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Research Article

A Quasi-experimental Study to Assess Effectiveness of Information Booklet on Prevention of Respiratory Problems among Traffic Police in Metropolitan City

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Abstract

Introduction: Humans will never fit this environment; hence, perfect health is impossible. Health is the ability to adjust to changing life conditions. Air-filled and spongy lungs are on either side of the chest. The heart and mediastinum divide the thoracic cavity into two chambers. Pulmonary ventilation exchanges air with the lungs' alveoli.

Aim: The aim of the study was to study a Quasi-experimental Study to Assess Effectiveness of Information Booklet on Prevention of Respiratory Problems Among Traffic Police in Metropolitan City.

Materials and Methods: The study employed a quantitative descriptive evaluative research design with one group pre-test and post-test research design. The sample included 60 traffic cops who met the inclusion criteria for the sample selection. The approach of non-probability convenient sampling was used. The Paired *t*-test was used to analyses the influence of an education booklet on traffic officers' knowledge and behaviors regarding selected components of respiratory issue prevention.

Results: The pre-test mean of traffic cop knowledge was 6.03, while the post-test mean was 19.85. The estimated *t* value 35 is more than the tabulated value 2.0 at the 5% level of significance. The mean of the traffic police procedures collected before the test was 1.68 and it jumped to 3.90 after the test. The estimated *t* value 14 is bigger than the tabulated value 2.0 at the 5% level of significance.

Conclusion: Knowledge and practices in relation to selected aspects of prevention of respiratory problems among traffic police. The information booklet helped to increase the knowledge and practice of traffic police.

Keywords: Assess, Effect, Information booklet, Prevention, Respiratory problems

Introduction

India has 18% of the global population and increasing burden of chronic respiratory disease. A systematic understanding of the distribution of chronic respiratory disease and their trends over time is not readily available for all the states of India. The contribution of chronic respiratory disease in India increased from 4.5% in 1990 to 6.4% in 2016.[1]

According to latest WHO data published in 2017, respiratory disease is the leading cause of death and disability in the world. About 65 million people suffer from COPD and 3 million died from it in each year. About 334 million people suffer from Asthma. Pneumonia kills millions of people annually. Over 10 million of people develop tuberculosis and 1.4 million die from it each year, making it most common lethal infectious disease.[2,3]

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Air pollution from vehicles is main source of pollution in capital city. Road traffic has the potential to significantly increase emission of pollutant such as carbon monoxide, oxide of nitrogen, particular matter, and hydrocarbon. These pollutants can induce harmful effect on health. Road traffic exposes traffic police to determined effect of air pollution on respiratory health. Across the world cigarette smoking is the most commonly encountered risk factor for COPD.[4] Cigarette smokers have high prevalence of respiratory symptoms and lung function abnormalities. Other type of tobacco (Cigar, pipe, and water pipe) and marijuana is also risk factors for COPD, passive exposure to smoke may also contribute to respiratory symptoms by increasing lung's total burden of inhaled particles and gases.[5]

Bhaskar Hari Sharma (June 17, 2017) published study on one in five traffic police has respiratory problems at New Delhi. Pulmonary function test was performed in this out of 200 participants, 35–40% suffered from breathing problems. Lung infection, asthma, and throat irritation were common problems detected[6]

Karki *et al*., (2015) conducted study on prevention of respiratory problems in traffic police, in India. In this study, the selected two groups: In one group, they selected 20–29 years old (Age) participants and in another group, they selected 30–39 years old (Age) participants. In this study, researcher found that only 19.3% of policemen are having adequate knowledge and only 4.8% policemen are taking measures to prevent respiratory problems.[7]

Materials and Methods

Research approach

The research method adopted for the present study is quantitative descriptive approach.

Research design

In the present study, the investigator selected a one group pre-test and post-test.

Variables

- Dependent Variables: In the present study, dependent variable is knowledge on prevention of respiratory problems among traffic police
- Independent Variables: Independent variable is information booklet on prevention of respiratory problems among traffic police.

Population

In this study, population is traffic police of metropolitan city.

Target population

Target population selected for this study are traffic police who are not previously diagnosed with respiratory problems.

Accessible population

In this study, sample consisted of traffic police working in urban areas.

Sampling technique

The sampling technique used in this research study is non-probability purposive sampling technique.

Sample size

In this study, the study samples consisted of the 60 traffic police.

Criteria for sample selection

Inclusion criteria

The following criteria were included in the study:

- Traffic police working in Metropolitan City
- Traffic police who are willing to participate in this study
- Those who are exposed to air pollution.

Exclusion criteria

- Traffic police those who already have respiratory problems was excluded from the study.

Data analysis

- The collected data were coded, tabulated, and analyzed using descriptive statistics (mean, percentage, and standard deviation). The researcher planned to analyses the data in the following manner.
- The demographic data will be analyzed in terms of frequency and percentage and will be presented in the forms of tables and graphs.
- Knowledge and practices will be analyzed using frequency and percentage and will be presented in the forms of tables and graphs.
- One-way analysis of variance (ANOVA) will be used to assess correlation of knowledge with selected demographic variables.

Data management and analysis procedure

- Data analysis to be done using descriptive and inferential statistics.
- Consolidation and organization of data.
- Frequency and percentage for the analysis of demographic characteristics of the respondent.
- Mean and standard deviation for pre- and post-test scores in knowledge and practice regarding prevention of respiratory problems among traffic police in Metropolitan City.
- The "*t*" test for observation of significant level of difference in pre- and post-test score on knowledge regarding prevention of respiratory problems.

Results

The data were entered into master sheet for tabulation and statistical processing, the obtained data were analyzed, organized, and presented under the following headings:

- SECTION I: Description on demographic variable of the traffic police.
- SECTION II: Description of knowledge score regarding prevention of respiratory problems among traffic police.

- SECTION III: Description of evaluation of effectiveness of information booklet
- SECTION IV: Description of association of demographic variable of traffic police with pre-test knowledge score.

Section I

Description of the demographic variables of the traffic police

Table 1 shows that age group of traffic police is maximum, 42 (70%) were above 40. Table 2 reveals that traffic police 58 (96.6%) were male and 2 (3.3%) were female. Table 3 reveals that is 30 (50%) are up to SSC. In Table 4, only 3 (5%) are having 0–5 years of experience, 14 (23%) has 6–10 years of experience, 20 (33%) traffic police has 11–15 years of experience, and 23 (38%) has above 15 years of experience. Table 5 specifics that 47 (78%) have health problems such as diabetes mellitus, and hypertension. Table 6 explain about addiction most of the, that is., 39 (65%) are having chewing tobacco, smoking 10 (17%). In Table 7, only 5 among 60 (48.33%) had family history of respiratory problems.

Section II

Description of knowledge and practice score regarding prevention of respiratory problems among traffic police

Table 2 explains pre- and post-assessment of knowledge levels regarding prevention of respiratory problems among traffic police in Metropolitan City before and after administration of information booklet. Pre-test explains about 21 (35%) had poor knowledge. About 38 (63.33%) had average knowledge and only 1 among 60 (1.66%) had good knowledge. After administration of information booklet, the knowledge in post-test explains that about 2 (3.33%) had good knowledge, 27(45%) had very good knowledge, and 31 (51.66%) had excellent knowledge.

Table 3 explains pre- and post-assessment of practices levels regarding prevention of respiratory problems among traffic police in Metropolitan City before and after administration of information booklet. Pre-test explains that about 45 (75%) had poor practices and only 15 (25%) had good practices whereas in post-test, 11 (18.33%) had poor practices and maximum 49 (81.66%) had good practices.

Table 1: Percentage wise distribution of traffic police on prevention of respiratory problems according to demographic characteristics *n*=60

Demographic characteristics	Frequency	Percentage
Age		
18–24	0	0
25–32	2	3.33
33–40	16	26.66
Above 40	42	70
Gender		
Male	58	96.67
Female	2	3.33
Educational Qualification		
SSC	30	50
HSC	20	33
Graduation	9	15
Post-graduation	1	2
Years of experience		
0–5 years	3	5
6–10 years	14	23
10–15 years	20	33
Above 16 years	23	38
Health problems		
Yes	47	78
No	13	22
Addiction		
Chewing tobacco	39	65
Smoking	10	17
Alcoholism	8	13
No Addiction	3	5
Family history of respiratory problems		
Yes	5	48.33
No	55	51.67

Section III

Description of evaluation of effectiveness of information booklet

In Table 4, the calculated "t" value was found to be 34.626 for knowledge. As the calculated "*t*" value is greater than the table "*t*" value 2.00 at 0.05 level of significance with the degree of freedom being 59, so the null hypothesis ($H0_a$) is rejected and alternate hypothesis ($H1_a$) is accepted. This shows that there is a statistically significant difference in the mean of pre- and post-test knowledge of the sample at 0.05

Table 2: Assessment of overall knowledge score *n*=60

Overall knowledge level	Range	Pre-test		Post-test	
		F	%	F	%
Poor knowledge	0–5	21	35	0	0
Average knowledge	06-Oct	38	63.33	0	0
Good knowledge	Nov-15	1	1.66	2	3.33
Very good knowledge	16–20	0	0	27	45
Excellent knowledge	21–25	0	0	31	51.66

Table 3: Assessment of overall practice *n*=60

Overall knowledge level	Range	Pre-test		Post-test	
		F	%	F	%
Poor practice	0–2	45	75	11	18.33
Good practice	0–3	15	25	49	81.66

Table 4: Comparison of pre-test and post-test mean knowledge score *n*=60

Knowledge comparison	Mean	SD	t value	Table "*t*" value	*P*-value
Pre-test	6.083	1.618	34.626	2	0.05
Post-test	19.85	2.34			

Table 5: Comparison of pre-test and post-test mean practice score *n*=60

Practices comparison	Mean	SD	*t*-value	Table "*t*" Value	*P*-value
Pre-test	1.683	1.066	14.045	2	0.05
Post-test	3.9	0.6298			

Table 6: Association of demographic variable of traffic police with pre-test knowledge scores-gender *n*=60

S. No.	Demographic variable of traffic police	*n*	Mean	df	*t*-value	Table "*t*' Value	*P*-value
1	Gender			59	22.237	2	0.05
	Male	58	0.9667				
	Female	2	0.0425				

Table 7: Association of demographic variable of traffic police with pre-test knowledge scores-health problems (*n*=60)

S. No.	Demographic variable of traffic police	*n*	Mean	df	*t*-value	Table "*t*' Value	*P*-value
1	Health Problems			59	8.784	2	0.05
	Yes	47	0.7833				
	No	13	0.2167				

significant levels. These results support the effectiveness of information booklet in the improvement of knowledge score regarding prevention of respiratory problems among traffic police in metropolitan city.

The calculated "*t*" value was found to be 14.045 for knowledge. As the calculated "*t*" value is greater than the table "*t*" value 2.00 at 0.05 level of significance with the degree of freedom being 24, so the null hypothesis ($H0_a$) is rejected and alternate hypothesis ($H1_a$) is accepted. This shows that there is a statistically significant difference in the mean of pre- and post-test knowledge of the sample at 0.05 significant levels. These results support the effectiveness of information booklet in the improvement of knowledge score regarding prevention of respiratory problems among traffic police in metropolitan city.

Section IV

Description of association of demographic variable of traffic police with pre-test knowledge score

Table 6 displays association of pre-test knowledge regarding prevention of respiratory problems with demographic variables of gender of traffic police. Based on the "*t*" test for unpaired sample the calculated "*t*" value for gender is 22.237. The calculated "*t*" value for gender is more than their respective "*t*" table value at 2.000. Hence, the null hypothesis (H_{0b}) is rejected for gender. This indicates that traffic police knowledge is dependent on gender.

Table 7 displays association of pre-test knowledge regarding prevention of respiratory problems with demographic variables of health problems of traffic police. Based on the "*t*" test for paired sample, the calculated "*t*" value for prevention of respiratory problem is 8.784. The calculated "*t*" value for gender is more than their respective *t* table value at 2.000. Hence, the null hypothesis (H_{0b}) is rejected for gender. This indicates that traffic police knowledge is dependent on health problems.

Discussion

Suchiral *et al*. (May 21, 2019) conducted cross-sectional study of respiratory and associated morbidities among traffic police personnel in Aurangabad City. In these study, sample size was 100. The prevalence chronic respiratory morbidity was 28%. Out of the 100 police personnel, only two reported the use of an appropriate respirator during their duty hours. Of those who reported to use of face masks, 97% of them used only some kind of face barriers like kerchiefs or disposable masks that do not offer adequate protection. The high prevalence of respiratory morbidity in traffic policemen is a matter of concern since it may be due to their occupational exposure to vehicular exhaust-related air pollution.[8]

Sridher *et al*. (July 4–September 2017) conducted study on health status of traffic police in Chennai City. It was cross-sectional study among 139 traffic police. The study result reveals that 17 (12.5%) of traffic policemen suffers from respiratory problems. Conclusion of the study was regular screening and health education need to be implemented.[9]

According to estimates from the Global Burden of Disease study, COPD was prevalent in more than 300 million people in 2013. The disease burden and its financial impact is predicted to increase, mainly due to population aging. Several studies reported on the prevalence of COPD. The prevalence of COPD ranges between 15–20% and is higher in men than in women. While tobacco smoking is a major risk factor for COPD, only approximately 20% of smokers develop the disease. More evidence is rising to suggest that other risk factors such as air pollution, respiratory infections, poor nutritional status, chronic asthma, impaired lung growth, poor socioeconomic status, and genetic factors are also important for disease development. About 15–20% of COPD cases are due to occupational exposures to pollutants at the workplace, and about 50% of subjects who died from COPD in developing countries have been exposed to biomass smoke during lifetime.[5,10,11]

Nair *et al*., (August 4, 2016), conducted cross-sectional studies on carbon dioxide exposure among traffic police officer working in traffic dense region of Southern India. In this study, researcher has included non-smoking traffic police age group between 30 and 50 years and those who worked more than 2 years. In this, they have collected venous blood sample. In this study, among 76.5% of traffic police

had increased CO_2 by ≥2.5%. Increased CO2 in blood means hypercapnia.[12]

Finding of the present study revealed that the mean pre-test knowledge score was 23.88±2.98 whereas the mean post-test knowledge score was 47.64±2.32. A significant association was found between the pre-test knowledge score with the sociodemographic variable, that is, gender ($t = 22.23$, $P < 0.05$). Thus, the null hypothesis H_{0b} is rejected for this variable. There was no significant association found between pre-test knowledge score with the sociodemographic variable, that is, age and respiratory problems and thus null hypothesis H_{0b} is accepted for these variables. The study concluded that the information booklet was effective in improving the knowledge regarding prevention of respiratory problems among traffic polices

Conclusion

The traffic police had inadequate knowledge regarding prevention of respiratory problems. The post-test showed significant change in knowledge level as a result of information booklet. In this study, information booklet found to be effective in improving knowledge of traffic police.

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Conflicts of Interest

All authors declares that they have no conflicts of interest.

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