A Study to Assess the Effectiveness of Structured Teaching Programme on Knowledge Regarding Prevention of Respiratory Problems among Petrol Pump Workers in Selected Petrol Pumps at Gonda

Shashank Shekhar[1], Sandhya Kumari[2], Arvind Kumar Shekhar[3]

[1]Assistant Professor, BSM College of Nursing, Lucknow, Uattardhona, Uttar Pradesh, India
[2,3] BSM College of Nursing, Lucknow, Uattardhona, Uttar Pradesh, India

ABSTRACT

A study to assess the effectiveness of structured teaching programme on knowledge regarding prevention of respiratory problems among petrol pump workers in selected petrol pumps at Gonda" the objectives of the study are to assess the pretest knowledge regarding prevention of respiratory problems, to assess the post test knowledge regarding prevention of respiratory problems, to compare the pretest and post test knowledge scores regarding prevention of respiratory problems, to find the significant difference between pretest and post test knowledge scores regarding prevention of respiratory problems, and to find the significant association between pretest knowledge scores regarding prevention of respiratory problems among petrol pump workers in selected petrol pumps at Gonda and the selected socio demographic variables. In order to accomplish the objectives of the study, a pre experimental one group pretest post test design was adopted. In this study, the sample consists of 50 petrol pump workers who fulfilled the inclusion criteria for the study. The non-probability purposive sampling technique was used for this study. A structured socio demographic data and knowledge questionnaire on respiratory problems were selected on the basis of the objectives of the study. The instrument selected in a research should be as far as possible the vehicle that would best obtain data for drawing conclusions, which were pertinent to the study. The tools are prepared in three sections. Section A was socio- demographic data, and the Section –B was knowledge questionnaire on respiratory problems. For the main study the data collected from 03-01-2019 to 28-01-2019 from petrol pump workers who fulfilled the inclusion criteria. The study concluded that In pretest 11(22%) samples were having adequate knowledge regarding respiratory problems. Whereus in posttest 33(66%) samples were having adequate posttest knowledge regarding respiratory problems. There was significant difference between pretest and posttest knowledge scores as the t value is higher than the tabulated value in the p value 0.05 level of significance. It shows that there is a significant effectiveness on the administration of structured teaching programme. Therefore, the H1 hypothesis is accepted. The chi-square table explains that there is a significant association between socio demographic variables such as age in years, gender, educational status, number of duty hours per day, knowledge on respiratory problems as the chi-square value is higher than the tabulated value at 0.05 level of significance (p<0.05). Therefore, the H2 is accepted.

Need for the study:

In a study involving six cities of India, the measured annual PM10 concentration in microgram per cubic meter ($\mu g/m^3$) averaged 94.0 ± 20.4 in Ahmedabad, exceeding the annual standard of 60 $\mu g/m^3$, along with other five cities. It has been found that an increase of 10 $\mu g/m^3$ of PM10 and NO_2 is associated with a decrease of about 3% and 0.7% in FEV 1 (forced expiratory volume in the first second), respectively. The emission of pollutants from motor vehicles can be evaporative emission, exhaust emission or crankcase (running loss) emission, out of which 20 - 32% is due to evaporative emissions.

Owing to the volatile nature of petrol and the high environmental temperature in a city like Ahmedabad, hydrocarbon vapors from the petrol evaporate constantly into atmosphere, mainly from fuel lines, fuel tanks, and carburetors, depending upon the fuel composition, engine operating temperature, and ambient temperature. Hence, in addition to exhaust emission, petrol pump workers are also exposed to evaporative emission of pollutants. A detailed study conducted in Italy to determine the exposure of petrol pump workers to the benzene content of petrol has shown the highest benzene concentrations in the breathing zone of petrol station attendants. The study also shows that in a single refueling operation that lasts for about one minute, the mean air concentration of benzene to which a petrol pump worker is exposed is 3709 $\mu g/m$. In addition, most of the benzene (88%) is emitted while supplying fuel to the vehicle.

The toxic effects of the benzene content of petrol on the various hematological indices and liver have been studied in gasoline-filling workers, with documented neurotoxicity. 13 Petrol pump workers work 10 hours/day and six days/week at most of the pumps. The high level of environmental pollution and exposure to petrol and diesel vapors can have an impact on the lung function of petrol pump workers. Chest radiographs and arterial blood gas (ABG) analysis are unable to detect any significant airway obstruction in the early stages of respiratory disease. Spirometry is a valuable tool to assess lung function in the initial asymptomatic stages of respiratory dysfunction, as compared to other tools. It has been documented that only spirometry enables the detection of chronic obstructive pulmonary disease (COPD) - five to ten years before shortness of breath develops. Petrol pump workers, who are asymptomatic, may have abnormal lung function. Hence, the purpose of this study is to assess the lung function of petrol pump workers by means of spirometry.

In all over India nearly 55,000 retail outlets of petrol bunks are working and have 15 lack employees directly and indirectly involved in this industry. In retail outlets employees are facing health problems like dust allergy, sounds allergy, pneumonia (respiratory), plastic anaemia (blood), skin allergies and irritations, headache, Nausea etc. The population, environment and health are the main aspects of developing countries like India. The state government, union territories and the union government of taking necessary steps to provide health to all by its policy. It is emphasising on the population control under the name of family planning, it is concentrating on environmental aspects also under government eco-friendly policies.

Objectives of the study are

1. To assess the pretest knowledge regarding prevention of respiratory problems among petrol pump workers in selected petrol pumps at Gonda.

2. To assess the posttest knowledge regarding prevention of respiratory problems among petrol pump workers in selected petrol pumps at Gonda.

3. To compare the pretest and posttest knowledge scores regarding prevention of respiratory problems among petrol pump workers in selected petrol pumps at Gonda.

4. To find the significant difference between pretest and posttest knowledge scores regarding prevention of respiratory problems among petrol pump workers in selected petrol pumps at Gonda.

5. To find the significant association between pretest knowledge scores regarding prevention of respiratory problems among petrol pump workers in selected petrol pumps at Gonda and the selected socio demographic variables.

Material and method:-

Research approach and design: - Quantitative approach with pre experimental one group pretest post-test design was adopted.

Setting of the study: - Alfa Filling Station HP petrol pump Balpurjat, U.P.

Study population: - Petrol pump worker.

Accessible population: - 50 petrol pump workers in Alfa Filling Station HP petrol pump Balpurjat

Sample size: - 50

Sampling technique: - Non probability Purposive sampling technique.

Inclusion Criteria

1. Petrol pump workers who are interested to participate in this study.
2. Petrol pump workers who knows Hindi language.

Exclusion criteria

1. Petrol pump workers who are all attended the same type of study earlier.
2. Petrol pump workers who are all sick at the time of interview.

Variables under study

The variables identified in the study were as follows:

Dependent variables: Knowledge and respiratory morbidities among petrol pump workers.

Independent variable: Structured teaching programme is the independent variable

Baseline variables: age in years, educational status, monthly income in rupees, duration of duty hours, years of working experience, knowledge on respiratory problems, if yes mode of knowledge.

Description of Tools

A socio demographic data, knowledge questionnaire on respiratory problems was constructed by the investigator which contains items in the following aspects.

Section – A: Socio- demographic data consist of 9 items such as age in years, educational status, monthly income in rupees, duration of duty hours, years of working experience, knowledge on respiratory problems, if yes mode of knowledge.

The details of socio-demographic schedule are given in annexure.

Section – B: The knowledge questionnaire on respiratory problems consists of 30 items which includes causes of respiratory problems effects of air pollution & petroleum products on respiratory system, signs & symptoms and complications of respiratory problems, diagnosis of respiratory problems and treatment and prevention.

Scoring

Minimum score = 0

Maximum score = 30

Data collection procedure:

A formal written permission was obtained from the petrol pump manager of Alfa Filling Station HP petrol pump Balpurjat. The data collected from 03-01-2019 to 28-01-2019 from petrol pump workers who fulfilled the inclusion criteria. The socio demographic data, and knowledge questionnaire on respiratory problems were administered to collect background information of on respiratory problems. The data collection took 30 – 40 minutes. Before conducting the study, consent was taken from samples by explaining the purpose of the study.

Limitations of the study

1. Only 50 samples are used for this study.

2. Only samples form selected schools from - Alfa Filling Station HP petrol pump Balpurjat, U.P.

Analysis and interpretations

Section I:- Base line characteristics of participants.

Table 1: - Baseline characteristics of the participants

Sl.no	Demographic variables	frequency	percentage
1	**Age in years** 20-25 years	21	42
	26-30 years	15	30
	31-35 years	08	16
	36-40 years	06	12
2	**Gender** Male	32	64
	Female	18	36
3	**Marital status** Single	16	32
	Married	24	48
	Widower	05	10
	Separated	05	10

4	**Education status**		
	Primary education	09	18
	Higher education	10	20
	Graduation	17	34
	Post graduation	14	28
5	**Monthly income in rupees** <10000	10	20
	10000-20000	09	18
	20001-30000	20	40
	>300000	11	22
6	**Work experience** <1	09	18
	2 to 4	20	40
	5 to 7	15	30
	>7	06	12
7	Number of duty hours per day <6	05	10
	6	32	64
	8	08	16
	>8	05	10
8	**Knowledge on respiratory problems** Yes	22	44
	No	28	56
9	**If yes the mode of knowledge** Petrol bunk management	10	20
10	Health workers	12	24
11	No knowledge	28	56

Section II: - Effectiveness of STP on prevention of respiratory problems among petrol pump workers.

Table no 2: - Effectiveness of STP on Anemia.

Knowledge level	Inadequate	Moderate	Adequate
Pre test	19	20	11
Post test	06	11	33

Paired t test used to assess the effectiveness of STP on knowledge regarding prevention of respiratory problems and the obtained value was 5.62 and the table value was 2.02 at 0.05 level of confidence. Since the obtained value greater than the table value STP was effective So, the H1 hypothesis was accepted. The investigator concluded the structured teaching programme was effective.

Assess the association between post test knowledge score with selected demographic variables.

Table no: - 3 chi square showing association between post test knowledge with selected demographic variables.

Sl.no	Demographic variables	Mean		Obtained value	Table value	Interference
		< = mean	>mean			
1	**Age in years** 20-25 years	11	10	8.81	7.81	S
	26-30 years	05	10			
	31-35 years	07	01			
	36-40 years	01	05			
2	**Gender** Male	13	19	4.9	3.84	S
	Female	11	07			
3	**Marital status** Single	07	09	3.76	7.81	NS
	Married	12	12			
	Widower	01	04			
	Separated	04	01			
4	**Education status** Primary education	02	07	14.57	7.81	S
	Higher education	04	06			
	Graduation	11	06			
	Post graduation	07	07			
5	**Monthly income in rupees** <10000	03	07	2.81	7.81	NS
	10000-20000	06	03			
	20001-30000	09	11			
	>300000	06	05			
6	**Work experience** <1	06	03	3.45	7.81	NS
	2 to 4	07	13			
	5 to 7	07	08			
	>7	04	02			
7	Number of duty hours per day <6	04	01	11.26	7.81	S
	6	15	17			
	8	03	05			
	>8	02	03			
8	**Knowledge on respiratory problems** Yes	12	10	8,54	3.84	S
	No	12	16			
9	**If yes the mode of knowledge** Petrol bunk management	07	03	2.24	5.99	NS
10	Health workers	05	07			
11	No knowledge	12	16			

1=3.84, 2=5.99, 3=7.81

The chi-square calculation explains that there was a significant association between knowledge level and the sociodemographic variables such as Age in year, gender, Educational status, number of duty hours per day, and knowledge on respiratory problem as the chi-square value was greater than the table value at 0.05 level of significance.

Conclusion:

In pretest 11(22%) samples were having adequate knowledge regarding respiratory problems. Whereus in posttest 33(66%) samples were having adequate posttest knowledge regarding respiratory problems. There was significant difference between pretest and posttest knowledge scores as the t value is higher than the tabulated value in the p value 0.05 level of significance. It shows that there is a significant effectiveness on the administration of structured teaching programme. Therefore, the H1 hypothesis is accepted. The chi-square table explains that there is a significant association between socio demographic variables such as age in years, gender, educational status, number of duty hours per day, knowledge on respiratory problems as the chi-square value is higher than the tabulated value at 0.05 level of significance ($p<0.05$). Therefore, the H2 is accepted.

References

[1] Wauquier JP. Petroleum Refining: Crude oil, petroleum products, process flowsheets: Editions Technip; 2015.

[2] Mutua J, Fedha I. Safety and health assessment in Kenyan petrol stations. Research and Innovation. 2016 July; 1(1): p. 65-8.

[3] Bahadar H, Mostafalou S, Abdollahi M. Current understandings and perspectives on non-cancer health effects of benzene. Toxicology and Applied Pharmacology. 2014 February; 276(2): p. 83-94.

[4] India's air pollution, health burden get NIEHS attention. National Institute of Environmental Health Sciences. 2018 September 4.

[5] Hanzala A. A Comprehensive Study of Air Pollution in India. Environmental Protection. 2017 July 19.

[6] Saiyed H, Tiwari R. Occupational health research in India. Ind Health. 2014 January; 42(1): p. 55-6.

[7] cseindia. [Online].; 2013. Available from: http://cseindia.org/node/483.

[8] Epidemiological Study on Effect of Air Pollution on Human Health (Adults) in Delhi. Environmental Health Series. 2018 August.

[9] Guttikunda S, Jawahar P. Application of SIM-air modeling tools to assess air quality in Indian cities. Atmos Environ. 2016 January; 62(1): p. 551-61.