

Awareness about Climate Change among High School Students in Urban Areas of Mysuru

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Abstract

Introduction: The global climate is changing primarily due to anthropogenic forcing. India due to its climatic and geographic features is highly vulnerable to negative effects of climate change. The support of the general public is necessary to succeed the measures being taken against the changing climate. As the young generation need to adopt sustainable lifestyle changes to bring down climate change, this study was conducted to assess the awareness about climate change among high school children in urban areas of Mysuru. **Methods:** A cross-sectional study was conducted among high school students in 2018–19. The schools were selected by the simple random method and students from each school were recruited by Population Proportional to Size method. Descriptive statistics like percentages were applied and appropriate inferential statistical tests were done for association. **Results:** Among the students interviewed, 69.5% were aware of climate change and 61.9% were aware of the health impacts of climate change. 63.3% were aware of global warming and only 51% were aware of the greenhouse effect. Only 10% of study participants had good knowledge about climate change. 32.9% of students had a satisfactory knowledge, 24.3% had average knowledge and 32.9% had only poor knowledge about climate change. **Conclusion:** The awareness of climate change is low among high school students of urban areas of Mysuru. Only a minority of students have good knowledge about climate change. More educational activities should be designed and implemented in schools to improve awareness among children.

Keywords: Awareness; Climate Change; School Children.

Introduction

Man's unnatural interventions and activities have resulted in a global climate change. According to the records, the global climate is constantly changing since the 1960s.¹ The major course for the same is anthropogenic forcing in many ways. Emission of greenhouse gases, industrialization, fuel combustion etc are the main contributors to global warming and climate change. The change in climate

has huge environmental, social, economic and health impacts. The change in patterns of occurrence and distribution of infectious diseases like dengue, malaria, cholera, meningitis, increased incidence of natural emergencies and disasters of various kinds like floods and cyclones, droughts, wildfires leading to airborne dispersion of hazardous materials etc and emerging environmental threats like effects of extreme heat stress and cold, pollen allergies and UV radiation exposure can be attributed to this change in climate. The increase in the incidence of

natural disasters due to climate change increasing the burden on social, economic and health sectors.²

India being a country with unique geo-climatic conditions, is highly vulnerable to the adverse effects of climate change. Vast areas are susceptible to Natural disasters like floods, cyclones and drought. Majority of the rural population in the country directly depends on climate-sensitive sectors like agriculture, forests, and fisheries and natural resources such as water, biodiversity, mangroves, coastal zones and grasslands for their subsistence and livelihoods.³ Infectious diseases like Malaria, dengue, and diarrhoea are major public health concerns in the country and their changing patterns and increasing occurrence will increase the burden on health sector.⁴

The measures being taken against climate change can succeed only if the general public and key stakeholders support effective action. The major proportion of greenhouse gas emissions accounts to activities of daily living by the public and private sector industries. Policies, regulations and legislation cannot bring desired changes unless the public is aware of climate change. Providing information and explanations is therefore vital for generating public and stakeholder support for government policies and regulations.⁵

The young generation should be the main target for behavioural change communication as they will be key role players in adopting sustainable lifestyles and preventing further changes in the climate in future. With this background, the study aims to assess the awareness about climate change among high school children in urban areas of Mysuru.

Materials and Methods

A cross-sectional study was conducted among high school students in 2018–19. A similar study conducted among school children in the same state showed that 91.7% of students were aware of at least one health impact of climate change. With this prevalence, 4% absolute precision and confidence level of 95%, the sample size was estimated to be

210, including a 10% non-response rate.⁵ High school students, studying in state syllabus schools in urban areas of Mysuru were included while students not willing to participate were excluded.

The study participants were selected from 4 high schools in urban areas of Mysuru, managed by the JSS Mahavidyapeetha. The schools were selected by lottery method and the number of students to be evaluated from each school to be was calculated by probability proportional to sample method. A sampling interval (N) was calculated for each school by PPS method and the students' names were listed. Every Nth student was assessed by direct interview method provided they satisfy eligibility criteria. Basic social and demographic details like age, sex parent's occupation etc were obtained from the participants. The awareness was assessed using a newly designed, validated detailed questionnaire by direct interview method. Scoring was done based on the questionnaire and each quartile in ascending order was graded as poor, average, satisfactory and good knowledge.

The data obtained were entered into the Microsoft Excel spreadsheet and was analyzed using licensed SPSS version 22. Descriptive statistics like percentages were applied and appropriate inferential statistical tests were done for association.

Results

A total of 210 high school students were interviewed as part of the study. Among the study participants, 85 (40.5%) were boys and 125 (59.5%) were girls. The maximum number of students were studying in 8th standard (94 students, 44.8%). 69 students participated in the study (32.9%) were studying in 9th standard while 47 students (22.4%) were studying in 10th standard (Table 1).

Among the students interviewed, 69.5% were aware of climate change. The awareness about the health impacts of climate change among high school students was 61.9%. An awareness of 63.3% about global warming was observed among the

Table 1: Distribution of study participants based on gender and standard currently studying in.

	Characteristics	Number	Percentage
Gender	Male	85	40.5
	Female	125	59.5
Standard of Education	8 th standard	94	44.8
	9 th standard	69	32.9
	10 th standard	47	22.4

study participants and only 51% were aware of the greenhouse effect. The knowledge about climate change, its health impacts and causes was assessed using the restructured questionnaire and only 10% of study participants had good knowledge about

the same. 32.9 % of students had a satisfactory knowledge while 24.3% had average knowledge on the subject. 32.9% of students had only poor knowledge about climate change (Table 2).

Table 2: Awareness and knowledge about climate change, its health impacts, global warming and greenhouse effect among the students

Characteristics		Number	Percentage
Climate Change	Aware	146	69.5
	Not Aware	64	30.5
Health Effects of Climate Change	Aware	130	61.9
	Not Aware	80	38.1
Global Warming	Aware	133	63.3
	Not Aware	77	36.7
Greenhouse Effect	Aware	107	51
	Not Aware	103	49
Level of Knowledge about Climate Change	Poor	69	32.9
	Average	51	24.3
	Satisfactory	69	32.9
	Good	21	10

Among the students aware of the climate change, the source of awareness was assessed using the questionnaire and multiple responses were collected. 126 students (86.3%) pointed teachers as the main source of information while 63 students (43.1%) opted textbooks as a source of

information. 70 students (47.9%) chose television as one of the sources of information. 15 students (10%) gained information through newspapers and a minority of students showed social media and friends as sources of information (4.1% and 2.05% respectively) (Fig. 1).

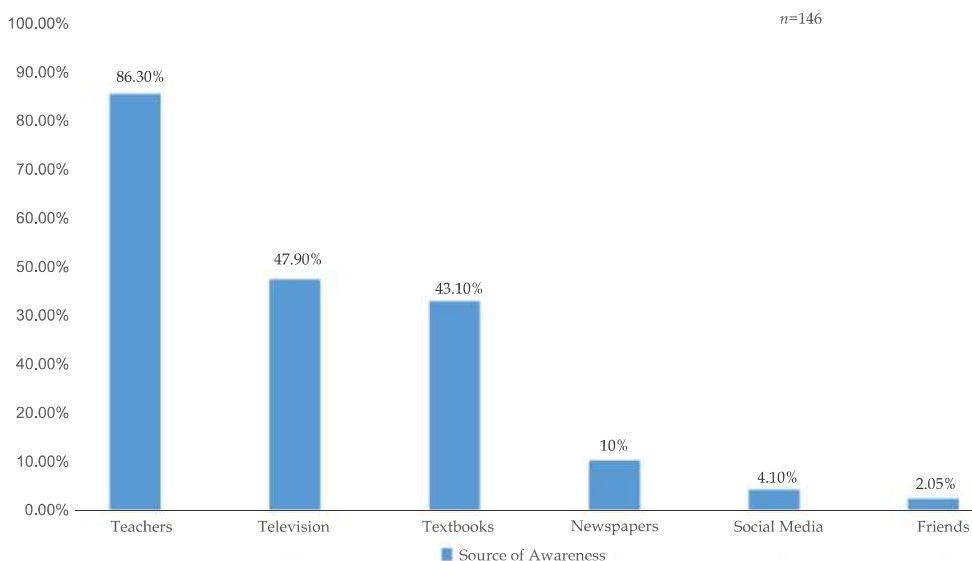


Fig. 1: Sources of awareness about climate change among the study participants.

Among the 146 students who were aware of the climate change, the majority blamed anthropogenic forcing as the main reason for the same. Multiple

responses were collected for reasons of climate change. 81.5% (119) students believed industries causes climate change while 78% (114) and 73.2%

(107) respectively answered deforestation and burning of fuels including motor vehicles as reasons for climate change. 21.9% (32) pointed construction works and 18.4% (27) pointed mining as causes for climate change. 8.9% (30) students chose energy

production as one of the reasons for climate change. 26.7% (39) students showed the natural process of volcanic eruption also as a reason for climate change (Fig. 2).

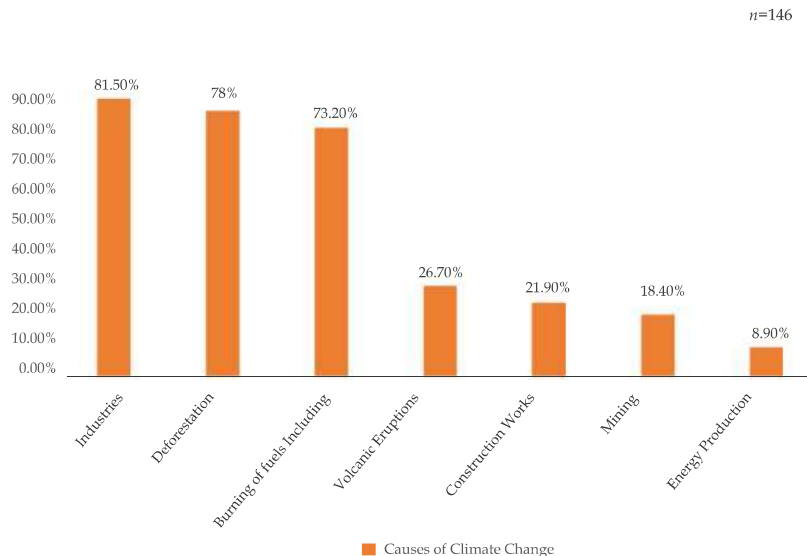


Fig. 2: Main reasons of climate change shown by the high school students during the study

Multiple responses were collected from students who were aware of the health impacts of climate change. The major health outcomes of climate changes chosen by students were an increase in communicable diseases, Injuries from different natural disasters resulting due to climate change,

Diseases related to water including health problems due to water scarcity, skin diseases, health impacts from reduction in food production, health problems due to increase in temperature, mental disorders and respiratory diseases (Fig. 3).

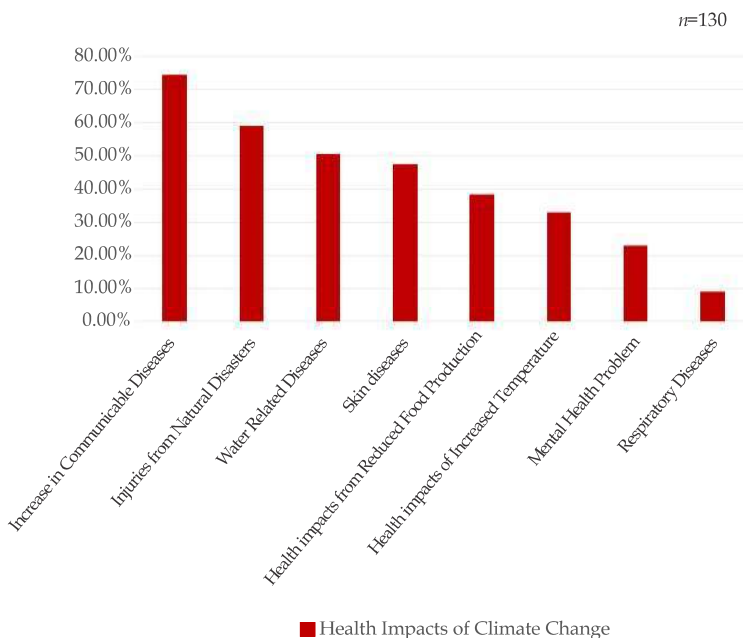


Fig. 3: Major health impacts of climate change answered by the study participants

A significant association with a chi-square test p -value less than 0.005 was observed between the gender of the students and awareness about climate change. The awareness was higher among boys (81.2%) than girls (61.6%). The awareness was maximum among 10th standard

students (91.5%) followed by 9th standard (76.8%). The least awareness was observed among 8th standard students (53.2%). This association was proven to be statistically significant by doing a chi-square test, which showed a p -value less than 0.001 (Table 3).

Table 3: Comparison of awareness about climate change across various categories of gender and levels of current education.

Characteristics		Awareness about Climate Change		p -value
		Aware	Not Aware	
Gender	Male	69 (81.2%)	16 (18.8%)	0.002
	Female	77 (61.6%)	48 (38.4%)	
Standard of Education	8 th standard	50 (53.2%)	44 (46.8%)	<0.001
	9 th standard	53 (76.8%)	16 (23.2%)	
	10 th standard	43 (91.5%)	04 (8.5%)	

Discussion

The awareness regarding climate change among the school children of urban areas of Mysuru was 69.5% according to our observation. 63.3% of students were aware of global warming and 51% were aware of the greenhouse effect. A higher level of awareness was observed among secondary school students in a similar study conducted by Carr, Paul *et al.* where the awareness about climate change was 82%.⁶ On comparison with similar studies from the country a higher awareness was observed in two studies conducted among undergraduate medical students from Meerut and Pune, where the awareness was above 95% among both study groups.^{7,8} The awareness regarding greenhouse effect among school children was higher than that among a group of medical students from the same country.⁷ The inclusion of greenhouse effect and global warming in the teaching curriculum is the probable factor leading to the better awareness.

The awareness about the health impacts of climate change among high school students was 61.9%. The major health outcomes of climate changes chosen by students were an increase in communicable diseases, Injuries from different natural disasters resulting due to climate change, and diseases related to water including health problems due to water scarcity. In a similar study from the same state, the main responses for the health impacts of global warming were cardiovascular and respiratory problems, heat stroke and malnutrition.⁹ In studies among medical students, most of the participants commented health impact of extreme weather events as the main negative health impact of climate change.^{7,8}

The main reasons for climate change according to school children were industrialization, deforestation and use of motor vehicles. In a study conducted in a similar setting in Karnataka, students opined burning of coals and mines followed by intensive farming and use of fossil fuels as main causes of emission of greenhouse gases and thereby climate change.⁹

By analyzing the scores study participants secured in the interview we observed that only 10% of study participants had good knowledge about the same. 32.9 % of students had a satisfactory knowledge while 24.3% had average knowledge on the subject. The remaining 32.9% of students had only poor knowledge about climate change. A better scenario was observed by Jitendra Kumar Sah *et al.* in a study where, 16.5% of students had good knowledge about global warming while majority (70.5%) had average knowledge and 13% had only poor knowledge on the subject.⁵ A significant difference of awareness across different gender and standard of education was noted in other studies also.^{5,9}

The most important source of information regarding climate change were teachers. A significant number of students named textbooks and televisions also as major sources of information on climate change. In various studies across the world, it was shown that major sources of information were television, newspapers and schools.^{6,10}

Conclusion

The awareness of climate change and its health impacts is low among high school students of

urban areas of Mysuru. Only a minority of students have good knowledge about climate change. Since the major sources of information about climate change are teachers and schools more educational activities should be designed and implemented in schools to improve awareness among children. More behavioural change communication activities should be conducted to improve awareness about climate change among school children.

Ethical Issues: None

Conflicts of Interest: Nil

Source of Funding: Self

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