


BMJ Open Measuring negative emotional responses to climate change among young people in survey research: a systematic review protocol

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ABSTRACT

Introduction Many young people report experiencing negative emotional responses to their awareness of climate change and the threats it poses to their future. With that, an increasing number of survey instruments have been developed to examine young people's negative emotional responses to their awareness of climate change. This report describes a protocol for a systematic review that aims to identify, synthesise and critically appraise how negative emotional responses to climate change among young people have been measured in survey research. The research questions addressed in this review are: (1) How has negative emotional responses to climate change been defined and measured among young people? (2) How do survey instruments measuring young people's negative emotional responses to climate change vary in terms of reliability and validity? (3) What factors are associated with negative emotional responses to climate change among young people?

Methods and analysis Seven academic databases (CINAHL, ERIC, MEDLINE, PsycINFO, Web of Science, Scopus, and Environment Complete) will be searched to retrieve studies published between 1 January 2006 and 31 March 2022 and published in English. Studies including survey instruments that measure negative emotional responses among young people (aged 10–24 years) will be eligible for inclusion. Targeted journals will be hand-searched. This review will follow Preferred Reporting Items for Systematic Reviews and Meta-Analyses 2020 guidelines for systematic reviews. The methodological quality, in terms of reliability and validity, of the included studies will be assessed using the Consensus-based Standards for the Selection of Health Measurement Instruments (COSMIN) checklist for risk of bias of patient-reported outcome measures. To rate the quality of the instruments, we will use a modified Grading of Recommendations, Assessment, Development and Evaluations technique defined by the COSMIN guidelines.

Ethics and dissemination Ethical approval is not applicable for this study. We will disseminate the findings through publication in peer-reviewed journals and presentations.

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STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This study reviews a broad set of multidisciplinary databases to provide a comprehensive assessment of published literature on survey measures of negative emotional responses to climate change among young people.
- ⇒ The implementation and reporting of the review are guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines.
- ⇒ The Consensus-based Standards for the Selection of Health Measurement Instruments checklist will be used to assess risk of bias (quality).
- ⇒ The systematic review will not include studies that are not available in English, as well as white and grey literature.

INTRODUCTION

Climate change has, and will continue to have, a profound effect on human health.¹ The environmental impacts of climate change include extreme heat, fire, drought, rising sea levels and the warming and deoxygenation of oceans.^{2–3} As a result, climate change is directly affecting human health through increased waterborne and vector-borne diseases, illness and injury.⁴ As such, both the World Health Organization (WHO) and the *Lancet* called climate change the greatest health threat of this century.^{5,6}

While climate change is undeniably a threat to people's physical health, there are also implications for their mental health and well-being.^{7–9} In 2017, the American Psychological Association (with Climate for Health and ecoAmerica) released a report describing the multiple ways climate change influences mental health.¹⁰ Broadly, the mental health and well-being impacts of climate change have been categorised as (1) direct (the impact on those in communities that experience an extreme weather event), (2) indirect (the

impacts that occur due to shifts in social, economic and environmental determinants of mental health and well-being) and (3) negative emotional responses stemming from an awareness of the imminent threats to the planet due to climate change. Negative emotional responses to an awareness of climate change, such as anxiety (often termed climate anxiety), worry or distress, have recently become an area of research interest.^{8 11}

When it comes to the health consequences of climate change, these can vary by geography and demography. Young people (defined by the WHO as those aged 10–24 years¹²) are recognised as a disproportionately at-risk group to experience effects of climate change.^{12–14} At few points in history, has a generation faced such a global threat.¹⁵ Additionally, during this developmental period – among other physical, social and emotional changes – young people are undergoing significant cognitive development during which their worldview is developing and refining^{16 17}; all the while, this generation is exposed to increased media and educational coverage of climate change and its impacts. This underscores that there is a critical need for greater understanding of young people's emotional experiences of climate change. Particularly as young people are found to be especially sensitive to issues related to the natural environment.¹⁷

It is important to note that experiencing negative emotions about climate change is a rational and potentially functional reaction, but for some these feelings may be overwhelming.¹⁴ Here, we use the term negative emotional responses to climate change broadly, referring to conscious states that elicit negative affect related to the climate change. These negative emotions can include concern, guilt, powerlessness, anger, confusion and anxiety.¹⁸ It might be that some negative emotions spur motivation to act, while some may impede action and impact an individual's ability to function.^{14 19–22} To better understand this phenomenon more research is needed. A recent scoping review, by members of the research team, found that much of the published academic work on this topic are theoretical or opinion papers rather than empirical studies.¹⁴ However, emerging evidence suggests a high proportion of young people experience negative emotional reactions to their awareness of climate change.^{22 23} For example, 84% of young people, aged 16–25 years, in 10 countries reported being at least moderately worried about climate change.²³ Therefore, it is timely to examine how survey instruments measure negative emotional responses to climate change among young people.

Researchers must use valid and reliable measures to understand the magnitude and impact of climate change on young people's mental health and well-being.^{14 24} Understanding how measurements are (dis)similar is important when comparing the results across studies and supporting decision-making for resource allocation and policy.²⁵ As such, developing age-appropriate and validated measures of climate change-related factors connected to mental health and well-being has been

identified as a global priority for climate change and mental health research.²⁶ Gains have been made in developing survey instruments for adults,¹⁹ but less is known about the state of the field for young people. Accordingly, the purpose of this systematic review is to identify and synthesise how negative emotional responses to climate change among young people have been measured in survey research.

RESEARCH QUESTIONS

The specific research questions we seek to address in this review are:

1. What survey instruments are used to measure negative emotional responses to climate change in young people?
2. How do survey instruments measuring young people's negative emotional responses to climate change vary in terms of reliability and validity?
3. What factors (eg, demographics, coping strategies, mental well-being, pro-environmental behaviours) are associated with negative emotional responses to climate change among young people?

METHODS AND ANALYSIS

Protocol and registration

This systematic review will be conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines.²⁷ The review has been registered with the International Prospective Register of Systematic Reviews (PROSPERO).²⁸ Any amendments to the protocol will be reported in the systematic review and include a rationale for such changes.

Eligibility criteria

To support our review objectives, we will include all peer-reviewed studies where a survey instrument has included a measure of negative emotional responses to climate change. For the purpose of this review, a survey instrument is defined as a close-ended question, or set of questions, in a questionnaire used to illicit data from respondents.

Population

The study population is young people (aged 10–24 years). However, no exclusion criteria will be applied based on age in the initial database search. During the full-text screening, we will examine survey instruments using a developmental lens by noting the age of study participants, and selecting studies where the measure is used, or developed for use, in studies of participants aged 10–24 years. Given the emerging nature of this field of study, this will ensure we capture any studies that explicitly state that measures have been developed to be appropriate for young people, even if not yet implemented on this population.

Study characteristics

Studies will be included that are (1) published in a peer-reviewed journal and (2) report the use, original development or refinement of survey instruments that have been developed to measure negative emotional responses to climate change awareness among young people, including pilot, cross-sectional, longitudinal, mixed-methods, and measurement validation studies.

Setting and time frame

The context of this review is global, so no inclusion/exclusion criteria are set for geographic region of study. The search will be limited to publications from 2006 onwards. This date limitation was selected as a previous scoping review found no empirical evidence on the topic published before this date.¹⁴

Report characteristics

Only peer-reviewed studies published in English will be included in the review.

Exclusion criteria

Research that *only* examines mental health responses from experiencing a specific acute weather event (eg, post-traumatic stress after a flood event), will be excluded, as this would be more indicative of a direct effect that may not apply to general populations of young people.

Unpublished papers, dissertations, conference proceedings, and grey literature will be excluded. Adult perceptions of young people's emotions, such as a parent responding about their child, will be excluded as well.

Search strategy

Searches will be conducted in seven academic databases (CINAHL, ERIC, MEDLINE, PsycINFO, Web of Science, Scopus, and Environment Complete). Targeted journals that are focused on climate change and health (the *Journal of Climate Change and Health*) will be hand-searched, as a key journal on the topic.

The search strategy contains three components: (1) negative emotions, (2) climate change and (3) survey instrument. Search strategies will be developed with consultation of the research team and a health information specialist librarian. Boolean and proximity operators will be used when conducting the searches and adapted to be database specific. See online supplemental tables 1–7 for search matrixes. Searches will be carried out by a health information specialist librarian with expertise in conducting database-specific searches.

Preliminary searches were carried out on 30 November 2021 and were updated in March 2022. This systematic review is expected to be completed in October 2022.

Study records

All identified records will be uploaded into the reference manager software Zotero, V.5.0.66 (<https://www.zotero.org/>), and duplicates will be removed. Study details will then be imported into the systematic review software Covidence (<https://www.covidence.org/>). Titles and

abstracts will be screened by two independent reviewers for assessment against the inclusion/exclusion criteria. After screening the titles and abstracts, potentially relevant articles will be further assessed for eligibility through full-text screening, again by two independent reviewers, and reasons for exclusion will be noted. Disagreements between the reviewers at each stage of the selection process will be resolved through discussion, involving a third reviewer to resolve disagreements when necessary.

Data extraction

Data will be extracted by one reviewer and confirmed for accuracy by a second reviewer. Data will be extracted from each publication, including the following information: DOI; author(s); year of publication; year of data collection; country of the study; urban/rurality; population; participants' ages; sample size; study design; negative emotions/concepts of interest (in authors' own language); survey instrument wording; survey items (i.e., questions); associations with other factors including direction of relationship and if the relationship is statistically significant at a level of $p < 0.05$ (all factors will be noted as this is an emerging field of study) and quality (based on the Consensus-based Standards for the Selection of Health Measurement Instruments (COSMIN) risk of bias checklist—see section on Risk of Bias Assessment below).

Where a study includes more than one survey instrument of interest, we will report these separately.

Risk of bias (quality) assessment

An evaluation of the methodological quality of survey instruments will be done using the COSMIN risk of bias of patient-reported outcome measures checklist.²⁹ The COSMIN module-based standardised checklist tool was designed to evaluate the methodological quality of measures from health status surveys based on reliability and validity indicators. We will use a subset of modules; specifically, we will address all questions related to development, content validity, cross-cultural validity and construct validity. Where a multi-item measure was used, we will also include structural validity and internal consistency. This approach is similar to past studies of young people that used the COSMIN checklist.^{25 30} To rate the quality of the instruments, we will use a modified Grading of Recommendations, Assessment, Development and Evaluations technique defined by the COSMIN guidelines for systematic reviews. The COSMIN guidelines classifies the quality of the evidence into four levels: 'high', 'moderate', 'low' or 'very low'.^{31–33} All appraisals will be made by two researchers independently. Disagreements between the researchers will be resolved through discussion, involving a third researcher to resolve disagreements when required.

Data synthesis

A narrative approach will be used to synthesise the findings of this review using textual descriptions of the publications. We will discuss the conceptualisation and



operationalisation of negative emotional responses to an overarching awareness of climate change among young people, taking the methodological quality and psychometric properties of the survey instruments into account.

Results will be presented in accordance with PRISMA guidelines. A PRISMA flow diagram will be used to summarise study selection. Data extraction and risk of bias assessment will be presented in tabular form and graphed to enhance data visualisation. Using a similar approach to Martin *et al*,²⁵ each survey instrument discussed in the included papers will be coded based on the study authors' terminology (eg, worry, distress) which will allow us to group the survey instruments into conceptual themes.

Patient and public involvement

Patients and/or the public were not involved in the design, conduct, reporting, or dissemination plans of this research.

Ethics and dissemination

Ethical approval is not applicable for this study, as the review uses only secondary data. We will disseminate the findings through publication in multidisciplinary peer-reviewed journals and academic conferences as well as presentations to organisations that focus on climate change and youth mental well-being.

DISCUSSION

To our knowledge, this will be the first systematic review undertaken on survey instruments used to assess young peoples' negative emotions about climate change. This review will identify, describe, evaluate, and compare all eligible instruments. The methodological quality and psychometric properties of all included instruments will be evaluated based on the COSMIN checklist. The findings will identify knowledge gaps and yield recommendations for future research implementing measures of negative emotional responses to climate change. This review aligns with the research priority of developing appropriate and validated measures related to climate change and mental health.²⁶ The results of this review will support professionals, practitioners, policy makers, and advocates who need robust evidence to help mitigate the effects of the climate change on the mental health of young people.²⁴

There are several limitations for this review to consider. A key limitation of this study is that it does not include studies that are not available in English, as well as white and grey literature; therefore, some relevant sources and documents may be missed. Furthermore, peer-reviewed articles not indexed in the databases used in this review will be missed by our search. Although key factors that are examined for association with negative emotions regarding climate change will be extracted, a full assessment of the statistical analysis is outside the scope of this review of survey instruments. Finally, as the negative emotions people experience about climate change is an

emerging research topic, new terminology that taps into this concept may be missed.

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Contributors GM, AC and KL conceptualised the study. GM was responsible for drafting the protocol. TR and MA substantially significantly contributed to inclusion/exclusion criteria, methods and tools. KGC, KC, AMK and MKG provided significant protocol feedback and edits. All authors read, revised and approved the final manuscript.

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Competing interests None declared.

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