

Systematic Review

The Impact of the Climate Crisis on Mental Health: A Systematic Literature Review

Benjamin Miranda Tabak ^{*,†}  and Laís Almeida da Conceição [†] 

School of Public Policy, Government and Business, Getulio Vargas Foundation (FGV/EPPGE), SGAN 602 Módulos A,B,C, Asa Norte, Brasília 70830-020, Brazil

* Correspondence: benjaminm.tabak@gmail.com or benjamin.tabak@fgv.br

† These authors contributed equally to this work.

Abstract

Background: Climate change, marked by extreme events such as droughts and floods, profoundly affects mental health, leading to climate anxiety, characterized by fear and worry about its effects, which can also adversely impact sustainability. **Objective:** To explore the socioeconomic and psychological factors influencing the levels of climate anxiety measured by the Climate Change Anxiety Scale (CCAS). **Methodology:** Systematic literature review following PRISMA guidelines, analyzing studies from various regions, focusing on empirical data using CCAS and other complementary instruments. **Results:** Young individuals and those with greater exposure to climate change report higher levels of anxiety, often associated with symptoms of depression and stress. Although anxiety can drive pro-environmental and sustainable behaviors, it can also lead to ecoparalysis in some individuals. **Conclusions:** The CCAS is an effective tool to measure climate anxiety and has the potential to identify vulnerable groups facing the climate crisis. This study highlights the importance of specific interventions to address the psychological impacts of climate change, and promote public policies focusing on sustainability issues.

Keywords: sustainability; climate change; climate change anxiety scale (CCAS); anxiety; mental health; pro-environmental behaviors

1. Introduction

Given the extreme weather events that have been occurring globally, there is no doubt that climate change is a real and ongoing phenomenon. When we analyze climate change, it's clear that its impacts manifest in different ways. According to the World Health Organization (WHO), climate change not only generates functional impacts on human beings but also affects the more subjective sphere of social and cultural relations within communities [1]. Initially, the experience of extreme weather events, repeated exposure to such content, or even the indirect experience of the consequences of climate change, even if at a lower intensity, can generate a series of functional impacts on daily life. The European Perceptions of Climate Change (EPCC), a group that brings together national research councils across Europe, has shown that climate change is a source of concern at the global level, as between 20% and 40% of Europeans, varying between countries, described themselves as “very concerned” about the climate issue [2].

On the other hand, this problem can be analyzed through its impacts that go beyond physical survival, from a more individual-centered perspective, which influences, for instance, the lived, subjective, and social experiences of individuals and communities



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exposed to climate change [3]. In a recent survey, 95% of individuals living in Tuvalu, a country at high risk of disappearing due to rising sea levels, said they felt distressed about climate change, describing it as detrimental to their daily functioning [4]. This impact involves significant changes in emotions, such as anxiety, fear, grief, and anger, alterations in social relations and cultural meanings, and is further shaped by inequalities and conditions of social vulnerability that permeate these dynamics [5]. In a socio-cultural perspective, experiencing this type of transformation, such as prolonged droughts, heat waves, floods, and forest fires, forces people to leave their homes and even their regions and countries, carrying with them uncertainty about the future and a sense of loss, both of material goods and part of their identity [6].

Given this, and with the aim of exploring not only the physical damage but also the mental damage, caused to people exposed to the effects of climate change, several studies have been dedicated to investigating how perceptions of the effects of climate change impact individuals' mental health [7,8]. Then, the literature points to the emergence of a new concept: climate anxiety, which refers to the feelings of fear, concern, and apprehension associated with the effects of climate change and how these events can affect people's lives in practical ways [9].

Part of the theoretical debate has focused on conceptualizing the different constructs emerging in the literature which, although similar, cover different spheres when it comes to the impact of the climate crisis on individuals' mental health. In this context, there is eco-guilt, which consists of a feeling of guilt caused by the perception that one is not meeting personal or social standards related to the environment [10]. In short, the individual feels remorse due to their belief that they are not acting in accordance with established environmental norms [11].

Eco-grief is another psychological concept related to the environment, consisting of a feeling of loss of identity in the face of exposure to significant environmental changes [12]. The environment is also an essential part of what makes a person who they are, so when such changes occur, their emotional and behavioral ties to the environment are destroyed, affecting their mental health [13]. On the other hand, eco-anxiety and climate anxiety can be distinguished conceptually. Eco-anxiety refers broadly to anxiety associated with the ecological crisis as a whole, whereas climate anxiety specifically denotes anxiety triggered by climate change. As a result, climate anxiety has become the most widely discussed and studied form of eco-anxiety [14].

In the United States, a recent study conducted by the American Psychological Association (APA), one of the leading scientific organizations in psychology, found that about two-thirds of respondents reported feeling at least some level of climate anxiety or concern about the effects of climate change. At the same time, approximately one-quarter said they felt a great deal of anxiety [15]. Reports of high levels of anxiety and concern about the future are not only common among adults from different populations, but also among more vulnerable groups, such as children and young people [9]. A study conducted in 2021 interviewed 10,000 young people from 10 countries to collect data on their thoughts and feelings about climate change. The results showed that participants from all countries were concerned about climate change, with 59% being very concerned and 84% being at least moderately concerned, describing feelings of sadness, anxiety, anger, helplessness, hopelessness, and guilt in the face of the problem observed [16].

In addition to anxiety and hopelessness, anger has also manifested itself among individuals, often prompting them to take action [17], adopt more pro-environmental behaviors, and seek ways to reduce their carbon footprint, thus characterizing eco-anger, marked by this feeling of indignation and anger in the face of the consequences, causes, and mismanagement of the environmental crisis [18]. The perception of government action in

mitigating or adapting to climate change has also been explored in several studies [16,19]. A study conducted in Canada showed that 78% of respondents reported that the climate crisis affects their mental health, and a large proportion rated government responses to climate change negatively, in addition to reporting a lack of confidence in the government's position on the issue [20].

Anxiety caused by the effects of the climate crisis also affects reproductive health, generating fear and apprehension about the future and influencing the decision to have children. A new study in Turkey looked at the link between climate change-related anxiety and fertility aspirations, demonstrating that as women's anxiety levels increased, their attitudes toward pregnancy became more negative, leading them to choose not to have children [19].

This type of reaction to climate change is essentially caused by exposure, either directly—through experiencing an extreme event—or indirectly, through access to information about the impacts of climate change on social media [21]. A study examined the correlates of climate anxiety across diverse national contexts, revealing a positive correlation between climate anxiety and the rate of exposure to information regarding the impacts of climate change, encompassing both the volume of media exposure and the content of the information, as well as the degree of attention individuals allocate to it. Data regarding the effects of climate change seems to correlate more significantly with climate anxiety than information pertaining to solutions for climate change mitigation and adaptation, hence fostering a climate of pervasive hopelessness [22].

Given the diversity of emotional responses associated with the climate crisis, it is essential to use psychometric instruments that are truly capable of distinguishing constructs such as eco-grief, eco-anxiety, eco-anger, and climate anxiety, and to measure the level of anxiety related to climate change in a valid and reliable manner. Based on this need, and with the aim of better identifying the level, possible causes and consequences, as well as other associated factors, several instruments have been developed to measure climate anxiety. In this sense, the Climate Change Anxiety Scale (CCAS) stands out for having been developed based on a clear conceptual definition of climate anxiety, distinguishing it from other related environmental emotional reactions, and for presenting robust evidence of internal consistency and psychometric validity in different samples [9,23].

In the present study, we emphasize the use of the Climate Change Anxiety Scale (CCAS) [9], a structured questionnaire based on three studies and validated in MTurk samples, whose results indicate strong internal consistency and broad cross-cultural validation. The CCAS consists of 13 items, subdivided into two scales: (1) Cognitive-Emotional Commitment (Items 1–8), which assesses the emotional and cognitive impact of climate anxiety, including difficulty concentrating, insomnia, and rumination; and (2) Functional Impairment (Items 9–13), which measures how concerns about climate affect the ability to perform daily tasks, work, or socialize. The scale uses a score from 1 to 5 (“never” to “almost always”) to indicate how often respondents experience the feelings or difficulties described. The instrument development study demonstrated high reliability, with Cronbach's alpha $\gg 0.80$ for all subscales, and identified that young people and women are more vulnerable to the cognitive and functional impacts related to climate change.

It is therefore evident that climate change is associated with increasing levels of stress, anxiety, and other mental health problems, affecting individuals and communities. In this sense, measuring anxiety becomes essential to better understand its level and the factors that influence climate anxiety, as well as to identify more vulnerable populations, such as young people, indigenous communities, or residents of climate risk areas, enabling specific interventions. Thus, this study will address the impact of climate change on mental health, with the aim of analyzing the results obtained from the application of the Climate Change

Anxiety Scale (CCAS) and identifying which factors significantly influence CCAS scores through a systematic review of the literature using the PRISMA protocol.

The contribution of this study lies precisely in the scientifically rigorous synthesis of the main results obtained from the application of the CCAS, a valid instrument for measuring climate anxiety, with the aim of identifying gaps, trends, and points of convergence or divergence between the studies analyzed. In addition to this introduction, we present the methods used in this systematic review of the literature, such as the search strategy and eligibility criteria for the articles included. Next, we present the results and discussion through the analysis of the data collected. Finally, we present our final considerations, highlighting the main gaps identified in the literature and some implications for practice and public policies related to mental health.

2. Materials and Methods

This study aims to systematically analyze the impacts of climate change on mental health, therefore, we adopted the PICOS framework (Population, Intervention, Comparison, Outcome, Study Design) as a strategy to delimit and clarify the research question. Accordingly, this review considered studies conducted in different populations in order to ensure broad coverage and sample diversity. The intervention component was not applicable in its traditional sense, in this case, we operationalized this element as the use of the Climate Change Anxiety Scale (CCAS), since the focus of the review lies on studies employing this tool. In turn, comparisons were made between social groups, considering sociodemographic variables such as age, gender, and educational level, and psychological factors, such as general anxiety, depressive symptoms, perceived self-efficacy and pro-environmental intentions, allowing us the assessment of differences in climate anxiety across distinct population profiles. The expected outcome was the identification of levels of climate anxiety and the analysis of factors that significantly influence these outcomes. Finally, the study design component included empirical observational and validation studies, predominantly cross-sectional in nature, that employed the Climate Change Anxiety Scale (CCAS).

Therefore, this systematic literature review seeks to answer the following research question: What socioeconomic and psychological factors influence levels of climate anxiety measured by the Climate Change Anxiety Scale (CCAS)? To this end, we conducted our review using the PRISMA guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), developed to improve transparency and accuracy in the preparation of systematic reviews and meta-analyses, presenting guidelines for identifying, selecting, evaluating, and synthesizing studies from the literature. PRISMA presents a checklist of 27 items that guide authors in reporting important information about the review process, such as justification, eligibility criteria, search and analysis methods, and results. Below, Table 1 presents this methodological rationale that guided the formulation of the research question and the inclusion criteria, organized according to the PICOS framework.

Table 1. Application of the PICOS framework for defining the research question.

Parameter	Description
Population (P)	Studies conducted on human populations in any geographic region.
Intervention (I)	It's not an intervention per se. The review focused on studies that employed the Climate Change Anxiety Scale (CCAS) to measure levels of climate anxiety.
Comparison (C)	Comparisons between social groups based on sociodemographic and psychological factors.

Table 1. *Cont.*

Parameter	Description
Outcome (O)	Identification of levels of climate anxiety and the factors that significantly influence CCAS outcomes.
Study Design (S)	Empirical observational and validation studies using the Climate Change Anxiety Scale (CCAS).

2.1. Search Strategy

The literature search was conducted in two academic databases: Scopus and Web of Science, in December 2025, using the search term “climate change anxiety scale”. The search was limited to documents published in English only. We preregistered the review protocol on the OSF platform: <https://osf.io/fw32c/overview> (accessed on 6 January 2026), in order to promote transparency and reduce reporting bias. After the literature search was completed, the title and abstract of each study were analyzed, and potentially relevant studies were subsequently assessed for eligibility. The selection of studies was performed independently by two reviewers, with the aim of reducing the risk of bias in the process.

In terms of eligibility criteria, only studies that employed the Climate Change Anxiety Scale (CCAS) [9] were included, given that the research objective is to identify socioeconomic and psychological factors associated with climate change anxiety levels assessed using this instrument, as well as the recognition of the CCAS as the most widely used and validated measure of climate anxiety, which allows for cross-study comparisons [24]. In addition, studies employing different methodological approaches were included, such as cross-sectional studies, validation studies, and studies with correlational analyses, as these designs allow for the identification of associations between variables, and the psychometric properties of the instrument, such as validity and reliability, across different contexts and populations, and the examination of statistical relationships between climate anxiety and socioeconomic, demographic, and psychological variables. Table 2 below systematically demonstrates the inclusion and exclusion criteria for the articles used in this review.

Table 2. Inclusion and exclusion criteria for study selection.

Inclusion Criteria	Exclusion Criteria
Peer-reviewed empirical articles published in English between 2020 and 2025.	Literature reviews, systematic reviews, scoping reviews, and meta-analyses.
Studies that used the Climate Change Anxiety Scale (CCAS) as the primary instrument, in accordance with Clayton and Karazsia (2020).	Research that either did not employ the CCAS or did not concentrate on climate fear as assessed by the CCAS.
Studies with the primary or secondary objective of examining socioeconomic, demographic, or psychological factors associated with levels of climate anxiety.	Studies focused exclusively on other climate-related constructs (e.g., environmental concern, risk perception, eco-guilt) without levels of climate anxiety measured by CCAS.
Empirical quantitative studies, including cross-sectional studies, validation studies, and correlational analyses.	Conceptual papers, theoretical essays, commentaries, short communications, conference abstracts, and dissertations.
Studies assessing psychological factors (e.g., anxiety, depression, coping strategies, emotions, beliefs, personality traits) and/or socioeconomic factors (e.g., gender, age education, income).	Studies with insufficient methodological detail or unavailable full texts.
Studies conducted in any country or cultural context, enabling cross-national and cross-cultural comparison of CCAS-related findings.	Studies using qualitative methods only, without quantitative CCAS-based analysis.

2.2. Eligibility Criteria

In the initial search, 127 documents were identified: 66 from Scopus and 61 from Web of Science. After verification, 56 duplicate records were removed. During the screening stage, based on titles and abstracts, 27 records were excluded. The remaining 44 reports were assessed for eligibility through full-text reading. Of these, 17 reports were excluded: one scoping review, four systematic literature reviews, and 12 reports that did not address the research question. A total of 27 studies were included in the final analysis. Below we present detailed information on the study selection process in the PRISMA flow diagram (Figure 1).

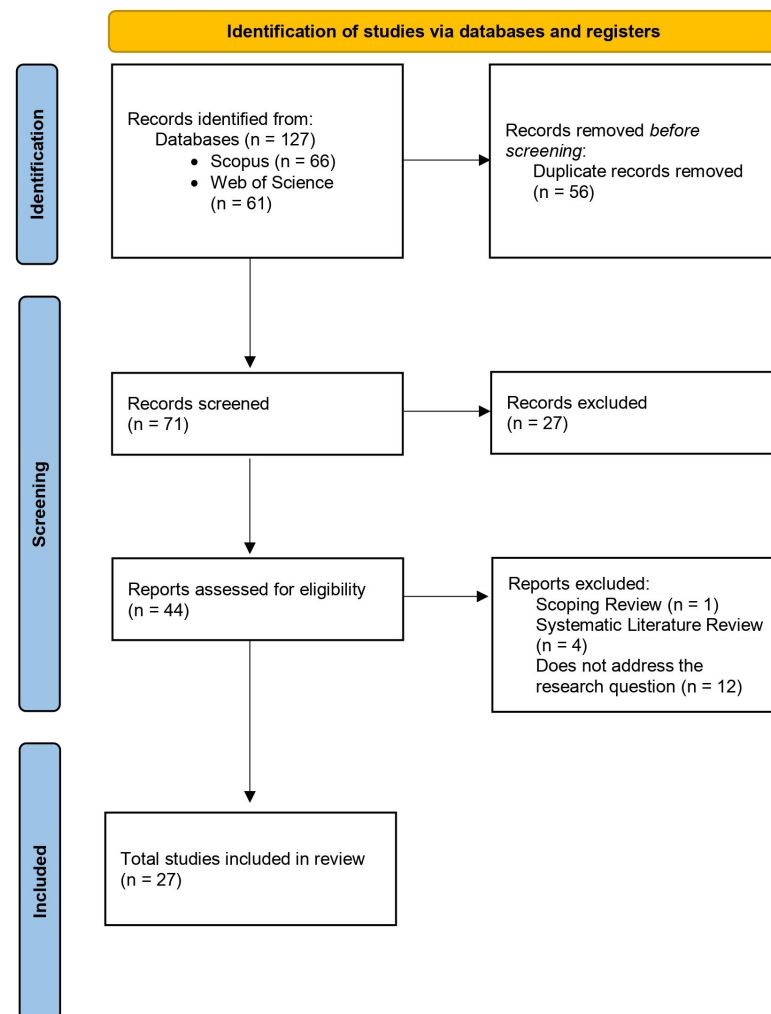


Figure 1. The PRISMA flowchart displays the quantity of studies at each review phase, the rationale for elimination, and the aggregate number of studies kept.

3. Results and Discussion

3.1. Study Characteristics

Among the 27 studies selected for analysis in this review, sample sizes ranged from 130 to 4000 participants. Most studies used non-probability sampling methods, predominantly convenience sampling, often combined with the snowball technique. Purposive sampling strategies were employed on a smaller scale, particularly in investigations with specific populations, such as the study conducted with climate scientists in Chile [25].

In addition, participants across the included studies were predominantly drawn from the general adult population living in the country where the research was conducted (17 studies), samples focused on students (5 studies, including nursing students, high school students, undergraduate students, and general student samples), young people or young adults (3 studies, including Generation Z participants, emerging adults, and youth aged 15–24), patients from a pediatric emergency department (1 study), and climate scientists (1 study).

The studies were conducted across a wide range of countries, including Italy (4 studies), the United States (3), Turkey (3), China (2), South Korea (2), Canada (2), Lebanon (2), the United Kingdom (2), Palestine (3), and Iraq (2). Single-country studies were also carried out in Portugal, Chile, France, the Philippines, South Africa, India, Japan, Egypt, Saudi Arabia, and the United Arab Emirates, as well as one study conducted in Iraqi Kurdistan, an autonomous region in northern Iraq. Overall, there was strong representation of Asian and Middle Eastern countries, as well as European and North American countries, especially the United States and Canada. In contrast, Africa was underrepresented, with only one study carried out in South Africa, and Latin America also appeared in a very limited way, with a single study carried out in Chile.

Regarding the instruments, all included studies employed the Climate Change Anxiety Scale (CCAS), once it constitutes an eligibility criterion and reinforces its role as a widely used and validated tool. Another complementary instrument, more frequently used in the studies, was the Generalized Anxiety Disorder Scale (GAD-7), present in nine studies, indicating a strong overlap between climate anxiety and general anxiety symptoms. Meanwhile, a wide variety of psychological, environmental, and behavioral instruments were used more sporadically, reflecting considerable methodological heterogeneity among the studies. It is noteworthy that five studies used exclusively the CCAS, without the use of additional psychometric measures, usually with the aim of assessing the validity and reliability of the instrument. Table 3 below summarizes the psychometric instruments most frequently used to assess climate anxiety, including a brief description of each instrument and their frequency of use across the analyzed studies.

Some instruments were used less frequently, having been employed in at least one article, indicating significant methodological heterogeneity in the literature. These include general measures of mental health and psychological well-being, for example the Spielberger State–Trait Anxiety Inventory, the Beck Hopelessness Scale, the Beck Depression Inventory-II, the Hospital Anxiety and Depression Scale, and the WHO-5 Well-Being Index, as well as instruments focused on personality traits and psychosocial constructs, such as the Interpersonal Reactivity Index, the Narcissistic Personality Inventory, the Five Facet Mindfulness Questionnaire, and the General Self-Efficacy Scale, as well as scales related to resilience and burnout, such as the Behavioral Resilience Scale and the Copenhagen Burnout Inventory. Other studies incorporated instruments specifically developed to capture attitudes, emotions, and behaviors related to climate change, in addition to measuring climate anxiety itself, such as the Willingness to Have Children Scale (WHCS), which found that, beyond gender differences, anxiety about climate change significantly affects individuals' reproductive decisions, leading to a reduced willingness to have children due to concerns about future well-being [26].

The included studies were predominantly cross-sectional ($N = 12$) and validation studies ($N = 10$), reflecting the dual focus of the literature on examining associations between climate anxiety and related factors, as well as on testing the psychometric properties of the Climate Change Anxiety Scale across different populations and cultural contexts. Validation studies focused on translating, adapting, and validating the CCAS for their language and context, such as validation in Mandarin, Arabic, Italian, Korean, and Japanese.

Regarding cross-sectional studies, climate anxiety was frequently associated with more significant psychological distress, including symptoms of depression, hopelessness, and stress [27–29].

The authors of the CCAS suggest that the classification of climate anxiety scores as high, medium, or low is not defined directly based on fixed thresholds, but they mention that when 25% of participants report difficulties functioning related to climate change more than “sometimes,” this indicates a significant impact on mental health. In the included studies, levels of climate anxiety varied considerably. Eight studies reported high levels of climate anxiety, especially among populations exposed to extreme weather events or emotionally involved with climate change. Eleven studies identified moderate levels of climate anxiety, often associated with psychological distress and pro-environmental involvement. In contrast, four studies reported generally low levels of climate anxiety, especially among student samples. Finally, four studies did not explicitly classify anxiety levels, as their primary focus was psychometric validation rather than prevalence. Other study designs, including descriptive, predictive, quasi-experimental, and secondary data analyses, were less frequent.

Table 3. Main instruments used to assess climate anxiety and related constructs.

Instrument	Instrument Description and Authors	Studies Using the Instrument (n)
Climate Change Anxiety Scale (CCAS)	The CCAS assesses anxiety related to climate change. It is composed of two subscales totaling 13 items: eight items addressing cognitive–emotional impairment and five items related to functional impairment. Responses are recorded on a 5-point Likert scale based on frequency, ranging from 1 (never) to 5 (almost always) [9].	27
Generalized Anxiety Disorder Scale (GAD-7)	The GAD-7 was developed to detect likely instances of generalized anxiety disorder based on DSM-5 criteria, with seven items assessed on a four-point Likert scale that measures the frequency of anxiety symptoms, with response options from 1 (never) to 4 (nearly every day) [30].	9
New Environmental Paradigm Scale (NEP/NEP-R)	The NEP scale comprises 15 assertions, with half being anthropocentric and reverse-coded. Responses are evaluated using a seven-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree), with elevated scores indicating more robust pro-environmental beliefs [31].	4
Patient Health Questionnaire-9 (PHQ-9)	The PHQ-9 is a nine-item self-evaluation tool for depression. Participants assess the intensity of symptoms encountered in the preceding fortnight on a scale from 0 (never) to 3 (nearly daily) [32].	3
Kessler Psychological Distress Scale (K6/K10)	The K10 is a self-administered instrument including ten items that assesses psychological discomfort. Items are evaluated using a five-point Likert scale, ranging from 1 (never) to 5 (always). It assesses aspects such as nervousness, negative affect, fatigue, and agitation. A short version of this instrument is also available (K6) [33].	3

Table 3. *Cont.*

Instrument	Instrument Description and Authors	Studies Using the Instrument (n)
Pro-Environmental Behaviour Scale (PEBS)	The PHQ-9 is a nine-item self-administered questionnaire designed to evaluate depression symptoms. Participants indicate how frequently they have experienced each symptom over the previous two weeks, using a scale ranging from 0 (never) to 3 (almost every day) [34].	2
Future Event Questionnaire (FEQ)	The FEQ assesses future event recognition, including optimism and pessimism. It consists of 34 items (17 for each dimension) rated on a five-point scale from 1 (not at all certain) to 5 (as certain as one can be), with total scores ranging from 17 to 85 [35].	2

3.2. Methodological Quality

The methodological rigor of the studies included in this review was examined, especially with regard to the characteristics of the samples used. Considering that the representativeness and size of the sample are essential factors in guaranteeing the validity and robustness of the results, aspects such as sample size, type of sampling, gender representativeness, origin of the participants, and adaptation and translation of the research instruments were analyzed, as well as the strategies adopted to reduce bias and exclude inconsistent responses. In all 27 articles reviewed, good methodological practices were observed with adequate sample sizes, ranging from 130 to 4000 participants. For example, studies with minimum samples of around 130 participants followed recommendations established in the literature [36], which suggests an ideal proportion of 10 respondents per item for confirmatory factor analyses, as well as recent simulations that indicate a minimum size of 145 participants to ensure convergence and reduce bias in statistical models [37]. On the other hand, studies with larger samples, up to 4000 individuals, have ensured greater statistical power and data diversity. This variation reflects the care taken by researchers to adapt the sample size to the objective and methods used, giving quality and reliability to the results presented.

With regard to the sampling technique used, we found that only one of the studies analyzed did not use non-probabilistic sampling methods [38]. This study used panel sampling with quotas (stratified), carried out by a research company, which gave the study great representativeness in terms of gender and age distribution. In addition, the study included participants from different income and education levels, broadening the diversity and representativeness of the sample. Apart from this exception, the studies used convenience or snowball sampling methods, techniques that, although widely used in exploratory research or in contexts where access to the target audience is difficult, still have a number of methodological limitations that may compromise the validity of the results. In this sense, there is a risk of a lack of representativeness, since the participants were not selected randomly, leading to a significant sampling bias.

The way in which the translation and cross-cultural adaptation of the instruments were conducted is an essential aspect for assessing the methodological quality of the studies. A widely recommended technique in this process is the forward-backward translation method [39], which consists of translating the instrument into the target language and then translating it back into the original language by a different translator in order to verify semantic and conceptual equivalence between versions. This technique is considered rigorous and reliable [40].

In this review, among the studies classified as validation studies, seven studies used the forward-backward translation method, two studies used the validated English version,

since they aimed to replicate and extend the initial investigation of the scale's structural and discriminant validity. Only one study did not mention the questionnaire translation process, possibly because it was not a central objective of the research, nor did it indicate the use of the forward-backward translation method or any other methodologically robust procedure for adapting the questionnaire.

3.3. Analyzing the Risk of Bias

Systematic flaws or limitations in a study's design or implementation may distort its findings. Such biases can emerge at any stage of the research process, making it essential to account for potential sources of bias when interpreting study findings [41]. Thus, several tools have been proposed to assess the methodological quality of observational studies in systematic reviews [42]. ROBINS-I (Risk Of Bias In Non-randomized Studies of Interventions) is a structured methodological framework that was developed to assess the risk of bias in non-randomized studies, focusing on identifying limitations that may compromise the internal validity of the results.

In the present study, we assessed the risk of bias using the ROBINS-I tool, adapting the domains of the tool to account for the heterogeneity of the included studies, which encompassed cross-sectional, descriptive, secondary, and quasi-experimental studies. Thus, we assessed the following domains for each of the 27 articles included: bias due to confounding, bias in participant selection, bias due to missing data, bias in outcome measurement, and bias in the selection of reported results. For this assessment, we considered the information made available and explicitly reported in the articles, such as sampling strategies, control of confounding variables, how missing data were handled, and the quality of the measurement instruments used.

The risk of bias assessment revealed a moderate to high level in several domains, especially in the domains of participant selection, measurement of outcomes, and selection of the reported result. Regarding the bias found in participant selection, it is noted that the vast majority of studies used convenience and snowball sampling. This recruitment strategy, often used through online platforms, may limit the representativeness of the samples and reduce the generalizability of the findings. Similarly, we found that the domains of outcome measurement and selection of reported results also had a high frequency of high risk. This is especially due to the use of ad hoc instruments or single-item indicators to assess more complex aspects of the topic. The use of unvalidated scales occurred less frequently, but their use also contributes to uncertainties regarding the reliability of these results.

On the other hand, the domains of bias due to missing data and confounding bias presented a more heterogeneous distribution, with studies classified as low risk or some concerns. However, there is still a high proportion of studies with high risk, suggesting that some socioeconomic and psychological variables may not have been adequately controlled for the context of the analysis, and sometimes the reporting of missing data was not transparent enough. Below Table 4 presents a summary of the risk of bias analysis by domain.

Table 4. Assessment of risk of bias using ROBINS-I tool.

Bias Domain	Low Risk	Some Concerns	High Risk
Confounding	2	3	22
Selection of participants	0	1	26
Missing data	2	6	19
Measurement of outcomes	0	3	24
Selection of the reported result	0	0	27

3.4. Socio-Economic Factors

With regard to socioeconomic factors, age proved to be a crucial factor in climate anxiety. Most articles demonstrated that being younger is directly associated with higher levels of climate anxiety, often because young people are more exposed to information about climate change and more concerned about the future [43–45]. Findings indicate that younger individuals reported elevated levels of climate anxiety and perceive a sense of powerlessness, frustration, and betrayal toward those in positions of authority to drive change [43]. The application of CCAS in the United Kingdom revealed that only younger age was a predictor of greater climate anxiety [44]. This highlights the need for studies that develop specific mental health interventions for young people, aimed at addressing psychological problems related to climate change awareness [46].

In the studies analyzed, although some articles found no significant differences in the level of climate anxiety between men and women [29], gender still emerged as one of the most consistently examined variables in relation to climate anxiety, with the majority of findings indicating higher levels of climate anxiety among women compared to men [25,47]. A study conducted in Turkey, which investigated reproductive preferences, showed that average CCAS scores were significantly higher among women than among men. Concerns related to climate change significantly affect reproductive decisions, leading to lower willingness to have children because of uncertainty regarding future well-being and environmental risks [26].

The results related to education reported by studies seem more heterogeneous and less consistent than those observed in other factors. In several cases, it is only described or used as a control variable, without being analyzed as a central explanatory factor. However, a divergent pattern can still be noted in the literature. Some studies indicate that a higher level of education is associated with a higher level of climate anxiety, since as awareness and knowledge about the topic increase, anxiety and hopelessness also reflect these changes [46]. On the other hand, anxiety also appears to be associated with economic vulnerability, so people with lower levels of education have more significant climate anxiety. One study revealed that this may be related to the greater socioeconomic challenges faced by these individuals, such as greater vulnerability and direct exposure to the impacts of climate change [43].

Another factor highlighted by studies is that the profile of the individual analyzed is relevant, such that people with a stronger connection to nature exhibit higher levels of climate anxiety [44]. One study described the so-called “concerned manager effect,” defined as the tendency of individuals who are more concerned about climate change to engage in behaviors aimed at reducing its impacts [48]. However, it was observed that this effect was attenuated among people with higher levels of climate anxiety, suggesting that other factors may influence the behavior of these individuals. On the other hand, another study showed that climate anxiety was the strongest predictor of interest in environmental sustainability, reinforcing the idea that higher levels of anxiety can stimulate action [45]. In other words, there is no point of convergence on this issue. High levels of anxiety can cause more or less action.

3.5. Pro-Environmental Behavior

Most of the research examined in this review investigated the connection between climate anxiety and pro-environmental behaviors. Several authors have indicated a positive correlation, where higher levels of climate anxiety is associated with greater involvement in pro-environmental actions [28], suggesting that participants with higher levels of climate anxiety are more willing to change their behaviors in order to cope with climate change [43]. A study conducted in Italy concluded that individuals with higher climate anxiety are

more likely to engage in more pro-environmental behaviors. This finding was confirmed by the study results, which showed that both CCAS subscales correlated positively with the total PEBS (Pro-Environmental Behaviors Scale) score [28]. Another study revealed that anxiety symptoms were most strongly related to PEB and were a significant predictor of PEB, meaning that higher anxiety symptoms predict higher behavioral engagement [49].

However, some studies have presented different results. While climate anxiety can motivate some individuals to adopt more pro-environmental behaviors, it can also lead to eco-paralysis in others. This state results in disengagement and avoidance of climate action [26]. Thus, climate anxiety appears to have a dualistic role. Despite promoting behaviors aimed at mitigating climate change [28,38], climate anxiety may simultaneously reduce self-efficacy by fostering negative beliefs and feelings of helplessness or hopelessness [48]. Lower levels of self-efficacy were observed in individuals with high climate anxiety, reflecting a perception of inability to cope with the situation [28].

This duality of results can be interpreted from the perspective of the Theory of Planned Behavior (TPB). The TPB was proposed by Icek Ajzen (1991) [50] and consists of a social psychology model used to understand how and why individuals adopt certain behaviors, especially when they involve decision-making, intention, and control. According to the Theory of Planned Behavior, the intention to perform a specific behavior is the most significant predictor of an individual's actions. In this setting, intention can be anticipated through three elements: attitudes, subjective norms, and perceived control of behavior (PBC) [51].

Attitude consists of a general evaluation, which can be positive or negative, of performing a certain behavior. Subjective norms refer to individuals' perceptions of whether people who are important to them would want them to perform the behavior. Finally, PBC is based on the extent to which individuals perceive that this behavior is under their control. In this sense, climate anxiety, which has the power to strengthen pro-environmental attitudes, increasing sensitivity to social and moral norms for combating climate change and caring for the environment, is also capable of undermining perceived behavioral control, thus reducing self-efficacy and promoting feelings of helplessness and hopelessness, creating a situation in which, despite strong concern, individuals may suffer from ecological paralysis, leading to disengagement and withdrawal from pro-environmental actions. According to the standard TPB model, individuals who hold more favorable attitudes toward environmental activism and perceive stronger social norms supporting it are more likely to intend to engage in pro-environmental behaviors [52]. Thus, climate anxiety seems to function as a double-edged emotional factor within the TPB framework, simultaneously motivating and inhibiting pro-environmental behavior, depending on its impact on perceived behavioral control. Below, Table 5 presents the main characteristics of the validation studies analyzed, including country, population, instruments used, and psychometric results of the climate anxiety scale adaptations. Next, Table 6 summarizes the characteristics and key findings of other relevant studies that used the CCAS to investigate climate anxiety in different populations and contexts.

Table 5. Features of the validation studies analyzed.

Study	Country	Population and Sample	Gender and age group (mean and SD)	Instrument	Results
Cruz e High (2022) [23]	US	General US population N = 513 Convenience and snowball sampling	Age not reported	CCAS, CCK-LS, and Spielberger State-Trait Anxiety Inventory	CCAS can be used to assess climate change anxiety levels. It has been replicated in diverse populations and can be treated as a multidimensional measure.
Innocenti et al. (2021) [28]	Italy	General population of Italian nationality and resident in Italy N = 130	Female = 67.6%; Mean age = 32.4 (SD = 11.72)	CCAS, GAD-7, K-10, NEP-R, BRS	The CCAS has good internal consistency and is associated with environmental concerns and climate change.
Lau et al. (2025) [43]	China	General Chinese population aged 18 years and over, living in Hong Kong N = 1567	Mean age = 27.3 (SD = 11.6)	CCAS, PHQ-4, WHO-5, IRI-D, NPI-R, CBI-S, DBS	The CCAS showed excellent reliability and internal consistency. No significant gender differences were found, but a lower correlation for societal concern compared to other dimensions.
Fekih-Romdhane et al. (2024) [29]	Lebanon	General population, residents of Lebanon aged 18 and over N = 763	Female = 63.4%; Mean age = 28.57 (SD = 11.08)	CCAS	The CCAS showed good reliability. Higher climate anxiety levels were significantly associated with higher stress, anxiety and depression.
Abdu et al. (2024) [53]	Lebanon, Palestine, Egypt, Saudi Arabia, and the United Arab Emirates	Adults from selected Arabic-speaking countries N = 350 Convenience and snowball sampling	Female = 54.9%; Mean age = 30.6 (SD = 12.9)	CCAS	The Arabic version of the CCAS was successfully translated, culturally adapted, and validated, showing good validity and reliability under a bifactor model.
Jang et al. (2023) [54]	South Korea	General Korean population N = 459	Female = 51.0%; Mean age = 44.18 (SD = 13.54); Age range = 19–65	CCAS and FEQ	The Korean CCAS demonstrated good validity and reliability. Higher climate anxiety was associated with more pessimistic future expectations.
Mirandi et al. (2025) [55]	Italy	Italian emerging adults N = 891 Convenience and snowball sampling	Female = 67.6%; Mean age = 23.00 (SD = 2.50); Age range = 19–29	CCAS-SF, GAD-7, PHQ-9	Measurement invariance across sex was confirmed. Females showed higher cognitive-emotional impairment. The Italian version of CCAS is a reliable and valid measure to assess climate anxiety.
Innocenti et al. (2025) [56]	Italy	High school students N = 250 Convenience and snowball sampling	Female = 45.6%; Mean age = 16.13 (SD = 1.44)	CCAS, Climate Change Worry Scale, NEP-R	The CCAS demonstrated adequate psychometric properties. Higher CCAS predicted greater worry and rumination, which subsequently predicted pro-environmental attitudes.

Table 5. Cont.

Study	Country	Population and Sample	Gender and age group (mean and SD)	Instrument	Results
Prata and Matos (2025) [57]	Portugal	Portuguese general population hosted at the University of Coimbra N = 522 Snowball sampling	Female = 69.16%; Mean age = 44.49 (<i>SD</i> = 11.68); Age range = 18–65	CAS, HEAS, EAS, CNS-Brief, CEAS	The CAS showed good internal consistency and multiple forms of validity. The relationship between natural connection and well-being was mediated by climate worry and environmental activity.
Mouguiama-Daouda et al. (2022) [58]	France	French-speaking participants N = 305 (study 1) and N = 905 (study 2) Convenience sampling	Female = 72.13%; Mean age = 30.80 (<i>SD</i> = 11.32); Age range = 17–70	CCAS, GAD-7, BDI-II, EIDS	A 13-item, two-factor CCAS showed the best fit. Factors were correlated with depressed and environment identity, yet not with anxiety in general.

Table 6. Features of the other studies analyzed.

Study	Country	Population and Sample	Gender and age group (mean and SD)	Instrument	Results
Efeturk et al. (2024) [26]	Turkey	General population, literate and married (N = 977)	Female = 73.2%	CCAS and WHCS	Mean CCAS scores were higher for women. Climate anxiety significantly reduced willingness to have children due concerns about well-being and environmental conditions.
Tam et al. (2023) [38]	China, India, Japan, and USA	General population (N = 4000)	Age and Gender not reported	CCAS	The CCAS showed similar structure and psychological meaning across the four countries. Participants reported significant concern about climate change and elevated climate anxiety.
Eren et al. (2024) [59]	Turkey	Nursing students (N = 419)	Female = 79.7%; Mean age = 26.4 (<i>SD</i> = 1.95)	CCAS and GCCAS	Climate anxiety was associated with higher psychological distress and predicted lower mental health, with no association with psychological well-being.
Reyes et al. (2021) [27]	Philippines	Generation Z Filipinos (N = 433) Convenience sampling	Female = 66.51%; Mean age = 20.4 (<i>SD</i> = 1.60) Age range = 18–26	CCAS and MHI-38	Climate anxiety was positively associated with psychological distress and climate related behavioral engagement, although this relationship weakened at very high anxiety levels.
Lukacs et al. (2023) [48]	Canada	General population of British Columbia residents (N = 1553) Convenience sampling	Female = 50.4%; Age not reported	CCAS, K6, and Clayton Behavioural Engagement Scale	Climate anxiety was generally low. Younger age, greater weather concern, generalized anxiety and stronger nature connection predicted higher climate anxiety.
Whitmarsh et al. (2022) [44]	UK	UK general population (N = 891)	Female = 53.7%; Mean age = 47.1; Age range = 18–85	CCAS, GAD-7, FFMQ-18, NEP, and NR-6	

Study	Country	Population and Sample	Gender and age group (mean and SD)	Instrument	Results
Ediz et al. (2023) [46]	Turkey	Young people, climate activists and non-activists (N = 306)	Age not reported	CCAS and BHS	Heightened awareness and understanding of climate change correlated with elevated anxiety and despair.
Bratu et al. (2022) [60]	Canada	Individuals living in British Columbia (N = 859) Convenience sampling	Age range = 25–64	CCAS	Climate anxiety increased significantly after the 2021 heat dome, with average CCAS scores rising from 1.66 to 1.87.
Qader et al. (2025) [61]	Iraqi Kurdistan	General population (N = 385) Convenience sampling	Female = 58.5%; Mean age = 31.65; Majority aged 26–35	CCAS-SF	Climate anxiety adversely impacted emotional and functional well-being, especially among older, urban, and economically disadvantaged individuals.
Assaf et al. (2025) [47]	USA	Pediatric emergency department patients (N = 744) Convenience sampling	Female = 55.2%; Majority aged 14–15; Age range = 12–17	CCAS and GAD-7	The CCAS-S showed high sensitivity and specificity. Females and individuals with public health insurance showed higher odds of climate anxiety.
Chung et al. (2023) [45]	South Korea	South Korean adults (N = 459)	Age range = 19–65	CCAS, Climate Change Risk Perception Inventory, and FEQ	Eco-anxiety was the strongest predictor of environmental sustainability interest, highlighting the role of mental health assessment.
Sapiains et al. (2025) [25]	Chile	Chilean climate scientists (N = 249) Purposive sampling	Female = 55.8%; Majority aged 20–35	CCAS and GAD-7	Climate scientists demonstrated significant emotional responses to climate change, especially among women, younger demographics, and social scientists.
Ahmead et al. (2025) [62]	Palestine	Palestinian undergraduate students (N = 1338) Convenience sampling	Female = 69.4%	CCAS, HADS, and Kessler Psychological Distress Scale	Students reported low climate anxiety but high levels of depression, distress, stress, and anxiety, potentially limiting environmental engagement.
Ahmed et al. (2025) [63]	Iraq	Iraqi adults (N = 1019) Convenience sampling	Female = 52.2%; Majority aged 18–41	CCAS, PHQ-9, and GAD-7	Severe climate anxiety was reported by 71.4% of participants, with higher levels among older adults and positive correlations with depression and anxiety.
Roberts et al. (2025) [64]	UK	UK adults (N = 1044)	Female = 52.8%; Mean age = 49.5 (SD = 17.1); Age range = 18–98	CCAS and ERB intention measures	The S-CCAS showed acceptable validity. Climate anxiety shown a positive correlation with environmental responsible behavior intentions.
Cameron and Kagee (2025) [65]	South Africa	University students (N = 343)	Majority aged 18–23	CCAS, PHQ-9, GAD-7, NEP, Nature Relatedness Scale, and PEBS	Students exhibiting elevated levels of general anxiety, sadness, environmental concern, nature relatedness, and climate information seeking experienced heightened climate anxiety.
Innocenti et al. (2023) [66]	Italy	Healthy Italian adults (N = 394) Convenience and snowball sampling	Female = 64.21%; Age not reported	CCAS, PEBS, and GSE	Cognitive impairment related to climate anxiety both increased and reduced pro-environmental behaviors and negatively affected self-efficacy.

4. Final Considerations

This review highlighted important findings on climate anxiety, its determinants, and its behavioral and psychological implications. In this sense, young people are more likely to present higher levels of climate anxiety, often associated with greater exposure to information and concerns about the future. In addition, there is evidence that women may exhibit higher scores in specific contexts, such as the impact of climate anxiety on reproductive decisions. At the same time, schooling has been little addressed, with indications that lower levels of education increase socioeconomic and emotional vulnerability, resulting in higher levels of climate anxiety.

Regarding pro-environmental behavior, a generally positive relationship was observed between engagement and climate anxiety, with more anxious individuals showing a greater willingness to adopt mitigation actions. However, the impact of climate anxiety can be twofold: while it stimulates action in some individuals, it can generate hopelessness in others, a phenomenon known as eco-paralysis. Regarding the instruments used, the Climate Change Anxiety Scale (CCAS) was applied alongside various other tools to identify associations between climate anxiety and psychological distress, including symptoms of depression and hopelessness.

This review elucidated some gaps in the literature. Although young people have demonstrated higher climate anxiety levels, there remains a need for research that identifies specific mental health interventions aimed at this vulnerable group [46], as the literature lacks sufficient detail and practical implications for addressing this problem. In addition, the relationship between schooling and climate anxiety remains underexplored, with limited evidence and inconclusive results. Some studies focus on specific populations, such as health professionals or vulnerable communities, which may respond differently to climate anxiety.

In light of these findings, it is recommended that public health policies incorporate mental health interventions specifically targeted at young people and women, recognizing that these groups are more vulnerable to the mental health impacts of the climate crisis. Furthermore, the results suggest a need for greater integration of climate anxiety into educational policies and climate communication strategies. Accordingly, educational programs should provide accessible and contextualized information in order to reduce feelings of helplessness and enhance individuals' capacity to understand, adapt to, and respond to climate risks, thereby helping to prevent eco-paralysis.

Despite progress in adapting the Climate Change Anxiety Scale (CCAS) to different languages and cultural contexts, there remains a need to validate the instrument in a broader range of settings. For future research, the application of the CCAS is recommended to measure levels of climate anxiety in Latin American countries, as well as among Indigenous communities and residents of climate-risk areas. Validation of the scale across multiple languages and cultural contexts reinforces its relevance as a tool for future investigations. In addition, a standardized, valid, and reliable scale provides a robust methodological foundation, increasing confidence in study findings and helping to identify variables that influence climate anxiety, thereby supporting more effective policy development for mitigation and adaptation to the effects of climate change.

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