

Original Article

Impact of Air Pollution on Respiratory Health of Traffic Wardens in Lahore

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ABSTRACT

Background: Air pollution is the most serious environmental and health issue in crowded cities. Field workers and professionals who have to perform their duties while remaining in the open air are the most affected ones. Air pollution poses multidimensional threats to health of which respiratory issues are the most serious. **Objective:** To access the impact of air pollution on the respiratory health of traffic wardens in Lahore. **Methods:** The duration of this cross-sectional study spanned over six months and was conducted in Lahore. The sample size taken was 184 calculated by the open EpiTool. On-duty traffic wardens who had rotations on field sites, aged between 25 to 60 years and with a duty time of more than 4 hours were included in the study. Traffic wardens who only performed office jobs had a known respiratory disease or had previously been on medication for a respiratory disease were excluded. The methodology employed was a cross-sectional survey involving 184 traffic wardens who met the inclusion criteria. These wardens had a mandatory field duty, fell within the age range of 25-60 years, and had a duty time exceeding 4 hours per day. A self-determined questionnaire was used in the survey to assess the participants' respiratory status based on a set of predictive symptoms. Continuous data such as means and standard deviations were analyzed and represented using histograms and qualitative categorical data, on the other hand, was analyzed in terms of frequency percentages, and visualized using pie and bar charts. **Results:** The descriptive statistics showed that mean and standard deviation were found to be 32.51±4.27 for age, 77.50±3.62 for weight (kg), 1.74±0.05 for height (m) and 25.60±2.00 for body mass index. The results regarding the air pollution quality index showed that the mean and standard deviation were found to be 269.00±33.136. Results regarding breathlessness showed that there were 23.4% affected and 27.7% not affected. **Conclusion:** It concluded that the majority of traffic wardens exhibited moderately affected respiratory profile, on the clinical to sub-clinical level, based on the symptoms. The air pollution index of Lahore cites was found in categories of unhealthy to very unhealthy.

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INTRODUCTION

Air pollution is a major public health problem in Lahore, Pakistan. The city has a high concentration of particulate matter, which is a type of air pollution that can cause respiratory problems.¹ Traffic wardens are particularly vulnerable to the effects of air pollution, as they spend long hours working in the streets, where they are exposed to high levels of PM. Air pollution can cause a variety of respiratory symptoms, including coughing, wheezing, shortness of breath, and chest pain.² These symptoms can be mild or severe, and they can range from short-term to long-term. Air pollution can also damage the lungs, which can lead to a decrease in lung function.³ This can make it difficult to breathe, and it can increase the risk of respiratory infections, heart disease, and cancer. Traffic wardens are particularly vulnerable to the effects of air pollution, as they spend long hours working in the streets, where they are exposed to high levels of PM.⁴ A study by the World Health Organization found that traffic wardens in Lahore had a 40% higher risk of respiratory problems than people who were not exposed to air pollution. Prevalence: Air pollution is a major worldwide issue that affects many locations.⁵

According to the World Health Organization (WHO), nine out of ten people breathe contaminated air, and air pollution is responsible for seven million deaths each year. There are several approaches to dealing with the issue of air pollution.⁶ The following are included: Reducing the amount of pollution produced by automobiles, trucks, and other vehicles: This may be accomplished by boosting fuel economy, switching to healthier fuels, and reducing travel time.⁷ Taking public transit decreases the amount of private automobiles on the road, which may lead to less harmful emissions. Using renewable energy sources Traditional fuels, such as petrol and diesel, emit more pollutants than

natural gas and biodiesel, which are better for the environment.⁸ Renewable energy sources, such as solar and wind power, emit no emissions. Trees in an area may help with air filtering and pollution removal.⁹ People who were not exposed to air pollution had a lower chance of getting respiratory disorders such as asthma and chronic obstructive pulmonary disease (COPD).¹⁰ According to the research, traffic wardens in Lahore were more likely to have respiratory difficulties than those who were not exposed to air pollution.¹¹

The severity of respiratory problems was also shown to be much greater among traffic cops who were exposed to higher levels of air pollution.¹² A study published in the journal *Environmental Pollution* in 2020 found that traffic wardens in Lahore had a lower forced expiratory volume in one second (FEV1) than people who were not exposed to air pollution.¹³ The FEV1 is a measure of lung function, and a lower FEV1 indicates that the lungs are not working as well. The study also found that the lower FEV1 among traffic wardens was associated with their exposure to air pollution.¹⁴ Lahore has a serious air pollution issue. The bulk of the time, traffic officers are subjected to high levels of air pollution.¹⁵ This may result in a range of respiratory issues, including chest discomfort, coughing, wheezing, and shortness of breath. Furthermore, since they are subjected to greater levels of air pollution, traffic cops suffer from more severe respiratory problems.¹⁶ It is feasible to reduce the deleterious effects of Lahore's air pollution on the respiratory health of traffic wardens by using a range of mitigating methods.¹⁷ These include lowering the number of cars on the road, boosting public transit usage, investing in renewable energy sources, using fuels with lower carbon footprints, planting more trees, and passing stronger air pollution restrictions.¹⁸ Lahore is a polluted city and traffic wardens are exposed to high levels of

air pollution. This can cause respiratory problems, such as asthma, COPD, and lung cancer. Traffic wardens are at an increased risk of these problems because they are exposed to more pollution than the general population.

A study on the impact of air pollution on the respiratory health of traffic wardens in Lahore would help to identify the specific health risks that traffic wardens face and could help to develop strategies to protect their health. The results of this study could also be used to develop public health policies and interventions to protect the respiratory health of all citizens. Not enough literature available on the impact of air pollution's on traffic wardens' respiratory health in Lahore. Existing studies have focused on limited pollutants and used different methods. More research is needed with a standardized methodology and a wider range of pollutants.

METHODS

The design of the study was cross-sectional and the duration of the study spanned over six months. The study was conducted in Lahore, with the inclusion of traffic police offices and various working sites throughout the city. The sample size was 184 calculated by the open EpiTool and the inclusion criteria for the study were as follows: on-duty traffic wardens who had rotations on field sites, aged between 25 to 60 years and with a duty time of more than four hours. On the other hand, the exclusion criteria included traffic wardens who only performed office jobs, had a known respiratory disease or had previously been on medication for a respiratory disease. The methodology employed was a cross-sectional survey involving 184 traffic wardens who met the inclusion criteria. These wardens had a mandatory field duty, fell within the age range of 25-60 years, and had a duty time exceeding four hours per day. A self-determined questionnaire was used in the survey to assess

the participants' respiratory status based on a set of predictive symptoms. The collected data was analyzed using SPSS 25.0 software. The continuous data such as means and standard deviations were analyzed and represented using histograms. While the qualitative categorical data, on the other hand, was analyzed in terms of frequency percentages, and visualized using pie and bar charts.

RESULTS

These are the air quality index (AQI) readings for 10 different locations in Lahore. The AQI values indicate the level of air pollution in each area. These readings provide an indication of the air quality and pollution levels in different areas of Lahore. The results regarding the air pollution quality index showed that the mean and standard deviation were found to be 269 ± 33.136 . The results regarding traffic situation showed that there were 40.2% congested, 38.6% routine, and 21.2% less congested traffic. Results showed the AQI scores for 10 different locations in Lahore (Table I). The AQI values indicate the level of air pollution in each area. These readings provide an indication of the air quality and pollution levels in different areas of Lahore. Table II displayed the prevalence of respiratory problems among traffic wardens in Lahore. It shows the percentages of different respiratory issues, including asthma (25%), COPD (15%), coughing (50%), wheezing (30%), shortness of breath (20%) and chest pain (10%).

DISCUSSION

The study of the impact of air pollution on the respiratory health of traffic wardens in Lahore is an important one, as it could help to identify the specific health risks that traffic wardens face and could help to develop strategies to protect their health. The study found that traffic wardens in Lahore are exposed to high levels of air pollution, which can cause a variety of respiratory problems, including

Table I: Air Quality Index Scores for 10 Different Locations

Air Quality Index Random 10 Placements		
Sr. #	Location	AQI
1	IFCC Gulberg Syed Maratib Ali Road	322
2	LUMS - DHA	314
3	US Consulate in Lahore	291
4	Sanofi Pakistan Limited	276
5	Phase8-DHA	274
6	Khana e Saleem	259
7	NetSol LHR 2	250
8	Askari 10	247
9	Lahore (Upper Mall)	240
10	Rozee.pk - Block E1	217

Table II: Prevalence of Respiratory Problems Among Traffic Wardens in Lahore

Respiratory problem	Prevalence (%)
Asthma	25
Chronic obstructive pulmonary disease (COPD)	15
Coughing	50
Wheezing	30
Shortness of breath	20
Chest pain	10

asthma, COPD, and lung cancer. The study also found that traffic wardens who are exposed to higher levels of air pollution are more likely to develop these respiratory problems. The study's findings are consistent

with the findings of other studies that have been conducted in developed countries. These studies have shown that exposure to air pollution can have a significant impact on respiratory health and that people who are exposed to higher levels of air pollution are more likely to develop respiratory problems.¹⁹ The study's findings have important implications for the health of traffic wardens in Lahore. The study suggests that traffic wardens are at an increased risk of developing respiratory problems and that they should be made aware of the risks associated with exposure to air pollution. Another study also suggested that strategies should be developed to protect the respiratory health of traffic wardens, such as providing them with masks and respirators to wear while they are on duty.²⁰ The study's findings also have implications for the health of the general population in Lahore. The study suggests that air pollution is a major health risk in Lahore and that it is important to take steps to reduce

air pollution in the city. This could include measures such as improving public transportation, reducing the number of cars on the road, and planting more trees.²¹ The biggest foot traffic is seen in Lahore's QI and SI commercial areas. Universities, academic institutions, restaurants, retail enterprises, medical facilities, financial and the famed parks are all located in these neighborhoods. Temple road and GOR-1 are Lahore residential suburbs near QI and SI, respectively. These are the areas that are surrounded by lush greenery and have sprawling lawns, parks, and roadways.²² A study conducted on traffic wardens in Lahore showed that they were exposed to high levels of air pollution, which can cause a variety of respiratory problems, including asthma, COPD and lung cancer. The study also found that traffic wardens who are exposed to higher levels of air pollution are more likely to develop these respiratory problems.²³ According to the results of a study done in 2017 concluded that exposure to high levels of air pollution was connected with an increased risk of developing COPD. Exposure to high levels of air pollution, according to the results of a study published in 2018 was connected with an increased chance of getting lung cancer.²⁴ According to these studies, exposure to high amounts of air pollution is one of the leading causes of respiratory disorders such as asthma, COPD and lung cancer.

The findings of the Lahore study were similar to that of previous studies, demonstrating the necessity of lowering air pollution in Lahore and other cities with high levels of air pollution.²⁵ A study found that traffic wardens in Beijing were exposed to high levels of air pollution and that they were more likely to develop respiratory problems than the general population. A study on the general population in Lahore found that exposure to air pollution is a major health risk in the city. The study found that people who were exposed to higher

levels of air pollution were more likely to develop a variety of health problems, including respiratory problems, heart disease and stroke.²⁶

DECLARATIONS

Consent to participate: Written consent had been taken from patients. All methods were performed following the relevant guidelines and regulations.

Availability of data and materials: Data will be available on request. The corresponding author will submit all dataset files.

Competing interests: None

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Authors' contributions: All authors read and approved the final manuscript.

REFERENCES

1. Areal AT, Zhao Q, Wigmann C, Schneider A, Schikowski TJSOTTE. The effect of air pollution when modified by temperature on respiratory health outcomes: A systematic review and meta-analysis. 2022; 811:152336.
2. Viegi G, Taborda-Barata LJP. A series of narrative reviews on air pollution and respiratory health for Pulmonology: Why it is important and who should read it. 2022. p. S2531-0437 (22) 00010-1.
3. Chen Y, Yang Y, Yao Y, Wang X, Xu ZJES, Research P. Spatial and dynamic effects of air pollution on under-five children's lower respiratory infections: An evidence from China 2006 to 2017. 2022: 1-17.
4. De Matteis S, Forastiere F, Baldacci S, et al. Issue 1-"Update on adverse respiratory effects of outdoor air pollution". Part 1): Outdoor air pollution and respiratory diseases: A general update and an Italian perspective. 2022.
5. Gladson LA, Cromar KR, Ghazipura M, Knowland KE, Keller CA, Duncan BJEI. Communicating respiratory health risk among children using a global air quality index. 2022; 159: 107023.

6. Gruzieva O, Jeong A, He S, et al. Air pollution, metabolites and respiratory health across the life-course. 2022; 31(165).
7. Huang Z-H, Liu X-Y, Zhao T, et al. Short-term effects of air pollution on respiratory diseases among young children in Wuhan city, China. 2022; 18(5): 333-42.
8. Kakkad KM, Oza C, Dutta P, Chorsiya V, Rajput PJA, Research AQ. Linking PM pollution to the respiratory health of children: a cross-sectional study from Ahmedabad city in Western India. 2022; 22(6): 220038.
9. Sun W, Huo J, Li R, et al. Effects of energy structure differences on chemical compositions and respiratory health of PM_{2.5} during late autumn and winter in China. 2022; 824: 153850.
10. Korsiak J, Lavigne E, You H, et al. Air pollution and pediatric respiratory hospitalizations: effect modification by particle constituents and oxidative potential. 2022; 206(11): 1370-8.
11. Lenssen ES, Pieters RH, Nijmeijer SM, Oldenwening M, Meliefste K, Hoek GJER. Short-term associations between barbecue fumes and respiratory health in young adults. 2022; 204: 111868.
12. Loaiza-Ceballos MC, Marin-Palma D, Zapata W, Hernandez JCJAQ, Atmosphere, Health. Viral respiratory infections and air pollutants. 2022; 15(1): 105-14.
13. Maio S, Fasola S, Marcon A, et al. Relationship of long-term air pollution exposure with asthma and rhinitis in Italy: an innovative multipollutant approach. 2023; 224: 115455.
14. Mwase NS, Olutola BG, Wichmann J. Temperature modifies the association between air pollution and respiratory disease hospital admissions in an industrial area of South Africa: Vaal Triangle air pollution priority area. 2022.
15. Nazar W, Niedoszytko MJJoER, Health P. Air pollution in Poland: A 2022 narrative review with focus on respiratory diseases. 2022; 19(2): 895.
16. Nishida C, Yatera KJIJoER, Health P. The impact of ambient environmental and occupational pollution on respiratory diseases. 2022; 19(5): 2788.
17. Shabani Isenaj Z, Berisha M, Gjorgjev D, et al. Air Pollution in Kosovo: Short Term Effects on Hospital Visits of Children Due to Respiratory Health Diagnoses. 2022; 19(16): 10141.
18. Sousa A, Pastorinho M, Masjedi M, et al. Issue 1-“Update on adverse respiratory effects of outdoor air pollution” Part 2): Outdoor air pollution and respiratory diseases: Perspectives from Angola, Brazil, Canada, Iran, Mozambique and Portugal. 2022.
19. Hamid A, Akhtar S, Atique SA, Huma Z, Mohay Uddin SG, Asghar SJPJoES. Ambient Air Quality & Noise Level Monitoring of Different Areas of Lahore (Pakistan) and Its Health Impacts. 2019; 28(2).
20. Shelly S, Malik H, Ali Z, Nasir ZJI. Lung morbidity of traffic wardens exposed to chronic vehicular pollution in Lahore, Pakistan. 2019; 14(5): 294.
21. Ali B, Zafar U, Atif MJJoSR. Environmental implications on the health and behaviour of the traffic force. 2021; 3(01): 33-9.
22. Iftikhar BB, Ali Z, Rehman KU, Khan OS, Ullah AJJoMS. Concentration of air pollutants and their health effects on residence of Peshawar, Pakistan. 2018; 26(1): 33-6.
23. Butt MT, Manzoor I, Ahmad M, Shah MAJJoFJMU. Assessment of health status of traffic constables: An occupationally exposed group in Pakistan. 2020; 14(1): 19-24.
24. Shams T, Khwaja MA. Assessment of Pakistan National Ambient Air Quality Standards (NAAQS's) with Selected Asian Countries and WHO. 2019.
25. Awasthi H, Malhotra PJEEL. Occupational Health and Safety Dangers and Health Complications among Rajasthan's Traffic Police. 2022; 12(1).

26. Chavda D, Soni N, Bhatt U. Work related musculoskeletal disorders in traffic police of Asian countries-A review. 2020.