

**Journal of Pharmaceutical Advanced Research****(An International Multidisciplinary Peer Review Open Access monthly Journal)**Available online at: [www.jparonline.com](http://www.jparonline.com)**A cross-sectional Descriptive study: Awareness, prevalence and factors associated with Respiratory disorders among Petrol pump workers****Medonajudith.M<sup>1\*</sup>, Kowsalya Devi.S<sup>1</sup>, Kishorepandi.M<sup>1</sup>, Santhanakumar.M<sup>2</sup>**<sup>1</sup>Department of Pharmacy Practice, Arulmigu Kalasalingam College of Pharmacy, Anand nagar, Krishnankovil, Srivilliputhur, Tamil Nadu, India.<sup>2</sup>Department of Pharmacology, Arulmigu Kalasalingam College of Pharmacy, Anand nagar, Krishnankovil, Srivilliputhur, Tamil Nadu, India.

Received: 03.08.2023

Revised: 13.08.2024

Accepted: 20.08.2024

Published: 31.08.2024

**ABSTRACT:** The term ‘air pollution’ indicates the presence in the ambient atmosphere of matters such as gases, the mixture of gases, and particulate matter, produced by the activities of man. Petrol filling station is a place where workers are exposed to both petrol/diesel vapors and the vehicular exhaust. Occupational exposure to diesel/petrol vapors have been shown to affect the functioning of different systems of the body. Occupational benzene exposure mainly via inhalation most frequently occurs among benzene distillers in the petrochemical industry, employees of filling stations, professional (truck) drivers, and operators of machinery powered by internal combustion engines. Benzene has several toxic effects in humans, which includes hematotoxicity, immunotoxicity, neurotoxicity, and carcinogenicity. Gas station workers are unaware of the health risks of air pollution as well as gasoline smoke. Also, gas station operators do not use personal protective equipment and personal hygiene in the workplace varies. Personal protective equipment and other control measures can reduce respiratory problems. Therefore, early detection of adequate symptoms and preventive strategies can reduce the incidence of lung dysfunction among gas station workers.

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**INTRODUCTION:**

The term ‘air pollution’ indicates the presence in the ambient atmosphere of matters such as gases, the mixture of gases, and particulate matter, produced by the activities of man<sup>[1]</sup>. Health effects of occupational exposure to gasoline and air pollution from vehicular sources are relatively unexplored among petrol filling workers. Petrol filling station is a place where workers are exposed to both petrol/diesel vapors and the vehicular exhaust. Occupational exposure to diesel/petrol vapors have been shown to affect the functioning of different systems of the body<sup>[2]</sup>.

**Keywords:** Gas station, Lung disease, Fuel, Pollution, Petrol pump workers.

Petrol (gasoline) is a complex combination of hydrocarbons. About 95 % of components in petrol vapor are aliphatic and acyclic compounds and <2 % aromatics. The benzene content of petrol has typically been in range 1 to 5 %, but may have risen following the removal of lead additives [3]. Benzene is a solvent that leads to lung dysfunction, asthma, lung infection, central nervous system suppression, blood poisoning, genetic effects, chromosomal abnormalities, deoxyribonucleic acid DNA damage, and carcinogenesis [4,5].

As a result of the increase in the consumption of gasoline by cars, a wide range of environmental pollutants enter the atmosphere, among which volatile organic compounds play an important role [6]. Therefore, the air in cities is becoming, directly and indirectly, more polluted. This is an environmental problem in developing countries that has dangerous consequences for human health and the environment [7].

Occupational benzene exposure mainly via inhalation most frequently occurs among benzene distillers in the petrochemical industry, employees of filling stations, professional (truck) drivers, and operators of machinery powered by internal combustion engines [8]. Benzene has several toxic effects in humans, which includes hematotoxicity, immunotoxicity, neurotoxicity, and carcinogenicity [9].

Gas station workers are exposed to the organic and inorganic substances, which exist in gasoline, volatile aromatic hydrocarbons in the atmosphere of service stations and gas stations. Ethylbenzene is a colorless, flammable liquid with a benzene-like odor that is more commonly used as a solvent. Acute respiratory effects of ethylbenzene vapors include irritation of the airways, shortness of breath, eye pain, sore throat, neurological disorders, dizziness, drowsiness, and fatigue [10].

Gas station workers are unaware of the health risks of air pollution as well as gasoline smoke. In addition, gas station operators do not use personal protective equipment and personal hygiene in the workplace varies. Personal protective equipment and other control measures can reduce respiratory problems. Therefore, early detection of adequate symptoms and preventive strategies can reduce the incidence of lung dysfunction among gas station workers [11]. Concerning the importance of the subject, this study was conducted

to determine the prevalence of respiratory disorders in gas station workers.

#### **OBJECTIVES:**

- To assess the awareness and prevalence of respiratory morbidities among petrol pump workers.
- Gas station workers who are continuously exposed to gasoline/diesel smoke, are at high risk of causing respiratory problems. This study was conducted to determine the prevalence of respiratory disorders in gas station workers.

#### **MATERIALS AND METHODS:**

A descriptive study was used for this study. The research was carried out between May 2022 to September 2023. A total of 200 pump employees were present in the Fuel full station. The total numbers of pump workers during data collection (235) but (25) pump workers refused to participate in the study and (10) pump workers were unavailable during data collection because of their sick leave. Finally, the sample size of the study became (200) pump workers. Inclusion criteria include employees who have work at gas stations and perform oil changes and gasoline fills on vehicles. Exclusion criteria included the participant's unwillingness to continue participating in the study, suffering from incurable diseases such as cancer, and death of the participants during the study.

#### **Socio-demographic characteristics:**

A checklist of signs and symptoms of respiratory disorders was used to assess the prevalence of respiratory symptoms. This part was designed to assess the signs and symptoms of respiratory morbidities. The checklist consisted of five items which were classified into five cardinal respiratory symptoms such as cough, phlegm, wheezing, dyspnea, and chest tightness. It was based on ATS- DLD 78A (American Thoracic Society Division of Lung Disease Questionnaire) to elicit respiratory morbidities developed by ATS. Thereafter, written informed consent was obtained from all participants to participate in this study.

#### **RESULTS AND DISCUSSION:**

The results of the above study are given in Table 1 to 7. Almost all male and female petrol pump workers are equally suffering with respiratory disorders (Table 1). The petrol pump workers of ages 18 to 30 years are highly suffered with respiratory disorders (Table 2). The petrol pump unmarried workers are more suffered with respiratory disorders (Table 3). The economic status of petrol pump works revealed that earning lower than

expenses (Table 4). Most of the petrol pump workers exhibited irregular physical status (Table 5). The Socio-demographic characteristics of petrol pump workers is given in Table 6. The Prevalence of respiratory symptoms among petrol pump workers is presented in Table 7.

**Table 1. Gender Wise Classification.**

Gender	No of patient (N = 200)	Percentage
Male	107	53
Female	93	47

**Table 2. Age Wise Classification.**

Age	No. of patients (n= 200)	Percentage
18-30 years	88	44
31- 50 years	78	39
Above 51 years	34	17

**Table 3. Marital status Wise Classification.**

Marital status	No. of patient (n = 200)	Percentage
Married	84	42
Unmarried	116	58

**Table 4. Economic status Wise Classification.**

Economic status	No. of patients (n= 200)	Percentage
Earning higher than expenses	14	7
Earning lower than expenses	98	49
Earning equal to than expenses	88	44

**Table 5. Physical activity Wise Classification.**

Physical Activity status	No. of patient (n = 200)	Percentage
Regular	48	24
Irregular	153	76

The results of the above study are given in Table 1 to 7. Almost all male and female petrol pump workers are equally suffering with respiratory disorders (Table 1). The petrol pump workers of ages 18 to 30 years are highly suffered with respiratory disorders (Table 2). The petrol pump unmarried workers are more suffered with respiratory disorders (Table 3). The economic status of petrol pump works revealed that earning lower than expenses (Table 4). Most of the petrol pump workers exhibited irregular physical status (Table 5). The Socio-demographic characteristics of petrol pump workers is given in Table 6. The Prevalence of respiratory

symptoms among petrol pump workers is presented in Table 7.

**Table 6. Socio-demographical characteristics of petrol pump workers (N= 200).**

Sl. No.	Variables	Frequency	Percentage
1.	<b>Alcohol abuse history</b>		
	Yes	80	44
	No	74	41
	Quitted	26	15
2.	<b>Opioid abuse history</b>		
	Yes	162	81
	No	38	19
3.	<b>Shift status</b>		
	Morning	70	35
	Afternoon	64	32
	Evening	66	33
4.	<b>Years of education</b>		
	Below 10 <sup>th</sup> standard	58	29
	10 <sup>th</sup> standard	40	20
	12 <sup>th</sup> standard	60	30
	Graduate	42	21
5.	<b>Working by years</b>		
	1-5 years	89	44
	5-10 years	63	32
	Above 10 years	48	24
6.	<b>Working hours per week</b>		
	40-60 hours	12	6
	61-80 hours	14	7
	81-100 hours	50	25
	Above 100 hours	124	62
7.	<b>Respiratory morbidities</b>		
	Absent	78	39
	Present	122	61
8.	<b>Knowledge about respiratory morbidities</b>		
	Low	144	72
	Moderate	43	21
	High	13	7

**CONCLUSION:**

This study demonstrated that certain physiological dysfunctioning effects are constantly observed in the occupationally exposed petrol workers. The data suggests that background benzene and air pollutants

**Table 7. Prevalence of respiratory symptoms among petrol pump workers (N= 200).**

Variable	Statement	Yes Frequency	Yes (%)	No Frequency	No (%)
Cough	Do you cough, before doing anything else when you wake up?	142	71	58	29
	Presence of cough more than 3 consecutive months?	173	86	27	14
Chest tightness	Feeling of chest tightness while resting/walking/working?	148	74	52	26
Sputum excretion	Do you clear out sputum for more than three consecutive months in a year?	134	67	66	33
	Do you clear out sputum when you waking?	154	76	48	24
Cough attacks and airway mucus hypersecretion	Do you have cough attacks, sputum hyper secretion for more than three weeks in a year?	133	66	67	34
Shortness of breath	Do you have shortness of breath when walking fast on a flat surface or when climbing a gentle slope?	144	72	56	28
	Do you have to move slowly on a flat surface compared to your peers due to shortness of breath?	158	79	42	21
Wheezing	Do you feel wheezing sound in your chest while walking /climbing / working?	111	55	89	45

could account for substantial part of respiratory dysfunctioning. Workers at gas stations are subjected to fumes from vehicles as well as fuel and the vapors created when filling up automobiles.

It has been demonstrated that a variety of factors, including socioeconomic and environmental factors, have an impact on the frequency of respiratory diseases among gas station employees who load up vehicles with gasoline. It was also established that employees took inadequate safety precautions despite being aware of the harmful impacts of gasoline on health.

In order to prevent these among petrol filling workers, we suggest that medical observation, including pre-employment and periodic medical Checkups, should be performed which include pulmonary function tests. Control strategies should be adopted to reduce the benzene concentration in the ambient air and evaporation control. Early recognition and possibly the removal of sensitive workers from the working place before chronic impairment develops will help. It is generally recommended to implement prevention, intervention, and training programs regarding the use of safety equipment, keeping track of worker's health, and enhancing their understanding of gas station operations.

#### ACKNOWLEDGEMENT:

Authors wish to thank the authority of Arulmigu Kalasalingam College of Pharmacy, Anand nagar, for providing the facility to complete this work.

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**Conflict of Interest:** None

**Source of Funding:** Nil

**Paper Citation:** Medonajudith.M\*, Kowsalya Devi.S, Kishorepandi.M, Santhanakumar.M. A cross-sectional Descriptive study: Awareness, prevalence and factors associated with Respiratory disorders among Petrol pump workers. *J Pharm Adv Res*, 2024; 7(8): 2318-2322.