

GLOBAL WARMING: ITS IMPLICATIONS AMONG THE COLLEGE STUDENTS OF MANGALORE CITY

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ABSTRACT: INTRODUCTION: Warming of the climate system is unequivocal, as is now evident from the observations of increases in global average air & ocean temperatures, widespread melting of snow & ice & rising of global average sea levels according to UN Intergovernmental Panel on Climate Change. The impact of global warming on the common masses & its awareness is a controversial issue, hence a study was undertaken to assess the awareness of global warming & related behaviour among the students of Mangalore. **AIMS & OBJECTIVES:** To assess the awareness regarding climate change and its health hazards among the college students of Mangalore. **MATERIALS AND METHODS:** A Cross sectional Observational Study was conducted in the community with the sampling unit being college students and a sample size of 400. Convenient sampling was done for the sampling unit, 10% of the colleges were chosen based on the thumb rule, using simple random sampling. The study was conducted for over a period of 3 months. A pretested proforma was prepared which was validated for face validity and tested for reliability by conducting a pilot study and the validated questionnaires were used to collect data after obtaining consent by explaining the terms of the study and confidentiality was maintained. The questionnaire was a semi-structured self-administered questionnaire with multiple choice questions, ranking questions, multiple answer questions and a few open ended questions for in-depth qualitative analysis. Proper instructions were given for each question. The questionnaire would test the cognitive, affective and psychomotor domain of the student with regard to global warming. Statistical Analysis was performed using SPSS Version 17.0. **RESULTS:** Majority (80.5%) considered global warming as an issue of major concern. Around (18.8%) considered global warming as a national problem. Burning of fossil fuel being a major threat for global warming, was not ranked high by majority of the students. Contributing factors for global warming phenomena wasn't known by 23% of the students. Majority (40.2%) believed that it does affect human health. Around 90% had a positive attitude towards the prevention of global warming.

Around 26% of the students were confused regarding the methods for halting global warming. Less than 50% of the students were willing to contribute through one or the other means of stopping global warming. Only around 50% of the students were ready to convey the message to others.

INTRODUCTION: Warming of the climate system is unequivocal, as is now evident from the observations of increases in global average air & ocean temperatures, widespread melting of snow & ice & rising of global average sea levels according to UN Intergovernmental Panel on Climate Change. There is overwhelming evidence that humans are affecting the global climate and highlighted a wide range of implications for human health.[1] As evidence of climate change and its impact continues to be amassed, it has become clear that many of the causes of climate change are anthropogenic in

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nature through lifestyles, consumption, and choices that pollute and exploit resources in an unsustainable manner. The future health hazards of climate change are well documented, with forecasts made of increasing health problems caused by heat waves, storms, floods, fires, droughts, and infectious diseases. It is also predicted that climate change will have detrimental effects on agriculture and fisheries and may even result in collapsing ecosystems.[2] Future risks of pathogens and chemicals could therefore be very different than today, so it is important that we begin to assess the implications of climate change for changes in human exposures to pathogens and chemicals and the subsequent health hazards in the near term and in the future.[3]

The climate change was estimated to be responsible in 2000 for approximately 2.4% of worldwide diarrhea and 6% of malaria in some middle-income countries and was estimated to have caused 150,000 deaths and 5.5 million DALYS in the year 2000.[4]The impact of global warming on the common masses & its awareness is a controversial issue, hence a study was undertaken to assess the awareness of global warming & related behaviour among the students of Mangalore.

AIMS & OBJECTIVES: To assess the awareness, knowledge, attitude & practices regarding climate change and its health hazards among the college students of Mangalore.

MATERIALS AND METHODS: A Cross sectional Observational Study (KAP Study) was conducted in the community with the sampling unit being college students and a sample size of 400 based on the previous study knowledge level with the formula $4PQ/L^2$ (where P= 40% and L=5%). Convenient sampling was done for the sampling unit, that is the proportion of students present on the day of visiting the college were included within the age group of 18-20years. There are around 60 colleges in Mangalore, 10% of the colleges were chosen based on the thumb rule, ie 6 colleges to meet the sample size using simple random sampling. The education of the students constituted from a basic degree to professional degrees. The study was conducted for over a period of 3 months.

A pretested proforma was prepared which was validated for face validity and tested for reliability by conducting a pilot study and the validated questionnaires were used to collect data after obtaining consent by explaining the terms of the study and confidentiality was maintained. The questionnaire was a semi-structured self-administered questionnaire with multiple choice questions, ranking questions, multiple answer questions and a few open ended questions for in-depth qualitative analysis. Proper instructions were given for each question. The questionnaire tested the cognitive, affective and psychomotor domain of the student with regard to global warming.

The data was effectively entered in excel and after data cleaning was transferred to SPSS and the proportions of answers and ranking pattern were determined as follows:

RESULTS:

TABLE 1: Awareness of Global Warming

Heard of Global Warming	Frequency	Percent
NO	10	2.5%
YES	390	97.5%
Total	400	100%

97.5% of the students had heard about global warming.

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TABLE 2: Sources of Information regarding Global Warming

Sources of Information	Frequency	Percentage
Radio & Television	151	37.7%
Newspaper	142	35.4%
Internet	109	27.2%
Peers	16	4%

Radio, T.V (37.7%) & Newspaper (35.4%) were the major sources of information regarding global warming followed by the Internet (27.2%), emphasizing the role of mass media in spreading public awareness.

Around 80.5% of the students felt that global warming was an issue of major concern

TABLE 3: The causes of Environmental degradation

Causes of Environmental degradation	Frequency	Percentage
Growing population	126	31.4%
Newer technology	69	17.2%
Moral unconcern	101	25.2%
All the above	195	48.8%

31.4% of the students considered the growing population to be a major cause of environmental degradation while 48.8% felt that apart from growing population, newer technology & moral unconcern were also responsible.

TABLE 4: Environmental Hazards threatening our planet and their ranking

Environmental hazards threatening our planet	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Dint rank
Burning Forests	30%	6.2%	6.8%	9.2%	10.5%	37%
Automobile pollution	34.2%	12%	9%	5.5%	4%	35.2%
Industrial pollution of rivers	25.8%	17%	13.8%	5.2%	1%	37.2%
Burning of fossil fuel	19.5%	6.8%	8%	13.5%	7.2%	45%
Improper waste disposal	10.5%	3.5%	7.8%	9.8%	15.2%	53.2%

Automobile pollution was considered a major environmental hazard threatening our planet by 34.2% of the students, followed by the burning of forests by 30% but 35.2% and 37% of the students did not rank automobile pollution and burning of forests respectively & 45% did not rank burning of fossil fuel as an environmental hazard itself. Only 19.5% of the students ranked it as the number one cause.

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TABLE 5: Impact of Global Warming and their ranking

Impact of Global Warming	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Dint rank
Affects human health	40.2%	11.8%	14.5%	6%	3.5%	24%
Affects physical environment	26.8%	15.8%	12.5%	5.2%	4%	35.8%
Affects plant & animal life	23%	19.2%	12.5%	9%	1.5%	34.8%
Coastal degradation	4.2%	5.2%	7.2%	13.5%	25.8%	44%
Decrease agricultural production	7.5%	4%	9%	21.5%	16.8%	41.2%

Majority (53%) of the students believed that global warming affected human health, followed by 41% saying that global warming affected the physical environment like air quality and depletion of water resources. 35% of the students did not rank the effects on physical environment and bio-diversity like plant and animal life.

TABLE 6: Health Issues due to Global Warming and their ranking

Health issues due to Global Warming	Rank 1	Rank 2	Rank 3	Rank 4	Dint answer
Water borne disease	15.8%	20%	12.2%	7.2%	44.8%
Food borne disease	6.8%	11.8%	21.5%	11.8%	47.1%
Vector borne disease	7%	13.8%	10.8%	21%	47.2%
Increase in natural disasters	66.8%	2%	3.5%	7.5%	20.2%

66.8% students considered natural disasters to be the major health issue due to global warming, but 45-47% students did not rank water and food borne diseases as health hazards at all.

TABLE 7: Ranking of countries contributing towards Global Warming

Countries contributing to Global Warming	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Dint answer
India	14%	6.2%	16.5%	14.8%	5.8%	42.8%
USA	54.8%	7.2%	6.5%	2.5%	2.5%	26.5%
China	23.5%	12%	13.8%	10.2%	1.5%	39%
Africa	4.8%	4.2%	2.5%	7.5%	31%	50%
Europe	8.5%	18.2%	8.2%	11.2%	5.2%	48.5%

Majority(54.8%) of the students ranked USA to be the top most contributor of global warming but 40–50% of the students did not rank Europe, Africa and India as countries contributing to global warming.

As the causes for global warming phenomena were concerned 77.2% of the students answered that it was due to green house gases like CO₂ whereas 21.8% thought that it was due to holes in the ozone layer.

There were around 9 questions regarding knowledge of global warming and we found that the awareness of global warming was existent, major sources of information being radio, television and newspaper but the knowledge level of global warming among the students were not to up to the mark where 35-50% of the students did not rank the causes and impact of global warming in an appropriate way.

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The attitudes of students were assessed by way of ranking global warming as a national problem to the optimistic way of stopping global warming. It revealed that 94.8% were willing to contribute towards prevention of global warming and protecting the environment, 86.5% considered halting global warming was both the govt.'s and public's responsibility, and 7% considered it as a responsibility of the public only. 64.8% were optimistic that global warming could be halted and we could cut down CO₂ levels. 26.2% were unsure and 8% deferred that CO₂ levels could be lowered.

TABLE 8: Major national problems in our country

National Problem	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Didn't rank
Poverty	35.8%	10.8%	10%	5.8%	2%	35.2%
Corruption	45.5%	14.2%	4.8%	5.2%	2.2%	28%
Environmental degradation and Global warming	18.8%	8%	9.5%	9.5%	11.8%	42.5%
Other diseases	5.2%	5.0%	11.8%	12.5%	14%	51.5%
Crime and terrorism	7.8%	7.5%	8.5%	10.8%	13.2%	52.2%

Corruption was ranked as the greatest national problem by majority of the students (45.5%) It was also ranked 2nd by many (14.2%) of the students where as poverty was ranked 1st by 35.8% of the students. But 35.2% and 28% did not rank poverty & corruption respectively. 42.5% of the students did not rank global warming and only 18.8% ranked it 1st as a national problem and 11.8% ranked it 5th.

TABLE 9: Major measures to be taken in our country to halt global warming

Measures	Frequency
Stop Industrialization	81 (20.2%)
Grow trees	261 (65.2%)
Population Control	140 (35%)
Bicycle Use	78 (19.5%)
Minimize use of bio-fuel/fossil fuel	182 (45.5%)
Stop wastage of natural resources	151 (37.8%)

Majority of the students (65.2%) felt that growing trees would halt global warming, also 45.5% realized that minimizing the use of bio/fossil fuels would reduce global warming whereas only 20% felt that the use of bicycles and stopping industrialization can stop global warming.

As far as the practice of students regarding global warming was concerned 52.2% willingly said that they were responsible to talk to the community on protecting our environment, 37.8% were unsure and 8.5% felt that it was not their concern.

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TABLE 10: Measures being employed by the students right now to stop global warming

Measures	Frequency
Recycling	120 (30%)
Using public transport	192 (48%)
Car pooling	33 (8.2%)
Planting trees	158 (39.5%)
Using energy efficient appliances	105 (26.2%)
Careful use of water and electricity	180 (45%)

Only 48% used public transport and 8.2% pooled cars with 45% of them practicing careful usage of water and electricity and 40% planting trees. But only 26.2% were using energy efficient appliances.

DISCUSSION: In our study it was observed that the awareness of global warming among the students were quite high, mass media playing an important role, which is similar to the earlier studies conducted on medical students. It is interesting to know that in our study majority (80.5%) considered global warming as an issue of major concern unlike previous studies. It is also evident that even non medical students in our study showed concern and around (18.8%) considered global warming as a national problem which shows that information regarding global warming is spreading rapidly. But the knowledge regarding global warming was found to be inadequate which might be a concern as it would affect their attitudes and practices. Burning of fossil fuel being a major threat for global warming, was not ranked high by majority of the students. Also, the causes for global warming phenomena wasn't known by 23% of the students which was not so in earlier studies. The reason may be that the earlier studies included medical students whereas we had students from various fields in our sample. Earlier studies had pointed out the major health issues due to global warming were disaster, food borne and water borne diseases(1) whereas in our study majority had mentioned natural disaster and 35-37% did not rank food, water and vector borne diseases. The El Nino phenomenon provides an analog for understanding the future impacts of global climate change on infectious diseases (5). Though majority (40.2%) believed that it does affect human health, it was lower to the correct responses of earlier studies. Interestingly majority of them believed that USA is a major contributor to global warming which was ambiguous in earlier studies. It is good to know that around 90% had a positive attitude towards the prevention of global warming and they felt that they can halt the phenomena of global warming which was not so in earlier studies. But the attitude regarding the measures taken for curbing global warming wasn't very effective as there were gaps in their knowledge. So around 26% of the students were confused regarding the methods of preventing global warming. With gaps in the knowledge, though with the right attitude & practice for halting global warming, less than 50% of the students were willing to contribute through one or the other means of stopping global warming. Only around 50% of the students were ready to convey the message to others. So here we feel that the major issue of concern is the gap in knowledge which needs to be addressed scientifically. Mass media is increasing the awareness but the information is not being converted to knowledge to change the attitude and there by the practice. So it is our responsibility to inculcate global warming education among the youths with a scientific approach.

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LIMITATIONS OF THE STUDY: The study included only the youths who were educated and also well versed in English. The proforma had multiple answer questions which might have caused some confusion among the respondents. The demographic data of the students were not taken into consideration so comparison of their knowledge level with regard to their background is a limitation.

CONCLUSION: Awareness of global warming among the students in the age group of 18-20 years in Mangalore was found to be adequate. Knowledge gaps are prevalent regarding the same. Though majority of them are enthusiastic, the right attitude towards the prevention and stoppage of global warming has not yet developed. As far as their practices are concerned, majority of them put up a poor picture.

REFERENCES:

1. Fourth Assessment Report. Geneva: IPCC; 2007. Intergovernmental Panel on Climate Change 2007: Synthesis Report.
2. Nicholas A, Maynard V, Goodman B, Richardson J. Health, climate change and sustainability: A systematic review and thematic analysis of the literature. Environ Health Insights. 2009; 3:63-88. [PMC free article][PubMed]
3. Boxall AB, Hardy A, Beulke S, Boucard T, Burgin L, Falloon PD, et al. Hazards of climate change on indirect human exposure to pathogens and chemicals from Agriculture. Environ Health Perspect 2009; 117:508-14.
4. Majra JP, Acharya D. Protecting health from climate change: Preparedness of medical interns. Indian J Community Med 2009;34:317-20
5. World Health Organisation. Climate Change & Human Health: Risks & Responses. Summary. Geneva: WHO; 2003.
6. <http://www.climatechangecommunication.org>
7. <http://www.epa.gov/climatechange>

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