

Original Article

Adolescents' perceptions of climate change in urban Sri Lanka: Awareness, health impacts, and aspirations for action

Kavinda Dayasiri^{1*}, Geetha Anand²

¹ Faculty of Medicine, University of Kelaniya, Thalagolla Road, Ragama, Sri Lanka

² Oxford University Hospitals NHS Foundation Trust, Oxford, United Kingdom

*Corresponding author: kavindadayasiri@gmail.com

Abstract

Introduction : Climate change, driven primarily by human activities, poses significant global health challenges. Adolescents, being at a formative stage of development, are increasingly aware of these impacts. This study investigates how adolescents in urban Sri Lanka perceive the health effects of climate change and their associated anxieties. Understanding these perceptions is crucial for developing effective public health strategies and educational interventions.

Methods: This qualitative study involved adolescents aged 11 to 16 from two government schools in Colombo Education Zone, Sri Lanka. Data was collected through Focus Group Discussions (FGDs) from 105 participants, and a thematic analysis was performed to analyse the data. The FGDs explored participants' awareness of climate change, its health impacts, their actions towards mitigating climate change, and their future plans.

Results: Adolescents perceived climate change as severe, citing its impacts on health, such as heat-related illnesses, respiratory issues, and mental health concerns. Many expressed anxieties over the issue, feeling overwhelmed by its scale. Despite this, participants proposed interventions including tree planting, energy conservation, and raising awareness, while recognizing the need for systemic changes. Intended actions ranged from continuing personal environmental practices to advocating for broader societal efforts. However, some participants reported uncertainty about effective contributions.

Conclusion: Adolescents in urban Sri Lanka are acutely aware of the severity of climate change and its health impacts, with varying levels of engagement in addressing the issue. Educational initiatives should bridge gaps in knowledge and foster actionable steps, empowering adolescents to contribute effectively. Strengthening individual agency and integrating collective responsibility through community and policy support are critical for impactful climate action.

Keywords: Climate change, adolescents, perception, Sri Lanka

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Introduction

Climate change, driven primarily by anthropogenic activities, poses significant challenges to public health worldwide (1). Recent research underscores the importance of understanding diverse perspectives on climate change, especially among vulnerable populations such as adolescents (2). Adolescents, being at a formative stage of cognitive and emotional development, are increasingly recognizing the profound impacts of climate change on their health and well-being (3). Their perceptions and responses can provide valuable insights into how younger generations understand and address environmental issues (4).

Adolescents represent a critical demographic in addressing climate change due to their unique position as both current stakeholders and future leaders. At this formative stage of cognitive, emotional, and social development, adolescents are particularly vulnerable to the health and psychosocial impacts of climate change (5). They are increasingly exposed to climate-related disruptions, such as extreme weather events and environmental degradation, which can have lasting effects on their well-being⁵. Moreover, adolescents are in a pivotal period of forming attitudes, values, and behaviours that will shape their engagement with environmental issues throughout their lives. Despite this, there is limited research exploring how adolescents perceive the severity of climate change, their anxieties, and their intentions to act. Understanding their perspectives is essential for developing targeted inter-

ventions that not only address their concerns but also empower them to take meaningful action.

In urban Sri Lanka, where rapid urbanization and environmental changes intersect, exploring adolescents' views on climate change is crucial. Sri Lanka, like many other countries, faces a range of climate-related challenges, including increased temperatures, altered precipitation patterns, and heightened vulnerability to natural disasters (6). Understanding how these challenges are perceived by the younger population can inform more effective public health strategies and educational interventions. Previous studies have highlighted that children's awareness of climate change often combines scientific understanding with personal and anecdotal experiences, shaping their attitudes and actions toward environmental conservation (7). This study aimed to delve into adolescents' perceptions of the health effects of climate change in Colombo, Sri Lanka. By focusing on two government schools within the Colombo Education Zone, the research sought to capture a nuanced understanding of how climate change was perceived by young individuals in an urban context. Through qualitative methods, specifically Focus Group Discussions (FGDs), the study explored participants' awareness of climate change, its potential health impacts, their current and future actions to address it, and the psychological aspects associated with their perceptions. This approach allowed for a comprehensive analysis of both individual and collective attitudes of both

individual and collective attitudes toward climate change, providing insights that are critical for shaping targeted educational and policy interventions.

Methods

Study design

This study utilized a qualitative design to explore adolescents' perceptions of climate change, its health impacts, potential interventions, and their intentions to act. The focus on qualitative methods allowed for a deeper understanding of the participants' subjective experiences and insights, capturing the nuances of their perceptions and anxieties. The study was conducted from January 2024 to August 2024.

Study setting

The study was conducted in the Colombo district of Sri Lanka, which is home to a predominantly urban population. The interviews were conducted in two government schools within the Colombo Education Zone, comprising one girls' school and one boys' school. The selected locations represented predominantly urban communities to ensure a diverse range of perspectives among participants. The study sites were chosen based on accessibility, prevalence of climate-related issues, and diversity.

Participant recruitment

Participants were adolescents aged 11-16 years studying in the chosen study settings. Recruitment was carried out using purposive sampling to ensure that participants represented diverse demographic and socioeconomic backgrounds.

The recruitment process was conducted by the study investigators, who approached school principals and obtained necessary permissions prior to engaging participants. Written informed consent was obtained from both the participants and their parents or guardians before participation.

Development of study guides

The study guide for Focus Group Discussions (FGDs) was developed based on a comprehensive literature review and expert input. The guide was structured to include open-ended questions exploring participants' awareness of climate change, its health impacts, potential solutions, and their future plans. The draft guide was adapted to suit the cultural and contextual relevance of the study population by consulting with experts in adolescent health and climate change. The guide was pilot-tested with a small group of adolescents outside the study sample to ensure clarity, cultural appropriateness, and comprehensiveness. Feedback from the pilot test was incorporated into the final version of the guide.

Validation of study tools

To ensure validity, the study guide underwent review by experts in psychology, adolescent health, qualitative research, climate change. Content validity was assessed by comparing the guide against established frameworks for qualitative climate change research. Additionally, the guide was translated into native languages, and back-translation was performed to ensure linguistic accuracy.

Data collection

Data were collected through FGDs facilitated by the principal investigator using a validated guide. Each FGD included 10 to 15 participants and lasted between 25 to 30 minutes, allowing for a focused yet comprehensive exploration of the topics. Open-ended questions were used to encourage participants to freely introduce and discuss relevant topics. Discussions were conducted in participants' native language, and audio recordings were made with the participants' consent for subsequent transcription and analysis.

Data analysis

A combination of deductive and inductive thematic analysis was applied during data analysis. Thematic saturation ensured that the findings were robust and reflective of the participants' perspectives, capturing the nuanced views of adolescents on the health impacts of climate change. Broad themes were initially developed based on the study's aims, theoretical framework, and interview guide. As the analysis progressed, key themes were inductively generated and then, clearly defined. Codes were generated by coding the interviews with the richest data. Codes were organized into categories, sub-themes, and overarching themes, resulting in an analytical matrix. This matrix was then employed to chart significant quotes supporting our findings and to draw comparisons between participants.

Results

The analysis of children's perceptions of climate change revealed several key themes, highlight-

ing both their awareness and the challenges they face in fully understanding the issue. Overall, their views reflected a fragmented yet insightful grasp of climate change, often characterized by personal experiences and observations of changing weather patterns and environmental impacts.

Awareness and understanding of climate change

The children's perceptions of climate change, as reflected in their transcriptions, revealed a broad but somewhat fragmented understanding of the phenomenon. Many recognized climate change as a significant alteration in weather patterns and temperatures over extended periods, often attributing these changes to human activities. For instance, one child noted, "Climate change has occurred because of worse human activities," while another mentioned, "It's hotter than usual because of the intense sunlight." The children described the impacts of climate change in terms of hotter temperatures, irregular weather patterns, and the deterioration of the environment. One child pointed out, "People's lives are in dire straits due to water scarcity," while another observed, "We had a calming climate earlier, and now it makes us feel like we are burning." Some associated these changes with global issues such as rising sea levels and food insecurity, showing an awareness of the broader consequences: "The change in climate includes global warming, rise of sea level, and food insecurity that occurs secondary to human activities." However, the perceptions also

highlighted a mix of scientific understanding and personal observations, with some children expressing skepticism, such as one child who stated, "It is apparently not real." This range of responses underscored the varied ways children interpreted and internalized information about climate change, influenced by their environment, education, and experiences. The insights gathered suggested that while children were aware of the concept of climate change, their understanding was shaped by a combination of accurate scientific knowledge and more subjective, personal experiences.

Perceived health impacts

Adolescents' perceptions of the health impacts of climate change revealed a strong awareness of both direct and indirect consequences on human health. Many recognized that rising temperatures and altered weather patterns can lead to respiratory issues, with one stating, "Higher temperatures and altered weather patterns can worsen air pollution, triggering respiratory problems like asthma." Others link climate change to more severe conditions, such as cancer, with another adolescent noting, "Climate change may cause an increase in skin cancers." Heat-related illnesses are a common concern, with responses such as "Climate change can make really hot days more common, which can make us sick," and "Dehydration, bad effects for eyes, regular headaches, and problems on skin" indicating the physical toll of extreme weather. Mental health was also highlighted, as one adolescent shared, "This climate issue affects human mental health. I feel the same mentally un-

stable feeling with this high heat." Additionally, some adolescents expressed concerns about the emergence of new diseases, with one noting the potential for "pandemic situations like cholera, dengue, and others," and another referencing the possibility of "outbreaks of pre-historic diseases." These responses suggested that adolescents have a nuanced understanding of the multifaceted health impacts of climate change, recognizing the interplay between environmental changes and various physical and mental health challenges. Their insights reflected a growing awareness of the urgent need to address climate change to mitigate its health consequences.

Mental health concerns emerged as a significant theme, with participants expressing anxiety, stress, and feelings of helplessness about the future. One participant shared, "Thinking about how the environment is getting worse makes me feel worried all the time."

Actions taken and challenges faced

The children's actions regarding climate change reflected a mix of active engagement and uncertainty. Many were involved in practical, environmentally friendly practices such as planting trees and gardening. As one child shared, "I have planted greenery in my garden," and another mentioned, "I have planted some plants, helped my mother grow vegetables and fruits in our home garden during the COVID-19 pandemic." These activities highlighted a hands-on approach to contributing to environmental sustainability. Others were conscious of their carbon footprint, with one child

stating, "I always use public transport instead of my private vehicles to reduce my carbon footprint and follow the reduce, reuse, recycle concept."

However, there was also a notable portion of children who express uncertainty or lack of action. Responses such as "I haven't taken any direct actions to impact climate change" and "No opportunity to make a significant change" suggested that some children felt their capacity to influence climate change was limited or were unsure how to contribute meaningfully. Additionally, a few children focused on personal well-being rather than environmental action, with one stating, "I keep myself hydrated always and try to motivate my brothers to do the same," indicating a focus on adapting to climate change rather than mitigating it.

Overall, while many children were actively involved in small-scale environmental actions, there was also a sense of uncertainty and a need for greater education and empowerment to help them understand how they can contribute more effectively to combating climate change. A recurring sentiment was the need for collective action and support from communities and governments to drive meaningful change.

Aspirations and future intentions

In reflecting on their future actions to combat climate change, children expressed a strong commitment to environmental stewardship and a desire to influence both individual and collective behaviour. Many emphasized the importance of planting trees, with responses such as "I will grow a garden and eat fresh foods"

and "Planting as many plants as possible around the house where I live," indicating a belief that reforestation and personal gardening can significantly impact the environment. Others planned to adopt broader eco-friendly practices, such as "I will use less electricity. Whenever I can, for example, I will make sure that the lights are off or dimmed."

There was also a sense of responsibility towards raising awareness and advocating for larger societal changes. For instance, one child stated, "I can continue to raise awareness about climate change, promote sustainable practices, and support the development of environmentally friendly technologies to combat the climate crisis." Another highlighted the need for governmental involvement: "Ask the government to inform more details about this issue and make everyone plant a tree or protect the environment by themselves as a nation." However, some responses revealed uncertainty or lack of specific plans, as seen in responses such as "I don't know" or "Still didn't think about it." This suggests that while many children were motivated to take action, there was also a need for more education and guidance to help them develop concrete strategies for impacting climate change. Overall, the data reflected a mix of proactive environmentalism and a call for broader societal engagement, underscoring the importance of both individual actions and collective efforts in addressing climate change.

Despite their concerns, adolescents expressed a strong commitment to contributing toward

climate action in the future. They outlined intentions to continue personal efforts, such as planting trees and conserving resources, while advocating for broader societal changes. Some participants emphasized the importance of education and awareness campaigns to empower others to join the fight against climate change. A participant remarked, "I want to encourage others to take action and work together to protect the environment."

These findings highlighted the adolescents' nuanced perceptions of climate change, emphasizing the interplay between awareness, health impacts, personal actions, and collective aspirations. The results underscored the importance of bridging gaps in knowledge and fostering a sense of agency among adolescents through targeted education and community support.

Discussion

This study revealed several important themes regarding adolescents' perceptions of the health effects of climate change in urban Sri Lanka. The findings align with global research that underscores adolescents' growing awareness of climate change and its health impacts, but also reveal varying degrees of understanding and engagement (8). A study by Ojala (2013) highlighted similar findings where adolescents, while aware of climate issues, exhibited differing levels of emotional responses and actions depending on their socioeconomic and educational background (9). Our study's results further support the idea that adolescents' perceptions are shaped by both personal experiences and environmental factors, reinforcing the im-

portance of targeted education to enhance their knowledge base (10).

The health impacts of climate change, particularly respiratory illnesses, heat-related conditions, and mental health, emerged as major concerns among the adolescents (11,12,13). This is consistent with report by the World Health Organization (WHO, 2020), which emphasizes the vulnerability of young populations to climate-related health risks (14). The adolescents in our study expressed fears about increased heatwaves and air pollution, concerns echoed in global reports linking rising temperatures and pollution levels to adverse health outcomes. These findings suggest that adolescents are not only aware of the physical consequences of climate change but are also able to relate these impacts to their daily experiences, such as difficulty breathing during high temperatures.

In this study, mental health emerged as a significant concern, with adolescents expressing feelings of stress and anxiety related to climate change. This aligns with findings from the recent reviews, which highlight the growing prevalence of climate anxiety among youth due to heightened awareness of environmental issues (15). The psychosocial impact of climate change is frequently neglected in policy discussions, yet our study underscores the need for more robust mental health interventions for adolescents grappling with the effects of environmental degradation and uncertainty about the future (16).

A key point of discussion is the role of education in shaping adolescents' climate perceptions. Studies show that school-based climate education can significantly enhance students' understanding of climate change and their ability to engage in mitigation efforts (17). However, our study also revealed gaps in knowledge, with some adolescents expressing uncertainty about the science behind climate change or their capacity to make a difference. This highlights the need for more robust climate education curricula that not only teach the science but also empower adolescents with practical tools for action.

Furthermore, the tension between individual responsibility and the need for collective action was a recurring theme. Many adolescents felt that planting trees or reducing energy consumption were meaningful actions, but also recognized the limitations of these efforts without broader systemic change. This is in line with studies which shows that while individual behaviours are important, policy-level interventions are crucial to achieving significant environmental impacts (18). The adolescents' call for government intervention mirrors findings from international studies, suggesting a growing awareness that effective climate action requires both individual and societal efforts (19).

The role of community and government in supporting adolescents' environmental engagement was another important theme. Our findings suggest that while adolescents are eager to contribute, they often feel constrained by a lack of resources or platforms to amplify their voices.

This points to the need for stronger institutional support, such as community programs or youth councils, that empower young people to participate in decision-making processes related to climate policy (20).

Our findings emphasize the importance of creating a sense of agency among adolescents. Research suggests that adolescents are more likely to take climate action when they feel their efforts can make a real difference (21). Our study supports this notion, as those adolescents who expressed more concrete plans for future climate actions were also those who felt more empowered by their personal actions. This indicates that fostering a sense of agency, alongside providing educational and institutional support, is critical to mobilizing adolescents for effective climate action (22).

Based on observations made in the study, it is recommended that a comprehensive, multi-faceted program be implemented to address adolescents' concerns about climate change and foster their active participation in mitigation and adaptation efforts. Such programs should involve collaboration between the government, educational institutions, and community organizations. Key components include integrating a climate education curriculum in schools, with hands-on activities to foster critical thinking and problem-solving skills. Additionally, establishing youth-led environmental clubs will provide platforms for advocacy and allow adolescents to engage with policymakers directly. To address mental health concerns such as eco-anxiety, the program should

offer tailored mental health resources, including peer support groups and mindfulness workshops. Community engagement should be promoted through initiatives such as reforestation projects and the adoption of sustainable household practices. Government support is crucial and can be achieved through policies such as renewable energy subsidies and incentives for eco-friendly behaviours. A robust monitoring and evaluation framework should be developed to assess program effectiveness in improving adolescents' knowledge, fostering behavioural changes, and generating measurable environmental impacts, ensuring long-term success and empowering youth to drive sustainable environmental action.

This study has a few limitations that should be considered when interpreting the findings. First, the study was conducted among adolescents in urban Sri Lanka. Adolescents in rural or more economically disadvantaged areas may have different perceptions of climate change and its health impacts due to varying levels of education, exposure, and environmental conditions. Second, the study relied on focus group discussions (FGDs) as the primary method of data collection, which may have introduced group dynamics that could potentially influence individual responses.

Conclusion

This study provides valuable insights into adolescents' perceptions of climate change and its health impacts in urban Sri Lanka. The findings highlight that while adolescents have a basic awareness of climate change and its potential

health consequences, their understanding is often fragmented, shaped by both personal observations and limited scientific knowledge. Many adolescents recognized the direct and indirect health risks associated with climate change, including heat-related illnesses, respiratory issues, mental health concerns, and the spread of infectious diseases. However, there was also a clear gap between awareness and action, with some participants expressing uncertainty about how to contribute meaningfully to climate change mitigation efforts. The study underscores the importance of enhancing climate change education in schools to bridge this gap, empowering adolescents with the knowledge and skills necessary to take more effective action. Moreover, it highlights the need for broader societal engagement, including government and community efforts, to support these initiatives and foster collective responsibility in addressing the complex challenges posed by climate change.

Declarations

Ethical considerations

Ethical approval and written permission to carry out the study was obtained from the Ethics Review Committee, Postgraduate Institute of Medicine, University of Colombo, Sri Lanka. Informed consent was obtained from all participants of the study. In addition, written consent was also obtained from the parents or legal guardians of all participating children. The participation was voluntary, and investigators kept all responses confidential. Data records were kept safe using locked boxes.

Conflict of interest

Both authors declare that they have no conflicts of interest that could have influenced the study.

Authors contribution

KD designed the study, conducted data analysis, and drafted the initial manuscript. KD also played a key role in interpreting the results and revising the manuscript for important intellectual content. GA supervised the study. Both authors read and approved the final manuscript.

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