very strong, 5 = not concerned / not at all), *p < .05, Bonferroni-adjusted to α = 0.0125.

with peaks during summer and winter. Moreover, in both mood disorder groups climate anxiety was significantly associated with multiple dimensions of symptom severity, including depressive, somatic, and anxiety symptoms (Mohamed et al., 2025b). In our sample, participants with affective disorders tended to show higher levels of climate-related concern and perceived impacts, whereas participants with schizophrenia reported lower levels of concern and perceived impact on psychological symptoms. This contrasts with recent findings from a cohort study in Egypt, indicating that individuals with schizophrenia may experience elevated climate anxiety, particularly during summer, and that symptom severity, especially negative symptoms and medical comorbidities, can predict climate-related distress (Mohamed et al., 2025a). These discrepancies may reflect differences in measurement tools, sample characteristics, or exposure to the effects of climate change. Notably, participants with developmental disorders such as ADHD or tic disorders reported significantly higher levels of climate-related distress across several items. One systematic review comprising the findings of 32 studies suggests a higher prevalence of anxiety disorders as well as multiple other psychiatric disorders in individuals with ADHD (Choi et al., 2022), which may increase susceptibility to environmental and future-oriented stressors such as climate change. In this context, climate-related concerns may be integrated into existing patterns of worry and emotional dysregulation, rather than representing a distinct or isolated source of distress.

Further, in a study of outpatients in a psychosomatic setting, only a subset of 21 % of patients reported anxiety or depressive symptoms that they explicitly attributed to awareness of climate change (Gebhardt

et al., 2023). However, within this group, the severity of these climate-related symptoms was strongly predicted by baseline levels of anxiety, depression, and post-traumatic stress (Gebhardt et al., 2023). This pattern suggests that climate-related distress in clinical populations may be observed alongside indicators of psychopathology rather than standing as an independent condition. At the same time, differences between diagnostic groups in the present study should be interpreted with caution. While some patterns were observed, effect sizes were generally small and not all differences remained statistically significant after correction for multiple testing. These findings therefore point to potential differences between diagnostic groups that warrant further investigation, rather than indicating clear or robust group-specific effects. Moreover, diagnoses were self-reported and not externally validated

Regarding the impact of sociodemographic characteristics, gender was unrelated to most dimensions of climate-related distress, and age effects were small and weak, suggesting that sociodemographic patterns observed may be less pronounced in this group. Exploratory multivariable analyses yielded results largely consistent with the bivariate findings, suggesting that the observed associations were small and not driven by confounding between variables. This further supports the interpretation that climate-related distress in this sample is not strongly explained by individual sociodemographic or diagnostic factors. Given that individuals with mental disorders represent a vulnerable population, a better understanding of how they perceive and experience climate-related concerns is important. A more nuanced understanding of these experiences may help to inform how climate-related aspects can be considered in clinical care and mental health services.

Another important aspect of the present findings is the relatively low level of reported interference with everyday functioning. In contrast to youth samples, where climate anxiety is often linked to sleep problems, concentration difficulties, and impaired daily functioning, most participants in the present study did not perceive climate-related concerns as substantially disruptive. This pattern suggests that climate-related emotional responses do not necessarily translate into functional impairment. Consistent with this, emerging evidence indicates that the form of emotional response may play an important role. Research from Australia shows that eco-anger, a climate-related emotional response distinct from anxiety, was associated with better mental health outcomes and greater engagement in climate action, indicating that not all climate-related emotions are necessarily maladaptive (Stanley et al., 2021). Consistent with this, empirical studies show that active engagement and participation in climate action can buffer the association between climate anxiety and depressive symptoms, while other perspectives highlight the role of positive psychology interventions, such as emotion regulation, meaning focused coping, and cognitive

reframing in shaping whether climate-related distress becomes psychologically impairing (Sangervo et al., 2022; Schwartz et al., 2022; Nimo et al., 2025).

4.1. Strengths and limitations

Some limitations of this study need to be considered. First, the cross-sectional design prevents conclusions about causality or directionality between climate-related distress and mental disorders. Diagnoses were based on self-report, and no information was available on symptom severity, treatment status, functional impairment or illness duration, which may limit the clinical interpretation of the findings. Climate-related distress was measured using single items rather than validated multi-item scales, limiting reliability and depth of assessment. Therefore, the findings should be interpreted as reflecting selected aspects rather than a comprehensive assessment of climate anxiety. Moreover, the absence of a control group without mental health disorders limits the ability to determine whether the observed patterns are specific to clinical populations. In addition, the sample was predominantly female and highly educated, raising the possibility of selection bias and limiting generalizability. In addition, participation in an online survey may have introduced self-selection bias, and diagnoses were based on self-report rather than clinical verification. This may have contributed to variability within diagnostic groups and should be considered when interpreting subgroup differences. Furthermore, participation was restricted to adults aged 18 years and older, although previous research suggests that climate-related distress may be particularly pronounced among younger populations, limiting the applicability of the findings to adolescents. The study was also conducted in a high-income country, where many individuals may not yet have experienced direct climate change-related natural disasters, which may further limit generalizability to populations more immediately affected by climate impacts. Finally, potentially relevant factors such as exposure to extreme weather, media use, political orientation, and coping strategies were not assessed and may have contributed to individual differences in climate-related distress. However, the key strength of our study is that it addresses a major gap in the literature by examining climate-related distress in individuals with diagnosed mental disorders, a population that has been largely neglected in previous research. Individuals with mental disorders often experience heightened stress sensitivity, reduced coping resources, and greater exposure to social and health-related adversities, which may increase their susceptibility to climate-related stressors. By focusing on this population and assessing multiple dimensions of climate-related distress, the present study provides clinically relevant insights into how climate-related distress may manifest in a group likely to be disproportionately affected by ongoing and future climate change.

4.2. Conclusion

In conclusion, the present findings suggest that climate-related distress in individuals with mental disorders occurs within a broader psychological context. Rather than constituting an independent syndrome, climate-related distress appears alongside existing symptom patterns and vulnerabilities. Although overall reported scores for climate-related distress and functional interference were relatively low in this clinical sample, some participants reported associations between climate-related concerns and their psychological symptoms. These findings highlight the importance of assessing climate-related distress within the wider framework of mental health, avoiding the pathologization of climate concern while recognizing its potential to exacerbate distress in susceptible individuals. At the same time, the mechanisms through which individual vulnerabilities and climate-related distress interact remain insufficiently understood and warrant further investigation. Further research using longitudinal designs and validated multidimensional measures is needed to clarify under which conditions climate-related distress becomes clinically relevant in populations with

mental disorders.

As a vulnerable population in itself, we need to continue to build evidence to better understand how individual functioning and responses are being shaped in this group amidst global climate change.

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Data availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Ethics approval

The study involving human participants was reviewed and approved by the ethics committee of the Medical Faculty of the Ludwig-Maximilians-University (LMU) Munich, Germany (Ref. 24-0009) and was performed in accordance with the ethical standards as defined in the Declaration of Helsinki.

CRediT authorship contribution statement

Theresa Halms: Conceptualization; Methodology; Investigation; Formal analysis; Data curation; Interpretation of data; Writing – original draft; Writing – review & editing; Project administration. **Janine Grimmer:** Investigation; Data curation; Formal analysis; Writing – review & editing. **Selina Hindermayr:** Investigation; Data curation; Writing – review & editing. **Stefan Leucht:** Conceptualization; Writing – review & editing; Funding acquisition. **Natalie Sonntag:** Interpretation of data; Writing – review & editing. **Jochen Gensichen:** Conceptualization; Writing – review & editing; Funding acquisition. **Manasi Kumar:** Interpretation of data; Writing – review & editing. **Siqi Xue:** Interpretation of data; Writing – review & editing. **Jurjen J. Luykx:** Interpretation of data; Writing – review & editing. **Alkomiet Hasan:** Conceptualization; Methodology; Writing – review & editing; Project administration; Funding acquisition.

Declaration of generative AI and AI-assisted technologies in the manuscript preparation process

An artificial intelligence-based language model (ChatGPT, OpenAI; GPT-4 architecture, accessed via <https://chat.openai.com>) was used to assist with language editing, text condensation, and improvement of clarity in portions of the manuscript. All content was critically reviewed, revised, and approved by the authors, who take full responsibility for the accuracy, integrity, and originality of the manuscript.

Declaration of competing interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest. AH has served as a consultant for AbbVie, Axunio, Boehringer Ingelheim, Lundbeck, Otsuka, and Teva; has served as an advisory board member for or received speakerships from AbbVie, Advanz, Boehringer Ingelheim, Janssen, Lundbeck, Otsuka, Recordati, and Rovi; and is the Editor of the German schizophrenia guideline. All other authors report no competing interests.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.psychres.2026.117190](https://doi.org/10.1016/j.psychres.2026.117190).

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