

## **A Study to Assess the Effectiveness of Structured Teaching Programme Regarding Knowledge on Effects of Air Pollution on Health Among High School Students in Selected High School in Bangalore.**

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**Abstract:** The present study is conducted to evaluate the effectiveness of structured teaching programme on effect of air pollution regarding Knowledge among the high school students in selected high school areas of Bangalore. In the present study, evaluative approach was selected. One group pre and post test design was adopted. The Structured Knowledge Questionnaire on the effects of air pollution on health, was developed to collect the data. Pilot study was conducted from 20.6.2007 to 26.6.2007 at Mirambika school for new age J.P. Nagar of Bangalore. The final study was conducted from 19<sup>th</sup> July 2007 to 26<sup>th</sup> July 2007 at the Oxford secondary school in J.P.Nagar area of Bangalore with sample size of 60 high school (10<sup>th</sup> standard) students, selected by simple random sampling technique and the data collected were analyzed and interpreted based on descriptive and inferential statistics. As a result the overall mean knowledge score in pre test was 48.6 % with standard deviation of 12.2 %. The overall mean knowledge score in post test was 74.6% with standard deviation of 8.1% the obtained 't' value 22.63 is greater than the table value and found to be highly significant at the level of  $P < 0.005$ . It is observed that there was an increase in the knowledge level regarding the effect of air pollution on health after the intervention. This finding evidenced that the structure teaching programme was effective in enhancing the knowledge of high school (10<sup>th</sup> standard) students regarding the effects of air pollution on health

**Keywords:** The structure teaching programme – The effect of air pollution on health – The High school (10<sup>th</sup> standard) students.

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### **I. Introduction**

#### **“Life depends up on pure air”<sup>1</sup>**

Air is important necessity in the life of man, animal, plants. Every creature on the earth depends up on air for its survival, for maintenance of healthy life, pure and clean atmospheric air is necessary. Air is the mixture of gases in the composition of which is as oxygen 20.96%, Nitrogen 78%, and carbon dioxide is 0.03%. The balance is made up of other gases such as argon, neon, and xenon etc.<sup>2</sup>

Air pollution may be defined as the presence of substances in air at concentrations,

durations and frequencies that adversely affects human health, human welfare or the environment.<sup>3</sup> Air is said to be polluted when physical, chemical and biological agents are present in it to such an extent that they become harmful to man. Pollution of external atmosphere by chemical agents and smoke is a growing menace in large industrial towns. More than 100 pollutants arising from different sources are added into the air every day. The problem of air pollution has reached a critical level in big cities in many countries.<sup>4</sup>

Air pollution is major problem in the world. About 3 million premature deaths in the world occur each year due to air pollution. The highest numbers are assessed in India. Human health especially children (aged 4 – 18 years) are more affected by air pollution, about 41.33% household screened. 1089 children reported current asthma, 60,000 heart related death and 500,000 adult cases with the lung cancer.<sup>4</sup>

The world health organization said that “sick building syndrome” is suffering from indoor air pollution. This syndrome is characterized by eye, nose and throat irritation; a sensation of dry mucous membranes and skin, erythematic, mental fatigue, headache. A high frequency of airway infections are, cough, hoarseness, wheezing, itching and non specific hypersensitivity and nausea and dizziness. This shows the effect of air pollution on over all health of a person<sup>5</sup>

### **II. Review of Literature**

**National Institute of Occupational Health, Ahmedabad (2000)** Conducted a study on air pollution of 2,031 children and adults in five megacities. Out of 1,852 children tested for blood lead level, 51.4% had blood lead above 10  $\mu\text{g}/\text{dL}$ . The percentage of children having 10  $\mu\text{g}/\text{dl}$  or higher blood lead level ranged from 39.9% in Bangalore to 61.8% in Mumbai. In adults 40.2% showed blood lead level above 10  $\mu\text{g}/\text{dL}$ .<sup>15</sup>

**Chittaranjan National Cancer Institute, Kolkata , (2000)** To investigate the impacts of air pollutants on the Kolkata population, CNCI Kolkata, University of Calcutta, and Department of Environment of the West Bengal

government jointly conducted a study during 1996-2001. In this study 1,310 adult individuals from all over the Kolkata metropolitan area and 200 individuals from rural areas were examined for respiratory symptoms, impairment in lung function, alveolar macrophages count, abnormal sputum cytology, activation of excretory function of alveolar macrophages, abundance of iron laden alveolar macrophages, alveolar macrophages apoptosis, genotoxic effect, hematological changes, metabolic disorders and behavioral and hormonal changes. The study demonstrated a direct relationship between status of air pollution and, alveolar macrophage response.<sup>6</sup>

### III. Material & Method

The study was conducted in The Oxford Secondary School in J. P. Nagar first phase of Bangalore. The selection of these Schools was done on the basis of geographical proximity, feasibility of conducting study and availability of sample. This school has good physical set up, good cross ventilation .the 10<sup>th</sup> standard student are setting in two rooms ,each room have students , the comfortable benches also provided by school management. Probability Sampling -Simple random sampling technique was used to select the sample of the present study. The research design selected for this study is Quasi-experimental one group pre and post-test design is used in the study.. The survey is carried out for providing an accurate portrayal of knowledge, of high school students regarding effects of air pollution on health. The sample of the study consists of 60(10<sup>th</sup> standard) students in the Oxford secondary School students in J. P. Nagar 1st phase area of Bangalore. demographic section consists of 10 items on personal demographic variables like age, sex, ordinal position, number of sibling, economic supporter, language known, religion, type of family, number of member in family, and source of information. The structured questionnaire consists of 35 items, which deals with Knowledge items on the effects of air pollution on health. The items were developed as to cover four selected aspects of effect of air pollution on health .The selected aspects are General information about air (6 items), Air pollution school(15items) , Health effect trough pollution(8items) and aspect of prevention and control of air pollution (6 items) the total possible score is 35. Validity was ensured by the experts in the field of Nursing departments. 10 experts comprising of 8 nurse educators in the field of Community health nursing and one for high school principal and one from Statistician for the content validity. The structured questionnaire was administered to 6, (10<sup>th</sup> standard) students of Bangalore. The reliability was established by using split half technique. Pre testing of the structured questionnaire was done to check the clarity of the items, their feasibility and practicability. It was administered to six 10<sup>th</sup> standard students. The sample chosen were similar in characteristic to those of the population under study. It was found that it took 30 – 40 minutes to complete the questionnaire, and it was found that the items simple to comprehend. Structured teaching programme was developed on the effect of air pollution on health . The content areas included were General information about air, Air pollution, Health effect through air pollution. Aspects of prevention and control of air pollutions. students should be educated on health promotion and disease prevention by early deduction of the disease. The effectiveness of the structure teaching program is established can be used as an illustrative information mode to the student as well as clients and their family members and community. Every student should be encouraged in providing information to the clients and the community for which they have to be prepared properly.

### IV. Results

The mean post-test knowledge scores was higher than the mean pre test scores, with 't' = 6.92 being significant at 0.05 level. The findings of the data reveal that this study is feasible. The findings of the present study revealed that the majority of the Respondents 65% were in the Category of 13-15 years of age and number of respondents 39, the majority of the Respondents 35% in the Category of 15.1-17 years of age and number of respondents 21%.

Section II: Knowledge of the High School students on Effect of air pollution on health by pre and post test score

**Table-I :** Aspect wise pre test mean knowledge score of Respondents on Effect of air pollution on health .

Table -1 It focusing the pre test mean knowledge of high school students on effect of air pollution on health. . Four aspects having 35 statement , the first aspect have 6 statement the maximum score also 6,

**Table -1:** Comparison of knowledge of the High school student by pre and post test .

No.	Aspects	Statements	Knowledge scores (%)						Paired "t" Value
			Pre-test		Post-test		Enhance- Ment		
			Mean	SD	Mean	SD	Mean	SD	
I	General information about air	6	61.1	16.4	80.8	11.4	19.7	14.2	10.75*
II	AIR pollution	15	51.2	14.9	79.4	9.7	28.2	14.3	15.28*
III	Health effect through pollution	8	37.1	14.5	63.1	17.4	26.0	15.7	12.83*

IV	Prevention & control of air pollution	6	44.7	21.8	71.4	17.9	26.7	17.9	11.55*
	Combined	35	48.6	12.2	74.6	8.1	26.0	8.9	22.63*

\* Significant at 0.005 % level

Table -1 is focusing the comparison of knowledge of high school students on effect of air pollution on health by pre and post test comparing the mean, standard deviation, and t' valu of pre and post test aspects wise. Four aspects having 35 statement , the first aspect have 6 statement the knowledge scores in pre test mean percentage 6.1% , SD 16.4 % and post test mean 80.8 % and SD 11.4% and the enhancement mean 19.7% and SD 14.2 % and t' value is 10.75 is significant at 0.005 level. the second aspect have 15 statement the knowledge scores in pre test mean percentage 51.2% , SD 14.9 % and post test mean 79.4 % and SD 9.7 % and the enhancement mean 28.2% and SD 14.3 % and t' value is 15.28 is significant at 0.005 level.

the third aspect have 8 statement the knowledge scores in pre test mean percentage 37.1 % , SD 14.5 % and post test mean 63.1 % and SD 17.4 % and the enhancement mean 26 % and SD 15.7 % and t' value is 12.83 is significant at 0.005 level. . the fourth aspect have 6 statement the knowledge scores in pre test mean percentage 44.7% ,and SD 21.8 % and post test mean 71.4 % and SD 17.9 % and the enhancement mean 26.7 % and SD 17.9 % and t' value is 11.55 is significant at 0.005 level. . the combined aspects 35 statement the knowledge scores in pre test mean percentage 48.6% ,and SD 12.2 % and post test mean 74.6 % and SD 8.1 % and the enhancement mean 26 % and SD 8.9 % and t' value is 22.63 is significant at 0.005 level.

### V. Discussion

**All India Institute of Medical Sciences, Delhi (2001)** A survey was conducted on air pollution by AIIMS Delhi, on 200 school children in residential and commercial areas of Delhi. It was observed that blood lead levels among 56% of school going children in residential areas and 72% in commercial areas had elevated blood lead levels More than 10 micrograms per deciliter (µg/dL). In another survey it was found that IQ levels of children with low blood lead levels was higher than those with high blood lead levels .AIIMS has also studied the correlation of outdoor air pollution and emergency visits during 1997-98. Emergency visits of asthma, chronic obstructive airways disease, and acute coronary events increased by 21.3percent, 24.9 percent and 24.3 percent, respectively, on account of higher acceptable level of air pollutants .<sup>8</sup>

The pre test mean knowledge of high school students on effect of air pollution on health. . Four aspects having 35 statement , the first aspect have 6 statement the maximum score also 6, and mean score 3.67 , knowledge scores in pre test mean percentage 61.1% , Standard deviation 16.4 % . The Second aspect have 15 statement the maximum score also 15, range 4-13 , and mean score 7.68 , knowledge scores in pre - test mean percentage 51.2%, Standard deviation 14.9%. the Third aspect have 8 statement the maximum score also 8, and mean score 2.97 , knowledge scores in pre - test mean percentage 37.1% , and Standard deviation 14.5 % , the fourth aspect have 6 statement the maximum score also 6, and mean score 2.68 , knowledge scores in pre -test mean percentage 44.7% , and Standard deviation 21.8 % . , the combined aspect have 35 statement the maximum score also 35,and mean score 17.00 , knowledge scores in pre test mean percentage 48.6% ,and Standard deviation 12.2 % . These findings are consistence with the finding of W.jomes brander man (2004), Recharh Ingham (2002). This study reveals that mostly students were aware of effect of air pollution on health.

The finding of study is focusing the post test mean knowledge of high school students on effects of air pollution on health. Four aspects having 35 statement , the first aspect have 6, mean score 4.85, knowledge scores in post test mean percentage 80.8 % ,and standard deviation 11.4 % . The Second aspect have 15 statement and mean score 11.92 , knowledge scores in post test mean percentage 79.4 % , and standard deviation 9.7 % . The Third aspect have 8 statement, and mean score 5.05 , knowledge scores in post test mean percentage 63.1 % , and standard deviation 17.4 % .,the four aspect have 6 statement, and mean score 4.28 , knowledge scores in post test mean percentage 71.4 % , and standard deviation 17.9 % . , the combined aspect have 35 statement and mean score 26.10, knowledge scores in post test mean percentage74.6%,and standard deviation 8.1%. The findings of the present study suggest that the overall mean knowledge score in pre test was 48.6% with standard deviation of 12.2% The overall mean knowledge score in post test was74.6% with standard deviation of 8.1%.the obtained 't' value 22.63% is greater than the table value and found to be highly significant at the level of P<0.005. This indicates that the structure teaching program was effective in enhancing the knowledge of High school students regarding on effect of air pollution on health. Hence the research hypotheses stated that there will be significant difference between pre and post test knowledge scores regarding effect of air pollution on health was accepted.

These findings are consistence with the finding of Geroge Myers (2004), and India Together News (2007). This study reveals that the structure teaching programe is effective to the students to improve the knowledge of effect of air pollution on health.

## **VI. Conclusion**

In present study in socio- demographic data , the majority of participants, in the age group that 65% were belong to age group of 13-15 years. In sex group 51.7% were Male. In ordinal position 68.3 % were first ordinal position. In number of sibling 53.3% had one sibling. The economic supporter 95% belong to father group. In language known 93.3% in English group. The number of family members 70% had four members. Religion group Hindu had 86.7%. the nuclear family 95% and The Television / Radio had 76.7% majority.

- The knowledge were assessed through structure questioner method, the respondents had 63% inadequate, 36.7 moderate in pre test and in post test 50% moderate and 50% adequate.
- The mean knowledge scores assessed by pre and post test of respondents . in pre test mean 17 and knowledge percentage 48.6% mean, 12.2% standard deviation in post test mean 26 and knowledge 74.6% mean, 8.1 SD. t-value 22.63\*.

## **Implications**

The findings of the study have implications in various areas of nursing i.e., nursing practice, nursing education, nursing administration and nursing research.

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