

A Study To Assess The Effect of Health Teaching on Knowledge Regarding Ill Effect of Air Pollution Among Residents in Selected Area

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ABSTRACT

Background: Air pollution is a growing public health problem that can lead to serious health issues such as respiratory and cardiovascular diseases. However, many residents have limited knowledge about its harmful effects and prevention. Health teaching can play an important role in improving awareness and promoting healthy practices.

Objective: The objective of the study was to assess the effect of health teaching on residents' knowledge regarding the ill effects of air pollution in a selected area.

Methods: The research method adopted for this study was quasi-experimental one group pretest post-test research design with quantitative approach. Non-probability sampling technique was used to select 100 residents from selected area. Tool consists of demographic variables, structured questionnaire on knowledge.

Result: Paired t-test was used for assessing effectiveness of health teaching program knowledge regarding air pollution and its ill effect among residents in selected area. Average knowledge score in pretest was 20.6 which increased to 21.9 in posttest. T-value for this test was 2.7 with 99 degrees of freedom. Corresponding p-value was small (less than 0.05), the null hypothesis was rejected. Average knowledge score in posttest was significantly more than that in the pretest.

Conclusion: The study concluded that it is evident that the health teaching program is significantly effective in improving the knowledge among residents regarding air pollution and its ill effect. More such health teaching programs can benefit public at large with health benefits.

KEYWORDS: Assess, Effect, Ill Effect, Air Pollution, Residents

INTRODUCTION

Air pollution has become a major global threat to human health. It refers to the presence of harmful substances—such as smoke, toxic gases, dust, vapours, and fine particles—in the atmosphere, which negatively affect humans, animals, plants, buildings, and monuments. Air pollution causes both short-term and long-term health problems. In the short term, it can lead to acute bronchitis and, in severe cases, even immediate suffocation. Long-term exposure is associated with conditions such as lung cancer, allergies, emphysema, bronchial asthma, and chronic bronchitis. Every year, nearly 9 million deaths are linked to human-made air pollution, making it one of the most serious global public health concerns.¹

Chronic asthma, reduced lung function, cardiovascular diseases, and heart-related deaths are also linked with prolonged exposure. The health effects caused by air pollution may include difficulty in breathing, wheezing, coughing, asthma and worsening of existing respiratory and cardiac conditions. These effects can result in increased rate of medication use, increased doctor or emergency room visits, more hospital admissions and premature death. The human health effects of poor air quality are far reaching, but principally affect the body's respiratory system and the cardiovascular system²

The problem is particularly alarming in developing countries due to high population density,

uncontrolled urban growth, and expanding industrial activities. The term air pollution can be referred when there is an excess of foreign matter in the air. That can be harm full to the man and his environment

Poor air quality is more common in regions with significant socioeconomic disparities and limited awareness of environmentally safe practices. Low-income families often rely on wood or other solid fuels for daily cooking and heating, resulting in continued exposure to polluted indoor air about three billion people worldwide still depend on such fuels every day.⁴

Pollution is the contaminants into an environment that causes instability, disorder, harm or discomfort to the ecosystem i.e. physical systems or living organisms. Pollution can take the large amount of chemical substances, or energy, such as noise, heat, or light energy. Pollutants, the elements of pollution, can be foreign substances or energies, or naturally occurring; when naturally occurring, they are considered contaminants when they exceed natural levels. Pollution is often classed as point source or nonpoint source pollution⁵.

Rapid industrialization, urban expansion, and increased use of motor vehicles contribute to worsening air quality in both urban and rural regions. In India and Nepal, the burning of biomass for household purposes remains a major source of indoor air pollution⁶

Women and young children are particularly vulnerable because they spend more time inside the home. Children under five often suffer from acute lower respiratory infections, while women are more prone to chronic obstructive respiratory disease (cord) and lung cancer.⁷

The health effects of air pollution are both immediate and delayed. The immediate effects are borne by the respiratory system, the resulting state is acute bronchitis the delayed commonly linked with air pollution are chronic bronchitis, lung cancer, bronchial asthma, emphysema, and respiratory allergies.⁸

The world health organization states that lung cancer, heart disease, and respiratory infections are all significantly impacted by air pollution it can exacerbate pre-existing heart and lung diseases and cause breathing problems, coughing, and wheezing. These problems may lead to an increased need for medication, hospital stays, and possibly premature death. The respiratory and cardiovascular systems are primarily impacted by poor air quality, and the effects vary based on the kind and quantity of pollution as well as an individual's health and heredity.⁹

Air pollution is a growing global public-health problem and is responsible for significant morbidity and mortality. Residents in many communities are exposed daily to pollutants from vehicles, industries, domestic fuel burning, and waste-disposal practices. Even with increasing environmental risks, public awareness regarding the ill effects of air pollution remains inadequate. Poor knowledge contributes to unsafe practices, higher exposure levels, and increased incidence of respiratory diseases such as acute and chronic bronchitis, bronchial asthma, emphysema, respiratory allergies, and lung cancer.

Health teaching is an effective community-health strategy to improve knowledge and promote preventive behaviour. Educating residents about air-pollution hazards can enable individuals to recognize risks early, adopt protective measures, and reduce health complications. It is therefore essential to evaluate whether structured health teaching significantly improves knowledge regarding the ill effects of air pollution among community residents.¹⁰

Praful Damor (2021) Study conducted with objectives: 1.To assess the knowledge regarding effects of air pollution on health among community people Gujarat. 2. To assess the attitude regarding effects of air pollution on health among community people in central Gujarat3. To find out the association between knowledge score regarding effects of air pollution on health with selected socio demographic

variables. Study conducted at central part of Gujarat and quantitative research approach at survey design was adopted to conduct the study. 60 Sample selected by convenience sampling technique. The data obtained was analyzed and interpreted in terms of the objectives of the study. A structured questionnaire was used to assess the knowledge and Likert scale was used to assess the attitude on effects of air pollution on health among community people. The result of the study showed that the 53% female and 47% male samples, highest percentage 91% are belongs to hindu, 1% Muslim, 3% Cristian, 4% are others, majority of people were age group of 26-35 years (33%), 15-25 years (20%), 36-45 years (20%), above 45 years (26.6%), 43% people received up to secondary level education, 91% people are Hindu, 71% people are self-employed, 18.3% people are living in nuclear family, 45% people having less than 5000rs income, 70% people living in pakka housing, 56.6% get knowledge regarding effects of air pollution on health from T.V. 2. The score of the study is mean (16.1) and standard deviation is (3.46). The study concluded that the overall knowledge and attitude about the effects of air pollution on health was average which suggested that people having average knowledge regarding effects of air pollution Group.¹¹

India experiences very high pollution levels, with cities like New Delhi among the most polluted in the world. Poor visibility often affects flights at New Delhi international airport. As we all know, the atmosphere is the life blanket of the earth. It is therefore essential that we know more about the atmosphere and the way in which it is polluted. Air is considered safe when it contains no harmful dust and gases.

OBJECTIVES

1. To assess the level of knowledge regarding air pollution and its ill effect among residents in selected area.
2. To evaluate the effect of health teaching program knowledge regarding air pollution and its ill effect among residents in selected area.
3. To find association of knowledge with selected demographic variables.

MATERIALS AND METHODS

3.1 Study Design:

A quasi-experimental, one-group pretest-posttest design was adopted for this study

3.2 Study Setting and Population:

The study was conducted among residents of selected area.

3.3 Sample Size and Sampling Technique:

A total of 100 residents were selected using non - probability purposive sampling based on inclusion criteria.

3.4 Sampling Criteria

Inclusion criteria

Those who are available while data collection.

Those who understand Marathi and English.

Exclusion criteria

Those not willing to participate in the study.

Those who doesn't understand Marathi and English language.

3.5 Hypothesis

H₀: There is no significant difference between pre-test and post-test knowledge score.

H₁: There is significant difference between pre-test and post-test knowledge score.

3.6 Ethical Aspects

Ethical clearance was obtained from Institutional Ethics Committee. Participants of the study were explained about the study, informed consent was obtained.

RESULTS

Section I: Description of samples (residents) based on their personal characteristics

Table 1: description of samples (residents) based on their personal characteristics in terms of frequency and percentage **N=100**

Demographic variable	Freq	%
Age		
21-30 years	54	54%
31-40 years	29	29%
41-50 years	16	16%
51-60 years	1	1%
Gender		
Male	47	47%
Female	53	53%
Education		
Primary	28	28%
Graduate	33	33%
Secondary	33	33%
Postgraduate and above	6	6%
Occupation		
Private employee	91	91%
Government employee	9	9%
Type of family		
Nuclear	39	39%
Joint	60	60%
Extended	1	1%
Residence		
Urban area	100	100%
Religion		
Hindu	96	96%
Muslim	4	4%

Table 1 shows that, 54% of the residents had age 21-30 years, 29% of them had age 31-40 years, 16% of them had age 41-50 years and 1% of them had age 51-60 years. 47% of them were males and 53% of them were females. 28% of them had primary education, 33% of them had graduation. 33% of them had secondary education and 6% of them had post-graduation and above. 91% of them were private employees and 9% of them had government employees. 60% of them had joint family, 39% of them had nuclear family and 1% of them had extended. All of them were from urban area. 96% of them were Hindu and 4% of them were Muslim.

Section II: Analysis of data related to the knowledge regarding air pollution and its ill effect among residents in selected area

N=100

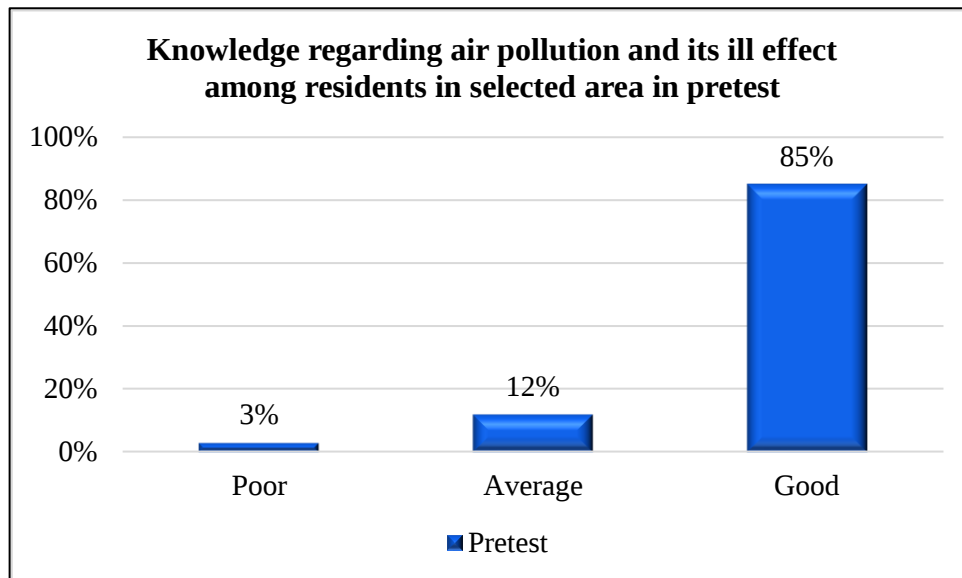


Fig: 1 Knowledge regarding air pollution and its ill effect among residents in selected area

Fig 1 shows that, in pretest, 3% of the residents had poor knowledge, 12% of them had average knowledge and 85% of them had good knowledge regarding air pollution and its ill effect.

Section III

Analysis of data related to the effect of health teaching program knowledge regarding air pollution and its ill effect among residents in selected area

N=100

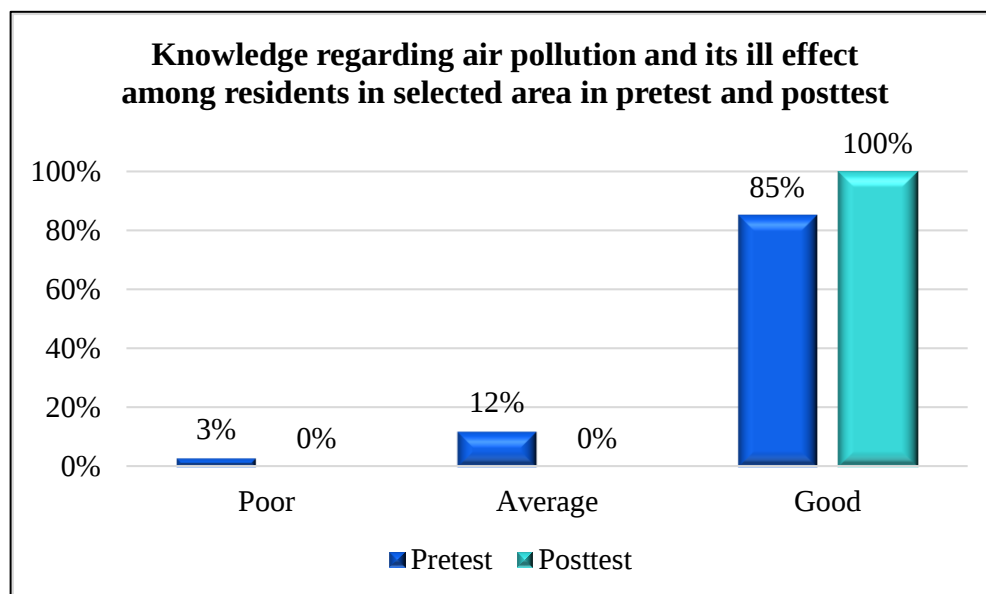


Fig: 2 Effect of health teaching program knowledge regarding air pollution and its ill effect among residents in selected area

Fig 2 shows that, in pretest, 3% of the residents had poor knowledge, 12% of them had average knowledge and 85% of them had good knowledge regarding air pollution and its ill effect. In posttest, all the residents had good knowledge regarding air pollution and its ill effect. This indicates that the knowledge among residents regarding air pollution and its ill effect improved remarkably after the health

teaching program.

Table 2: paired t-test for the effectiveness of health teaching program knowledge regarding air pollution and its ill effect among residents in selected area N=100

	Mean	SD	T	Df	P-value
Pretest	20.6	4.2	2.7	99	0.005
Post-test	21.9	2.0			

Table 2 shows that paired t-test was used for assessing effectiveness of health teaching program knowledge regarding air pollution and its ill effect among residents in selected area. Average knowledge score in pretest was 20.6 which increased to 21.9 in posttest. T-value for this test was 2.7 with 99 degrees of freedom. Corresponding p-value was small (less than 0.05), the null hypothesis is rejected. Average knowledge score in posttest was significantly more than that in pretest. It is evident that the health teaching program is significantly effective in improving the knowledge among residents regarding air pollution and its ill effect.

Table 3: Knowledge item analysis

N=100

Knowledge	Pre test		Post test	
	Freq	%	Freq	%
Air pollution refers to the presence of substances in the air that are:	87	87%	100	100%
Pollutants can be in the form of:	86	86%	98	98%
Which of the following is a gaseous pollutant?	81	81%	88	88%
Indoor air pollution can occur due to:	84	84%	99	99%
Air pollution affects mainly which body systems?	88	88%	99	99%
Which disease is linked to long-term exposure to air pollution?	88	88%	98	98%
The term “air pollution” is used when there is:	82	82%	88	88%
Immediate effects of air pollution include:	74	74%	32	32%
Delayed effects of air pollution include:	83	83%	90	90%
Which pollutant is an example of a particulate?	75	75%	72	72%
Cardiovascular disease linked to air pollution includes:	83	83%	99	99%
Asthma is associated with:	90	90%	97	97%
A common chronic effect of air pollution is:	85	85%	95	95%
Indoor pollutants include:	91	91%	94	94%
The respiratory system is affected because:	95	95%	98	98%
Air pollution contributes to:	86	86%	68	68%
Which pollutant is a nitrogen-based gas?	89	89%	85	85%

Soot can be classified as:	70	70%	92	92%
Pneumonia risk increases due to:	84	84%	81	81%
Which of the following is not a health effect of air pollution?	84	84%	94	94%
Air pollution is considered a threat because:	78	78%	95	95%
A delayed cardiovascular effect of air pollution is:	79	79%	77	77%
One major source of indoor air pollution is:	76	76%	88	88%
Acute bronchitis is classified as:	71	71%	82	82%
Emphysema is:	74	74%	82	82%

Table 3 presents the frequency and percentage of the correct responses by residents to each knowledge item in pretest and posttest. It is clear from this table that the correct responses to each knowledge item improved remarkably in posttest as compared to those in pretest. Health teaching program is effective in improving the knowledge among residents regarding air pollution and its ill effect.

Section IV: Analysis of data related to association of knowledge among residents regarding air pollution and its ill effect with demographic variables

Table 4: fisher's exact test for the association of knowledge/e among residents regarding air pollution and its ill effect with demographic variables **N=100**

Demographic variable		Knowledge			P-value
		Poor	Average	Good	
Age	21-30 years	2	8	44	0.550
	31-40 years	1	4	24	
	41-50 years	0	0	16	
	51-60 years	0	0	1	
Gender	Male	3	4	40	0.133
	Female	0	8	45	
Education	Primary	2	5	21	0.444
	Graduate	0	5	28	
	Secondary	1	2	30	
	Postgraduate and above	0	0	6	
Occupation	Private employee	2	12	77	0.215
	Government employee	1	0	8	
Type of Family	Nuclear	1	3	35	0.644
	Joint	2	9	49	
	Extended	0	0	1	
Religion	Hindu	2	12	82	0.181
	Muslim	1	0	3	

Table 4 shows that, since all the p-values were large (greater 0.05), none of the demographic variables were found to have significant association with the knowledge among residents regarding air pollution and its ill effect.

CONCLUSION

There was significant difference observed in knowledge scores in the post test. This indicates that the health teaching program has effectively improved knowledge among residents regarding ill effects of air pollution. None of the demographic variables were found to have significant association with the knowledge among residents regarding air pollution and its ill effect.

DISCUSSION:

Jasneet kaur conducted a research with objective was to assess the level of awareness and knowledge among the people regarding air pollution and its prevention in selected urban areas of Pune. As well to find the level of knowledge on AQI and to find the association between knowledge among the People regarding air pollution and its prevention in selected urban areas of Pune city. The Methods for this study was a non-experimental descriptive design with quantitative approach, was adopted to assess the knowledge on air pollution and its prevention and Air Quality index among people residing in urban areas of Pune city. It includes 250 samples from selected areas. Non probability convenience sampling technique was adopted in this study. The result of this study showed that the knowledge level was identified as; 20.8% of the people have a poor knowledge level on air pollution, its prevention and air quality index; 76% of the people have an average knowledge regarding air pollution, its prevention and air quality index and only 3.2% of the people have good knowledge regarding air pollution, its prevention and air quality index. By using the paired t test formula, the t value is 0.05. The demographic variable of education alone has an association with 0.001 as the closest value to the average. The other demographic variables of gender, age and employment do not have an association with the t value, as they are more than the average with findings of 0.119, 0.643 and 0.481 respectively.¹²

RECOMMENDATIONS

- Replication of same study on a large sample may help to draw conclusions that are more definite and can be generalized to a larger population.
- Various teaching approaches can be used to perform studies.
- More research is needed to understand the air pollution ill effects.
- Implement community engagement and outreach programs to raise awareness about air pollution. This can involve collaboration with local community leaders, health workers, and non-governmental organizations to ensure that information reaches a wider audience.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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