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A systematic review of social, political and geographic factors associated with eco-anxiety in children and young people

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Eco-anxiety refers to distress arising from climate and environmental changes, with children and young people particularly affected. Here we systematically reviewed social, political and geographic factors associated with eco-anxiety among children and young people. Database searches were conducted up to August 2024, and citations to January 2025. Quality was assessed using the Mixed Methods Appraisal Tool. Sixty-nine studies (42 quantitative, 16 qualitative, 11 mixed methods) were included in the narrative synthesis. Most studies used non-probability sampling, covering the Global North. Findings were grouped into 3 overarching categories and 13 sub-categories: social (age and developmental stage, gender, ethnicity, media, socioeconomic context, intergenerational relations, peer and cultural norms), political (distrust, government inaction, individual views and participation) and geographic (exposure to environmental hazards, cross-country differences, urban–rural residence). More consistent findings were found for age, developmental stage and gender, with young adults and particularly young women reporting higher levels of eco-anxiety. Media exposure and perceived government inaction were also consistent factors related to eco-anxiety. Further study is needed to understand how adaptive strategies can target specific factors to foster the positive benefits of eco-anxiety and prevent adverse effects on mental health.

Climate change is leading to a range of cumulative, interconnected and escalating effects on global health[1,2]. The associated health impacts include shifts in the incidence and distribution of vector-borne diseases, heat-related morbidity, and mortality linked to extreme weather, among others[3]. Climate change disproportionately affects children and young people (CYP), who are projected to experience between two and seven times more extreme climatic events over their lifetimes, compared with older generations[4]. These effects are expected to be most severe in the Global South[4]. In particular, under Paris Agreement commitments, a child born in 2020 is estimated to face seven times the risk of extreme heatwaves and twice the risk of wildfire exposure compared with a person born in 1960, and this risk is even higher for children living in poverty and in high-climate-risk regions[4–6]. These stressors are likely to have severe consequences for physical health, and also mental health and well-being[6]. Despite this, children's mental health is almost invisible within national adaptation policies on climate change[7].

Climate change impacts mental health via direct, indirect and overarching pathways[8,9]. Direct effects arise from exposure to extreme weather events, such as heatwaves[10], and slower-onset changes, such as drought[11]. Indirect effects may occur via disruptions to social, economic and other determinants of mental health, such as food

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insecurity, displacement and interruptions to education[8]. In addition, the anticipation, awareness and understanding of climate change threats can also affect mental well-being, even among people without first-hand experience of climate-related events[12]. This overarching psychological burden may particularly affect CYP, who are increasingly exposed to educational content and media coverage concerning climate change and the lack of sufficient policy action[13,14]. Adolescence, a developmental period marked by heightened interest in global and environmental issues[13], also coincides with the onset of many mental health disorders[15]. CYP are therefore disproportionately affected not only owing to their increased exposure to climate hazards but also owing to a period marked by rapid brain development, developmental immaturity, vulnerability to disease, and limited capacity to avoid or adapt to climate change[16].

A range of terms—such as eco-anxiety, climate worry, climate anxiety, climate distress, solastalgia and ecological grief—have emerged to describe the psychological responses to climate and environmental changes, predominantly within Western contexts[9,14,17]. Worry reflects apprehensive thoughts and emotional discomfort related to perceived future threats or anticipated negative outcomes[18,19]. Although often regarded as a negative cognitive-emotional state, worry can serve an adaptive function by motivating individuals to take preparatory or protective action[20,21]. In relation to climate change, climate worry is typically characterized by verbal-linguistic processing (rather than visual imagery) focused on current or potential changes in the climate system and the anticipated consequences[9,22]. Importantly, climate worry has been related to increased engagement in pro-environmental behaviors[23,24]. However, when worry becomes persistent, difficult to control and repetitive, it may signal the presence of anxiety[18,22]. Eco-anxiety encompasses a broader range of distressing emotions linked to environmental degradation, including—but not limited to—climate change, and reflects concern over the numerous and intersecting threats posed by the ecological crisis[25]. Climate anxiety, considered a subset of eco-anxiety, specifically denotes psychological distress related to the climate crisis[9,16]. Here we adopt the term 'eco-anxiety', which encompasses both research on climate anxiety and wider anxieties around environmental threats. Eco-anxiety may be adaptive or maladaptive; the former motivating climate action and the latter potentially leading to anxious passivity, helplessness and despair[26].

Several psychometric instruments have been developed to assess levels of eco- and climate anxiety, including the Climate Change Anxiety Scale (CCAS)[17] and the Hogg Eco-Anxiety Scale (HEAS)[27]. The CCAS comprises four dimensions: cognitive-emotional impairment (for example, experiencing nightmares about climate change), functional impairment (for example, concerns about climate change that interfere with daily responsibilities, such as work or school), behavioral engagement (for example, taking actions such as recycling or consuming less meat) and personal experience (for example, being directly affected by climate-related events)[17]. The HEAS also comprises four dimensions—affective symptoms, rumination, behavioral symptoms and anxiety related to personal impacts—but adopts a broader scope by incorporating concerns about a wider range of environmental issues beyond climate change, such as species extinction, pollution and deforestation[27]. High or chronic levels of eco-anxiety, in the absence of effective coping strategies, could lead to emotional fatigue or psychological burnout, affecting capacity to engage constructively with environmental challenges or participate in collective climate action[28]; however, research is still in its infancy. A systematic review of 12 studies examining the health implications of eco-anxiety found the evidence base to be of limited methodological quality, but associations with functional impairment, symptoms of depression, anxiety, post-traumatic stress disorder, stress, insomnia and poorer self-rated mental health were suggested[29]. However, given the dominance of cross-sectional studies, causal evidence is limited and the likelihood of reverse causation is high[30]. A meta-analysis of 25 studies assessing the relationship between climate anxiety (restricted to studies using the CCAS) and well-being also demonstrated a moderate negative correlation that may be stronger among people with a stronger environmental identity[31]. Climate worry has also been associated with future risk of clinical levels of anxiety among a large sample of adults across Europe[32]. Some scholars have suggested there may be a 'Goldilocks' zone for climate anxiety, whereby levels of anxiety are 'just right' for adaptive coping and engagement in pro-environmental behavior[33]. This may also represent a tipping point, above which climate anxiety becomes maladaptive and damaging to mental health and well-being[33]. Identifying and understanding the diverse factors that contribute to eco-anxiety is essential to formulate comprehensive strategies to support psychological well-being and avoid anxiety becoming maladaptive.

The emergence and intensity of eco-anxiety is likely to be shaped by a complex interplay of individual, social, political and environmental factors[9,34]. A social-ecological approach can help to conceptualize the various factors that may contribute to eco-anxiety among CYP[34]. Disparities in vulnerability to climate change and differential exposure to environmental threats across sociodemographic groups may contribute to unequal experiences of eco-anxiety. Disadvantaged communities, particularly those residing in regions disproportionately affected by environmental hazards, often experience poorer mental health outcomes—especially in the aftermath of extreme weather events[35,36]—owing to limited adaptive resources and heightened exposure to adverse social and economic determinants of health. However, little research has examined whether these groups also experience correspondingly high levels of eco-anxiety. Indeed, critiques of the concept highlight the individualized and depoliticized mainstream approach to eco-anxiety, suggesting that it represents a 'privileged anxiety'[37,38], dominated by white experiences[39], mainly from the Global North[9].

Although eco-anxiety has attracted increasing global attention across media discourse[40], clinical settings[41,42] and academic research[31,43,44], there remains a notable gap in understanding the various social, political and geographic determinants that influence its development and persistence among CYP. Existing literature reviews have focused on defining and measuring eco-anxiety among CYP[45], primarily within the Global North setting, or exploring its psychological impacts[13,46], with relatively limited investigation into the broader contextual determinants shaping its expression in younger populations[34]. The objective of this Analysis is to synthesize evidence from a wide range of studies to provide a comprehensive overview of the social, political and geographic factors influencing eco-anxiety experiences among CYP.

Results

Study selection

The database searches yielded a total of 11,782 results. Ninety-nine articles were also identified from other sources (for example, citations and gray literature searches). After removing 1,309 duplicates, 10,572 titles and abstracts were screened for inclusion. Following title and abstract screening, 217 articles were screened using the full texts. Ultimately, 69 met the eligibility criteria after excluding 148 full texts (Fig. 1 provides full details of the search process and reasons for exclusion).

Study characteristics

Sixty-nine articles were included in the systematic review (summarized in Table 1). All selected studies were published between 1995 and 2025, with a notable increase from around 2021. There were 42 quantitative, 16 qualitative and 11 mixed-methods studies. Of the quantitative studies, most were cross-sectional, with only 2 studies identified as longitudinal[47,48]. The sample size included within studies varied from 7 participants in a qualitative study examining eco-anxiety experiences and coping strategies[49], to 139,941 in a cross-sectional study of Norwegian school pupils[50]. In terms of geographic location, there was a higher representation of countries from the Global North such as Australia,

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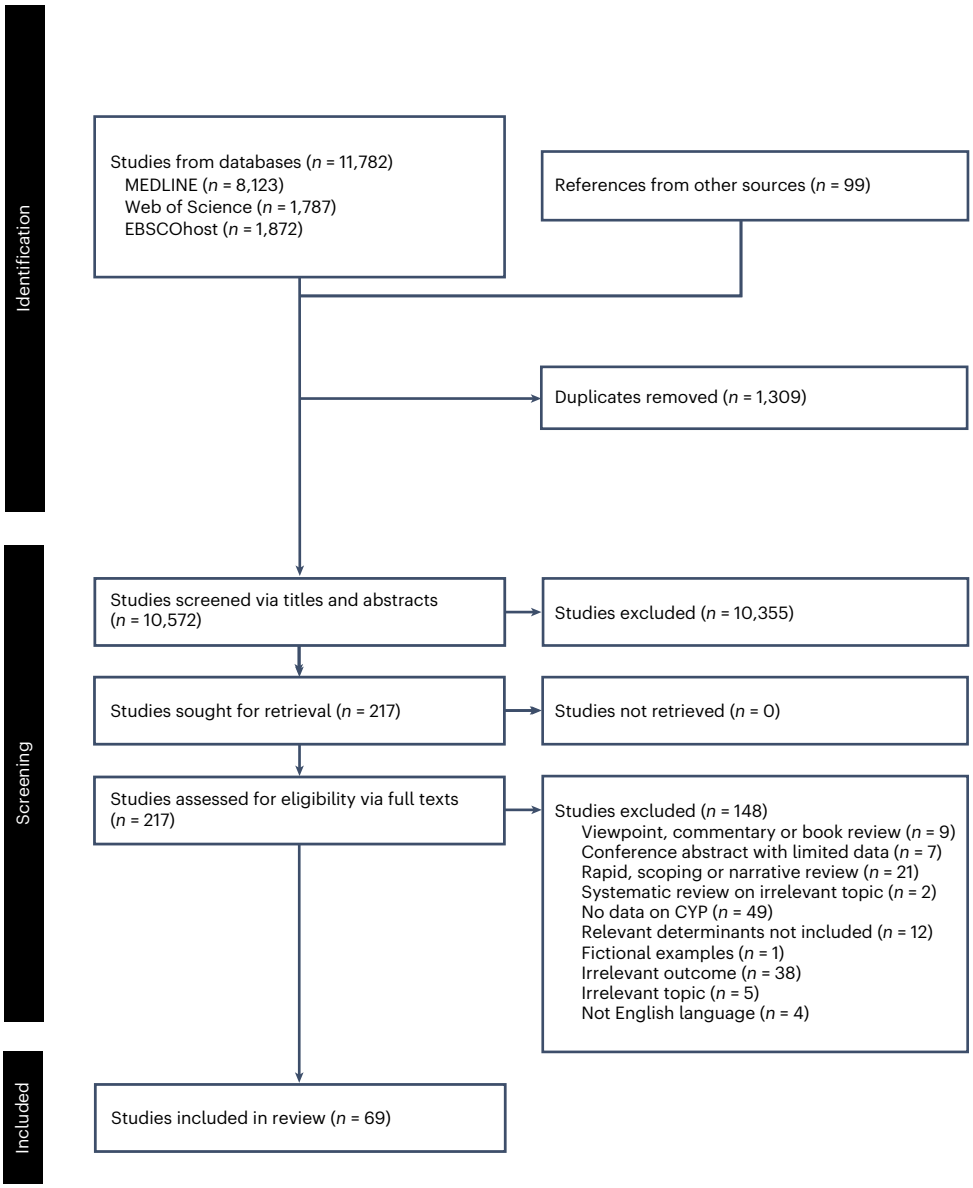

Fig. 1 | PRISMA flow diagram of study selection. A total of 10,572 articles were screened via titles and abstracts, 217 full texts were assessed for eligibility and 69 met the inclusion criteria and were included in the review.

the United Kingdom (UK), Canada, Sweden and the USA compared with those from the Global South. Only two studies that focused on a single country were identified from Africa, these were from Tanzania[51] and Kenya[52]. Only one study was identified concentrating on a country from Southeast Asia, which was based within the Philippines[53], and very few were from East Asia (China[54]) and South America (Brazil[55]). Among the cross-national studies included, again the Global South was under-represented, with the USA and European countries, in particular the UK, represented in the greatest number of studies[21,56–58].

Study quality was variable, with the Mixed Methods Appraisal Tool (MMAT) checklist score ranging from 0 to 5, with an average of 3 (full results of the quality appraisal can be found in Supplementary Table 1). Across all studies, most adopted convenience, snowball or quota sampling, which are likely to have a high risk of bias. A few quantitative studies included samples that were believed to be nationally representative of the general population, based on probability sampling[21,50,59]. The absence of a standard measure of eco-anxiety led to a variety of measurement approaches being implemented within quantitative studies. Among 26 studies that included a validated scale, the HEAS[27], the CCAS[17], the Climate Change Worry Scale (CCWS)[22] and the Climate Distress Scale (CDS)[60] were used. Most used the CCAS[53,54,61–75] and the HEAS[76–81], with a few using the CDS[77,82] and the CCWS[83–85]. In other studies, which tended to be older studies published before validated measures were developed, the authors created their own questions[86,87], which were often simple single-item measures. A notable trend was the use of online methods for data collection, both for surveys and qualitative interviews, perhaps reflecting that data collection for many recent studies tended to take place during or after the COVID-19 pandemic period. Most quantitative studies involved survey data collection, with a few analyzing secondary data of an existing dataset[21,47,51,88]. A couple of studies included an experimental component that tested the effect of media exposure on eco-anxiety[54,71]. A notable limitation across all studies was the lack of ethnic diversity and inclusion of Indigenous groups[56,79,85,89], as well as the over-representation of people from more advantaged socioeconomic backgrounds[55,79] and young women[71,74,82,90–93].

Among the qualitative and mixed-methods studies, data were collected via focus groups[55,56,70,93,94], in-depth interviews[49,61,70,78,85,89,91,95–101], open-ended survey questions[74,79,82,90,102], participatory action research[66,103], auto-photography[91], diary[80,104], drawing[96,104], participant

Table 1 | Summary of included studies

First author	Year	Country and setting	Study design	Participant age	Participant sex or gender	Other sample characteristics	Sample size	Outcome	Dataset/Sampling	Main findings
Szagun[86]	1995	- Country: Germany and Russia - Setting: schools	- Quantitative (survey questionnaire) - Cross-sectional (data collection dates are NS)	Range: 12–18 years Groups of 12, 15 and 18 years German: Mean (s.d.): 12.2 (0.52); 15.4 (0.66); 18.9 (1.48) Russian Mean (s.d.): 12.3 (0.38); 15.2 (0.35); 18.0 (1.19)	Female: 51.8% Male: 48.2%	German: 14 state schools. Resident in Oldenburg, northwest Germany. Russian: Akademgorodok near Novosibirisk, western Siberia. Two towns similar in size and relative lack of industrialization.	Sample size: 1,220 (610 German and 610 Russian adolescents)	Eco-anxiety: anxiety about future environmental destruction (6 items): rated from 6 (strongly agree) to 1 (strongly disagree)	Purposive sampling with comparability across countries, age groups and school types. Participants selected from schools in specific cities in Germany and Russia. The sample was balanced by design—equal numbers from each age group (12, 15, 18) and from both countries.	Overall anxiety mean (s.d.): German, 5.13 (0.75); Russian, 5.12 (0.65). Mean (s.d.) anxiety by age group and culture: German, 12 years, 5.21 (0.76); 15 years, 5.05 (0.78); 18 years, 5.15 (0.72). Russian, 12 years, 5.06 (0.71); 15 years, 5.15 (0.62); 18 years, 5.17 (0.61). Mean (s.d.) anxiety by age group and gender: Female, 12 years: 5.22 (0.71); 15 years: 5.28 (0.61); 5.37 (0.50). Male: 12 years, 5.06 (0.76); 15 years, 4.89 (0.76); 4.92 (0.75).
Hokka[87]	1999	- Country: Finland, Russia, Estonia - Setting: schools	- Quantitative (structured questionnaires) - Cross-sectional (data collected between 1994 and 1995)	Range: 13–18 years Mean (s.d.): NS	Helsinki: female 56%, male 44% Moscow: female 54%, male 46% Tallinn: female 56%, male 44%	- Father's education level: 51% university degree in Moscow, 33% in Tallinn, 19% in Helsinki - Perception of local environment: more positive in Helsinki, more negative in Moscow and Tallinn	Sample size: 3,282 Helsinki, *N*=1,396; Moscow, *N*=618; Tallinn, *N*=1,268 Response rate: not specifically mentioned, but noted as generally high.	Eco-anxiety: questionnaire with structured multiple-choice questions addressing 13 environmental issues and health impacts. The pupils had to indicate whether they were very worried, somewhat worried or not at all worried about these problems, or 'cannot say'.	In Helsinki, data collected from six lower secondary and upper-secondary schools in autumn 1994. Moscow: nine schools in spring 1995; Tallinn: 10 randomly selected secondary schools in autumn 1995. Non-response was mainly due to absences on the research day.	- Finnish girls and older students showed higher environmental worry, for example, 26% of Finnish girls in lower classes very worried about the greenhouse effect, compared with 46% in higher classes. Age and gender differences in Estonia and Russia less pronounced.
Ojala[95]	2007	- Country: Sweden - Setting: young volunteers in environmental and justice organizations	- Qualitative (semi-structured interviews) - Cross-sectional (collected between May 2003 and 2004)	Range: 19–25 years Mean (s.d.): NS	Female: 61.9% Male: 38.1%	- Activists in environmental and justice organizations - Majority from an intellectual middle-class background - 15 students (college/university level), 4 high-school students, 2 working full time - Likely of Swedish national origin or residing in Sweden	Sample size: 21	Environmental worry	Qualitative interview data collected from 21 young volunteers, recruited through purposive sampling from local groups of Friends of the Earth, a national youth environmental organization and a fair-trade organization in four Swedish municipalities.	- Worry was the first emotion that came to mind when thinking about environmental problems. - Environmental worry among young volunteers primarily moral, focusing on future generations, animals/nature and global issues rather than personal health. - Three types of worry identified: worry as a constructive force, worry related to guilt, worry related to helplessness.

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Ojala[102]	2012	- Country: Sweden - Setting: schools and university	- Mixed methods (questionnaire with both open-ended and Likert-type questions) - Cross-sectional (collected in 2009)	Mean (s.d.): - Late childhood: 11.7 years (0.48) Adolescence: 16.4 (0.59) - Young adulthood: 22.6 (2.65)	Late childhood: 43% boys, 57% girls Adolescents: 35% boys, 64% girls Young adults: 32% men, 68% women	- All participants lived in central Sweden in and around a medium-sized municipality - The study was conducted in 2009, during a time of high media visibility for climate issues in Sweden	Sample size: 348 (late childhood/ early adolescence (n=90), mid to late adolescence (n=146), and early adulthood (n=112)) Response rates: children, 79%; adolescents, 82%; young adults, 50%	All three groups rated how much worry and how much hope they felt about climate change on a 6-point scale: not at all (1), a little (2), fairly little (3), fairly much (4), a lot (5), very much (6). One open-ended question about worry answered by respondents that indicated feeling worry fairly much, a lot or very much.	Convenience sample from 3 groups: children in intermediate school (n=90), adolescents in senior high school (n=146) and young adults in college/university (n=112). Children and adolescents completed the questionnaire at school, young adults completed it at home after being approached in university classrooms.	- Those feeling worry fairly much, a lot or very much: children, 29%; adolescents, 62%; early adults, 61%. - Children use more distancing and less problem-focused coping for climate change-related worry compared with older groups.
Strife[96]	2012	- Country: USA - Setting: schools in Denver, Colorado	- Qualitative (demographic questionnaires, in-depth semi-structured interviews and drawings of what Earth might look like in 100 years) - Cross-sectional (dates NS)	Range: 10–12 years Mean (s.d.): 10 (NS)	Male: 46%, Female: 54%	- Non-Hispanic White: 20; Hispanic: 28; Black: 1; Other: 1. - Socioeconomic status: US$0–10,000 (12), US$10,000–30,000 (15), US$30,000–60,000 (6), US$60,000–100,000 (8), >US$100,000 (8) - Average years lived in Denver: 16.5 years - Average household size: 4	Sample size: 50	'Ecophobia': in-depth interviews with children about environmental concerns and emotions.	50 in-depth interviews. Participants recruited through letters sent to 170 fifth-grade families from 3 selected schools in Denver, Colorado, with approval from relevant research committees. The selection was purposive.	- 82% of children expressed fear, sadness, helplessness and anger about environmental problems. - A majority (72%) of children shared pessimistic views about the future state of the planet. Anger directed at parents and public. - Children's negative emotions were often linked to their primary sources of environmental information, such as television, news and movies. Over 70% of children discussed these as their central source of fear about environmental issues.
Chiw[124]	2019	- Country: Australia - Setting: general population (Gray literature report)	- Quantitative (online survey via Facebook and Google Forms) - Cross-sectional (collected November 2017 to April 2018 by non-governmental organization Millennium Kids)	Range: 7–25 years Mean (s.d.): NS	NS	- Majority Australian (90 out of 102 responses) - Needed access to Facebook and email	Sample size: 74 Response rate: NS	Eco-anxiety: 'I am worried about the effects of climate change'. 5-point scale (strongly agree, agree, neither agree nor disagree, disagree, strongly disagree).	Participants recruited through public access via Facebook and an email database sent to parents and community organizations working with youth.	- 89% worried about effects of climate change. 59.5% and 29.7% of sample strongly agree and agree that they are worried about the effects of climate change. - There is a lack of confidence in the government's handling of climate change, with 60% feeling it is not taken seriously enough.

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Coppola[97]	2021	- Country: USA - Setting: University (University of Vermont) (Undergraduate dissertation)	- Mixed-methods (qualitative interviews via Microsoft Teams and informal survey) - Cross-sectional study (interviews between October 2020 and December 2020)	Range: 18–21 years Mean (s.d.): NS	NS	- Majority white - College-educated - Involved in environmental organizations - Most in their senior year - Eight participants either environmental studies or environmental science majors	Sample size: 14	Eco-anxiety: survey about emotions related to the environment and climate change and qualitative interviews.	Participants recruited from members of six environmental organizations at the University of Vermont.	- Fear-based emotions resonated most strongly with participants - Main sources of eco-anxiety: politics and institutional behavior, academics/higher education, perceived lack of self-efficacy. - Other sources included environmental organizations, media, personal experience.
Hickman[58]	2021	- Country: Australia, Brazil, Finland, France, India, Nigeria, Philippines, Portugal, UK and USA - Setting: general population	- Quantitative (online survey) - Cross-sectional (data collection between 18 May and 7 June 2021)	Range: 16–25 years Mean (s.d.): 20.82 (2.54)	Male: 51.4% Female: 48.6%	- Participants were from ten countries, reflecting a range of national origins - The selection aimed to represent diverse cultures, incomes, climates and climate vulnerabilities	Sample size: 10,000 (15,543 began the survey) Completion rate: 68%	Climate anxiety and related emotional responses. Survey questions were developed specifically for the study, which included domains such as climate-related worry, functional impact, emotions, thoughts and perceptions of government response.	Participants recruited via the Kantar platform, specifically from the LifePoints online research panel and other double opt-in panels within the Kantar network. Quota sampling used based on age, gender and region.	- 60% say they felt 'very' or 'extremely' worried about climate change (mean score of 3.7 on a scale from 1 to 5 (s.d. 1.7)). - More than 45% of respondents said their feelings about climate change negatively affected their daily lives - Strong correlation between climate anxiety and dissatisfaction with government responses, and feelings of betrayal.
Jones[104]	2021	- Country: England - Setting: school (primary classroom)	- Qualitative (ethnographic study participant observation, research diaries and analysis of children's drawings after education lesson on climate change)	Range: 9–10 years Mean (s.d.): NS	NS	- Urban school in England	Sample size: 60	Emotional response to climate education explored via drawing activities, discussions, research diaries, photos. Pupils asked where on the spectrum they were in reaction to four sentences: I feel nervous about climate change; I feel worried about climate change; I feel angry about climate change; I feel restless about climate change. Pupils used stickers to record answer on a whiteboard.	Data collected from participant observation, research diaries and analysis of children's drawings after education lesson on climate change within two classes. Participants recruited as part of a long-term project.	- Some pupils exhibited cataclysmic view 'all polar bears losing their homes' and 'all the people on Earth drowning'. - Majority of the group felt nervous and worried about climate change. Children most worried about 'the polar bears', 'rising sea levels', 'the end of the Earth'. Expressed anger at adults.

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Metsäranta[105]	2021	- Country: Finland - Setting: Four universities (Tampere, Helsinki, Lappeenranta and Turku) and 14 high schools and 9 upper comprehensive schools around Finland. (Master's dissertation)	- Quantitative (online survey) - Cross-sectional (data collected in 2020)	Range: 15–29 years. 49% aged 15–18 years, 15% 19–23 years, 36% 24–29 years. Mean (s.d.): NS	Male: *N*=74 Female: *N*=106	- Socioeconomic status: financially secure (15%), financially quite secure (32%), financially okay when judiciously makes purchases (22%), parents support financially (24%), financially quite considerate (5%), financially considerate (2%) - Education level: basic education (43%), academic (49%), vocational (4%), other (5%) - Region: north and east Finland (3%), west Finland (51%), south Finland (33%), capital region (10%), Uusimaa (2%)	Sample size: 193	Eco-anxiety; frequency of experiencing five emotions (anxiety, fear, depression, guilt and anger) related to climate change. (1, rarely than once per month; 2, once per month; 3, once per week; 4, every day; 5, I don't know).	Based on a previous survey by the Finnish company Sitra in 2019. Participants recruited by sending the survey to four universities and multiple high schools and upper comprehensive schools across Finland.	- 12% of sample experienced eco-anxiety every week. - Mean eco-anxiety 1.56 (s.d.=0.61), mean climate anxiety 1.82, s.d.=0.83. - Eco-anxiety and climate-related anxiety was experienced the most in the 24–29 age group, increased across age groups. Eco-anxiety had a mean of 1.65 (s.d.=0.66) and climate-related anxiety had a mean of 1.96 (s.d.=0.91). - Negative climate-related emotions primarily triggered by awareness of climate change effects, news, and media content.
Sciberras[47]	2021	- Country: Australia - Setting: general population (adolescents)	- Quantitative (secondary data from the Longitudinal Study of Australian Children) - Longitudinal study design across an 8-year period (data collected at ages 10–11, 12–13, 16–17 and 18–19 years, from 2009–2010 to 2017–2018)	Range: 10–19 years Mean (s.d.): NS	Male: 50%, Female: 50%	- Majority of primary caregivers born in Australia (78.95%) - Lower representation of Aboriginal or Torres Strait Islander caregivers (0.36%) - Higher education level among primary caregivers (36.02% completed tertiary education)	Sample size: 2,244 included in analysis from 2,739 participants. 59% enrollment at Wave 1 and 61% participated in Wave 8.	Worry about climate change assessed at Wave 4 and Wave 5 by asking 'How worried are you about.the environment (climate change, drought, pollution)?' using a 4-point scale: 1, 'not at all worried' to 4, 'very worried'. At Wave 7 and Wave 8, the question changed to 'How concerned are you about climate change?', on a 5-point scale: 1, 'not at all' to 5, 'very much'.	Kindergarten cohort of the Longitudinal Study of Australian Children. Participants recruited from the Australian Medicare database using a two-stage cluster sampling design, stratified by state and urban–rural status, with postcodes sampled across Australia except for the most remote areas. Children born between March 1999 and February 2000 invited to participate.	- 13% (*n*=290) of adolescents had high persistent worry, moderate (*n*=559, 24.9%) or increasing worry (*n*=546, 24.3%), persistent low worry (*n*=376, 16.8%), slightly decreasing worry (*n*=297, 13.2%) and steeply decreasing worry (*n*=176, 7.8%). - Adolescents with high persistent climate worry had higher depression symptoms compared to those with moderate worry.

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Barnes[98]	2022	- Country: Canada - Setting: university (Dalhousie University) (Undergraduate dissertation)	- Qualitative (in-depth, semi-structured interviews) - Cross-sectional (dates of data collection NS)	Range: 19–28 years Mean (s.d.): 23 (NS) Median: 22	Female: 66.7% (*N*=6) Male: 33.3% (*N*=3)	- Majority from Canada, with two international students (Caribbean/ Asia) - All Dalhousie University students enrolled in environmental studies programs	Sample size: 9	Eco-anxiety explored via in-depth, qualitative, semi-structured interviews based on the HEAS[27].	Participants recruited through emails to professors, Facebook page posts, an email chain and verbal recruitment.	- Each participant identified as being eco-anxious, albeit to varying degrees. Participants defined eco-anxiety as a chronic stress, frustration, hopelessness, restlessness, uselessness and dreadfulness about climate change. - Eco-anxiety derived from existential anxiety and environmental threats. Participants who did report feeling distressed, often felt so when they were studying.
Bright[89]	2022	- Country: Aotearoa New Zealand - Setting: schools (secondary school students who were climate strike leaders)	- Qualitative (in-depth, semi-structured interviews via Zoom) - Cross-sectional (interviews conducted over 2 months, dates NS)	Range: 13–18 years Mean (s.d.): NS	Female: *N*=11 Male: *N*=4	- Diverse ethnicities - Lived in urban and rural settings - Primarily secondary school students - Motivated and high achieving - Attended schools from higher economic communities	Sample size: 15	Emotional states (apathy, awareness, anxiety, anger) explored through in-depth interviews with climate strike leaders	Participants recruited through newspaper articles and social media, with snowball sampling used to identify additional participants.	- Climate strike leaders experienced a journey through emotional stages such as apathy, awareness, anxiety and anger, which motivate them toward climate action. - Emotions such as anxiety and anger are important motivators for youth political agency and action.
Diffey[103]	2022	- Country: Multinational (Canada, USA, UK, Netherlands, Poland, United Arab Emirates, Republic of Korea, Jamaica, South Africa, Nigeria, Egypt, Kenya, India, Vietnam, Philippines) - Setting: peer group of young people	- Qualitative (hybrid participatory action research and stakeholder analysis with detailed questionnaires, group workshops and online discussion documents) - Cross-sectional (data collected over 3 months)	Range: 16–29 years Mean (s.d.): NS	NS	- Diverse national origin from high-, upper-middle- and lower-middle-income countries - School students, university students and graduates - Direct experience with climate impacts - Diverse vocations including photography, poetry, marine biology - English speakers with internet access, greater-than-average experience in climate crisis research	Sample size: 23	Range of climate-related feelings (for example, worry, sorrow, grief, fear, anger, hopelessness, responsibility).	Participants recruited through social media posts with a link to an application form, aiming to maximize geographic and age diversity.	- Young people around the world share deeply uncomfortable climate-related feelings that disrupt their daily lives, especially without adequate support. - Young people's feelings and hopes often neglected in policymaking, impacting their well-being and the effectiveness of climate crisis responses.

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Table 1 (continued) | Summary of included studies

First author	Year	Country and setting	Study design	Participant age	Participant sex or gender	Other sample characteristics	Sample size	Outcome	Dataset/Sampling	Main findings
Feick[78]	2022	- Country: Netherlands - Setting: general population (Master's dissertation)	- Mixed methods (online survey and semi-structured interviews) - Cross-sectional study design (collected May to June 2022)	Range: 15–30 years Mean (s.d.): NS. 69% aged 15–25 years	Female: 55% Male: 41% Other: 5%	- Majority atheist (52%) - Majority students of applied science (87%) - Varied levels of involvement in climate activism	Sample size: 110 Response rate: 68%	Eco-anxiety measured using HEAS[27].	Participants recruited online, likely through platforms or networks related to climate involvement. Five semi-structured interviews were conducted with volunteers from the survey participants.	- 85% of all participants have felt climate change-related anxiety at least at one point in their life. - Trust is associated with fewer affective symptoms of eco-anxiety, while connectedness with nature is related to more anxiety about personal impact. - Spirituality interacts with eco-anxiety in different ways, suggesting it should be considered when addressing eco-anxiety.
Finnegan[106]	2022	- Country: England - Setting: secondary schools	- Quantitative (online survey) - Cross-sectional (collected in 2021)	Range: 16–18 years Mean (s.d.): 16.96 (NS). 26% 16 years, 52% 17, and 22% 18.	Female: 67% Male: 30% Other: 1% Withheld: 2%	- Majority white (78%) - Even split between state (51%) and independent schools (49%) - Majority of the participants were from 12 secondary schools in Greater London and the Thames valley Region (Berkshire, Buckinghamshire, Oxfordshire) - Sixth-form students	Sample size: 512 students and 69 teachers. Response rate: not applicable.	CCD using questions adapted from Searle and Gow (2010)[125]. Students reported how much they felt a series of negative emotions with respect to climate change and the 'quite' and 'very much' responses were combined.	Participants recruited using convenience sampling (based on geography and participation in sustainability networks), snowball sampling (teachers sharing the questionnaire), and voluntary response sampling (participation through specific classes or activities).	- Feelings reported were anxiety (68%), worry (68%), frustration (67%), anger (58%), fear (57%), powerless (48%) and hopeless (38%). - Students reported moderate levels of CCD, and students that identified as female had higher levels of CCD than males. - Slight difference in distress by ethnicity, students from ethnic minorities (excluding white minorities) reporting lower levels of CCD (mean 3.40, s.d.=1.08) than white students (mean 3.68, s.d.=0.91); $t(510)=2.79$, $P<0.01$.
Gunasiri[126]	2022	- Country: Australia - Setting: general population (Conference abstract)	- Quantitative (nationwide survey) - Cross-sectional (dates of data collection NS)	Range: 18–24 years Mean (s.d.): NS	NS	NS	Sample size: 5,483	Eco-anxiety, but the specific measurement tool not mentioned.	Australian nationwide survey on the mental health impacts of climate change. Specific recruitment details are not mentioned.	- Young people aged 18–24 years experienced higher rates of eco-anxiety, pre-trauma and post-traumatic stress disorder compared with other age groups. - Direct experiences of climate change events are related to increased eco-anxiety among young people.

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Table 1 (continued) | Summary of included studies

First author	Year	Country and setting	Study design	Participant age	Participant sex or gender	Other sample characteristics	Sample size	Outcome	Dataset/Sampling	Main findings
Gunasiri[61]	2022	- Country: Australia - Setting: general population (young people aged 18–24 years)	- Mixed methods (semi-structured interviews and an online survey) - Cross-sectional (data collected from 13 July to 3 August 2020)	Range: 18–24 years Mean (s.d.): 21 (1.92)	NS	NS	Sample size: 60 (14 semi-structured interviews, 46 survey); 21 from climate/ environmental groups and 25 from general population. Response rate: NS	Worry, eco-anxiety, stress, hopelessness/ powerlessness and feelings of not having a voice. These were measured using an online survey with 13 questions, including validated and new scales pre-tested by young people and academics. Interviews explored these in more depth.	Online survey hosted on Qualtrics and semi-structured interviews. Participants recruited using convenience and criterion sampling strategies through existing networks, social media, and youth and health organizations.	- Negative mental health impacts of climate change on young people included worry, eco-anxiety, stress, hopelessness and feelings of powerlessness. - Engaging in climate action may lead to positive mental health outcomes such as feelings of optimism and control. - Social media played a dual role in young people's mental health, acting both as a stressor and a tool for positive engagement.
Hathaway[79]	2022	- Country: Aotearoa, New Zealand - Setting: schools (Master's dissertation)	- Mixed methods (online survey) - Cross-sectional (data collected between June and September 2022)	Range: 11–14 years Mean (s.d.): 12 (0.74)	Female: 26 Male: 18 Non-binary: 1 Prefer not to say: 2	- Ethnicity: 76.6% NZ European, 8.5% Māori, 2.1% Niuean, 2.1% Chinese, 10.6% multiracial or other race - Socioeconomic status: majority from higher deciles (80.9% from deciles 8 and above)	Sample size: 47 Response rate: 47/52 (approximately 90.4%)	Eco-anxiety (HEAS)[27]. Qualitative questions included: 'When you think about the environment what kind of thoughts do you have?'	Online survey conducted through Qualtrics. Participants recruited by emailing principals from schools, social media posts and individual emails to teachers. Information about the research was distributed to parents of Year 7 and 8 students through school emails or newsletters.	- Young adolescents are moderately affected by eco-anxiety and environmental issues, with most experiencing symptoms only some days over a 2-week period. - The study identified a range of emotions related to eco-anxiety, including feelings of insignificance, anger, loss and hope. - Collective action and hope seen as key factors in coping with eco-anxiety.
Lawrance[111]	2022	- Country: UK - Setting: general population (young people)	- Quantitative (online survey) - Cross-sectional (data collected between 5 August and 26 October 2020)	Range: 16–24 years Mean (s.d.): 21.0 (2.53)	Female: 63% Male: 34% Non-binary: 2% Preferred to self-define: <1% Chose not to disclose: <1%	- Majority white (71.4%) - Ethnically diverse: 5.6% mixed race, 16.6% Asian, 5.4% Black, 1% Arab or other - 16% identified as LGBTQ+ - Mean Family Affluence Score: 8.22 (s.d. 2.29) - Living arrangements: 64% with family, 11% with a partner, 17% with peers, 6% alone	Sample size: 530	Psychological responses to climate change, distress and emotions, including the CCD scale[60].	The dataset used was the 'Changing Worlds survey. Participants recruited through a survey panel accessed via Prolific and direct approaches to youth groups and schools.	- Young people experienced more distress from climate change than from COVID-19, despite the pandemic having greater immediate impact on daily life, mean score 13.08, s.d. 6.60 for climate change. - 19.8% feel 'very much' anxious about climate change, 25.9% moderately anxious. - Climate distress was associated with greater sense of agency to address the crisis, unlike the COVID-19 pandemic.

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Table 1 (continued) | Summary of included studies

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Leonhardt[50]	2022	- Country: Norway - Setting: schools	- Quantitative (online survey) - Cross-sectional (data collected in 2021)	Range: 13–19 years (lower secondary 13–15; upper secondary 16–19). Mean (s.d.): NS	Female: 50.5%, Male: 47.6%, Other: NS	- Self-perceived family finances: majority perceive as good - Parental education: majority have at least one parent with higher education - Centrality: varied, with some living in more central areas and others in less central areas	Sample size: 128,484 in analysis (139,941 participants). Response rate: lower secondary schools, 83%; upper-secondary schools, 67%	Worries about climate change; measured using a survey question with response options: 'not worried at all', 'a little worried', 'quite worried', 'very worried' and 'I don't know'.	'Ungdata', an annual nationwide online youth survey conducted by the Norwegian Social Research Institute. Participants recruited from lower- and upper-secondary schools across Norway, with the survey being offered to all municipalities and county councils. Self-administered during school hours.	- 37.6% of Norwegian adolescents were worried about climate change, with higher prevalence among girls, those with at least one parent with higher education, and those living in urban areas. - Adolescents who were worried about climate change showed more symptoms of depression compared with those who were less worried.
Myers[101]	2022	- Country: Aotearoa or New Zealand - Setting: young people engaged in climate change activism (Master's dissertation)	- Qualitative (in-depth semi-structured interviews) - Cross-sectional (data collected November 2020 to September 2021 via Zoom)	Range: 16–30 years Mean (s.d.): NS	6 females	- Māori ethnicity - Well-informed about environmental issues - Value Indigenous knowledge (mātauranga Māori) - Involved in environmental activism	Sample size: 11 (6 aged under 25 years).	Perceptions and attitudes toward climate justice and intergenerational justice	Interviews with 11 young people (rangatahi) engaged in climate change and environmental activism in Aotearoa. Participants recruited purposively via involvement in climate activism or environmental groups.	- Young climate activists in Aotearoa did not blame older generations for the climate crisis, instead blaming the fossil fuel industry and its enablers. - Climate activists all experienced eco-anxiety which was worsened by dismissal by authority figures.
Parry[90]	2022	- Country: UK, Netherlands, other (USA, Mexico, Germany, Greece, Denmark) - Setting: university	- Mixed methods (online survey with open-ended questions) - Cross-sectional (data collected from April to August 2020 and December 2020 to January 2021)	Range: 16–25 years Mean (s.d.): stage one, 22.34 (2.23); stage two, 20.65 (3.19)	Male: *N*=11 Female: *N*=40	- Majority in education (stage one, 55%; stage two, 87%) - All participants in stage two were from the UK - English speaking - Most used social media platform was Instagram	Sample size: 51	Climate change anxiety. Open-ended qualitative questions and Likert scale questions	The dataset was collected through a two-stage iterative online survey hosted on Qualtrics. Participants were recruited via university accounts on Twitter, where the study was advertised.	- 78% (18) reported an increase in climate anxiety in response to social media coverage. - Participants recommended changes in social media reporting to reduce anxiety and enhance motivation for positive engagement.

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Prati[48]	2022	- Country: Italy - Setting: schools and university	- Quantitative (self-administered questionnaire, either online or pencil and paper) - Longitudinal (data were collected in two waves: wave 1 in November 2016 to January 2017 and wave 2 in November 2017 to January 2018)	Range: 15–30 years Mean (s.d.): 19.18 (3.29)	Female: 61.3% Male: 38.7%	- Italian nationality - Public school students from various educational tracks - Residents of Emilia-Romagna, a developed and wealthy region	Sample size: 1,288	'Worry about climate change' measured via 5-point Likert scale: participants indicated their agreement with a statement about their worry regarding the impact of climate change on their country (1, strongly disagree to 5, strongly agree).	The dataset used in the study was part of the CATCH-EyoU project. Participants recruited using convenience sampling. Adolescents aged 15–19 were approached in 6 upper-secondary schools in the Emilia-Romagna region, while young adults aged 20–30 were contacted via email through University of Bologna and youth organizations.	- Climate change worry linearly increased from the age of 15 years to about 23–25 years. At the age of 23–25 years, a plateau was reached, after a small decrease in climate change worry observed. - Antidemocratic attitudes, authoritarianism, nationalism and place of living (countryside) correlated negatively with climate change worry. - The relationship between gender (male) and climate change worry was negative. - Age, tolerance toward migrants and tolerance toward refugees had highest node purity increase values for climate change worry.
Sarrasin[99]	2022	- Country: Switzerland - Setting: schools (environmental education interventions)	- Mixed methods (online questionnaires, interviews and observational notes) - Cross-sectional study (data collected around February to April 2022)	Range: 11–19 years Mean (s.d.): 13.77 (1.13)	Male: 41.3% Female: 44.7% Other/prefer not to answer: 10%	- Pre-vocational track: 52% - Pre-academic track: 14% - High school: 1.33% - School of commerce: 1.33%	Sample size: 150 Response rate: 88.76%	Single item assessing worry about climate change (range 1 to 5, where 5 is strongly agree).	Data collected from four Youth Climathons held in French-speaking Switzerland. Participants were recruited from schools, with 3 classes (about 60 participants) involved in each Climathon.	- Climate anxiety positively related to stronger pro-environmental intentions among adolescents. - Mean worry about climate change 3.73 (s.d.=1.07).
Simon[53]	2022	- Country: Philippines - Setting: university	- Quantitative (online survey) - Cross-sectional study design (dates of data collection NS)	Range: NS Mean (s.d.): 19.18 (0.99)	NS	- Filipino national origin - Undergraduate students, enrolled in a private university in Manila	Sample size: 452	Climate change anxiety measured using the CCAS[17]	Participants were recruited through announcements in online classes and email messages containing details about the study. They received course credits for their participation.	- A modified two-factor model of the CCAS was validated for Filipino youth. - The CEI component of climate change anxiety mediated the relationship between experiencing climate change and engaging in mitigation behaviors, while the functional impairment component did not. - Mean CEI 18.67 (s.d.=6.81); mean FI 9.85 (s.d.=9.85)

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Table 1 (continued) | Summary of included studies

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Thomas[56]	2022	- Country: USA, France - Setting: general population	- Qualitative (semi-structured focus groups) - Cross-sectional (data collected 2021- 2022)	Range: 7–18 years. USA Median: 13. France Median: 14.	USA Male: 39%, Female: 61%. France Male: 41%, Female: 59%	- Majority white - Parents in professional careers - Diversity in race/ethnicity	Sample size: 74 participants (39 in the USA and 35 in France).	Eco-anxiety explored via 18 semi-structured focus groups.	Participants recruited from the general public in the USA and France via social media platforms (Instagram and TikTok) and purposive sampling.	- Young people experienced a range of negative emotions due to climate change, including anger and frustration about the burden of fixing previous generations' mistakes. - Participants recognized the importance of individual actions but also acknowledged their limitations in addressing systemic climate issues. - Collective action provided a sense of empowerment and hope, helping to mitigate feelings of helplessness.
Togneri[66]	2022	- Country: Wales - Setting: high schools (Doctoral thesis)	- Qualitative (participatory action research with data collected through co-operative inquiry involving face-to-face interactions with young people and supportive adults) - Iterative qualitative study design (linked inquiries, June–November 2021)	Range: 13–14 years Mean (s.d.): NS	All female	- Participants from a high school in Wales - Self-identified as being concerned about eco-anxiety	Sample size: 9 participants (5 young people and 4 supportive adults)	Eco-anxiety explored via co-operative inquiry.	Two separate but linked inquiries: one with five young people aged 13–14 and another with four supportive adults who were teachers from the same school.	- Meaning-focused coping strategies linked to greater self-efficacy and well-being among young people. - Creating safe spaces for young people to express their concerns seen as crucial for managing eco-anxiety.
Chou[55]	2023	- Country: Brazil - Setting: cities of São Paulo (state of São Paulo) and Salvador (state of Bahia), as well as several villages of Ilha de Itaparica (state of Bahia) and schools (peer group)	- Qualitative study (focus groups online and in-person) - Cross-sectional design (data collected in 2021 and 2022)	Range: 5–18 years. 56% aged 5–12 years. Mean (s.d.): NS	Female: 62% Male: 38%	- 44% Black, 42% white, 14% Asian. - 48% in formal employment, 41% freelance or informal worker, 11% unemployed. - High SES in São Paulo region, low SES in Bahia region. - Most Bahia participants attended public schools, most from São Paulo attended private schools.	Sample size: 50	Children's and adolescents' emotions related to climate change.	Participants recruited through convenience sampling, with some known to the researchers and recruited face-to-face, and others recruited through a school via email advertisement.	- The study identified three profiles of involvement with climate change among Brazilian youth: unaware, disengaged and engaged, influenced by socioeconomic contexts. - Spatial and temporal perceptions of climate change varied by age and socioeconomic status, affecting engagement levels.
Clayton[88]	2023	- Country: Australia, Brazil, Finland, France, India, Nigeria, Philippines, Portugal, UK and USA - Setting: general population	- Quantitative (secondary analysis of survey data collected by Hickman et al.[58]) - Cross-sectional (data collection between May and June 2021)	Range: 16–25 years Mean (s.d.): 20.82 (2.54)	Male: 51.4% Female: 48.6%	- Participants were from ten different countries: Australia, Brazil, Finland, France, India, Nigeria, Philippines, Portugal, UK and USA.	Sample size: 10,000	Climate-related worry, functional impact, emotions, thoughts and beliefs about government response.	Participants were recruited via Kantar's LifePoints online research panel, with 10,000 young people aged 16–25 from 10 countries. Recruitment was opt-in.	- Women expressed greater concern and negative emotions about climate change than men, who were more optimistic and had more faith in government responses. - Climate worry among women: 3.51 (s.d.=1.15), men 3.81 (s.d.=1.08).

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Table 1 (continued) | Summary of included studies

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Daeninck[68]	2023	- Country: UK - Setting: university (environmental and non-environmental degree students)	- Quantitative (online survey) - Cross-sectional (data collected between 20 June and 21 July 2022)	Range: approximately 18 to 60 years Mean (s.d.): Overall: 24.49 (6.10) Environmental group: 25.07 (6.60) Non-environmental group: 23.84 (5.43)	Female: 53.7% Male: 43% Non-binary: 1.9% Preferred not to disclose: 0.8%	- Majority European heritage/white (64%) - Asian heritage (20%) - Mixed race or multiple heritage (8.9%) - Only 37% listed the UK as their country of origin - Largest non-UK group was European (28.5%) - Split between undergraduate (42.5%), Masters/postgraduate (38.3%) and PhD students (18.8%) - Large proportion self-identified as environmentalists (77.8%)	Sample size: 473 (249 environmental degree students, 224 non-environmental degree students).	Climate anxiety measured using CCAS,[17] including functional impairment and cognitive-emotional impairment subscales.	Online questionnaire implemented on the Qualtrics platform. Participants recruited through purposive sampling strategy involving university emails, departmental newsletters, institutional and personal social media platforms, and snowball sampling. Faculty from 18 universities in Greater London and eight mental health organizations contacted to distribute the questionnaire.	- Environmental degree students reported higher levels of climate anxiety (mean 26.79, s.d.=10.33) compared with non-environmental degree students (mean 21.28, s.d.=7.94). Both subscales higher among environmental degree students. - Highly climate-anxious students were more likely to consider climate change in all five decision-making domains, including family planning, long-term habitation, career, financial and travel decisions.
Ediz[69]	2023	- Country: Turkey - Setting: general population	- Quantitative (online questionnaires) - Cross-sectional (data collected between 15 March and 10 May 2023)	Range: 15–24 years Mean (s.d.): NS	Climate activists: female, 71.8%; male, 28.2% Non-climate activists: female, 76.8%; male: 23.2%	- Majority university students (78.1%), reside in urban areas (72.5%), have knowledge about climate change (63.1%), not participated in climate change actions (75.5%), not received education on climate change (58.8%), not previously sought psychological support (70.9%)	Sample size: 306 (103 climate activists, 203 non-climate activists).	Climate change anxiety measured using the CCAS[17], Turkish version.	Participants recruited based on their status as climate activists or non-activists, via social media and through high school/university administrator networks.	- Young climate activists had higher levels of climate change anxiety compared with non-activists. - Climate activists mean 4.38±1.60, non-climate activist 3.34±1.33. - Increased awareness and knowledge about climate change correlate with higher levels of anxiety. - No relationship was found between gender, age, place of residence, and receiving education about climate change and climate anxiety.
Galway[110]	2023	- Country: Canada - Setting: general population	- Quantitative (online survey) - Cross-sectional (data collected from 23 February 2022 to 2 March 2022)	Range: 16–25 years Mean (s.d.): 21.2 (2.60)	Female: 54% Male: 44% Non-binary or preferred not to answer: 3%	- White/European: 50% - Southeast Asian: 13% - South Asian: 12% - Black: 11% - Indigenous (Inuit/First Nations/Metis): 5% - Arab and West Asian: 5% - Latin American: 4% - Other: 1% - Majority completed survey in English (84%)	Sample size: 1,000	Climate emotions including anxiety, measured via an online survey with some questions replicated from Hickman et al.[58].	Abacus Data (online polling company) administered the survey. Participants recruited through the Lucid exchange platform marketplace using a set of 21 partner panels representing a potential pool of approximately 1,000,000 Canadians.	- 63% of young Canadians experienced climate anxiety, 66% reported feeling afraid and 65% felt sad, 58% helpless, 56% powerless, impacting their mental health and daily functioning. - 48% reported feeling very or extremely worried about climate change. - There was a prevalent negative perception of governmental responses to climate change among young Canadians, with feelings of betrayal outweighing reassurance.

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Table 1 (continued) | Summary of included studies

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Hagquist[59]	2023	- Country: Sweden - Setting: schools	- Quantitative (online questionnaire) - Cross-sectional (data collected from April to June 2020 and December 2020 to March 2021)	Range: 16–17 years Mean (s.d.): NS	Female: 57% Male: 43%	- Lower parental educational background, 18%; mid, 20%; higher, 63%. - Foreign national background: 14%	Sample size: 3,068 in grade 1, 2149 in grade 9 (70% in both) Response rate: 32%	Worry (measured through a series of questions about COVID-19-related and general concerns, including climate change). Answers: seldom, sometimes, often, always.	'The Evaluation Through Follow-up (ETF) hosted by the University of Gothenburg, Sweden. Participants recruited through a two-stage sampling procedure by Statistics Sweden, involving stratified sample of schools and selection of classes from 2004 birth cohort. Nationally representative sample.	- 34% worried about climate change. Higher among girls and higher parental education. No difference according to Swedish or foreign national background.
Jylhä[127]	2023	- Country: Sweden - Setting: schools	- Quantitative (face-to-face survey during mandatory class time) - Cross-sectional study design (dates of data collection NS)	Range: NS Mean (s.d.): 17.9 (0.68)	Female: 58.4% Male: 40.7% Other: 0.8% (handled as missing value)	- Students from upper-secondary schools in central Sweden	Sample size: 474 (from 661) Response rate: 72.9%	Climate change worry (5 items from Ojala, 2012)[128]	Participants recruited by contacting school principals, who facilitated the distribution of consent forms and allowed students to complete the survey during mandatory class time using Örebro University's Oru-Survey software.	- Mean climate change worry 4.17 (s.d. =1.24), range 1–6. - Attitudes were the strongest predictor of intentions to make climate-friendly food choices among emerging adults. - Climate change worry was the second strongest predictor.
Lee[70]	2023	- Country: UK - Setting: schools (Doctoral thesis)	- Mixed methods (online Q-sorts, semi-structured online interviews and focus groups) - Cross-sectional study design (dates of data collection NS)	Range: 11–18 years Mean: 14.33	Female: 19 Girl: 1 Demigirl: 1 Male: 9	- Ethnicity: White British (18), White (3) Irish/British (2), Caucasian (2) and others - Religion: none (17), Christianity (4), Roman Catholic (2), agnostic (2), atheist (2) and others.	Sample size: 30 (2 people excluded due to invalid answers)	Climate anxiety; measured using the CCAS[17]	Q-sorts completed by 32 young people. Participants recruited through emails sent to friends and contacts working with young people, educational psychologists, members of the Climate Psychology Alliance and SENCOs of secondary schools.	- Young people in the UK experienced climate change concerns through three main perspectives: hopeful environmental concern, urgent fear for the future, and resigned frustration focusing on adaptation. - CCAS: behavioral engagement: mean 4.08; overall mean 2.36.

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Leger-Goodes[85]	2023	- Country: Canada - Setting: general population in Quebec (children and parents)	- Qualitative (semi-structured interviews for children and online questionnaires for parents) - Cross-sectional (data collected between September 2021 and January 2022)	Range: 8-12 years Mean (s.d.): NS	Children: Girls: *N*=9 Boys: *N*=6 Parents: Women: *N*=9 Men: *N*=2 Non-binary/ gender fluid: *N*=1	- Majority White Canadian (11 out of 12 parents) - Majority lived in urban areas (8 out of 12 families), 3 in suburbs and 1 in rural area. Language of interview: 13 French, 2 English	Sample size: 15 children and 12 parents (12 families).	Eco-anxiety explored via semi-structured interviews for children and a survey for parents, which used the CCWS and open-ended questions about feelings around climate change.	Participants were recruited using a non-probabilistic convenience sampling technique.	- Parental awareness of children's climate change concerns associated with more adaptive coping mechanisms in children. - Thematic analysis identified children's understanding, emotional reactions and coping strategies as key themes. - CCW among parents mean 3.06, s.d.=0.55, min=2.4, max=4.4. Most common words were worry (7) and urgency (5).
Loll[71]	2023	- Country: Germany - Setting: general population	- Quantitative (online survey) - Experimental pre- and post-test (data collected from 22 November to 31 December)	Range: 18–57 years Mean (s.d.): - Overall: 24.6 (8.215) - Control group: 21.8 (2.92) - Radio group: 22.6 (3.15) - Newspaper group: 26.6 (11.5) - Video group: 26.7 (9.01)	Female: 77% Male: 22% Diverse: 1%	NS	Sample size: 70 Response rate: 61.40%	Eco-anxiety measured using the German translation of the CCAS[17], adapted by Wullenkord et al. (2021)[129]	Multi-day online survey on the SoSci survey platform. Participants were recruited primarily via social media, snowball sampling, and flyers distributed around Kamp-Lintfort and Kleve, Germany.	- There was a difference in eco-anxiety levels before and after media intervention, with video media having a significant effect. - Other media types, such as radio and newspaper, showed no effect on eco-anxiety. - A correlation was found between neuroticism and eco-anxiety levels, influencing both pre-intervention levels and overall change.
Lykins[92]	2023	- Country: Australia - Setting: general population (young Australians aged 16–25)	- Quantitative (online survey) - Cross-sectional (data collected from early March 2020 for 3 months)	Range: 16–25 years Mean (s.d.): 21.1 (2.79)	Female: *N*=584 Male: *N*=152 Other/prefer not to say: *N*=10	- 137 (18.4%) self-reported 'yes' to the question: 'Have you been directly affected by any of the bushfires over the past year?' which covered the Black Summer period - 622 (83.4%) reported having been exposed to bushfire smoke	Sample size: 746 Response rate: not mentioned	Concern (range 7–35) and distress (range 7–42) related to climate change (measures from Hine et al. 2013)[130].	Participants were recruited through Qualtrics TM, focusing on young Australians in New South Wales.	- Young Australians directly exposed to the Black Summer bushfires showed higher climate change-related distress and concern. - Concern: overall 27.39 (6.18), exposed 28.38 (6.09), unexposed 27.17 (6.18). - Distress: overall 27.90 (7.16), exposed 29.25 (6.71), unexposed 27.59 (7.23)
Mathers-Jones[80]	2023	- Country: Australia - Setting: university and general community	- Mixed methods (data collected using an online survey and mobile application for a week-long diary) - Longitudinal design but cross-sectional data analysis	Range: 18–31years Mean (s.d.): 20.86 (3.44)	Female: 70.8%	- Majority Australian nationality (58.2%) - Political orientation: slightly liberal (32.3%) or very liberal (28.1%) - Residing in Australia - Recruited from university student pools and social media - Fluent in English - Own a smartphone	Sample size: 130 (final sample 96) Response rate: 73.85%	Eco-anxiety measured with the HEAS[27].	Participants recruited through social media advertisements and psychology student research pools at the University of Sydney and University of Western Australia. The dataset included a dot-probe assessment and measures of eco-anxiety.	- Low average eco-anxiety in sample (mean 0.43, s.d.=0.48). - Eco-anxiety predicted greater engagement in pro-environmental behaviors.

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Table 1 (continued) | Summary of included studies

First author	Year	Country and setting	Study design	Participant age	Participant sex or gender	Other sample characteristics	Sample size	Outcome	Dataset/Sampling	Main findings
Patrick[62]	2023	- Country: Australia - Setting: general population	- Quantitative (online survey) - Cross-sectional (data collected from 11 August to 11 November 2020)	Range: 18–75+ years Mean (s.d.): 52.71 (19.96)	Male: 40.0% Female: 58.1% Non-binary, trans and gender-diverse: 1.0% Prefer not to say or none of the above: 0.9%	- Location: Participants were categorized by major cities (67.8%) versus not major cities. Various states including Victoria, New South Wales, Queensland and others. - Index of Relative Socio-economic Disadvantage quintiles from most disadvantaged to least disadvantaged (19.6% in quintile 1, 29.9% in quintile 5).	Sample size: 5,483 (281 aged 18–24 years). Response rate: not mentioned.	Eco-anxiety, measured using CCAS[17]. Score of 3 or more indicated high eco-anxiety.	Nationwide Australian survey with participants recruited in two stages: (1) unrestricted self-selection community sampling via news and social media, and (2) purposive sampling using an online panel company.	23.5% of adults aged 18–24 years experienced high eco-anxiety, the highest prevalence across all age groups examined (23.16% on cognitive subscale and 29.04% on functional subscale). - In adjusted model, the 18–24 year olds had OR 13.38 (95% CI 6.36–28.18) compared with oldest age group for eco-anxiety.
Prencipe[51]	2023	- Country: Tanzania - Setting: general population of youth in rural areas (Mbeya and Iringa)	- Quantitative (face-to-face survey interviews) - Cross-sectional analysis of secondary cluster RCT data (data collected between 25 January and 3 March 2021)	Range: 18–23 years Mean (s.d.): NS. 59% were younger than 21 years	Male: 55% Female: 45%	- 13% married, - 87% attended religious services regularly - 53% had some secondary education - Respondents from Mbeya (49%) and Iringa (51%) - Engaged in livelihood activities such as farming, caring for livestock - Experience food and water insecurity - 44% not aware of the Swahili term for climate change	Sample size: 2,053 Response rate: NS	CCD: 'How distressed, if at all, are you about changing weather patterns (for example, increases in heat, rain) or changing seasons (for example, length of agricultural season)?' Slight or moderate or extreme versus none.	Tanzania Adolescent Cash Plus Intervention. Participants recruited in 2017 as adolescents aged 14–19 years from households enrolled in the national cash transfer program. By 2021, they were aged 18–23 years and re-interviewed for this study. Primary sampling units were 130 villages (clusters) within four districts of mainland Tanzania, stratified by region.	- 946 (46%) reported any distress about climate change, 4% experienced extreme distress (40% also experienced depression). - Distress was higher among female, more educated, more religious, older youth and those working in extreme temperatures. - Adjusting for climate awareness—a factor strongly associated with climate distress—helped to explain some associations.
Ramirez-Lopez[67]	2023	- Country: Mexico - Setting: undergraduate university students from the largest public universities in Mexico	- Quantitative (online survey) - Cross-sectional (data collection occurred from 11 February to 11 April 2021)	Range: 18–25 years Mean (s.d.): 21.4 (1.6)	Female: 64.5% Male: 35.5% Other: excluded (N=7)	- Mexican undergraduate university students - Middle-income country context	Sample size: 461 in analysis sample (485 overall)	Climate anxiety measured using the CCAS[17], translated to Spanish.	Participants were recruited by sharing the survey on social media platforms targeting student groups.	- Overall score for CCAS, mean 12.38 (s.d.= 9.05) - Women, time spent reading news, knowledge about climate change and prosociality associated with higher climate anxiety scores - Students whose courses included climate change content had higher climate anxiety scores. - These factors are specifically related to climate anxiety and not to general anxiety. - Only 5% of the sample scored 30 or above using the CCAS.

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Table 1 (continued) | Summary of included studies

First author	Year	Country and setting	Study design	Participant age	Participant sex or gender	Other sample characteristics	Sample size	Outcome	Dataset/Sampling	Main findings
Sampaio[76]	2023	- Country: Portugal - Setting: university	- Quantitative (online survey) - Cross-sectional (data collection occurred from 30 March to 7 July 2022)	Range: 18–25 years Mean (s.d.): 20.46 (1.83)	Female: 81.5% Male: 18.5%	- 53.0% single, 46.4% cohabiting - Low membership in environmental associations (only 6 members) - 59.7% grew up, 71.3% live in urban areas - Chronic physical disease (14.3%) - Chronic mental disorder (11.2%)	Sample size: 623	Eco-anxiety measured using HEAS[27],Portuguese version	Participants were recruited from higher-education institutions across Portugal, with 4 faculties/schools and 12 universities participating. The institutions emailed students with study information.	- The Portuguese version of the HEAS was validated, showing good internal consistency and reliability. - Higher paternal education level predicted greater eco-anxiety in children.
Samuels[63]	2023	- Country: USA - Setting: schools (11th- and 12th-grade high schools in the southern region of Florida) (Doctoral thesis)	- Quantitative (online survey) - Cross-sectional (data collected during spring semester of the 2022–2023 school year)	Range: 16–18 years Mean (s.d.): 17 (NS)	Male: *N*=154 Female: *N*=220	-Minority student population (80% minority registration) - 37% white, 33% Hispanic, 21% Black, 3% multi-race, 2% Asian/Islander, <1% Native American/ Native Hawaiian	Sample size: 374 out of 500 survey responses.	Climate change anxiety measured using CCAS[17]	Participants were recruited through a stratified sampling approach, with information disseminated by gatekeepers to teachers who identified eligible students.	- Gen-Z students experience eco-anxiety, which influences their intent to pursue natural science degrees due to concerns about climate change.
Shao[54]	2023	- Country: China - Setting: university (college students)	- Quantitative (online experiment and an survey) - Cross-sectional (data collected at a single point in time; specific dates NS)	Range: 16–34 years Mean (s.d.) Study 1: 21.08 (2.00) Mean (s.d.) Study 2: 21.71 (2.15)	Study 1: Male: 45.8%, Female: 54.2% Study 2: Male: 55.0%, Female: 45.0%	Chinese college students with higher education	Study 1: 284; Study 2: 507	Eco-anxiety measured using the CCAS[17], Chinese version; State eco-anxiety measured using a 7-item scale from the adapted State-Trait Anxiety Inventory[131] answers were on a 5-point scale (1, not at all to 5, extremely). Emotions included: calm, tense, relaxed, anxious, peaceful, worried and terrified.	Participants were recruited online through WeChat advertisements for Study 1 and through the Sojump platform for Study 2, targeting Chinese college students.	- Mean level of CCA was 2.76 (s.d.=0.95). Global warming news increased eco-anxiety and donations to environmental organizations, but did not directly link eco-anxiety to pro-environmental behavior. - Regular attention to climate change news was positively correlated with both eco-anxiety and pro-environmental behavior, with eco-anxiety mediating this relationship. - High resilience reduced eco-anxiety and pro-environmental behaviors
Smith[91]	2023	- Country: Canada - Setting: general population (young women in British Columbia)	- Qualitative (auto-photography and qualitative interviews) - Cross-sectional (data collected in summer and autumn 2020)	Range: 18–25 years Mean (s.d.): NS	100% cisgender women (*N*=7)	All nulliparous, all current or previous residents of British Columbia, Canada. All English speaking.	Sample size: 7	Eco-anxiety explored using auto-photography (33 photographs) and qualitative interviews with photo-elicitation.	Participants recruited through social media platforms (Twitter, Facebook, Reddit). Participants were self-recruited by responding to social media advertisements and contacting the research team.	- Climate change influenced young women's childbearing decisions, with themes of eco-anxiety, hesitancy toward having children and a desire for systemic change emerging from the data. - Climate change not the sole factor affecting reproductive decisions, as social-environmental factors such as cost of living also played a role.

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Table 1 (continued) | Summary of included studies

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Usta[107]	2023	- Country: Turkey - Setting: university students	- Quantitative (online survey via Google Forms) - Cross-sectional (data collected between 21 September 2022 and 7 October 2022)	Range: 18–30+ years Mean (s.d.): NS 18–23: 96%, 24–29: 3.5%, 30+ years: 0.5%	Female: 59.9% Male: 40.1%	- Majority single (98.5%) - Majority lived in urban areas (74%) - Majority not received education on climate change (96.2%) - Various academic programs (, first and emergency aid : 33%, civil defense and firefighting : 28.1%).	Sample size: 651	Climate change anxiety measured using the Climate Change Concern Scale, adapted to a Turkish setting[22,132]	Participants recruited on a voluntary basis through an online survey distributed via social media (WhatsApp), using a convenience sampling method.	- Statistically significant but weak positive relationship between age and climate change anxiety - Females exhibited higher levels of climate change anxiety compared with males. - The place of residence and grade did not affect climate change anxiety levels.
Valle[49]	2023	- Country: Multinational (specific countries not specified) - Setting: general population (Master's dissertation)	- Qualitative (semi-structured interviews via videoconferencing and a brief survey using Qualtrics) - Cross-sectional (data collected during spring 2023)	Range: 18–25 years Mean (s.d.): NS	Male: *N*=3 Female: *N*=4	Quality of climate change education: average	Sample size: 7	Eco-anxiety explored via semi-structured interviews	Participants recruited through social media platforms, specifically WhatsApp and Instagram, in April 2023.	- Young people with vicarious reactions to climate change experienced a range of negative emotions including concern and helplessness. - Emotion-focused coping strategies, particularly distancing the most commonly used by participants to manage eco-anxiety.
Vercammen[82]	2023	- Country: UK - Setting: general population	- Mixed methods (online survey with quantitative scales and qualitative free-text responses) - Cross-sectional (data collected between 5 August and 26 October 2020)	Range: 16–24 years Mean (s.d.): 21.01 (2.54)	Female: 60.9% Male: 31.9% Non-binary: 2.2% Not disclosed: 5%	Ethnicity: white (68.1%), 15.8% Asian descent, 5.3% African/ Caribbean, 5.3% mixed, 0.7% Arab, 0.2% Latinx, 4.6% not provided. 15.8% identifed as LGBTQ+. Majority resided in urban or peri-urban settings (78.8%), 11.9% rural or small town, 9.3% not provided. Most lived with family (60.9%), partner (10.6%), friends (15.8%), lived alone (5.4%). Mean Family Affluence Score: 8.23 (indicating higher socioeconomic status, range 0–13)	Sample size: 539 (812 survey responses)	Climate distress measured using Climate Distress Scale by Reser et al.[60] (modified version)	Participants recruited through social media, mailing lists, youth networks, youth-focused charities, a paid quota survey panel (Prolific), and snowball sampling via the Young Persons Advisory Group.	- 36.7% experienced low levels of climate distress, 53.2% moderate and 10.1% high. - Higher distress observed in individuals with existing mental health conditions. - Climate distress associated with demographic factors such as gender and higher socioeconomic status, and it motivated both activism and pro-environmental behavior.

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Table 1 (continued) | Summary of included studies

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Wu[64]	2023	- Country: Canada - Setting: schools	- Quantitative (online survey) - Cross-sectional (data collection in autumn 2020 and spring 2021)	Range: 15–18 years Mean (s.d.): 16.3 (0.5)	Woman/girl: 45.9% Man/boy: 51.3% Gender minority: 2.8%	- Indigenous peoples in Canada: 7.2% - South Asian: 17.4% - White/European descent: 53.5% Parental education: - Graduate or Professional degree: 15.0% - University degree : 22.0% - College Program: 21.1% - High school or less: 17.5%	Sample size: 2,306 included in analysis from total of 3,795. Response rate: 61.9%	Climate anxiety measured using the CCAS short form (CCAS-S)	The dataset used in the study was from the Youth Development Instrument. Participants were recruited from 11th-grade students in four schools across two British Columbian school districts for the pilot stage, and a larger group of students was invited for the second stage.	- Most adolescents reported feeling climate change worry (75.8%), with a smaller proportion experiencing climate anxiety (48.7%). - The CCAS-S was validated as a reliable and valid tool for measuring climate anxiety in adolescents.
Wullenkord[133]	2023	- Country: Sweden - Setting: high schools	- Quantitative (face-to-face surveys during regular school hours) - Cross-sectional (data collected in 2010 for Study 1 and late 2019/early 2020 for Study 2)	Study 1: Range: 16–20 Mean (s.d.): 17.17 (0.49) Study 2: Range: 16–22 years Mean (s.d.): 17.91 (0.68)	Study 1: 52.68% female Study 2: 58.43% female	- High-school students from central Sweden - Enrolled in various college preparatory and vocational programs (Social Science, Natural Science, Art, Music and Drama, Technology, and Childcare)	- Study 1 sample size: 321 - Study 1 response rate: 84% - Study 2 sample size: 474 with valid data (from 480) - Study 2 response rate: 68%	Climate change worry, using a five-item scale by Ojala, 2012[128], assessing micro- and macro-worry.	The dataset consists of two convenience samples of Swedish high-school students. Study 1 included students from 5 municipalities in central Sweden in 2010, and Study 2 included students in late 2019/early 2020.	- Macro-worries mean 3.53 (s.d.1.33) higher than micro-worries mean 2.76 (1.27) in both 2010 and 2019–2020 mean 4.58 (1.36); mean 3.58 (1.42). - Climate change worry negatively associated with subjective well-being and positively associated with climate pessimism and pro-environmental behavior. - Macro-worry more strongly related to pro-environmental behavior, micro-worry more strongly related to negative mental well-being. - Problem-focused coping mediates relationship between climate worry and pro-environmental behavior.
Boyd[94]	2024	- Country: Australia - Setting: regional youth mental health service (headspace Port Macquarie, New South Wales)	- Qualitative (focus groups, one with clients, one with clinicians) - Cross-sectional (dates of data collection not mentioned)	Range: 12–25 years Mean (s.d.): NS	NS	- Participants had existing mental health issues and direct experience with climate-related disasters - Participants expressed socio-political awareness or engagement regarding climate change	Sample size: 25 (13 clinicians, 12 clients)	Eco-anxiety explored via focus group discussions	Participants were recruited through headspace Port Macquarie, recruited via advertisements on social media and flyers at the center's reception desk, while clinicians were recruited through the center manager and clinical lead.	- Three dimensions of eco-anxiety identified: helplessness in the present, hopelessness about the future, and acute stress related to climate-related events. - Disconnect between clinicians' perceptions and clients' experiences of eco-anxiety. - Misalignment between young and older people, including governments was a source of eco-anxiety.

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Table 1 (continued) | Summary of included studies

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Donati[84]	2024	- Country: Italy - Setting: schools	- Quantitative (online survey during school time) - Cross-sectional (data collected during the 2022–2023 school year)	Range: 13–21 years Mean (s.d.): 16.37 (1.27)	Male: 58% Female: 42%	- Participants attended different types of secondary schools: 44% lyceum, 35% technical institute, 21% vocational institute - Study conducted in Tuscany, Italy	Sample size: 1,846	Climate change worry measured using the CCWS[22], Italian version.	Participants were recruited by randomly selecting schools in Tuscany, contacting school principals.	- CCWS scores were higher in girls (mean 26.83, s.d.=8.58) than boys (mean 24.43, s.d.=8.07), with a moderate effect size, $t(1,844)=-5.98$, $P<0.001$. Concerning age, CCWS scores were higher in older adolescents (mean 26.14, s.d.=8.62) than in younger adolescents (mean 24.72, s.d.=7.97), with a small effect size, $t(1,844)=-3.58$, $P<0.001$.
Geraci[83]	2024	- Country: Italy - Setting: university students, research assistants and their acquaintances	- Quantitative (an online survey) - Cross-sectional	Range: 19–26 years Mean (s.d.): 21.04 (1.65)	Female: 61%, Male: 39%	- Majority had a diploma (87.9%), university degree (8.9%), middle-school certification (3.1%) - Parental marital status: cohabitating or married (76.8%) - Parents mostly held high-school diplomas (father: 42.4%, mother: 47.8%) - All participants Italian native speakers	Sample size: 224	Climate change anxiety, measured using the CCAS[17]. Climate change worry, measured using the CCWS[22]. Both using the Italian adapted versions.	Snowball sampling: students and research assistants distributed the survey among their acquaintances.	- Three distinct profiles identified among young people regarding their perception and experience of climate change: eco-disengaged, eco-engaged/oriented, and eco-engaged/disoriented. - Mean climate change worry 2.94 (s.d.=0.75). - Mean climate change anxiety 1.49 (s.d.=0.62). - Women reported higher climate worry (2.73 versus 3.07; $P<0.001$) and anxiety (1.42 versus 1.53; P not significant) compared with men.
Kałwak[108]	2024	- Country: Poland - Setting: college students	- Quantitative (online survey) - Cross-sectional (data collected between February and May 2023)	Range: 21–24 years Mean (s.d.): NS	Male: 15.9% Female: 80.8% Other: 3.2%	- Polish residents - First-, second-, third-, fourth- and fifth-grade students accounted for 18.9%, 28.8%, 31.3%, 13.2% and 7.9% of the participants, respectively - Heterosexual (70.5%) - Living with parents (28.3%) or roommates (29.5%) - At least partially financially independent (54.6%) - Working occasionally (30.0%) or regularly (42.0%)	Sample size: 403	Stress caused by the ecological crisis (1, I do not feel stressed about it at all; 2, I rather do not feel stressed about it; 3, I feel stressed about it a little bit; 4, I feel stressed about it very much).	Participants recruited using convenience sampling, with an online survey distributed via an anonymous link to students at various universities and faculties in Poland.	Overall descriptives for stress related to the ecological crisis: Not at all stressful, 6.95%; rather not stressful, 23.08%; stressful, 46.9%; very stressful, 23.08%. Logit regression models: Females and non-heterosexual had higher odds of stress related to the ecological crisis.

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Table 1 (continued) | Summary of included studies

First author	Year	Country and setting	Study design	Participant age	Participant sex or gender	Other sample characteristics	Sample size	Outcome	Dataset/Sampling	Main findings
Kenstler[81]	2024	- Country: USA - Setting: university	- Quantitative (online survey) - Cross-sectional study design (dates of data collection NS)	Range: 18–24 years Mean (s.d.): 20.01 (1.82)	Female: 57.4% Male: 36.7% Non-binary, genderqueer or gender non-conforming, transgender, or preferred not to specify: 5.9%	- Participants from a variety of environmental science and non-environmental science majors - 37% of the environmental science program's 98 majors participated in the study	Sample size: 169 (185 before removal of missing data). 41 environmental science majors, 144 non-environmental science majors	Eco-anxiety measured using the HEAS[27] and the CCAS[17]	Participants recruited through the online SONA system for General Psychology students and in-person classroom visits for environmental science majors.	- Environmental science majors reported higher levels of climate change anxiety compared with non-environmental science majors.
Lau[57]	2024	- Country: China, Portugal, South Africa, USA and UK - Setting: general population	- Quantitative (online survey) - Cross-sectional (data collected between 20 October and 3 November 2023)	Range: 18–29 years Mean (s.d.): 24.36 (2.86)	Male: *N*=1,000 Female: *N*=1,000	- Education level: Bachelor's degree or above (76%), below Bachelor's degree (24%) - Housing status: public housing (20%), private housing (76%), other (3%) - No mental disorder diagnosed in past 12 months. - Literate in English or Chinese.	Sample size: 2,000 (400 from each country)	Emotional responses toward global crises were measured by asking: 'How strongly do you feel each of the following emotions when you think about the issue of [Climate Change]?' for 18 emotional items: 'Sad', 'Guilty', 'Helpless', 'Ashamed', 'Anxious', 'Afraid', 'Outraged', 'Frustrated', 'Disgusted', 'Angry', 'Disappointed', 'Isolated', 'Disconnected', 'Interested', 'Hopeful', 'Engaged', 'Courageous' and 'Concerned'. 4-point Likert scale (0, not at all to 4, very much).	Participants recruited using stratified purposive sampling through online platforms www.wenjuan.com and www.prolific.com.	- China had highest emotional engagement with climate change, USA the lowest. China was also the most anxious about climate change, South Africa was the least anxious.

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First author	Year	Country and setting	Study design	Participant age	Participant sex or gender	Other sample characteristics	Sample size	Outcome	Dataset/Sampling	Main findings
Maduneme[75]	2024	- Country: USA - Setting: university/college in Western USA	- Quantitative (survey) - Cross-sectional (dates of data NS)	Median 20 years	Female: 67% Male: 29% Prefer to self-describe: 1.3% Transgender: 1.3% Non-binary/third gender: 1.0% Prefer not to say: 0.5%	- Majority white (70%) - Predominantly sophomores (45%) - Nearly half identified as somewhat liberal (48%)	Sample size: 440 (398 in final sample)	Climate change anxiety measured using the CCAS[17]	Participants recruited using non-random convenience sampling method, and they were offered extra credit for participation.	- Mean climate anxiety 2.04 (s.d.=0.60). - Media exposure variables explained approximately 33% of the variance in climate anxiety, frequency of media use and attention given to climate change news significantly predicted climate anxiety. When controlling for political affiliation, gender, education, ethnicity and age, the model improved, explaining approximately 39% of the variance. Political affiliation, level of education, and gender were significant covariates. - Climate anxiety had a curvilinear relationship with pro-environmental intentions, where moderate anxiety predicted positive intentions, but higher anxiety led to negative intentions.
Martin[21]	2024	- Country: multinational (22 European countries and Israel) - Setting: general population (adolescents and young adults)	- Quantitative (secondary analysis of face-to-face surveys) - Cross-sectional (data collected between August 2016 and December 2017)	Range: 15–35 Mean (s.d.): NS	Boy/man: 49.92% Girl/woman: 50.08%	- Urban city: big city (36.10% weighted), other region type (63.90% weighted) - Socioeconomic status: living comfortably (30.74% weighted), coping (46.92% weighted), difficult/very difficult (22.34% weighted) - Excluded those who did not believe the world's climate is changing (2.4%)	Sample size: 11,825	Climate change worry: 'How worried are you about climate change?'. Responses were given on a 5-point scale where 1 indicated 'not at all worried' and 5 indicated 'extremely worried'.	2016–2017 European Social Survey Round 8. Participants recruited through random probability sampling, and data were collected via face-to-face interviews conducted in participants' homes.	-Weighted mean of worry about climate change was 3.04 (s.e.=0.02). - Girls/young women and those who frequently thought about climate change worried more about climate change and were higher on beliefs about personal responsibility to reduce climate change in unadjusted estimates. Those aged 26–35 and 19–25 did not report being more worried about climate change than 15–18 year olds. - Worry about climate change negatively associated with happiness and life satisfaction among adolescents and young adults.

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Table 1 (continued) | Summary of included studies

First author	Year	Country and setting	Study design	Participant age	Participant sex or gender	Other sample characteristics	Sample size	Outcome	Dataset/Sampling	Main findings
Ndetei[52]	2024	- Country: Kenya - Setting: high schools	- Quantitative (paper and pencil questionnaire in a classroom setting) - Cross-sectional (data were collected between May and June 2022)	Range: 13–23 years Mean (s.d.): 16.13 (1.38)	Female: 33.2% Male: 66.6% Other: 0.2%	- Majority from rural areas (61.3%) - Schools represented different levels of government funding (national, extra-county, county, subcounty) - Students experienced direct impacts of climate change (for example, loss of livelihoods)	Sample size: 2,652 Response rate: 97.9%	Climate-related worry ('I am worried that climate change threatens people and the planet', 0, 'Not worried,' 1, 'A little'; 2, 'Moderately'; 3, 'Very worried'; 4, 'Extremely worried'; 5, 'Prefer not to say'); climate-related emotions: ('Does climate change make you feel anxious?'; 'Does climate change make you feel angry?'; 'Does climate change make you feel afraid?'; 'Does climate change make you feel powerless?', answers 'yes', 'no', or 'prefer not to say').	Ten schools in three regions of Kenya. Participants recruited through non-random approach based on willingness of schools to participate, with deliberate focus on including more rural schools.	- Majority of respondents (69.9%) were worried about climate change. 35.4%, 25.5%, 36.4% and 22% of the respondents felt anxious, angry, afraid and powerless, respectively. - Males more likely to report not being worried about climate change compared with females (29% versus 19.3%). Females were more afraid of climate change than males (42.3% versus 33.8%). - Significant difference in worry about climate change depending on location. Respondents in rural areas had higher proportion of being very worried about climate change compared with urban areas (19.9% versus 15.6%). - Climate change associated with mental health concerns and suicidality, with gender differences observed in levels of worry and fear.
Parsons[93]	2024	- Country: Aotearoa (New Zealand) - Setting: youth peer groups in Auckland	- Qualitative (data collected using focus groups) - Cross-sectional (data collected in early 2021)	Range: 16–24 Mean (s.d.): NS	Female: 88.89% Male: 11.11%	- Over-representation of Asian, European, and Middle Eastern and Latin American ethnic groups - Underrepresentation of Pacific peoples and Māori - Some participants are migrants - High level of involvement in youth-led ENGOs and school strikes movement	Sample size: 18 Response rate: not applicable	Eco-anxiety. Focus groups with flexible discussion prompts	Participants recruited using posters on student and community notice boards and digital recruitment through Facebook pages and other social media sites.	- Participation in climate activism reduced eco-anxiety and increased hopefulness among youth about their collective ability to address climate change. - Youth believe that their individual actions can collectively lead to systemic changes, but they are critical of the shifting of mitigation responsibility onto individuals by governments and corporations.

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Table 1 (continued) | Summary of included studies

First author	Year	Country and setting	Study design	Participant age	Participant sex or gender	Other sample characteristics	Sample size	Outcome	Dataset/Sampling	Main findings
Qin[73]	2024	- Country: China - Setting: schools in Chengdu, Sichuan province	- Quantitative (paper survey) - Cross-sectional (dates of data collection NS)	Range: NS Mean (s.d.): NS	Male: 44.4% Female: 55.6%	- High school 1 (23.23%), high school 2 (23.28%), middle school 1 (14.59%), middle school 2 (11.83%), middle school 3 (27.07%) - Urban (90.28%), rural (9.72%) - Resident at school (40.90%), not-resident (59.10%) - Parental marital status: divorce (13.18%), non-divorced (86.82%)	Sample size: 1,851 Response rate: 95%	Climate change anxiety measured using the CCAS[17]	Participants recruited by randomly selecting schools and distributing questionnaires. 2,000 questionnaires were distributed, and 1,851 valid responses were obtained after excluding invalid ones.	- CCA slightly higher among high-school students compared with middle school. - Negative correlation between climate change anxiety and pro-environmental behaviors in adolescents. - Future self-continuity mediated relationship between climate change anxiety and pro-environmental behaviors.
Rizeq[112]	2024	- Country: Sweden, Qatar - Setting: secondary schools in Qatar and southern and mid part of Sweden	- Quantitative (online surveys) - Cross-sectional (data collected from spring 2021 to spring 2022)	Range: 16–19 years Mean (s.d.): NS	Sweden: Female: 61.37% Male: 36.82% Missing: 1.81% Qatar: Female: 49.25% Male: 50.75%	NS	Sample size: 411 (Sweden: 277, Qatar: 134)	Participants asked to indicate (from 1, 'not at all' to 6, 'a very large extent') the level of worry and hope they experience in relation to the climate crisis using single items: 'To what extent are you worried about the climate change problem?' and 'To what extent do you feel hope about the climate change problem?'.	Participantswere recruited through convenience sampling by sending emails to secondary schools, and data collection was facilitated by trained assistants during school hours using an online survey system.	- In Sweden, mean climate worry 3.76 (s.d. 1.27) and in Qatar, 3.81 (1.22). - Climate worry positively associated with climate-friendly behaviors in both Swedish and Qatari young people. - In Qatar, climate worry linked to negative affect and lower life satisfaction, while in Sweden, it was linked to negative affect. - Climate hope related to enhanced climate-friendly behaviors in Qatar and improved life satisfaction in Sweden, especially at high levels of worry.
Romano[72]	2024	- Country: Italy - Setting: high schools	- Quantitative (online survey) - Cross-sectional study design (dates of data collection NS)	Range: 13–19 years Mean (s.d.): 16.09 (1.46)	Female: 74% Male: 26%	- All participants were Italians - Majority attended high schools in southern Italy and the islands (83%) and 17% in northern Italy	Sample size: 480	Climate anxiety measured using the climate anxiety scale[129], translated to Italian.	Participants recruited through internal school communications.	- Mean climate anxiety 19.41 (s.d.=10.5), range 12-84. - Higher climate anxiety associated with increased social media usage for pro-environmental content, leading to a greater likelihood of participating in pro-environmental movements. - Mediation of social media usage on the relationship between climate anxiety and movement participation stronger in boys than girls.

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Table 1 (continued) | Summary of included studies

First author	Year	Country and setting	Study design	Participant age	Participant sex or gender	Other sample characteristics	Sample size	Outcome	Dataset/Sampling	Main findings
Russell[100]	2024	- Country: Australia - Setting: young adults, primarily university students or those in tertiary education	- Qualitative, interpretivist study (semi-structured interviews conducted over Zoom) - Cross-sectional (data collected around the time of the 2022 Australian Federal election)	Range: 18–24 years Mean (s.d.): NS	NS	- Most participants had completed or were currently enrolled in tertiary education - Participants recruited from multiple jurisdictions in Australia (Australian Capital Territory (n=5), New South Wales (n=3), Queensland (n=1), South Australia (n=2) and Victoria (n=3)) - Likely represent a group highly engaged on issues of climate change and politics	Sample size: 14	- Emotional responses to climate change (for example, worry, hopelessness, sadness, frustration) explored using semi-structured interviews. – 'How often do you think about climate change? How does it make you feel?' Follow-up: 'Can you describe what sorts of feelings they are, or what they focus on?'	Participants recruited using social media platforms (Twitter and Facebook) and snowballing.	- Climate change considered a multidimensional emotional challenge, involving fragmented education, political disillusionment, uncertain futures and issues of agency. - Participants experienced interrelated emotions that resist reduction to single labels like 'eco-anxiety' and commonly expressed anger, overwhelm, depression and guilt, often compounded. - An overarching sense of worry about the impacts of climate change produced deep unease about the future and uncertainty about personal life choices.
Zimmermann[65]	2024	- Country: Switzerland - Setting: university	- Quantitative (online survey) - Cross-sectional (data collected between 14 December 2021 and 28 February 2022)	Range: 18–25 years Mean (s.d.): 21.90 (1.84)	Female: 79.2% Male: 20.8%	- Majority Swiss citizens (85.9%) - Participants all childless - All students (30.2% first-year Bachelor, 42.8% sophomores/ juniors, 27% Masters students) - Living arrangements: 49.7% with parents, 27% in shared flats, 13.6% alone, 7.1% with a partner	Sample size: 1,211 Response rate: not mentioned	- Climate anxiety measured using the CCAS[17], French version.	Participants recruited through an online survey distributed via email to all undergraduate and graduate students at the University of Lausanne. Participants were childless students, excluding those older than 25 or who were parents.	- Mean climate anxiety 1.82 (s.d.=0.68). Climate anxiety predicted greater perceptions of threat, which in turn related tomore negative childbearing motivations. - Threat perceptions fully mediated the relationship between climate anxiety and negative childbearing motivations and partially mediated the relationship with positive motivations. - No gender differences found.
Hill-Harding[74]	2025	- Country: UK - Setting: university	- Mixed methods (online survey with quantitative questionnaires and open-ended questions) - Cross-sectional (data collected between 22 March 2023 and 28 April 2023)	Undergraduate (54%) and postgraduate students (40%)	Male: 13.5% Female: 69.6% Non-binary: 3.7%	- College of Arts: 25.7% - College of Medical, Veterinary and Life Sciences: 23.8% - College of Science and Engineering: 15.9% - College of Social Sciences: 29.0% - UK origin: 51.4% - European origin: 11.7% - International origin: 31.8%	Sample size: 869 (2.5% of the student population)	Climate anxiety using CCAS[17] and the student Situated Assessment Method for Climate Anxiety Measurement (SAM^2 CAM), climate change-related emotions and thoughts.[134]	Participants recruited through social media, university Teams channels, university subject pools, emails, and in-person advertising. They were required to provide their student email to ensure they were part of the university. Data collection using Qualtrics.	- Students experienced moderate climate anxiety intensity and high levels of negative emotions. - Students experienced climate anxiety 'rarely', mean 2.03 (1 to 5 scale; s.d.=0.74). - High levels of negative emotions, particularly feeling powerless (mean 7.22; 0 to 10 scale) and helpless (mean 7.15). Students experienced high climate anxiety especially when engaging with news and social media.

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Table 1 (continued) | Summary of included studies

First author	Year	Country and setting	Study design	Participant age	Participant sex or gender	Other sample characteristics	Sample size	Outcome	Dataset/Sampling	Main findings
Vercammen[77]	2025	- Country: USA - Setting: general population	- Quantitative (online survey) - Cross-sectional (data collection between November 2021 and January 2022).	Range: 16–24 years Mean (s.d.): 20.4 (2.5)	- Female: 49.8% - Male: 43.8% - Gender non-conforming: 4.5% - Self-defined: 0.8% - Not disclosed: 1.2%	- Majority white (48.5%), Hispanic/Latinx (20.9%), Black/African-American (14.2%), mixed race (7.0%), Asian (6.6%), Indigenous (1.8%) - LGBTQI+ (26.8%) - Students (32.3%) and part-time workers (28.0%), majority finished high school (80.1%), at least a Bachelor's degree (16.2%) - Median Family Affluence Scale score: 7 (IQR, 5–9; range, 0–13). Metropolitan residents (88.3%), micropolitan areas (6.8%), rural areas (4.9%). - 33.5% reported having a current mental health diagnosis or treatment	Sample size: 2,834 valid responses (overall sample 2,883).	- Eco-anxiety via HEAS. - Climate distress via the Climate Distress Scale by Reser et al.[60] - Climate emotions: 21 questions chosen based on feedback from study's Young People's Advisory Group.	Cross-sectional online survey of US youth, adapted from the Changing Worlds survey conducted in the UK. Participants recruited through a Qualtrics research panel, with sampling designed to mirror US census demographics and additional recruitment from areas vulnerable to climate events.	- Self-reported direct experience of climate-related events associated with eco-anxiety (adjusted mean difference 6.9 (95% CI 6.2–7.6)) and climate distress (5.2 (95% CI 4.6–5.7)), strongest for wildfires. - Direct exposure to climate impacts associated with stronger emotional reactions and more functional interference. - Climate distress (possible score range 8–40) was moderate (mean 21.6, s.d.=7.6). 30.7% classed as experiencing low levels of climate distress (score 8–18), 56.5% moderately distressed (19–29), and 12.9% highly distressed (score 30–40). - Relatively low HEAS scores (range 0–39), although high variation in the scores (mean 13.1, s.d.=10.1). - Interference with daily functioning (sleeping, focusing): 'some' interference (median 3, IQR=1–3). - Most endorsed climate emotions were concern, interest, disappointment, frustration, sadness, anxiousness and anger.

CCD, climate change distress; CCW, climate change worry; CCWS, climate change worry scale. CEI, cognitive-emotional impairment; FI, functional impairment; HEAS, Hogg eco-anxiety scale; IQR, interquartile range; NS, not specified; RCT, randomized controlled trial.

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Table 2 | Subthemes within the categories of social, political and geographic determinants of eco-anxiety

Category	Subthemes	Explanation	
Social determinants	Age and developmental stage	Vulnerability owing to identity formation, future uncertainty, developmental immaturity	▲47 ▲48 ▲50 ▲73 ▲84 ▲87 ▲88 ▲107 ▲133 ●102 △86 △51 △62 △105 △126
	Gender	Higher eco-anxiety among girls and young women potentially related to emotional labor among women and feminization of care	▲21 ▲48 ▲50 ▲52 ▲54 ▲59 ▲67 ▲77 ▲84 ▲87 ▲88 ▲107 ▲108 ▲127 | ■98 ■93 △86 △51 △65 △72 △83 △106
	Ethnicity, race and migration	Structural discrimination may impact exposure to climate hazards, 'whiteness' of climate anxiety	▲48 | ■55 ■101 △106
	Socioeconomic context	Limited resources reduces adaptive capacity, but education and knowledge increase awareness	▲48 ▲50 ▲59 ▲63 ▲67 ▲76 ▲77 ▲108 ■55 ■66 ■89 ■98 ■100 △51 △68 △69 △81 △105 ○78
	Media exposure	Saturation can lead to emotional overload and constant threat perception in absence of positive narratives. Social media can help to spread information, awareness and solidarity	▲47 ▲50 ▲54 ▲67 ▲111 ■49 ■56 ■66 ■95 ■96 ■100 ■101 ●70 ●74 ●61 ●102 △71 △72 △75 △105 ○90 ○97
	Intergenerational relations	Perceived betrayal, lack of action by older generations, worry about future generations and family planning	■49 ■56 ■66 ■85 ■91 ■95 ■94 ■96 ■101 ■104 ○78
	Peer and cultural norms	Social approval, expression norms influence emotional coping, climate change a taboo subject in some contexts	■56 ■66 ■103 ○99
Political determinants	Distrust	Lack of belief and confidence in institutions and leaders, feeling betrayed	▲48 ▲58 ▲110 ■66 ■98 ■100 ■101 ●102
	Government and institutional inaction	Inaction may increase feelings of helplessness	▲58 ▲77 ▲110 ▲111 ■49 ■66 ■89 ■93 ■94 ■95 ■98 ■100 ■101 ■103 ●70 ●74 ●61 △105 △124 ○78 ○79 ○97
	Individual views, actions and participation	Liberal views related to eco-anxiety. Political participation and climate activism provides outlet for anxiety but may lead to burnout	▲21 ▲47 ▲48 ■56 ■89 ■93 ■94 ■95 ■98 ■100 ■101 △69 △75 ○78 ○79 ○97
Geographic determinants	Direct exposure to environmental hazards	First-hand experience with disasters, extreme weather and degradation may trigger eco-anxiety	▲53 ▲77 ■49 ■91 ■94 ■101 ■103 △92 △126
	Cross-country differences	Eco-anxiety may be higher in regions vulnerable to climate change and due to other socio-political factors	▲57 ▲58 ▲87 ▲88 ▲112 ■56 ■103 △86
	Urban–rural residence	Uneven adaptation resources, education, culture or exposure to hazards between regions	▲48 ▲50 ▲52 ■55

Study design: ▲ Quantitative; ■ Qualitative; ● Mixed methods. Study quality: filled, moderate/higher quality; empty, lower quality.

observation[104] and Q sorts[70] methods. Particular limitations concerning the mixed-methods studies were the small sample size of the quantitative components[61,79], and the lack of analysis of the divergencies and inconsistencies between the quantitative and qualitative findings. The qualitative studies included also sometimes lacked detail on their analysis approaches[89,98,103].

Synthesis of findings

The analysis identified several themes within the three categories of determinants contributing to experiences of eco-anxiety, but studies varied in methodological quality (Table 2 and Supplementary Table 1). Social determinants included factors such as age and developmental stage, gender, media exposure, intergenerational relations, peer and cultural norms, and socioeconomic context. Political determinants encompassed government and institutional inaction, distrust, and individual political views, actions and participation. Geographic determinants captured the influence of place-based experiences, including direct exposure to environmental hazards, cross-country differences, and urban–rural distinctions. Each overarching set of determinants is discussed in detail below (further details in Supplementary Table 2).

Social determinants

Age and developmental stage. Age and developmental stage were noted as key predictors of eco-anxiety among CYP. A consistent pattern emerged across multiple studies whereby levels of eco-anxiety tended to increase as age increased into young adulthood. Several studies documented that older adolescents and young adults often engage more deeply with climate issues, with this engagement intensifying as their cognitive and emotional capacities matured[87,95,102]. This pattern was reinforced within longitudinal studies, which demonstrated an age-related increase in climate worry from 15 to 21 years, indicating that as individuals aged, their perception of environmental threats became more acute[48]. The 8-year longitudinal study conducted by Sciberras and Fernando found that as age increased from 10–11 years up to 18–19 years, increasing levels of climate worry were observed[47]. Similarly, in their longitudinal study, Prati et al. observed that climate worry increased from age 15 years to around 23–25 years, after which a small decrease was observed[48]. In a mixed-methods study focusing on Swedish children and young adults, Ojala noted climate worry was stronger among adolescents (aged around 16–17 years) and young adults (aged around 20–25 years), compared with children (aged around 11–12 years)[102]. Metsäranta found that eco-anxiety was experienced more strongly among people aged 24–29 years compared with those aged 15–23 years in a sample of Finnish young people[105]. Similar findings were also observed by Prencipe et al., who found that older youth (aged 23 years) in Tanzania reported the highest levels of climate distress[51], and by Donati et al. who found that climate worry was higher among older adolescents than younger adolescents in Italy[84].

However, a cross-national study across 23 countries mostly in Europe found little difference in climate worry between age groups[21],

but differences between countries were not explored. In a Norwegian study of people aged 13–19 years, those aged 15–16 years were more likely to be worried about climate change, but the relationship with age was nonlinear, decreasing among those aged 18–19 years[50]. In a qualitative study by Chou et al., the authors noted that children aged around 11–12 years may experience more climate distress compared with younger children as they develop and become more able to envisage a hypothetical future[55]. These results suggest that eco-anxiety may not be uniformly distributed across age groups, but may instead be shaped by psychological development, marking adolescence as a particularly critical period.

Gender. Consistent gender differences in the experience of eco-anxiety were found, with most studies suggesting that young women and girls express higher eco-anxiety levels compared with other genders[21,50–52,59,67,83,84,87,88,106–108]. Leonhardt et al. found that adolescent girls were more likely to experience eco-anxiety than boys: 14% of girls reported being very worried about climate change, compared with 7% of boys, and 28% of boys reported being not worried at all, compared with 10% of girls, in their study including 128,484 Norwegian participants[50]. In their logistic regression models adjusted for sociodemographic factors and leisure activities, girls had 2.60 (95% confidence interval, 2.53–2.67) higher odds of eco-anxiety compared with boys, and this association persisted after further adjustment for mental health and health behaviors[50]. In a study including 2,652 high-school pupils in Kenya, young women were more likely to report being afraid of climate change compared with men (42.3% compared with 33.8%)[52]. This gender disparity was also found within several other studies, with a few exceptions.

Comparing climate activists with non-climate activists in Turkey, Ediz and Yanik found no notable differences in climate anxiety between genders[69]. Hill-Harding et al. found no apparent differences between genders for most results in their study of students at a large UK university[74]. However, overall findings suggest gender differences in eco-anxiety emerge early and generally persist across developmental stages and different country contexts. Parsons et al. found that even among a relatively gender-progressive country, young women in New Zealand often felt a greater sense of responsibility for pro-climate action compared with men, which was linked to the general feminization of care practices:

> "is the emotional and psycho-social burden[s] of caring [for the environment] and [concern about] climate change falls to a huge extent onto women… [This results in] negative impacts [for me and] a lot of women's psyches, like carrying this burden. I think about [how I can] help fix [the climate challenges faced by] underprivileged women in other countries as well." (Izadora, FG1; page 1451 in ref. 93)

Ethnicity, race and migration. Very few studies reported on ethnic differences in eco-anxiety and studies generally lacked adequate representation of ethnic minority groups. One study found that students from ethnic minority groups reported lower levels of eco-anxiety compared with those from the white majority group in a study within English secondary schools[106]. A Swedish study found no difference in climate worry when comparing people from Swedish and foreign national backgrounds[59]. A number of studies included people from Māori and other ethnic minority groups in Aotearoa (New Zealand), suggesting these group may be particularly affected by eco-anxiety[79,89,101].

Socioeconomic context. Several studies highlighted the socioeconomic context as a potential influential factor for eco-anxiety, but findings differed depending on the aspect of socioeconomic position studied (for example, education level, occupation or income) and scale (for example, individual, parental, household or area level). According to Leonhardt et al., adolescents who perceived their family's financial situation as good had lower risk of being worried about climate change, compared with those who perceived their financial situation as poor, in the large Norwegian study[50]. They also found that the level of parental education was consistently associated with eco-anxiety; compared with those with no higher education, young people whose parents had higher education had 1.57 (95% CI, 1.52–1.61) higher odds of being worried about climate change[50], which was also found in several other studies, including within Sweden[59], Portugal[76] and Tanzania[51]. In a study based in Australia, those living in less advantaged areas (according to the Index of Relative Socio-economic Disadvantage) had higher odds of experiencing eco-anxiety compared with those living in more advantaged areas[62]. Among UK residents, higher socioeconomic status (measured by the Family Affluence Scale[109]) was associated with higher levels of eco-anxiety[82]. However, a study in Poland found that young adults in an unfavorable financial situation had higher odds of experiencing stress related to the climate crisis[108].

Chou et al. elaborated in their qualitative study using focus groups with participants aged 5–18 years in three areas of Brazil[55] that the socioeconomic context shapes awareness and engagement with climate change:

> 'There are two types of rich and poor people who deal with this situation: the rich ones either don't care, they only think about money—or are informed and try to do as much as possible, because they have the money for it. There are two types of poor people, who either have no place to find information—or they have information, but they don't have money to afford organic food." (12,F; page 260 in ref. 55)

Furthermore, they found that the groups who were more aware and engaged with climate change issues belonged to the wealthier social classes and experienced more eco-anxiety[55]. This group comprised children and adolescents whose parents were more engaged in environmental action, or who attended private schools that had climate change integrated into their curricula. The influence of parental occupation was also noted by a participant, who noted that as their mother was a journalist, they felt well informed by them[55]. Working in extreme temperatures was also linked with climate distress in a Tanzanian study[51], but there was a general lack of studies examining occupational influences. Another study highlighted how youth climate activists from privileged backgrounds had greater access to emotional and social resources to navigate eco-anxiety, further highlighting inequality in resilience and response capacity[89]. Other studies noted the educational context; students enrolled in environment-related courses tended to report higher levels of eco-anxiety[67,68,81,98]. However, these cross-sectional studies do not imply a causal relationship as students likely self-select based on their concern about the environment.

Media exposure. Media exposure emerged in several studies as a potential determinant of eco-anxiety[54,61,67,71,72,75,90,96,97,105]. In multiple qualitative studies, increased exposure to climate-related news, especially through social and mass media, was mentioned as a key theme. Studies highlighted that media allow the distribution of helpful information that can inform people about environmental issues[95], but it can also intensify feelings of helplessness, especially when messaging is fear-based or lacks hopeful framing[57,75]. The frequency of media use and attention given to climate change news were key predictors of climate anxiety in a study based in the USA, with media exposure variables explaining around a third of the variance in climate anxiety scores[75].

Many studies mentioned social media as an important factor affecting how CYP experience eco-anxiety[47,50,61,90]. A mixed-methods study by Gunasiri et al. including 46 participants aged 18–24 years in Australia found that negative stories about climate change shared on

social media can contribute to feelings of hopelessness, guilt, shame and anxiety, which can be overwhelming[61].

> "I do get a lot of climate anxiety when I read the stuff about how June was the hottest month, I'm like yeah I can't do anything about that." (Interview participant 7; page 6 in ref. 61)

However, social media was also reported to have a positive role, providing a platform for young people's voices and action:

> "You can be speaking to people on the other side of the globe that you'd never interact with at any other point in your life and you're able to build a community and a network." (page 7 in ref. 61)

In another Australian study by Sciberras and Fernando, greater societal engagement, including consumption of news relating to international affairs, was related to high and increasing levels of climate worry over time[47]. A study across eight countries also found that participants reported increased climate anxiety due to social media coverage[90]. In contrast, the large cross-sectional Norwegian study by Leonhardt et al. found that individuals who expressed higher levels of concern about climate change tended to spend less time using social media[50]. Despite some variation, the overall pattern suggests that media can act as both a conduit for climate awareness and action, as well as a vector for eco-anxiety.

Intergenerational relations

A few studies indicated that intergenerational relations, including trust in older generations and worry about future generations, are potentially related to eco-anxiety[49,56,68,91,94]. Boyd et al. highlighted a 'generational misalignment', where youth report frustration and distress arising from perceived climate inaction by older generations[94]. This lack of trust in adults' willingness or ability to mitigate climate threats contributed to feelings of betrayal and powerlessness among young people with pre-existing mental health problems in Australia[94]. Frustration at the burden of trying to fix previous generations' actions was similarly highlighted in another qualitative study based in Quebec, Canada[85].

> "Yeah, I'm also angry at previous generation because actually, it's us, it's us who have to live with this… Like people who are 70 will die in like 30 or 20 years even, you know… it's me who is 11 years old that will live in 40 years, 50 years, 60 years… Probably I'm going to live that again and again because others who are 70 years old today will have passed away when I'll be 70 years old… But I will be there, I will see everything that degrades." (Participant 15, 11 years old; page 10 in ref. 85)

Smith et al. also documented how young women expressed eco-anxiety in the context of contemplating future family planning, citing concerns about the environmental legacy being inherited from previous generations[91]. These findings suggested that diminished intergenerational trust may contribute to eco-anxiety, with eco-anxiety also relating to life choices which will affect future generations[49,68].

> "I mainly think about my own children that I want to have in the future […] And, you know, since I feel like they will be close to me because they are my family, I feel like I'm already worried about them. And these children don't even exist and this future that doesn't even exist. But it's something that worries me the most. I think about my future family living in a world with climate change." (Participant 7, female, 23; page 34 in ref. 49)

Peer and cultural norms. The influence of peer and cultural norms emerged as correlates of eco-anxiety in some studies[47,56,86,87]. Thomas et al. found that young people often described their climate emotions as shaped not only by personal experiences but also by the social environments in which they are embedded, including peer interactions and broader cultural narratives[56]. Cultural expectations regarding environmental responsibility, particularly in collectivist or activist-oriented communities, may heighten pressure to respond emotionally or behaviorally to the climate crisis. Sciberras and Fernando reported that individual worry profiles may be influenced by shared social and cultural contexts, where normative beliefs about climate change can either validate or suppress eco-anxiety[47]. In a qualitative study using participatory action methods, young people also highlighted the stigma surrounding climate concern and the unwillingness to talk about these issues in countries such as Jamaica (where some older people considered extreme weather to be a normal occurrence), but also in the UK (where it has been considered a taboo subject)[103]. They also mentioned struggling with whether to discuss concerns with family, friends and colleagues. A culture of denial was also found to be a source of eco-anxiety in a small mixed-methods study among adolescents participating in environmental groups at the University of Vermont, Canada[97]. Being 'shamed' by peers, belittled and experiencing derision related to their interest in climate issues was highlighted by several participants in a small study based within a Welsh school:

> "I was made fun of and called Greta Thunberg for speaking out loud for defending my opinion. I know for a fact that I am not the first one, and sadly will not be the last one to experience it… I believe that is the school's duty to stop shaming people for their beliefs and start to give better education." (Sara, YP5, 2166–2174; page 80 in ref. 66)

Political determinants

Distrust. Studies consistently revealed concern from CYP regarding their lack of inclusion and representation in decision-making processes and their lack of trust in government and institutions, which can exacerbate eco-anxiety[58,79,82,100,103,110]. The cross-sectional study by Hickman et al. with data from 10,000 young people across 10 countries found that participants felt more betrayal (highest in Brazil, India and the Philippines) than reassurance toward the government, which correlated with climate anxiety and distress[58]. Barnes found that participants expressed pervasive distrust in government actors, associating this with heightened existential concern and hopelessness about the future[98]. Similar sentiments were reported by Thomas et al. where US participants described disappointment and anger toward political leaders as intensifying their eco-anxiety[56], and in a study focused on Australia exploring CYP's emotional responses to climate change:

> "We have a few more Independent politicians in Parliament now […] so I think that is a positive… I feel more hopeful, but the trust is still low due to the previous government when nothing happened." (young person, age 24; page 9 in ref. 100)

Other studies further elaborated that CYP often perceive political leaders as unresponsive or indifferent to the urgency of the climate crisis, resulting in frustration, alienation and a diminished sense of agency[55,56,66,100,103]. These studies suggest that eco-anxiety is not merely a reaction to environmental degradation, but a response to political systems perceived as inadequate or disingenuous in addressing the crisis.

Government and institutional inaction. Government and institutional inaction was identified as a recurring theme contributing to eco-anxiety. The large cross-sectional study by Hickman et al. highlighted that young people's negative perceptions of governmental responses to climate change were associated with increased levels of distress[58]. Moreover, government inaction was frequently mentioned to be intertwined with political interests and industry lobbying, exemplified by Myers et al. in an Australian study, which highlighted young

people's frustration and anger as they witnessed fossil fuel industries influencing policymaking and distributing misinformation[101]. This hindered effective climate action, leading to reduced trust and contributing to eco-anxiety, especially when young people felt that their concerns were being dismissed. These findings were corroborated in another study by Boyd et al.:

> "They're really letting us down, like, [the Prime Minister] is putting so much money towards fossil fuels. When we really need to focus on the environment at the moment, because what's the point of making money if you're not going to have a planet? You know those politicians who are meant to oversee the stuff, they're in their like, 60 s, 70 s. So by the time it actually hits really hard, a lot of them will probably not be here anymore. So it's a bit discouraging as well. Like, it's sort of been relegated to us." (Client8; page 1027 in ref. 94)

Several studies revealed that perceived governmental inaction, lack of transparency and symbolic rather than substantive climate policies erode public confidence and contribute to emotional distress[49,55,61,62,78,89,91,94,97,98,103,111]. Hill-Harding et al. examined students' emotional responses to climate change among university students in the UK and also found that perceptions of inadequate institutional responses, in this case, the university, may exacerbate eco-anxiety[74].

Individual views, participation and actions. The literature consistently highlighted other political factors that may shape eco-anxiety, including political views and participation. Parsons et al. found that youth engaged in climate activism frequently expressed both empowerment and psychological strain, highlighting the emotional weight of taking on political responsibility when institutional responses are seen as inadequate[93]. Sciberras and Fernando found that adolescents with consistently high or increasing climate worry were more politically engaged[47]. Gunasiri et al. similarly found that participants who took climate action reported higher levels of worry, but that there were also positive psychological benefits (for example, feeling more in control)[61], and in other studies the development of a social network that validated their identity was highlighted[95]. Some studies also noted concern around the potential repercussions of protest involvement[101]. Other studies also noted that a more liberal or left-leaning political orientation was associated with higher eco-anxiety among CYP[75,98].

Geographic determinants

Direct exposure to environmental hazards. The direct experience of climate-related events was highlighted in several studies that explored CYP's personal experiences[53,55,61,77,92,101]. A cross-sectional study by Vercammen et al. in the USA reported that individuals who had direct experience of climate change impacts (particularly wildfires) had higher mean scores for climate distress and eco-anxiety compared with those who had not encountered such impacts, even when taking into account age, gender, education level, family affluence, urban–rural residence and ethnicity[77]. The cross-sectional study conducted by Lykins et al. investigated Australian youth mental health in the aftermath of the Black Summer bushfires during 2019–2020, highlighting the mental health impact of localized events related to climate change on the individuals affected directly[92]. Young people directly exposed to the bushfires experienced higher levels of climate distress and concern compared with those who were not directly exposed. The study found that the proximity of the bushfire event, whether in terms of physical distance, social or temporal aspects, did not appear to have an impact on anxiety levels[92]. Simon et al. similarly found that young people living in the Philippines, where many people constantly experience first-hand the effects of climate change-related typhoons and droughts, were prone to experiencing eco-anxiety, but this also motivated them to take climate action[53].

Qualitative research in New Zealand highlighted the potential impact of living in a coastal community, where one participant saw first-hand the erosion of the foreshore on his journey to school[101]. Chou et al. also highlighted that having family members impacted by climate-related events, such as flooding, led to feelings of fear among some participants in a qualitative study based in Brazil[55]. People living in low-lying countries, such as the Philippines and Jamaica, reported experiencing despair that their homelands may cease to exist in the future owing to sea-level rise and flooding[103]. Hearing the rain was also highlighted as a trigger for eco-anxiety among those affected by flooding in an Australian study focusing on young people with mental health problems[94].

> "And at night time that rain, for me, it was triggering. It was like, 'Are we going to be flooded'? You know, I'm safe, but it still doesn't help you not think about it. Think about others and yeah, animals, wildlife, all those things that are put out of place. I think that affects a lot of people too." (Client 7; page 1028 in ref. 94)

Cross-country differences. The study by Hickman et al. suggested that the climate vulnerability of regions may be an important geographic determinant of eco-anxiety, with notable cross-country differences[58]. Surveying 10,000 CYP across 10 countries—including both high-risk and less-affected regions—the study found that youth living in areas more vulnerable to climate impacts (for example, Philippines and India) reported higher levels of climate worry and distress[58], compared with countries such as Finland and France. In another multi-country study, Lau et al. explored differences in emotional engagement with climate change including climate anxiety, finding that participants in China had the highest levels, compared with Portugal, South Africa, the UK and the USA[57]. Other cross-national studies found few differences between levels of climate worry between countries[87,112]. Differences in measurement and scoring approaches used across quantitative studies made it difficult to synthesize results from single-country studies; therefore, we focused on the multi-country studies (Supplementary Table 3). However, these are also limited by the lack of nationally representative samples.

Urban–rural residence. Potential differences in the manifestation of eco-anxiety were found based on the urban or rural residence of the individual, but findings differed by country. For example, Strife et al. conducted interviews with urban American children who expressed heightened environmental anxiety, influenced by their exposure to urban environmental degradation[96]. In contrast, studies such as Ndetei et al. suggested that youth living in rural or semi-urban regions in Kenya may experience eco-anxiety differently, with their concerns more closely tied to direct interactions with the natural environment and localized climate impacts[52]. In this study, young people living in rural areas were found to experience a higher level of climate worry compared with those living in urban areas[52]. Chou et al. also identified regional disparities in Brazilian children's climate awareness, emphasizing that urban access to information and activism differed from rural lived experiences[55]. Adolescents living in urban areas of Norway were more prone to eco-anxiety, compared with those living in rural areas[50]. Similarly, Prati et al. found living in the Italian countryside to be negatively correlated with climate worry[48].

Discussion

This systematic review synthesized 69 studies exploring the determinants of eco-anxiety in CYP. While we found a range of factors to be potentially related to eco-anxiety, including social (age and developmental stage, gender, socioeconomic context, media exposure, peer and cultural norms, and intergenerational relations), political (distrust, government inaction, and individual views and participation), and geographic (direct experience of environmental hazards, cross-country

differences, and urban–rural status), the review also identifies a number of notable gaps in the literature and the overall lack of methodological quality affecting the evidence base.

The review highlighted the importance of age and developmental stage, with eco-anxiety appearing higher among young adults compared with children and younger adolescents[48]. This appears to reflect developmental changes in cognitive, emotional and moral reasoning[16]. Further exploration of the longitudinal development of eco-anxiety throughout the life course is needed to fully understand age and developmental trajectories, as well as differentiating these patterns from secular trends in an evolving climate. Gender also emerged as a strong correlate, with young women and girls more likely to report eco-anxiety across a number of diverse contexts[88]. Stigma and societal norms relating to emotional expressiveness and empathy might partly account for women and girls exhibiting a greater tendency for heightened eco-anxiety[55,90]. Socioeconomic context presented a more complex picture, with both higher and lower socioeconomic position linked to increased eco-anxiety, probably through different mechanisms—awareness, exposure and capacity for adaptation. Political determinants, particularly government inaction, were consistently reported as correlates of climate distress[58]. Many studies highlighted how a lack of trust in leadership and intergenerational inequity contributed to perceptions of helplessness, betrayal and existential worry. At the same time, youth agency and activism emerged as both a response to eco-anxiety and a coping strategy, although one that carries emotional burdens. Geographically, the experience of eco-anxiety seems heightened in climate-vulnerable regions and among populations directly exposed to environmental hazards, such as wildfires[58,92] and flooding[94]. Urban–rural differences were observed, but varied by country[48,50,52].

There was a general lack of diversity in the countries included, with several studies from Australia, Europe and the USA, but very few including populations living in Africa, Asia and South America. Further research is needed from countries in the Global South to understand the applicability of eco-anxiety among different cultures and to fully explore differences between countries and cultures. There was an important gap concerning research that linked aspects of the environment, such as air pollution, flood risk and temperature, to experiences of eco-anxiety. While this review covered a diverse range of determinants, evidence on specific factors, such as ethnicity and migration status, were lacking, limiting the depth of synthesis for some aspects. It should also be highlighted that studies sometimes mentioned other factors that were not fully investigated, such as religiosity, spirituality[78] and sexual orientation[108]. Most studies also recruited participants using online methods, which probably excludes those without internet access, such as people who live in more remote areas and Indigenous groups who may be at higher risk from climate change impacts. Studies frequently used non-probability sampling, limiting generalizability and the ability to adequately compare differences in prevalence between countries. Mixed-methods studies were of generally of poorer quality, particularly relating to their quantitative components. A key gap is the lack of studies that took an intersectional approach; there is therefore a need to examine the potentially compounded risks experienced by those with multiple disadvantages.

This systematic review has several strengths that build on existing reviews[13,45,46,113]. The comprehensive search process covered several interdisciplinary databases and included relevant studies across various contexts and populations. Including qualitative, quantitative and mixed-methods studies further enriched the depth of the review. Moreover, we assessed the quality of studies using the MMAT toolkit, but there may be some limitations with this approach and the quality appraisal process is inherently subjective[114]. However, most previous reviews have not assessed the quality of existing studies[13,46,113]. We included studies that were published in English, which may have introduced bias, potentially omitting valuable insights from non-English language literature. Heterogeneity in the definition and measurement of eco-anxiety limited the ability to conduct meta-analysis and made comparisons between studies challenging. There is generally a lack of conceptual clarity around eco-anxiety and related terms; therefore, there is a chance we may have overlooked studies that used other similar terms. Furthermore, our interest was in exploring the determinants of eco-anxiety, rather than attempting to establish causal relationships. This reflects the relatively early development of the evidence base, the need to understand who is most affected and to identify factors that warrant further investigation. While efforts were made to identify gray literature, language and publication biases may have influenced the pool of included studies. The narrative synthesis is also somewhat influenced by the authors' biases and subjective interpretations. Finally, while we defined young people as aged under 25 years[115], the inclusion of a small number of studies that covered participants aged over 25 may have introduced some heterogeneity.

An important research gap pertains to the long-term impacts of eco-anxiety on the mental health and well-being of CYP. There is limited research on how early-life eco-anxiety influences later psychological trajectories, coping strategies and decision-making behaviors over time. There is a need for longitudinal studies that track eco-anxiety, mental health and well-being during youth into adulthood across diverse contexts, currently limited by the lack of available data and measurement tools. The limited exploration of effective coping mechanisms and adaptation strategies for CYP to manage their eco-anxiety may hinder the development of approaches to mitigate its potential adverse impacts and amplify its positive benefits. Furthermore, research is needed to explore the influence of ethnicity, race and migration status and its intersection with other factors such as gender, education and income. Studies that explore environmental and geographic factors, such as living in urban, rural or coastal settings, are also needed to understand eco-anxiety experiences in different places.

Our review underscores the need for climate adaptation and mitigation policies that center the experiences, future and well-being of CYP. Young people increasingly report feeling like their views are not being heard and that they lack a say in important decisions that will affect them the most[58]. This can foster feelings of disempowerment and hopelessness. Political leaders can take important steps toward more inclusive and equitable decision-making. Reform of voting systems that often exclude young people is one way in which CYP could feel more empowered[100,116,117]. Teachers, health professionals and parents/carers, among others, could more actively encourage civic engagement among young people, while also taking effective action themselves[118].

To conclude, this systematic review demonstrates that eco-anxiety among CYP is probably shaped by a range of social, political and geographic determinants. While experiences of eco-anxiety vary across contexts, certain groups—particularly young adults, women and girls, individuals living in climate-vulnerable regions, and those exposed to government inaction or intense negative media coverage—may be particularly affected. These factors may amplify the risk of experiencing maladaptive eco-anxiety, but further research is required to unpack the mechanisms contributing to eco-anxiety that becomes adaptive and/or maladaptive. The review highlights the need for consistent, validated measures to assess eco-anxiety, as well as greater representation of populations within the Global South and survey data that are nationally representative. It also underscores the importance of examining eco-anxiety not only as an individual psychological response, but as a reflection of broader systemic failures, including political inaction, social inequality and environmental injustice. Managing eco-anxiety probably requires a dual approach: enhancing individual coping and resilience through education, support and open dialog, while simultaneously advancing structural changes that restore trust, and promote intergenerational equity and meaningful involvement of CYP in political decisions. As the climate crisis continues to evolve, understanding

and addressing the psychological dimensions of its impact, especially for younger generations, must be a key priority for researchers, policymakers, educators and mental health practitioners.

Methods

The study used a systematic review methodology and took a narrative synthesis approach to analyze literature focused on the determinants of eco-anxiety among CYP. The review is reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines[119]. The review design was guided by the PECO framework[120]: population included CYP aged under 25 years; exposure related to social, political and geographic determinants; comparator included different levels of the determinant being studied (for example, for gender: young woman, man or other gender); outcome was eco-anxiety. The systematic review was registered on the PROSPERO database (ID CRD42023440162, updated in October 2024).

Eligibility criteria

Studies were eligible for inclusion if they investigated eco-anxiety among children and/or young people, defined as aged under 25 years, consistent with World Health Organization and United Nations classifications[115]. Studies in which the majority of participants were aged under 25 years (or the median age of participants was <25 years), or where subgroup analyses allowed for extraction of data specific to this age group, were also considered for inclusion. All empirical study designs were considered, including quantitative, qualitative and mixed-methods studies, and systematic reviews and meta-analyses, provided that they included human participants.

To be included, studies had to contain information on the potential social, political or geographic determinants of eco-anxiety. This encompassed quantitative studies that assessed associations between specific variables (for example, gender, political orientation or country of residence) and eco-anxiety, as well as qualitative studies where such factors emerged as relevant themes. Studies that assessed the level or prevalence of eco-anxiety in a particular country or group, or which validated an appropriate measurement tool were also considered for eligibility. Outcome measures included eco- or climate anxiety, operationalized as anxiety, worry, fear or distress in relation to environmental issues or climate change. Studies conducted in any geographic location or setting were eligible, but only English language studies were included.

Articles were excluded if they did not report original research (for example, narrative reviews, opinion pieces or commentaries), did not include human participants, or examined populations predominantly aged 25 years and over without providing disaggregated data for CYP. Studies assessing general mental health outcomes (for example, generalized anxiety or depressive symptoms) in relation to extreme weather or environmental changes without consideration of eco-anxiety were also excluded. Studies published in a language other than English were not considered for inclusion.

Search strategy

A systematic search of electronic databases was conducted during August 2024. A librarian at the University of Glasgow was consulted for advice on the search strategy. Searches (title and abstracts) were performed using EBSCOhost, which included APA PsycArticles, APA PsycInfo, Child Development & Adolescent Studies, CINAHL, EconLit, GreenFILE, Health Source: Nursing/Academic Edition, Psychology and Behavioral Sciences Collection, and SocINDEX. Additional searches were conducted via Ovid MEDLINE (no limiters) and Web of Science (title and abstracts). Google Scholar (first ten pages of results) was also used to search for relevant gray literature (for example, reports). Relevant unpublished academic articles were searched for using pre-print servers (MedRxiv and PsyArxiv). All database searches were last conducted on 5 August 2024. Backward and forward citation searches were also performed to ensure completeness in the search process up to January 2025. An example of the search performed in MEDLINE is included in Supplementary Section 1. The search terms were as follows: ('eco-anxiety', 'ecoanxiety', 'climate anxiety', 'climate change anxiety', 'environmental anxiety', 'fear of climate change', 'eco-distress', 'ecological stress', 'climate-related stress', 'climate distress', 'climate worry', 'climate concern', 'environmental worry', 'environmental concern', 'environmental distress', 'climate emotions', 'ecological emotions') AND ('child', 'children', 'youth', 'young people', 'teenagers', 'teens', 'adolescence', 'juvenile', 'youngster', 'adolescent', 'minor', 'kid'). Searches were not limited by date of publication or language.

Study selection

Search results were exported to Covidence and duplicate articles removed. Zotero was used to manage references. Articles were first screened from titles and abstracts within Covidence, using the inclusion and exclusion criteria to eliminate irrelevant articles. The remaining articles were screened based on their full texts and reasons for exclusion were recorded. Two reviewers (C.L.N. and S.V.K.) independently conducted title and abstract screening, followed by full-text screening. Conflicts were resolved through discussion.

Data extraction

Study characteristics (authors, title, publication year, country, location/setting, sample size, sampling strategy, dates of data collection), study design (for example, quantitative, qualitative, mixed methods, systematic review, meta-analysis, observational or experimental, cross-sectional or longitudinal), participant characteristics (for example, age, gender, ethnicity, socioeconomic position), social determinants of eco-anxiety (for example, gender, education level, income), geographic determinants of eco-anxiety (for example, country, exposure to climate-related events), political determinants of eco-anxiety (for example, voting preference), outcome (for example, eco-anxiety, climate anxiety, climate worry), outcome measurement tool used (for example, CCAS, HEAS), analysis approach, key findings and limitations were extracted from each included study. Under key findings we also extracted summary measures for eco-anxiety if the study reported a mean, percentage or similar summary statistic. We used the artificial intelligence tool Elicit (elicit.com) to facilitate data extraction[121,122], the results of which were exported into Excel and thoroughly checked by C.L.N., and further data extraction was performed manually by C.L.N. where required (for example, from supplementary material). Studies for which data were unable to be extracted via Elicit ($N = 1$)[86] were manually extracted by C.L.N. S.V.K. completed data extraction for a random 10% sample and all data extracted were further checked by S.M.K.

Quality appraisal

Given the diverse range of study designs included, MMAT[114] was selected as the most appropriate quality assessment instrument to assess risk of bias. MMAT assesses the quality of qualitative, quantitative and mixed-methods studies, focusing on five core methodological quality criteria. For example, qualitative studies are assessed using the following questions. (1) Is the qualitative approach appropriate to answer the research question? (2) Are the qualitative data collection methods adequate to address the research question? (3) Are the findings adequately derived from the data? (4) Is the interpretation of results sufficiently substantiated by data? (5) Is there coherence between qualitative data sources, collection, analysis and interpretation?[114] To provide a crude overall quality score, 'yes' answers were scored as 1, and 'no' or 'can't tell' were scored as 0. The scores for each item were summed to provide an overall quality score ranging from 0 to 5, with those scoring 3 or more classified as moderate to high quality. Quality appraisal was conducted manually by C.L.N. (checked by S.M.K.), recorded in an Excel spreadsheet and a random 10% sample was independently completed by S.V.K.

Alongside the quality appraisal, the type of article was also noted (for example, peer-reviewed journal article, dissertation, pre-print, conference abstract).

Data synthesis

The data synthesis involved an iterative process of summarizing and analyzing the quantitative and qualitative findings from included studies using the data extraction spreadsheets, re-reading the articles, and noting key themes, statistics and quotations. A narrative synthesis approach was used to interpret and integrate the evidence on the factors associated with eco-anxiety. Relevant guidelines for narrative synthesis were consulted to improve transparency[123]. The narrative synthesis involved identifying common themes, patterns and trends across studies. Themes were categorized based on social, political and geographic determinants, allowing for the organization and comparison of findings. Further subgroup themes were identified within the overall themes, some of which were pre-defined based on previous literature—for example, age and gender. Others emerged from the synthesis, for example, if more than one study highlighted the theme. Limitations of the included studies and heterogeneity in findings were noted, paying attention to contradictory results. Synthesized findings were presented in a narrative format, supported by appropriate tables and quotations. Studies considered higher quality were given greater weight in the synthesis. The authors confirm that all data generated or analyzed during this study are included in this published article.

Reporting summary

Further information on research design is available in the Nature Portfolio Reporting Summary linked to this article.

Data availability

This is a systematic review study based on findings in published literature and did not involve analysis of newly generated data. All data extracted are available in the online appendix.

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Author contributions

C.L.N. was responsible for conceptualization of the study. C.L.N, S.M.K. and S.V.K. were responsible for the methodology. C.L.N, S.M.K and S.V.K. carried out the investigation. C.L.N and S.M.K. were responsible for data curation. C.L.N. and S.M.K. wrote the original draft of the paper, and S.V.K. reviewed and edited the work. C.L.N. supervised the project.

Competing interests

The authors declare no competing interests.

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