

## Original Research Article

# Knowledge, attitudes and practices on climate change among study participants in India

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## ABSTRACT

**Background:** Climate change is a global challenge with significant implications for ecosystems and health. Understanding the knowledge, attitudes, and practices (KAP) of communities is essential for designing effective mitigation and adaptation strategies. In India, where vulnerability to climate change is high, assessing public perception and response is particularly important.

**Methods:** A cross-sectional study was conducted among 159 participants from both rural and urban areas. Data were collected using a pre-tested, semi-structured questionnaire covering knowledge, attitudes, and practices related to climate change. Responses were analyzed using descriptive statistics, and results were expressed as frequencies and percentages.

**Results:** The study included 159 participants, predominantly aged 15-24 years (96.9%) and female (59.7%), with most residing in urban areas (81.1%). Over half (58.5%) had good knowledge of climate change, but only 36.1% demonstrated moderate practices. Major perceived causes included deforestation (87.4%) and vehicle emissions (83.6%). Most participants viewed climate change as a shared responsibility (69.2%) and believed it currently poses health risks (79.9%). Commonly perceived disease risks were respiratory infections (83.6%), allergies (81.8%), and skin cancers (81.1%). Overall, awareness was high, but practical engagement in climate change mitigation remained limited.

**Conclusions:** The study highlighted a high level of awareness and concern regarding climate change among participants, alongside positive attitudes toward mitigation. However, discrepancies between knowledge, attitudes, and practices were evident. Strengthening climate change education, promoting community-based initiatives, and enhancing institutional support are crucial to translating awareness into sustainable collective action.

**Keywords:** Climate change, Community perceptions, Environmental awareness, KAP, Mitigation

## INTRODUCTION

Climate change is a major global challenge with significant implications for ecosystems, livelihoods, and health. The Intergovernmental Panel on Climate Change (IPCC) has emphasized that rising global temperatures, extreme weather events, sea-level rise, and biodiversity loss are already evident and projected to intensify in the coming decades.<sup>1</sup> Developing countries like India are

particularly vulnerable due to their high population density, reliance on climate-sensitive sectors such as agriculture, and limited adaptive capacity.<sup>2</sup> In recognition of these widespread impacts, the United Nations has identified climate action as goal 13 of the sustainable development goals, urging nations to strengthen resilience and adaptive capacity to climate-related hazards. Aligning national efforts with SDG 13 is therefore crucial for countries like India, where proactive mitigation and

adaptation strategies are essential to safeguard vulnerable populations.

Understanding the knowledge, attitudes, and practices (KAP) of communities is essential for designing effective mitigation and adaptation strategies. Adequate knowledge and awareness foster environmentally responsible behavior, while positive attitudes and practices contribute to collective community action.<sup>3</sup> Studies have shown that although global awareness of climate change is increasing, misconceptions and knowledge gaps persist, hindering effective adaptation.<sup>4</sup>

In India, climate change has direct implications for agriculture, food security, water resources, and public health. Understanding community perceptions and practices is therefore vital for shaping context-specific interventions.<sup>5</sup> Against this backdrop, the present study was undertaken to assess participants' knowledge, attitudes, and practices regarding climate change and its impact on health and to investigate the mitigation measures undertaken at both individual and community levels.

## METHODS

A cross-sectional study was conducted in a medical college of Vijayapura city from July 2023 to August 2023, involving 159 MBBS students as study participants. A pre-structured questionnaire was designed to assess the knowledge, perceptions and behavioral practices of the students. The questionnaire was developed by reviewing questions from the UNDP JCCCP KAP survey (2016).<sup>6</sup>

The questionnaire was pilot-tested on a small group of 25 medical students, and necessary modifications were made with the help of subject experts from the community medicine department. The data was collected by electronically sending the questionnaires through Google forms, and the students were asked to complete the form and email it back to the investigator.

### Study instrument

The data was collected using a self-administered questionnaire. This study questionnaire was comprised of four different parts. The first part collected the socio-demographic data of the respondents involved- and the second part of the questionnaire focused on the respondents' knowledge of climate change. The questions had three answer options: 'yes,' 'no,' or 'not sure' for each question. The third part of the questionnaire was about the attitude of the respondents towards climate change. The Likert scale was utilized in the attitude part, consisting of five different answer options for each statement, which include 'strongly disagree,' 'disagree,' 'neither disagree nor agree,' 'agree,' and 'strongly disagree.' The final part of the questionnaire evaluated the respondents' practice toward preventing pertussis.

The scoring system used for KAP regarding climate change has been summarized in Table 1. The percentage range for each category was referred to as one earlier study. The percentage range for the poor category was less than 50% (<50%), for the moderate category was 51-69% and for the good category was more than 70% (>70%).

**Table 1: Scoring system for knowledge, attitude, and practice regarding climate change.**

Part	Knowledge	Attitude	Practice
	Correct answer =2 Not sure =1 Wrong answer =0	Strongly agree =5 Agree =4 Neutral =3 Disagree =2 strongly disagree =1 Don't know =0 Very important =5 Somewhat important =4 Not important =3 Don't know =0	Often =5 Rarely =4 Never =3 Don't know =0
<b>Total Score</b>	0 - 18	0-65	0-30
	Poor: <9 Moderate: 9-13 Good: >13	Poor: <33 Moderate: 33-46 Good: >46	Poor: <15 Moderate: 15-21 Good: >21

The knowledge, attitude, and practice (KAP) components of the questionnaire were designed to assess participants' understanding, perceptions, and actions regarding climate change. The knowledge section included ten dichotomous ("yes"/"no") questions evaluating awareness of the term "climate change," its perceived impact, and recognition of

related phenomena such as changing weather patterns, temperature rise, sea-level rise, flooding, crop seasonality, and pest increase. The attitude section explored concern about climate change and beliefs about mitigation measures like environmental law compliance, energy conservation, reforestation, and community

participation. It also assessed perceptions of governmental and community efforts, using a five-point Likert scale, with scores classified as poor, moderate, or good. The practice section examined participants' interest in learning more, previous climate-related actions, and reasons for inaction, focusing on behaviors such as tree planting, waste management, and energy efficiency. Practice scores were similarly categorized into poor, moderate, or good based on predefined cutoff criteria.

**Statistical analysis**

Data was converted into excel sheet and analysed using IBM SPSS Statistics for Windows version 21.0. A score was given for each knowledge based question about climate change and participants who scored 50% or more were considered to have adequate knowledge. The categorical variables were summarized using absolute frequency and proportions with 95% confidence interval (CI) and the quantitative variables were summarized by mean and standard deviation. The significance between the groups was assessed by Chi square test for categorical variables. The level of statistical significance was considered as 5%.

**Ethical considerations**

The study participants were briefed about the purpose and nature of the study, and informed consent was obtained before data collection. The institutional ethics committee approved the study.

**RESULTS**

Table 2 presents the socio-demographic distribution of the 159 study participants. The majority were aged 15-24 years (154, 96.9%), with only 25-40 years (5, 3.1%). Females constituted a higher proportion (95, 59.7%) compared to males (64, 40.3%). Most participants resided in urban areas (129, 81.1%), while a smaller proportion were from rural areas (30, 18.9%).

**Table1: Distribution of study participants.**

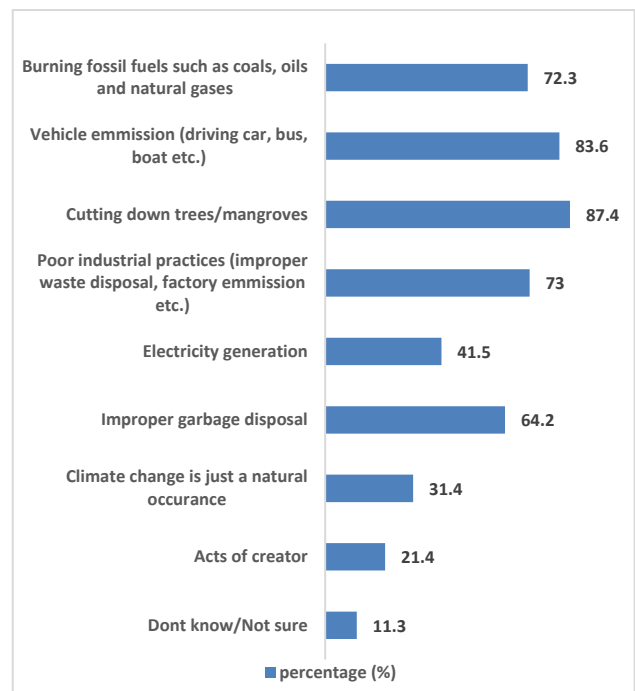
Variables		Frequency	Percentage
Age (years)	15 to 24	154	96.9
	25-40	5	3.1
Gender	Male	64	40.3
	Female	95	59.7
Place of Residence	Rural	30	18.9
	Urban	129	81.1

Figure 1 illustrates the distribution of participants' knowledge, attitude, and practice (KAP) levels regarding climate change. The majority of respondents demonstrated good knowledge (58.5%) about climate change, while 10.7% had a moderate level and 7.6% showed poor knowledge. In terms of attitude, more than half (54.7%) exhibited a moderate attitude, followed by

27.7% with a good attitude and 37.7% with a poor attitude. However, practices related to climate change mitigation were comparatively low, with 63.9% of participants showing poor practices, 36.1% exhibiting moderate practices, and none falling into the good practice category. Overall, while knowledge about climate change was relatively high, this did not consistently translate into positive attitudes or proactive practices among the participants.



**Figure 1: Knowledge, attitude and practice of study participants about climate change.**

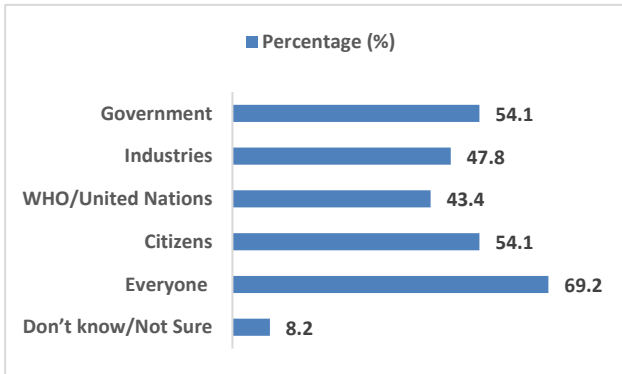


**Figure 2: Main causes of climate change according to study participants.**

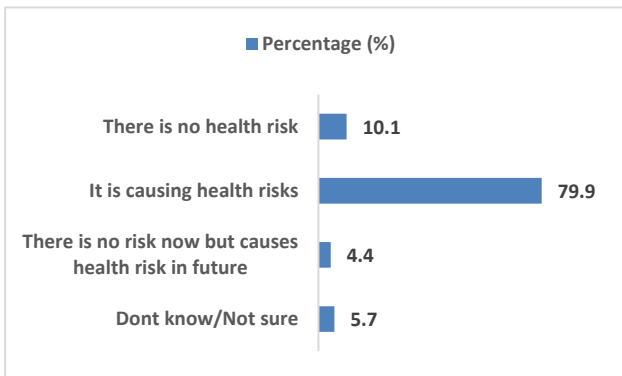
Figure 2 indicates that the most recognized causes of climate change were cutting down of trees/mangroves (139, 87.4%) and vehicle emissions (133, 83.6%). Other major causes included poor industrial practices (116, 73.0%) and burning of fossil fuels (115, 72.3%). Improper garbage disposal (102, 64.2%) and electricity generation (66, 41.5%) were also noted. Some

misconceptions were observed, with participants attributing climate change to natural occurrence (50, 31.4%) or acts of creator (34, 21.4%), while (18, 11.3%) reported they did not know.

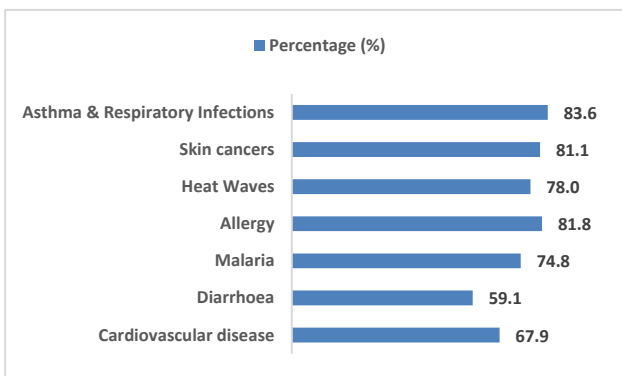
Figure 3 shows that most participants believed addressing climate change is a collective responsibility of everyone (110, 69.2%). Equal proportions identified government (86, 54.1%) and citizens (86, 54.1%) as responsible, followed by industries (76, 47.8%) and WHO/UN (69, 43.4%). A minority were not sure (13, 8.2%).



**Figure 3: Responsible for addressing climate change issues according to study participants.**



**Figure 4: Health risk posed by climate change according to study participants.**



**Figure 5: Disease risk increasing due to changing climate according to study participants.**

Figure 4 shows that most participants believed climate change is currently causing health risks (127, 79.9%). A few believed there was no health risk (16, 10.1%) or that risks would occur in the future (7, 4.4%). Some were uncertain (9, 5.7%).

Figure 5 highlights diseases perceived to be increasing due to climate change. The most reported were asthma/respiratory infections (133, 83.6%), allergies (130, 81.8%), and skin cancers (129, 81.1%). Other concerns included heat waves (124, 78.0%), malaria (119, 74.8%), and cardiovascular diseases (108, 67.9%). Diarrhea was less frequently reported (94, 59.1%).

## DISCUSSION

This study revealed that awareness of climate change was almost universal among participants, with 157 (99.7%) having heard of it and 135 (84.9%) acknowledging its impact on their community. This finding is in line with earlier studies reporting growing global awareness, particularly among younger populations who constituted the majority in this study (154, 96.9% were aged 15-24 years).<sup>3,6</sup> The predominance of youth, who are more exposed to education, media, and global discourse, may explain this high awareness level.<sup>4</sup>

Knowledge regarding the general impacts of climate change was strong, as seen with associations to changing weather patterns (147, 92.4%), rise in air temperature (138, 86.8%), and changes in crop seasonality (125, 78.6%). However, fewer linked climate change with frequent cyclones (110, 69.2%), coastal erosion (110, 69.2%), or increase in pests (117, 73.6%), reflecting limited understanding of localized and indirect consequences. Similar knowledge gaps have been highlighted in previous research emphasizing the need for contextualized education that connects global climate science with local realities.<sup>2,5</sup>

Attitudes toward climate change were overwhelmingly positive. Almost half (79, 49.7%) reported being very concerned, while another 75 (47.2%) considered it important. Participants recognized the importance of mitigation measures such as reforestation (134, 84.3%), conserving energy (132, 83.0%), water conservation (128, 80.5%), and raising public awareness (128, 80.5%). Furthermore, personal willingness to act was strongly expressed, with 139 (87.4%) agreeing to do whatever they could to address climate change. These trends mirror findings from other KAP studies that highlight strong individual readiness to engage in mitigation.<sup>1,3,7</sup>

However, institutional trust was relatively lower. Only 92 (57.9%) believed that the government was taking necessary actions, and 83 (52.2%) felt that community leaders were addressing climate change adequately. This gap between public expectations and institutional performance has also been reported in Indian and global

studies, emphasizing the need for stronger governance and accountability.<sup>8,9</sup>

Practices reported by participants showed an encouraging inclination toward individual-level measures. Proper waste disposal and reuse was universal (88, 100%), while raising awareness (80, 91.5%), energy conservation (79, 89.8%), reforestation/mangrove conservation (72, 81.4%), and water harvesting (71, 80.5%) were also highly practiced. However, fewer adopted carpooling/public transportation (64, 72.9%) or observing building codes (38, 43.2%). This mismatch between strong knowledge, positive attitudes, and somewhat selective practices reflects barriers such as limited resources, lack of institutional support, and insufficient community-level initiatives. Previous research has shown that awareness alone does not translate into sustained behavioral change without enabling environments.<sup>4,6,10,11</sup>

Participants also clearly recognized the health risks of climate change, with 127 (79.9%) reporting that it is already causing health problems. The diseases most frequently identified as climate-sensitive included asthma/respiratory infections (133, 83.6%), allergies (130, 81.8%), skin cancers (129, 81.1%), and heat waves (124, 78.0%). Vector-borne diseases like malaria (119, 74.8%) and chronic conditions such as cardiovascular disease (108, 67.9%) were also recognized, though fewer associated diarrhea (94, 59.1%) with climate change. These perceptions align with the WHO's assessment of climate change as a major public health threat and are consistent with studies in India and neighboring regions.<sup>9,13,14</sup>

Taken together, the findings of this study underscore that while participants demonstrated high awareness (99.7%) and positive attitudes (87.4% willing to act), actual practices varied, and institutional trust remained limited. Bridging this gap requires not only community-specific education but also stronger policy frameworks, resource support, and accountability mechanisms to sustain behavior change. Youth engagement, community-driven initiatives, and multisectoral collaboration could serve as transformative pathways for advancing climate change mitigation and adaptation in India.<sup>12,14,15</sup>

## CONCLUSION

This study demonstrated that participants possessed a high level of awareness about climate change and recognized its potential impacts on their communities. Attitudes towards climate change were largely positive, with strong concern expressed and broad agreement on the importance of mitigation and adaptation strategies such as reforestation, energy conservation, and public awareness initiatives. Moreover, most participants indicated a willingness to contribute personally to climate action.

However, a gap was noted between knowledge and practice. While individual-level measures such as conserving resources were commonly reported, participation in structured community-level initiatives and disaster preparedness activities was relatively limited. This suggests that awareness and positive attitudes alone may not be sufficient to bring about sustainable behavior change without supportive systems and institutional engagement.

The findings highlight the need for context-specific educational programs, community-driven initiatives, and stronger policy-level support to bridge this gap between knowledge, attitudes, and practices. Special emphasis on youth engagement, institutional accountability, and grassroots participation can play a transformative role in advancing climate change adaptation and mitigation efforts in India.

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## REFERENCES

1. Intergovernmental Panel on Climate Change (IPCC). *Climate Change 2023: Synthesis Report*. Geneva: IPCC; 2023.
2. Patel A, Singh R, Kumar S. Climate change vulnerability and adaptation in India: a systematic review. *Sustainability*. 2022;14(12):7345.
3. Lee TM, Markowitz EM, Howe PD, Ko CY, Leiserowitz AA. Predictors of public climate change awareness and risk perception around the world. *Nat Clim Chang*. 2020;5(11):1014-20.
4. Ojomo E, Elliott M, Goodyear L, Forson M, Bartram J. Sustainability and scale-up of household water treatment and safe storage practices: Enablers and barriers to effective implementation. *Int J Hyg Environ Health*. 2021;224:113443.
5. Bharati L, Sharma B, Smakhtin V. Climate change impacts and water resources in South Asia. *Environ Dev*. 2021;39:100648.
6. Watts N, Amann M, Arnell N, Ayeb-Karlsson S, Beagley J, Belesova K, et al. The 2021 report of the Lancet Countdown on health and climate change: code red for a healthy future. *Lancet*. 2021;398(10311):1619-62.
7. Kumar P, Yadav S, Singh S. Knowledge, attitude and practices regarding climate change among medical students in India. *J Educ Health Promot*. 2020;9:198.
8. Srivastava A, Kumar A, Chauhan S, Gupta AK. Climate change perception and adaptation strategies: a case study of rural communities in India. *Clim Dev*. 2021;13(5):423-34.
9. Rahman MA, Alam K. Climate change and health risks in Bangladesh: an assessment of perceptions

- and adaptive practices of coastal communities. *Int J Environ Res Public Health*. 2021;18(1):287.
10. Aryal S, Sapkota RP, Rimal B, Shrestha UB. Climate change awareness and local adaptation in Nepal. *Clim Dev*. 2019;11(9):751-63.
  11. Gupta J, van der Leeuw K, Asselt H. Climate change and development pathways. *Clim Policy*. 2020;20(4):419-35.
  12. Pachauri RK, Mayer L, eds. *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the IPCC*. Geneva: IPCC; 2014.
  13. World Health Organization (WHO). *Climate Change and Health*. Geneva: WHO; 2021.
  14. Government of India. *India: Third National Communication to the UNFCCC*. Ministry of Environment, Forest and Climate Change. 2021.
  15. United Nations Development Programme (UNDP). *Human Development Report 2022: Uncertain Times, Unsettled Lives*. New York: UNDP; 2022.

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