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Research Article

AWARENESS AND ADAPTIVE PRACTICES REGARDING FACTORS OF CLIMATE CHANGE AMONG URBAN RESIDENTS OF PUNE CITY

Sonopant Joshi*, Ranjana Chavan and Shital Waghmare

Tutor Symbiosis College of Nursing (Symbiosis International University) Pune, India

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ABSTRACT

Introduction/Background: Global Warming and Climate change is expected to increase the frequency of extreme events.

Aim: A cross sectional study was conducted to assess the awareness and practices regarding factors of Climate Change among the urban residents of Pune city.

Materials and Methods: Urban area of Pune city was selected for study. The sample size was 116 selected by simple random methods from two different urban settings. Structured questionnaire was prepared and data was collected. **Results:** The sample consists of 92 (79.3%) female and 24 (20.7%) male. 58% respondents were aware about climate change with mean 17.38 and mean adaptive practice score was 8.6 (53.89%). About 93(80%) respondents responded that climate is changing. Out of 116, 64(74%) respondents still using bio-mass as fuel. Only 60 (69%) respondents were aware of nonpolluting CNG vehicles. There is positive correlation between awareness level and adaptive practices ($r=0.678$). Research implications: It revealed that awareness level is average but adaptive practices among urban population are poor which is far below expected level. There is a need to spread mass awareness among population to reduce the impact of Climate Change. **Novelty/Originality:** Paper is significant to the health educators, social activists and mass media personnel to organize mass campaign regarding global warming and climate change.

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INTRODUCTION

There has been an alarming effect of global warming on the climate across the world. (Vignola and Mcdaniels, 2012) India is already a disaster prone area, with the statistics of 27 out of 35 states being disaster prone, with most disasters being water related. The process of global warming has led to an increase in the frequency and intensity of these climatic disasters. According to surveys, in the year 2012, India ranked the third highest in the world regarding the number of significant disasters, with 18 such events in one year, resulting in the death of 1103 people due to these catastrophes. (SG Joshi, 2012) There is urgent need to sensitize the general population and create awareness among them to reduce the impact on their health. (Pandve, 2007)

Scientists have found out that global GHG emissions due to human activities have grown since pre-industrial times, with an increase of 70% between 1970 and 2004. Furthermore, according to the report, the continued and unabated release of greenhouse gases from human activities at or above current rates would cause further warming and induce many changes in

the global climate system during the 21st century that would very likely be larger than those observed during the 20th century. Anthropogenic warming could lead to some impacts that are abrupt or irreversible, depending upon the rate and magnitude of the climate change (Nirmala and Arun 2015)

Intergovernmental Panel on Climate Change (IPCC) assesses the climate change status worldwide. (IPCC, 2014) Climate change is expected to increase the frequency of extreme events. (EPA, 2010) Major cities are main source of climate change, due to their developmental activities, migration of the peoples to the cities and industrializations (Lankao, 2009). Though climate change is happening, every change in the weather should not be correlated to climate change the weather has not changed much but we, on the other hand, are changing. (Vignola and Mcdaniels, 2012) This changing lifestyle is making us more aware about the changes in the weather (Raynauld 2010). This study contributes to address the issue by assessing the awareness and adaptive practices regarding factors of climate change among urban residents of Pune city.

*Corresponding author: Sonopant Joshi

Tutor Symbiosis College of Nursing (Symbiosis International University) Pune, India

MATERIAL AND METHODS

Cross sectional descriptive study was carried out in the urban area of Pune city, Maharashtra state of India. The aim of the study was to assess the awareness and adaptive practices regarding climate change in urban population of Pune city and to find co-relation between awareness and practices. The purpose of the study and all terms used in the questionnaire were explained to the respondents. Consent was taken and confidentiality maintained. The sample size was 116 selected by simple random methods from two different urban settings of Pune city. Structured questionnaire was prepared and data was collected. Face to face interview was taken using pre-validated questionnaire which includes open and close ended questions. In this study the researcher evaluate the awareness and adaptive practices regarding global warming and climate change according to the criteria. Data collection was done according to the objectives of the study. The data was analyzed using statistical software. The pilot study was conducted in the 1st and 2nd week of February on 16 samples from urban population in Pune city, to assess the feasibility of the study and to decide the plan for data analysis. The data was collected through structured questionnaire.

RESULTS

Total 116 respondents were interviewed using semi structured questionnaire. Maximum number of respondents were females 91 (78.4%), 39 (33.3%) samples were 25-30 years of age group, 34(30%) samples were from 31-35 years. Most of the samples were studied graduate level 46(40%). Majority of the samples were occupied in the job 50(43.3%). Majority of the samples belongs to nuclear family 70(60%). The most common source of information about climate change is television (68%) followed by radio and newspaper Mean awareness level regarding climate change and global warming was found 17.38 (57.94%) and mean adaptive practice score was 8.6 (53.89%). About 93(80%) respondents responded that climate is changing.

Out of 116, 64(74%) respondents still using bio-mass as domestic fuel. Only 60 (69%) respondents were aware of non-polluting CNG vehicles.

Majority of the respondents 75 (64.66%) opined that cities are expanding. There is large number of vehicles on roads in addition construction industry is expanding in the cities. This is big reason for climate change.

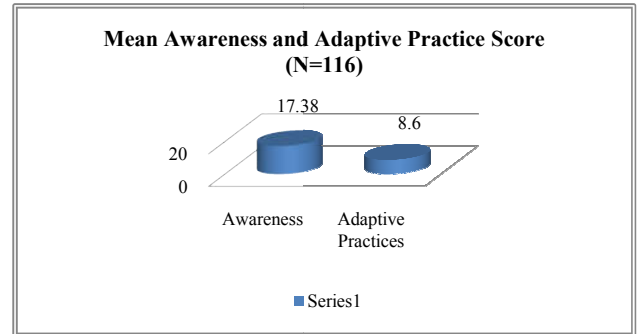


Fig 1 Mean awareness and adaptive practices

Fig 1, Shows that mean awareness score and percentage of urban population regarding global warming and climate change is 17.38 (57.94%) and the mean adaptive practice score and percentage is 8.6 (53.69%).

Table -3 reveals that male city residents have more knowledge i.e. 63.33% compare to female i.e. 51.94%. the post graduate people have more knowledge i.e. 66.29% followed by graduate with 62.39%, higher secondary with 43.71% , awareness level of housewife found very less i.e. 50%.

The above table shows that adaptive practices of the people are very poor. Researcher asked question regarding plantation of trees only 61(53%) people gave favorable reply. Only 68% uses public transport for daily commuting 68% people not using plastics and know about harmful effect of plastics. 23% people rely on local government to tackle the issue. 97% people believe in paperless work.

Table No 1 Demographic description of the samples (N=116)

Demographic Variable	Frequency (%)	Demographic Variable	Frequency (%)
AGE		Income Per Month	
25-30 years	39 (33.62%)	<5000	15 (13.34%)
31-35 years	35 (30%)	6000-15000	50 (43.33%)
36-40 years	29 (25%)	16000-25000	36 (31.66%)
41-45 years	13 (11.67%)	>250000	13 (11.67%)
Sex		Type of House	
Male	25 (21.67%)	Flat	71 (61.66%)
Female	91 (78.4%)	Chawl	10 (8.34%)
Education		Single kuccha house	35 (30%)
Secondary	25 (21.67%)	Type of Family	
Higher secondary	27 (23.33%)	Joint	25 (21.66%)
Graduate	46 (40%)	Nuclear	70 (60%)
Post graduate	17 (15%)	Separate	21 (18.34%)
Occupation		Waste Disposal	
House wife	50 (43.33%)	burning	17 (15%)
Service	50 (43.33%)	Open air	23 (20%)
Business	15 (13.34%)	dumping	52 (45%)
Labor	0 (0%)	others	23 (20%)
Number of family members		Water facility	
<2members	4 (3.33%)	Everyday	60 (51.66%)
2-4 members	75 (65%)	Alternate day	56 (48.34%)
5-7 members	33 (28.37%)	Electricity	
		Available	112 (96.67%)
		unavailable	4 (3.33%)

Table 2 Mean awareness score as per demographic variables

Demographic Variable	MEAN	%
25-30 years	16.95	59.47
31-35 years	18.55	61.85
36-40 years	16.40	54.66
41-45 years	17.14	44.44
Male	19	63.33
Female	15.91	51.94
Secondary	14.61	43.71
Higher secondary	13.14	48.80
Graduate	18.70	62.36
Post graduate	19.88	66.29
House wife	15	50
Service	18.65	62.17
Business	20.87	69.58
<5000	16.87	55
6000-15000	16.65	55.51
16000-25000	18.36	61.22
>25000	18	62.33

Adaptive practices of peoples regarding global warming and climate change

Variables	Yes	No
1. Have you contributed to tree plantation drive during last one year	61(53%)	55(47%)
2. I preferably utilise public transport for daily commuting	79(68%)	37(32%)
3. I avoid use of plastics in daily routine activities	79(68%)	37(32%)
4. Solar energy reduces impact of climate change	37(32%)	79(68%)
5. Industrial air pollution is major contributing factor for climate change	110(95%)	6(5%)
6. Municipal corporation is strategic organization working to reduce climatic variability	27(23%)	89(77%)
7. Communicable diseases rising due to climate change	89(77%)	27(23%)
8. I use water economically	49(42%)	67(58%)
9. Economical use of light, fan, AC is important to reduce Green House Gases	23(20%)	93(80%)
10. I believe in paperless work	112(97%)	4(3%)
11. Burning of garbage is dangerous to environment	73(63%)	43(37%)
12. Low rain fall is indication of climate change	32(28%)	84(72%)
13. Sea level rise and subsequent flooding are future anticipated disasters	40 (30%)	76(70%)
14. CNG vehicles are non polluting	60(69%)	56(31%)

DISCUSSION

This study conducted in the urban setting of the Pune city. Mean age of respondents was 31 years. Maximum respondents are female (78.4%) almost 46% of respondents are graduate, 60% people are from nuclear family, out of 116 respondents 87 (75%) of them responded that they heard about climate change and they further added that climate is changing . Majority of the respondents (61%) are unaware of green house gases, global warming, ozone depletion and consequences of climate change. Maximum respondents obtained the information regarding climate change through television (78%) followed by radio and newspapers. This result is lower than a study done on awareness of climate change in urban area of Gondar city of Ethiopia (82.25%). (Moges and Daniel, 2014)

In table -2 graduates of Pune city have higher level of awareness than non graduates. Urban residents, better educated likely to be more aware of climate change. Only 32% respondents understood the importance of solar energy and further said use of solar energy can reduce the impact of climate change.

Mean awareness score and percentage of urban population regarding global warming and climate change is 17.38 (57.94). In the present cross sectional study 92 (80%) responded that climate is changing. Only 60 (69%) respondents are aware about use of CNG in the vehicles reduces air pollution substantially. The above findings are supported by study

conducted by Pandve *et al* conducted study in Urban area that 92% urban population aware about climate change. (Pandve *et al*, 2011). Although the awareness of the climate change is good but they are unaware of the future consequences. It was also observed that graduate class of people of Pune city do not have clear idea about green house gases and ozone layer depletion. (Pandve, 2011)

In the present study male have 63.33% and female have 51.94 % awareness score which indicates that male have more awareness regarding climate change than females. A study conducted by Pandey found that there was no gender difference in the knowledge level among male and female. (Pandey and Nema, 2014)

Recycling method, use of solar energy, CNG vehicles still dream for the majority of the people. IPCC also finds that green house gases are directly responsible for climate change.

(IPCC, 2010) From the 116 respondents 53% answered that they are positively contributed to plantation of the tree whereas only 32% aware about solar energy is cheapest and most energy efficient source. According to study conducted by Jain Anjali at Madhya Pradesh, 80% of urban peoples are ready to take effective action such as economical usage of automobiles, fan, air conditioners etc (Jain Anjali and Jain Aditi, 2013)

There is positive correlation between awareness level and adaptive practices ($r= 0.678$). This study is supported by the study conducted by Moges and Daniel 2014. They found that gender, age and educational level and awareness level were not associated with adaptation practices of city of Gondar Administration Offices (Moges and Daniel, 2014)

CONCLUSION

There was lack of awareness among urban residents of Pune city regarding global warming and climate change. Media plays very important role in dissemination information. Simple measures like avoiding bio-mass as fuel, use of public transport for travelling, plantation of tree and increase the green belt is not practiced by urban public. Simple clear messages, repeated often, by a variety of trusted public health voices within a wider policy environment that supports greenhouse gas reduction behavior and healthy lifestyles. The government of India launched the ‘swacha bharat abhiyan’ is very motivating and proactive step in mitigating the issues related to climate

change. The people will see the result of this very innovative campaign in forthcoming years.

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