



Original Article

Difference in Perception and Emotional Response to Climate Change between Male and Female Teenagers in the Colombo Education Zone, Sri Lanka

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Abstract:

Climate change is increasingly recognised as a factor influencing the psychological well-being of adolescents, particularly in low- and middle-income countries. Gender may moderate adolescents' emotional responses to climate threats, yet data from South Asia remain limited.

This cross-sectional study assessed climate change-related perceptions, anxiety, and emotional responses among 395 adolescents aged 13–17 in two government schools (one all-girls and one all-boys) in the Colombo Education Zone, Sri Lanka. A structured, self-administered questionnaire measured awareness, subjective understanding, anxiety, anger, and influencing contextual factors.

The mean age of participants was 15.2 years (SD = 1.4), with 60.8% identifying as female. Female adolescents demonstrated significantly higher levels of climate change-related anxiety ($\chi^2 = 21.84$, $p < 0.001$) and self-reported understanding of climate change impacts ($\chi^2 = 15.84$, $p < 0.001$) compared to males. Anxiety was also significantly associated with increased awareness ($\chi^2 = 19.08$, $p = 0.0001$), parental discussion ($\chi^2 = 28.98$, $p < 0.0001$), and knowing someone affected by climate-related adversity ($\chi^2 = 4.58$, $p = 0.032$). Emotional responses such as anger were not significantly associated with gender ($\chi^2 = 2.33$, $p = 0.126$). Notably, 86% of participants expressed concern about the health consequences of climate change, while only 31.6% believed adequate national efforts were in place to address the issue.

Gender emerged as a significant determinant of climate change-related anxiety among adolescents in Sri Lanka, with females showing greater emotional impact. Findings highlight the need for gender-sensitive mental health strategies, improved climate education, and enhanced intergenerational dialogue to help adolescents navigate emotional responses to the climate crisis.

Keywords Climate change, gender, adolescents, Sri Lanka

Introduction

Climate change is an urgent global issue, with profound implications for the environment, society, and public health [1]. Adolescents, the emerging generation, are particularly vulnerable to its psychological and emotional impacts [2]. Increasingly, studies have shown that young people not only recognise the severity of climate change but also express heightened levels of anxiety, frustration, and concern regarding its future consequences [3]. In many parts of the world, including Sri Lanka, the younger population is becoming more vocal about their perceptions of climate change and the actions, or lack thereof, being taken to mitigate its effects.

With the growing frequency of climate-related events such as flooding, landslides, and droughts in Sri Lanka, it is crucial to evaluate children's understanding of climate change and the related health risks they may face [4]. Children are particularly vulnerable to the impacts of climate change, facing risks such as displacement due to severe flooding and landslides. The affected children lose their homes, schools, and essential items such as books, disrupting their education and stability. In the worst cases, children may even lose family members to climate-related disasters, leaving them not only physically uprooted but also emotionally and socially affected

The importance of how adolescents perceive and react to climate change cannot be overstated, as these perceptions may shape their future attitudes, behaviours, and involvement in climate-related initiatives [5]. Furthermore, gender has been identified as a key variable influencing how climate change is perceived, with previous research suggesting that females tend to express higher levels of concern and anxiety than males [6], [7], [8], [9]. However, data are scarce from low- and middle-income countries, such as Sri Lanka, on how adolescents experience climate change-related anxiety and how gender may shape these experiences.

This study explores the perceptions, anxiety, and emotional responses of adolescents in the Colombo Education Zone of Sri Lanka regarding climate change. By investigating gender-based variations in climate change anxiety and examining other influencing factors, such as family discussions and awareness of information sources, this study provides insight into how climate change affects adolescent mental and emotional well-being in Sri Lanka.

Methods

Study design and population

A cross-sectional survey was conducted among 395 adolescents within the Colombo Education Zone of Sri Lanka to investigate perceptions and anxiety regarding climate change. The study was conducted among children aged 13–17 years in two government schools within the Colombo Education Zone, one catering to girls and the other to boys.

Sample size and sampling strategy

The sample size of 395 was determined based on previously published studies of climate change-related anxiety among adolescents (CI – 95%, margin of error – 5%) [10]. A purposive sampling strategy was adopted to ensure representation from male and female adolescents, as gender was a key variable under investigation. Two government secondary schools within the Colombo Education Zone were selected, one all-boys school and one all-girls school, based on accessibility, administrative support, and student population size. All students within the eligible age group (13–17 years) in the selected schools were invited to participate, and recruitment continued until the target sample size was reached.

Gender classification

Participants were asked to self-identify their gender. All participants, including those who did not disclose gender, were included in the main analysis; however, gender-stratified analyses were conducted based on self-reported male and female categories only. Those with undisclosed gender were not included in comparative statistical analyses involving gender, to maintain analytic clarity and validity.

Data collection

The study used a structured, self-administered questionnaire to collect data on participants' demographics, climate change awareness, emotional responses, and opinions on climate change action. The questionnaire also explored the impact of gender on perception and self-reported anxiety. The questions assessed participants' self-reported anxiety and anger about climate change, awareness of information sources, perceptions of national action, and the impact of climate change on human and non-human life. The questionnaire also comprised open-ended questions which explored climate change-related topics, including calls for action and perceived barriers to addressing climate change.

Data analysis

Data were analysed using SPSS software 26.0. Descriptive statistics were computed to summarise demographic characteristics, with gender distributions calculated as percentages. Chi-square (χ^2) tests were performed to examine associations between gender and perceptions of climate change, including self-reported anxiety, anger, and subjective understanding of climate change. A p-value of <0.05 was considered statistically significant.

Ethical considerations

Before data collection, permission was obtained from the principals of both schools. The research followed the ethical standards outlined in the Declaration of Helsinki, with ethical clearance obtained from the Ethics Review Committee of the Postgraduate Institute of Medicine, University of Colombo (ERC/PGIM/2024/028). Informed consent was acquired from the adolescent participants and their parents, ensuring that participation was voluntary and based on a clear understanding of the study's objectives.

Results

Among 395 adolescents, the mean age was 15.2 years (range 13 – 17 years). Gender distribution was skewed towards females, with 60.8% identifying as female, compared to 37.0% male and 2.2% preferring not to disclose their gender. Approximately 23.8% acknowledged that climate change is worsening and requires immediate attention. Six per cent strongly believed that global summits and discussions need to translate into actionable steps rather than just being platforms for debate. However, 13.9% indicated that climate change is not a major concern or expressed scepticism about its urgency.

A significant association was noted between female gender and self-reported understanding about the impact of global climate change ($\chi^2 = 15.84$, $p < 0.001$). The analysis indicated a significant association between gender and self-reported anxiety ($\chi^2 = 21.84$, $p < 0.001$). Over 86% ($n=340$) of participants were worried about the future impact of climate change on health. Female

adolescents were significantly more worried than their male counterparts ($\chi^2 = 16.49, p = 0.001$). Conversely, the variable "Feeling angry when thinking about the future impact of climate change" ($\chi^2 = 2.33, p = 0.126$) did not demonstrate significant gender differences. Similarly,

the perception that "adults take climate change less seriously than children" ($\chi^2 = 3.23, p = 0.072$) did not reveal an impact by gender. The gender-based variations in perception and self-reported anxiety regarding climate change is shown in Table 1.

Table 1 - Gender-based variations in perception and anxiety regarding climate change

	Variable	χ^2	p
1	Feeling anxious about the future impact of climate change	16.49	0.001
2	Feeling anxious when thinking about climate change	21.84	<0.001
3	Feeling angry when thinking about future impact of climate change	2.33	0.126
4	Felt that they were not taught enough about climate change at school	28.98	<0.001
5	Felt that adults take this less seriously when compared to children of their generation	3.23	0.072
6	Felt that not enough has been done to positively impact climate change by the country	39.22	<0.001

The majority, 305, reported that they were aware of information sources to learn about climate change. However, their understanding of climate change did not correlate with awareness about information sources ($\chi^2 = 0.554, p = 0.457$). Approximately half of the participants shared a variety of opinions on climate change. Common themes included a strong call for collective action and increased awareness. Fifty-two per cent of the participants stressed that significant lifestyle changes and global cooperation are essential for effectively addressing climate change.

The data in Table 2 highlights potential associations with climate change-related anxiety. Variables such as "Increased awareness of adversities of climate change,"

"Female gender," "Parents talking about adversities of climate change," and "Feeling angry when thinking about climate change" exhibited highly significant associations ($p < 0.001$). The variable "Knowing someone whose life was directly affected by an adverse effect of climate change" also showed a significant but weaker association ($p = 0.03230$). On the other hand, "Perception that you are not taught enough about climate change at school" and "Awareness about information sources for learning about climate change" fell just outside conventional significance thresholds ($p = 0.0591$ and $p = 0.0586$, respectively).

Table 2 - Potential associations of climate change-related anxiety in adolescents

	Variable	χ^2	p
1	Increased awareness of adversities of climate change	19.08	0.00013
2	Female gender	21.84	<0.0001
3	Knowing someone whose life was directly affected by an adverse effect of climate change	4.58	0.03230
4	Parents talking about adversities of climate change	28.98	<0.0001
5	Feeling angry when thinking about climate change	16.13	<0.001
6	Perception that you are not taught enough about climate change at school	3.56	0.0591
7	Awareness about information sources for learning about climate change	2.88	0.0586

Discussion

The results of this study reveal significant gender differences in adolescents' perceptions of climate change, with female participants exhibiting notably higher levels of anxiety compared to their male counterparts.

The finding that female adolescents are more likely to feel anxious about climate change has important implications for mental health interventions, indicating the need for gender-sensitive approaches in addressing climate change-related psychological distress among young people.

Interestingly, while female adolescents reported higher anxiety levels, the data did not show significant gender differences regarding feelings of anger towards climate change. This may suggest that anxiety and anger are experienced differently across genders, with anxiety being a more internalised emotional response, particularly among females, whereas anger is less influenced by gender. The lack of a significant association between anger and gender underscores the complexity of emotional responses to climate change and the need for further exploration into how different emotions contribute to adolescents' engagement with climate issues.

These findings are consistent with international studies highlighting gender-based disparities in climate anxiety among adolescents. For example, research from Sweden and Australia has similarly reported that adolescent girls are more likely than boys to express heightened emotional responses, including anxiety and worry, about climate change threats [10], [11]. A large cross-national survey found that over 75% of youth across 10 countries reported climate-related fear and sadness, with female participants consistently reporting more distress [12]. These parallels suggest that gendered emotional responses to climate change may be a global phenomenon, likely influenced by social, cultural, and developmental factors. The Sri Lankan data contribute to this growing body of evidence, underscoring the universality of female vulnerability to climate-related psychological impacts, even in low- and middle-income contexts.

Moreover, the perception that adults take climate change less seriously than adolescents bordered on statistical significance, with female participants showing a slightly stronger belief in this view. This suggests that there may be a generational gap in how climate change is perceived, leading to frustration and helplessness among young people.

In this study, several adolescents expressed that economic concerns often overshadow environmental issues, particularly climate change. Adolescents, especially those in lower-middle-income settings, may perceive that addressing climate change is secondary to more pressing financial hardships, such as unemployment, poverty, or the rising cost of living. This sentiment highlights a broader challenge in global climate action, where developing nations are often compelled to focus on economic

development at the expense of environmental protection. In Sri Lanka, adolescents' awareness of economic constraints may shape their perceptions of the government's capacity or willingness to address climate change effectively. As 31.6% of respondents felt that insufficient action is being taken, it's clear that the intersection of economic concerns and environmental neglect is a critical barrier to robust climate initiatives. Consequently, adolescents may feel that meaningful climate action may remain unfeasible without addressing economic challenges first. Addressing these perceptions requires integrating climate action into broader developmental policies that balance economic and environmental priorities.

Another critical observation from this study is the significant association between family discussions about climate change and increased anxiety levels among adolescents. This suggests that conversations about climate change within the family may amplify concerns, possibly due to sharing personal experiences or heightened awareness of the issue's severity. However, these discussions could also be a double-edged sword, as they may provide adolescents with information while contributing to emotional distress. Interventions that encourage balanced, informative, and supportive conversations within families could be crucial in helping young people cope with the emotional impact of climate change.

A notable portion of participants believed that insufficient action has been taken to address climate change at the national and global levels. This sentiment was stronger among female respondents, who were more likely to express dissatisfaction with current efforts to mitigate climate change. The data suggests that adolescents, especially females, are highly critical of the political and social responses to climate change and call for more concrete and impactful measures. This sense of frustration may contribute to the heightened anxiety observed among female participants, as the perceived lack of action can create feelings of helplessness and exacerbate emotional distress.

Lastly, the association between awareness of climate change information sources and understanding of the issue was not statistically significant. This finding is important because it highlights a potential gap between information availability and comprehension. While many participants knew where to find information about climate change, this did not necessarily translate into a deeper understanding of the issue. This underscores the importance of enhancing climate change education, particularly in schools, to ensure adolescents are well informed and equipped with the knowledge needed to engage meaningfully with climate-related challenges.

Conclusion

Gender was identified as a significant determinant of climate change-related anxiety among Sri Lankan adolescents, with female participants exhibiting a

greater emotional burden. These findings underscore the importance of implementing gender-responsive mental health interventions, strengthening school-based climate education, and fostering intergenerational communication to support adolescents in coping with the psychological impacts of the climate crisis.

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