

## Original Research Article

# Climate change: what people living in Jammu city of India know?

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**Received:** 27 February 2019

**Revised:** 23 March 2019

**Accepted:** 04 April 2019

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## ABSTRACT

**Background:** Climate change has emerged as one of the greatest challenges of the present century. The current study explores the knowledge, attitudes and practices about climate change of the adults aged 18 years and above in Jammu city of North India.

**Methods:** A cross-sectional study was conducted among attendants of the patients visiting medical OPD of a tertiary care teaching hospital. A pilot tested questionnaire eliciting information on knowledge, attitudes and practices about climate change was administered to those who were willing to participate. The data collected was presented in proportions.

**Results:** Majority (95%) of the respondents had heard of the term climate change, and 43.9% of them related it to changes in the weather pattern. Plastic use as a major cause of climate change was agreed upon by 95% of the respondents. About half of the respondents were very much concerned about climate change and 80% of them were very much interested in knowing more about climate change and its impact. Only 24.8% of the respondents read/watch stories on climate change.

**Conclusions:** Knowledge levels of the respondents were found to be reasonably good but the same cannot be said about their attitude and practices. Role of NGOs, social communities and media is of utmost importance to make people aware of the harmful effects of climate change on both the environment as well as the health of the people.

**Keywords:** Attitude, Climate change, Knowledge, Practices

## INTRODUCTION

Climate change is defined as a change in the state of climate that can be identified and measured by changes in the mean and/or variability of its properties.<sup>1</sup> Climate change has been labeled as the greatest global health challenge of this century. It continues to represent one of the greatest threats to the global environment, society and the economy. Besides natural occurrences impacting the average global temperature, human activity continues to be the main contributing factor to climate change as it contributes towards an increased emission of greenhouse

gases. Human activities which cause climate change include bush burning, gas flaring and industrialization which all deplete the ozone layer. Other activities like deforestation, agriculture practices etc. reduce the amount of carbon absorbed from the atmosphere.

Globally rising temperatures, increased precipitation and rainfall have resulted in greater frequency of climatic events ranging from fires and floods to droughts and heat waves. In India alone, such events have been encountered at regular frequency in the last two decades. The resultant impact on health, nutrition and economic development

spans all ages. Low and middle-income countries like India with the most vulnerable populations are likely to be worst affected, given weaker health systems and poorer infrastructure. Heat waves in Ahmedabad, India in 2016 and floods in Kerala this year are just examples of recent vagaries of climate change in India. Many authors have linked increasing climate changes to the consequent devastating effects.<sup>2-6</sup>

The evidence is unequivocal regarding human activities being the primary cause of global warming.<sup>7</sup> The research has also reported that awareness levels and some socio demographic variables have an influence on the attitude as well as practices of surveyed population.<sup>8-10</sup>

The review of the literature revealed that no study was conducted in this region of India regarding knowledge, attitude and practices about climate change. It was with this purpose that the present study was conducted among the attendants of the patients attending the OPD of a tertiary care teaching hospital in Jammu, Jammu and Kashmir, India. The finding will reveal their awareness levels and would determine the knowledge gaps. Findings are likely to help in planning effective advocacy, communication and social mobilization programs.

## METHODS

The present study was conducted in a tertiary care teaching hospital in Jammu city of Jammu and Kashmir state during the months of September to November 2018. Due permission was sought from institutional ethical committee of Government Medical College Jammu before the start of the study. All the attendants aged 18 years and above accompanying the patient/s who were visiting the medicine OPD were eligible for the study during the above said three months, but only those who gave informed verbal consent were registered for the study. The study was conducted three times a week and a minimum of ten interviews were conducted in a particular day. The questionnaire was prepared by the faculty members of respectively Community Medicine Department of Government Medical College Jammu with extensive review of literature. The questionnaire so prepared was pilot tested on a sample of 25 attendants visiting the medicine OPD and who were not part of the final study subjects. The feedback so obtained was only incorporated into the final version of questionnaire, which was used for the study purposes. The final instruments had four sections first to elicit information about socio demographic characteristics while second, third and fourth enquired about knowledge, attitude and practice of the respondents towards climate change. The data thus collected was tabulated and analyzed. The results were presented as proportions.

## RESULTS

During the course of survey, a total of 428 respondents were enrolled for the study purposes. About one third

(66.82%) of the respondents were in 20-49 years age group and belonged to male gender. Level of education was found to be reasonably adequate as only one-fifth (19.15%) of them were up to primary level and rest had studied beyond that. 70% of the study participants were living in a nuclear family and about half of them (51.8%) had a monthly income in the range of 25000-50000 INR. About three-fifth (60.7%) of the respondents belonged to urban areas (Table 1).

**Table 1: Socio-demographic characteristics of the study population (n=428).**

Variables	Frequency	(%)	
Age (years)	<20	120	28.03
	20-49	286	66.82
	> 50	22	05.14
Sex	Male	290	67.7
	Female	138	32.2
Level of education	Up to primary level	82	19.15
	Up to matric level	132	30.84
	Up to senior secondary	94	21.96
	Graduate and above	120	28.03
Family type	Nuclear	300	70.09
	Joint	128	29.90
Monthly income in INR	<25000	68	15.88
	25000-50000	222	51.86
	>50000	138	32.24
Residence	Urban	260	60.74
	Rural	168	39.25

When asked if they had heard about climate change, 95.7% (410/428) of the study participants replied in the affirmative. Thus 18 respondents who had not heard of climate change were excluded for further interview. Only 410 study participants were interviewed in detail. When asked about the term climate change, 43.9% related it to changes in weather pattern and 22.4% to global warming. More than half of them (54.8%) agreed that climate change was affecting the community.

All the study participants agreed with the causes listed for the climate change but majority (87.8%) ascribed it to burning of fossil fuels. Regarding impact of climate change on communities, majority concurred with difference in crop seasonality (79.5%) although other impacts were also agreed upon. Further 95% of them labeled plastic use as the major reason for climate change (Table 2).

Results regarding attitude towards climate change revealed that about half of the respondents (50.7%) were very concerned towards climate change and 39.5% were somewhat concerned to prevent impact of climate change in communities.

There were 88.78% of the respondents opined that conserving energy and natural resources was very important followed by increased public awareness on public issues (76%). About 70% of the respondents were prepared to do whatever was needed to preserve

environment. More than half of the respondents (53.6%) were of the opinion that government is primarily responsible for addressing climate change issues in the country.

**Table 2: Knowledge of respondents about the climate change.**

Question	Response	Frequency	%
Have you heard the term climate change	Yes	410	95
	No	18	4.2
<b>What do you understand by the term climate change</b>			
Change in weather pattern		180	43.90
Change in sea level		35	8.50
Extreme heat		58	14.14
Global warming		92	22.43
Changes in temperature		45	10.97
Is climate change affecting your community	Yes	225	54.87
	No	185	45.12
<b>What causes climate change</b>			
Burning of fossil fuel (coal, oil etc.)	Yes	360	87.8
	No	50	12.19
Deforestation	Yes	310	75.60
	No	100	24.39
Transportation with vehicle emission	Yes	270	65.85
	No	140	34.14
Poor industrial practices	Yes	240	58.5
	No	170	41.4
Improper waste disposal	Yes	255	62.1
	No	155	37.8
Changing weather patterns	Yes	262	63.9
	No	148	36.0
Increase in air temperature	Yes	142	34.6
	No	268	65.3
Increase in landslide and flooding	Yes	290	70.73
	No	120	29.26
Difference in seasonality of crops	Yes	326	79.5
	No	84	20.4
Increase in insect pests	Yes	190	31.7
	No	220	53.6
Melting of icecaps at poles	Yes	110	26.8
	No	300	73.1
Increase in sea surface temperature	Yes	50	12.19
	No	360	87.8
Plastic use is one of the major reasons for climate change	Yes	390	95.1

Overwhelming majority (94%) had the attitude that global warming is a greater threat and 80% of them were very interested in knowing more about climate change and its impact (Table 3).

When practices were enquired about 61% of the respondents replied in negative regarding actions taken by them to prevent impact of climate change. Majority

(90%) had observed weather changes in the past one decade.

As far as actions taken by government to lessen the impact of climate changes, about 59% replied about increasing public awareness on climate change issues. Reforestation was the main action reported by respondents taken by community to lessen the climate change impact.

Among the reasons for not taking any action to prevent climate change, half of the respondents replied that community wasn't aware of all the actions, which need to

be taken. Only one quarter of them (24.8%) read or watch stories on the climate change (Table 4).

**Table 3: Respondent's attitude towards climate change.**

Question	Response					
How much are you concerned towards climate change	Frequency		%			
Very concerned	208		50.73			
Somewhat concerned	162		39.51			
Not concerned	30		07.31			
Don't know	10		02.43			
In your opinion if the following are important to help communities prevent impact of climate change	Very important		Not important		Don't know	
	Frequency	%	Frequency	%	Frequency	%
Compliance of environments laws	242	59.02	158	38.5	10	02.43
Conserve energy and natural resources	364	88.78	41	18	05	01.21
Encourage water conservation and reuse	306	74.6	100	24.3	04	0.97
Increase repetition	298	72.6	104	25.3	08	1.95
Increase public awareness on climate change issues	312	76.09	78	19.02	20	04.87
Plan for disaster management	200	48.78	150	36.5	60	14.6
Community participation encouragement	160	39.02	180	43.90	70	17.07
Do you concur with the following statement?	Yes frequency		No frequency			
Government is taking action to address the impacts of climate change on communities	196	47.8	214	52.1		
Members of community are also addressing climate change impacts by taking appropriate actions	110	26.8	300	73.1		
To preserve environment, I will do whatever needed	286	69.7	124	30.2		
In your opinion, who is primarily responsible for addressing climate issues in our country?	Government		Community organization		Everyone	
	220	53.6	110	26.8	80	19.5
How much are you interested in knowing more about climate change and its impact	Very interested		Not interested		Don't know	
	328	80	70	17.0	12	2.92
In your opinion, is global warming a great threat?	Yes		No		Don't know	
	386	94.1	19	4.63	05	1.21

## DISCUSSION

The results have revealed that 95.7% of the study respondents had heard of climate change. The results are in agreement with those reported by Belize study.<sup>11</sup> More than half of the respondents in the current study agreed that climate change was affecting their community and 43.9% related it to the change in the weather patterns. In contrast, 83% of the respondents in Belize study indicated that climate change was affecting their community but only 22% of them related it to the weather conditions.<sup>11</sup>

Majority (87.8%) of the respondents in the current study identified burning of fossil fuels as the main cause for climate change while poor industrial practices (54.8%)

and deforestation (48%) were reported as the main causes in Belize study.<sup>11</sup> In a study conducted in Guyana, 30% of the respondents attributed climate change to deforestation and 26% to carbon emissions.<sup>12</sup> About 80 % of the respondents in the present study identified difference in crop seasonality as the major impact of climate change while increase in temperature was reported as the most common effect of climate change from Guyana.<sup>12</sup> However, Ojomo E et al, from Nigeria reported that respondents were more knowledgeable about the causes of climate change than about its effects.<sup>13</sup>

Only half of the respondents in the present study were concerned towards climate change in comparison to 90% reported by Belize study.<sup>11</sup> Public awareness was

identified as the most important action to help the community in preventing impact of climate change in Belize study, while majority of the respondents in the present study opined that conserving energy and natural resources was important in this regard.<sup>11</sup> More than half of the respondents in the present study were of the view that primarily government is responsible for addressing climate change issues, which were in concurrence with the results reported by Belize study.<sup>11</sup> In the present

study 80% of the respondents were interested in knowing more about climate change in comparison to only 60 % as reported in Belize Study.<sup>11</sup> In a study conducted among students, Falaye FV et al, reported low knowledge although attitudes were slightly positive.<sup>14</sup> Sah JK et al reported average knowledge in 70% of the respondents towards global warming while 78 % had average attitude levels.<sup>15</sup>

**Table 4: Practices of the respondents about the climate change.**

Question	Response					
	Yes	%	No	%	Don't know	%
Any action taken by you or your community to prevent impact of climate change	110	26.8	250	60.9	50	12.1
Have you observed weather changes in past one decade	370	90.2	35	8.5	05	1.21
Any of the following actions taken by government to lessen the impact of climate change in community	<b>Frequency</b>		<b>%</b>			
Increasing public awareness on climate change issues	242		59.02			
Increased research on development of renewable technologies	152		37.07			
Reduce warning system for health-related impacts	076		18.5			
Early warning system for health-related impacts	112		27.3			
Among the following, actions taken by community to lessen impact of climate change	<b>Frequency</b>		<b>%</b>			
Water harvesting	182		44.3			
Reforestation	350		85.3			
Use of public transport/car pooling	152		37.07			
Proper waste disposal	070		17.07			
Raising awareness about climate change in community	176		42.9			
Reasons for not taking any action by community to prevent climate change	<b>Frequency</b>		<b>%</b>			
Not enough information	130		31.7			
Not aware of all actions needed to be taken	212		51.7			
Climate change not a concern to community	68		16.5			
How often you read/watch stories on climate change?	<b>Frequency</b>		<b>%</b>			
Very often	102		24.8			
Occasionally	160		39.02			
Never	58		14.14			
Don't know	90		21.9			

Among the actions taken by government to lessen the impact of climate changes, 59% of the respondents replied that it could be achieved by increasing public awareness and these results are similar to those reported by Belize study.<sup>11</sup> Only one quarter (25%) of the respondents watched /read stories on climate change in comparison to 40% as reported in Belize study.<sup>11</sup> In an Iranian study conducted among teachers, level of practices was found to be not desirable about climate change.<sup>16</sup>

## CONCLUSION

It was found that respondents had a very good knowledge about the climate change, although their attitudes and

practices were not up to the desired levels. Research has reported devastating effect of climate change on environment, agriculture, water resources and on the health of the people. People should be impressed upon through both electronic and print media to take responsible decisions to avert further deterioration of the environment.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

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**Cite this article as:** Gupta R, Majeed M, Kumari R, Gupta RK, Langer B, Singh P. Climate change: what people living in Jammu city of India know?. *Int J Res Med Sci* 2019;7:1746-51.