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A Study on Respiratory and Pulmonary Functions among Traffic Policemen in Gurgaon City

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ABSTRACT: Due to continuous industrialization and the increasing use of cars, pollution has become a serious health problem in today's Indian cities. Asthma, pulmonary disease, rhinitis, recurrent respiratory disease, and other respiratory problems are more widespread in traffic police depending on the nature of their profession and working conditions. Job dissatisfaction, seeing and hearing the buzz, and physical symptoms including burning eyes, ringing temples, and back pain have all been linked to moderate anxiety over the past six months, according to this study. In addition, severe anxiety was associated with age, femininity, lack of job satisfaction, and reporting of ear-ringing sensations in the past 3 years. The objective of this paper is to determine whether traffic police in Gurgaon have bronchial morbidity and to test their respiratory rate using an electronic spirometer. A 6-month bridge study was conducted at select traffic police locations (September 2020 to February 2021) in Gurgaon city. In the future, this knowledge will help offer people a means to monitor the health of traffic police at work and stay on top of things.

Keywords: Air Pollution, Health Risk, Pulmonary Function Test, Respiratory Illness, Traffic Policemen.

1. INTRODUCTION

In recent decades, air pollution is a significant public health issue in India [1]. Air pollution has the largest effect on the human body in most metropolitan centers, including Gurgaon, Delhi, Mumbai, Chennai, Bengaluru, and others [2]. Breathing disorders, cardiovascular disease i.e. a greater risk of cancer, and early mortality all seem to be effects of air pollution. Frustration in the eyes and eyebrows, cough, headache, and weariness are some of the extreme side effects. Extended exposure causes disorders like asthma and obstructive pulmonary disease. Because of the expanding number of motor vehicles and unplanned urbanization, automotive exhaust-related polluted air has increased dramatically [3]. The presence of multiple airborne pollutants from automotive emissions, including carbon dioxide, particulate matter, Sulphur, benzene, lead, nitrogen oxides, and nitric oxide, is important in the etiology of respiratory diseases [4].

World-Health-Organization (WHO) in 2018, 91 percent of the worldwide population was subjected to outdoor air pollution but it was at least 2.5 times higher than just the safety threshold. During the year 2020, six million people will have died as a result of external and interior air pollution [5]. Gurgaon is a metropolitan with a growing population, migratory influx from other regions of the country, and unchecked urbanization; increasing vehicle numbers and prolonged traffic jams contribute to greater concentrations of pollutants [6]. So according to data from Gurgaon's Transport Department Office, there are about 75 lakh registered autos on the road that affect air quality. According to the State Pollution Board's data regarding ambient air quality, Gurgaon's pollution levels are moderate to good. PM10 and PM2.5 levels, on the other extreme [7].

Traffic cops are constantly subjected to automobile diesel fumes and their hazardous repercussions depending on the nature of their work and the organization [8]. Computerised following equipment has been used to perform a pulmonary function test (PFT), which precisely measures lung volumes and flow and so improves in the early identification of breathing problems. There is limited evidence of the bronchial morbidity experienced by traffic officers [9]. As a result, the accompanying goals were set for this study to establish the severity and types of chronic respiratory comorbidities, as well as to evaluate the work of breathing using a computerized sphygmomanometer. Traffic cops, who are really in charge of guaranteeing that transportation laws are followed on that highways, are in danger of creating musculoskeletal injuries and non-communicable diseases [10]. According to several investigations, job stress, work disputes, temperature, health problems, and exposure to intimidation and violence have been associated with psychiatric disorders, including anxiety symptoms [11]. The majority of this research was performed in affluent countries; however, examinations on the professional medical problems of traffic policemen functioning in severely industrialized environments in undeveloped countries are also required to bring emphasis to this crucial issue. the issue among local governments and the general public [12]. This is a difficult job; the working hours are more than 8 to 10 hours, and the shifts are also irregular, implying that there is a lot of stress in this profession, resulting in the physical and mental state of those who desire to work for the traffic police. It is crucial to be courageous. Aside from that, several health issues may arise for traffic cops while they are stuck in traffic, as shown in Figure 1.

Figure 1: Illustrates the Major Problem of A Traffic Policeman.

2. LITERATURE REVIEW

The researcher R. Patil et al. [13] Traffic cops face a wide range of occupational stressors, suggesting that their employment is a significant driver of health. They work in some kind of noisy and dirty environment and are constantly subjected to traffic pollution. The purpose of this research is to look into the influence of occupational diseases on the health of traffic officers. We obtained and evaluated scientific paper materials on traffic cops reporting professional medical issues [14]. To provide enhanced, people have tried to obtain studies that revealed detrimental connections. Several scientists have found that breathing has decreased and asthmatic morbidity has worsened. The research mostly on chromosomal abnormalities or carcinogenic and mutagenic effects of motor vehicle emissions caused by long-term exposure to chemicals and some other aromatic compounds had yielded mixed results, with almost equivalent numbers of studies establishing and refuting any causal link. The indirect link between automotive pollution and its cancerous

effect has developed a huge body of epidemiological studies. Numerous studies show that traffic cops are particularly nervous.

According to the researcher Y. Zheng et al. [15] in the development of driverless vehicles, the complicated and various urban road surfaces were always tough and mentioned features, particularly at crossroads. In China, self-driving automobiles must've been able to notice traffic police gestures. The first element in identifying the traffic enforcement gesture at the crossing is to identify the existence of traffic cops somewhere at the crossing. At the moment, traffic enforcement detection studies are still in their infancy; there are frequent drawbacks with this technology, such as the painfully limit of detection being sluggish, because there are additional issues, and there is no uniform traffic-police-metadata either. This research proposes the lstm network for real-time problems and provides a new real-time detection technique for traffic cops depending on it. The method proposed in this work is robust and capable of accomplishing the target detection task fast. This research analyzes and reveals analogous data sets published throughout the research to address the existing data conundrum.

Another researcher M. Hammad et al. [16] declares that Employees' total performance can be influenced by stress, which can have both beneficial and detrimental consequences. Employees who are under a lot of pressure issues can occur, whilst those who are under a lot of stress keep improving. Around the world, authorities are regarded as high-stress institutions. The government, as well as the broader population, put a lot of stress on them to achieve success. Recent research has focused on traffic police officers. The studies indicate that the addition of stress among ticket inspectors has a significant impact on the outcomes. The effects of stress are reduced dramatically when positive coping strategies that function as effective moderators are added.

Research Question

- The goal of this research was to look into the strategic challenges surrounding traffic police safety in various elements.
- To recommend various solutions for reducing occupational stress due to the traffic environment.

3. METHODOLOGY

This cross-sectional survey was taken among Gurgaon traffic wardens. Employment hazards, precautionary equipment, and health complications were measured and use semi-structured questionnaires with documented internal consistency.

3.1. Design:

From September 2020 to February 2021 a descriptive explanatory check was directed between traffic police officers working at six locations in Gurgaon City [17]. Faridabad, Gurugram, Jhajjar, Rewari, and Sonipat were selected. With the help of the Metropolitan Traffic Police Division, these areas were chosen at random.

3.2. Instrument:

Self-administered (semi-structured) questionnaires were used to collect data in this study. The questionnaire includes socio-demographic information, an assessment of respiratory illness by the American-Thoracic-Society-Division of Lung (ATSDLD) [18], eye disorders and safety measures, noise and vibration, and associated health complications and preventive measures. Prevalence, percentage, mean, maximum, and standard error were used to assess the mean analysis. An appropriate co-integration test was conducted to analyze the relationship between the variables.

3.3. Data Sample:

The research implemented a simple random sampling technique. The Metropolitan Traffic Enforcement Division, Gurgaon, Haryana created several traffic police from each zone. The population was drawn from people who were available there in the chosen area and met the authors of the study measures. As a result, a total of 83 data were collected for the research. The study also did not include traffic cops who performed in managerial roles and had very little than 6 years of experience.

3.4. Data Collection:

Sampling methods were coded, replicated, and tables were created, after which the fieldwork ended. Despite these limitations, acceptable initial analytical techniques, including percentages and infographics, were applied for data

interpretation. It is just that respondents are unable to communicate their true feelings, and the other is that various traffic zones exist throughout Haryana, making data collection from interviewees across the region incredibly challenging.

Table 1: Illustrates the Effects on Respiratory System in Numbers.

Sr. No.	Effects on Respiratory System	No. of Patients
1.	Pneumonia	37
2.	Lung cancer	69
3.	Bronchial asthma	64
4.	Common cold	60
Total		**230**

Table 1, illustrates the impact of traffic police on the respiratory system while operating in a traffic area. Here clearly show that there is 37 person affected by Pneumonia, 69 people are affected by lung cancer and 64 people are affected by Asthma, and 60 people are affected by the cold.

Table 2: Illustrates the Symptoms and Signs of Respiratory Issues

Sr. No.	Symptoms and Signs of Respiratory Issues	No. of Patients
1.	Cough	50
2.	Breathing Difficulty	75
3.	Sound of Wheezing	61
4.	Nose Sneezing and running nose	44
Total		**230**

Everybody knows the traffic job is hectic and you have to be mentally stronger and physically too. But, in threshold time this job also becomes a major reason for different respiratory problems which is mentioned in Table 2 and it displays that there is 50 person who has the symptoms of respiratory problems, 75 people have breathing problems, 61 people have wheezing sound and 44 effected with running nose.

Table 3: Illustrates That the Different Morbidities Detected Problems

Sr. No.	Different Morbidity	No. of Patient
1.	Varicose veins	20
2.	Eye problems / visual difficulties	36
3.	Low back pain	67
4.	Skin disorders	26
5.	Respiratory problems	20
6.	Hypertension	30
7.	Diabetes mellitus	31

Among 230 participants gave some general problems which are mentioned in Table 3 i.e. 31 were diabetic, 30 were hypertensive, 16 had respiratory problems like allergic rhinitis and pharyngitis, 26 had skin problems, 71 complained of

low back pain, 36 reported eye problems like burning sensation, redness, watering and itching, 20 were found to have varicose veins by Trendelenberg's test, and 20 had low PEFR (Peak Expiratory Flow Rate) i.e., less than 400 lit/min.

3.5. Data Analysis:

This data analysis is being done based on the data surveyed 230 people. Based on that the data result in approximately.

Table 4: Illustrates the Effects on Respiratory System in Percentage

Sr. No.	Effects on Respiratory System	No. of Patients
1.	Pneumonia	16%
2.	Lung cancer	30%
3.	Bronchial asthma	27.8%
4.	Common cold	26%

Table 4, illustrates the impact of traffic police on the respiratory system while operating in a traffic area. Here clearly show that there is 16% person affected by Pneumonia, 30% person is affected by lung cancer and 27.8% person are affected by Asthma and 26% person affected by cold.

Table 5: Illustrates the Symptoms and Signs of Respiratory-Problems

Sr. No.	Symptoms and Signs of Respiratory-Problems	No. of Patients
1.	Cough	21.7%
2.	Difficulty in breathing	32.6%
3.	Wheezing sound	26.5%
4.	Sneezing and running nose	19.13%

Everybody knows the traffic job is hectic and you have to be mentally stronger and physically too. But, in threshold time this job also becomes a major reason for different respiratory problems which is mentioned in Table 5 and it displays that there is 22% person who has the symptoms of respiratory problems, 32% person have breathing problems, 27% person has wheezing sound and 15% effected with running nose.

Table 6: Illustrates That the Different Morbidities Detected Problems

In Percentages

Sr. No.	Different Morbidity	No. of Patient
1.	Varicose veins	8.6%
2.	Eye problems / visual difficulties	15.6%
3.	Low back pain	29%
4.	Skin disorders	11.3%
5.	Respiratory problems	8.6%
6.	Hypertension	13%
7.	Diabetes mellitus	13.6%

Among 230 participants gave some general problems which are mentioned in Table 6 i.e. 13.6% were diabetic, 13% were hypertensive, 8.6% had respiratory problems like allergic rhinitis and pharyngitis, 11.3% had skin problems, 29% complained of low back pain, 15.6% reported eye problems like burning sensation, redness, watering and itching, 8.6% were found to have varicose veins.

4. DISCUSSION

The results of this training displayed that the traffic police were aware of the dangerous properties of pollutants on their health. They knew that effluence could cause respiratory problems, lung cancer, inflammatory diseases, and pneumonia. Thus according to studies conducted in India, whenever traffic police are uncovered to polluted air for a long-time, they are more likely to develop various respiratory diseases, as seen in Figure 2.

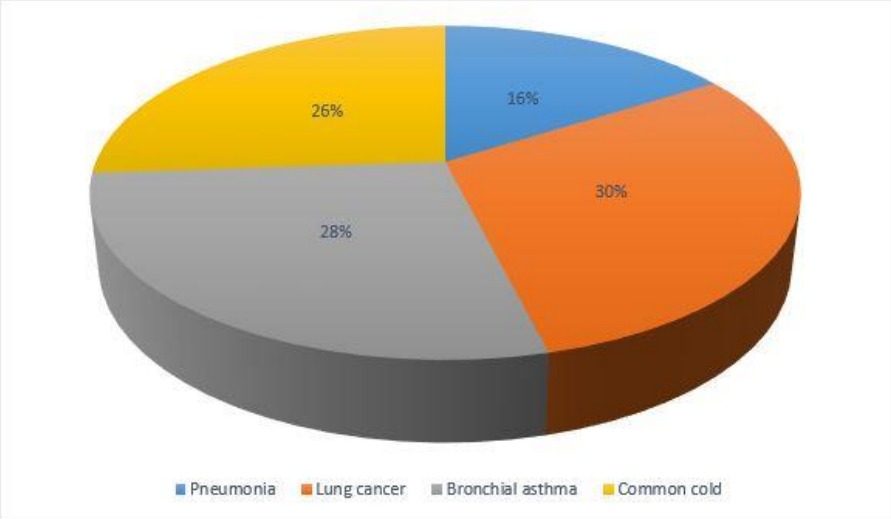

Figure 2: This Figure Shows the Graphical representation of the Effects on the Respiratory System

The traffic wardens need to be aware of a problem in the cities, especially those related to breathlessness. Even though a large number of traffic cops are aware of the importance of wearing anti-pollution helmets, some of them felt the need for regular medical evaluation. Regular examinations save lives even if there is no disease because good health does not just mean the absence of bad side effects. As in Figure 3, some people with frequent medical check-ups have a lower risk of developing invasive diseases and a higher chance of survival. Consequently, efficient accreditation initiatives and legislation involving regular health examinations and pollution mitigation should be initiated.

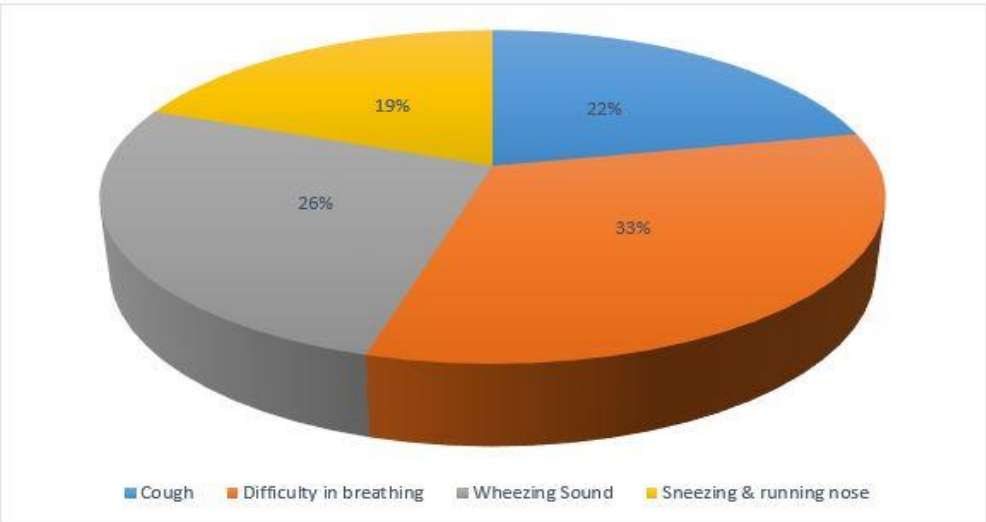

Figure 3: This Figure Shows the Respiratory Issues Signs and Symptoms

Many knowledge interventions for the preclusion of respirational difficulties among circulation constabularies were found to exceed performance levels in this study. A survey conducted found similar results: traffic police chiefs had a wealth of understanding above normal, although their amount of training was modest. Nevertheless, children should be forced to participate in clean and comfortable pollution-prevention measures. Additionally, the government needs to develop long-term solutions to achieve these problems.

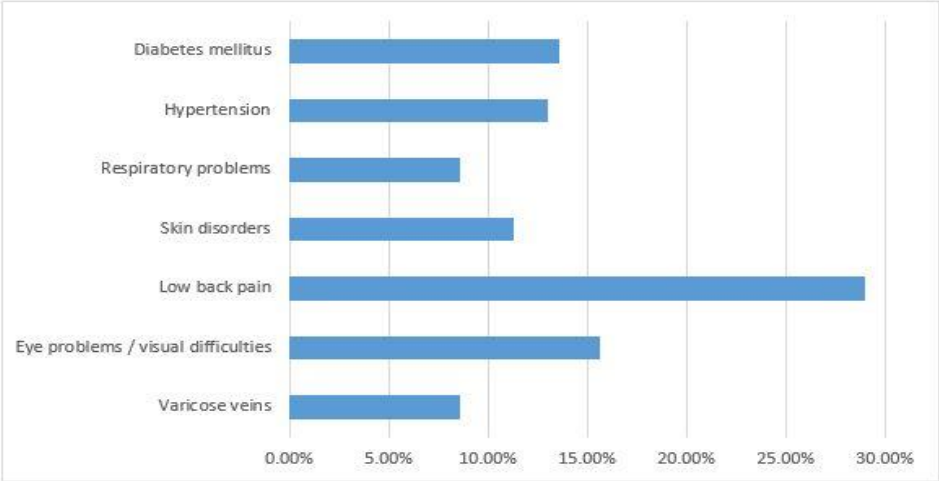

Figure 4: This Figure shows Morbidities Detected Problems

Most of the traffic officers in this research wore masks to reduce respiratory diseases. According to a study, wearing a facial mask can help reduce the adverse effects of air pollution. In this survey, a small percentage of traffic police enforced laws in autos to reduce gas emissions. This may be the result of poor measures to curb exhaust emissions [19]. As in Figure 4, automotive emissions are the primary cause of pollution in Gurgaon. According to research conducted in Gurgaon, the current total emissions (CO, CO_2, HC, NOX, SO_2) were 7,231,053.12 tonnes per year, with CO_2 accounting for 91.0% of the total emissions [20]. Furthermore, the evacuation of houses and highway construction was underway at the time of this research. This could have exacerbated the air quality, allowing the traffic cops' health has deteriorated. Only if the administration efficiently enforces vehicle registration and emission monitoring, as well as a ban on polluting automobiles, will the health of traffic officers and urban dwellers be secured.

5. CONCLUSION

Compared to the calculated returns, the traffic police across Gurgaon had a significantly higher burden of bronchial morbidity and lower lung capacity. Medical observation with a spectrometer is suggested regularly to evaluate breathing function, which aids in early diagnosis and therapy. Standard health education about the need for the use of surgical masks as well as health screening is important. Frequent exhaust emissions testing and carpooling techniques, along with the administration's promotion of hybrid and electric cars, are all examples of ways to reduce vehicular emissions. When it comes to respiratory problems, most traffic cops say that shortness of breath is a big sign and sign. Air pollution can be reduced in many different ways, including masks and standard health exams. To prevent breathing difficulties, the traffic police chief wears a mask, which is rotated during duty hours as well as at duty locations. Although the amount of knowledge among ticket inspectors is good, the level of effectiveness in preventing medical breathing problems is not. Exercise level is directly related to professional experience but not to traffic enforcement education in Gurgaon. It is the job of the government to deal with the challenges and get the appropriate officials. The overarching and long-term objective is to promote greater health among the traffic wardens of the capital.

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