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A study to assess the knowledge and practices among high risk traffic police personnel regarding prevention of respiratory problems in selected areas of Mumbai

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Abstract: *This study is conducted to assess the knowledge and practices among high-risk traffic police personnel regarding the prevention of respiratory problems in selected areas of Mumbai city. The effects of pollution are not measurable because the number of vehicles is increasing at a faster rate. Air pollution mainly affects the respiratory system, and the results are very dangerous to human health. By taking steps to provide traffic umbrellas at all junctions. They will be screened for diabetes, hypertension, and other ailments and maintaining the computerized database of their health. The occupational environment also plays a major role in the health of the exposed. The health hazards get more severe when the duration of exposure increases. This fact is more important in situations such as the personnel engaged in traffic duty. These personnel have to undergo physical strain in an environment polluted by fumes, vehicle exhaust, the use of blowing horns, the blowing of dust in the air by a speeding vehicle, etc. The personnel also pursue a near-sedentary type of necessity that arises. The aforementioned factors pose as a health hazard. Still little has been done to assess their health status and suggest preventive measures for the upliftment of their health. Traffic police are worried about the increasing traffic in the city. The reason for this is increasing vehicles day by day. Due to increasing vehicles, the pollution has reached to the top. Traffic police personnel should use masks to protect from inhaling the smoke, dust, and gases, etc. The scientific techniques for assessing health impacts of air pollution, including air pollutant monitoring, exposure assessment, oximetry, toxicology, and epidemiology, should be used. Air pollution is a major environmental risk to health. By reducing air pollution levels, countries can reduce the burden of disease from stroke, heart disease, lung cancer, and both chronic and acute respiratory diseases, including asthma. Some lung cancer deaths could have been averted by improving ambient air quality or by reducing tobacco smoking. Hence, with the above description, traffic police may have some knowledge about respiratory problems and their prevention, but it is necessary to concentrate on the respiratory health of traffic police because they are a high-risk group. Early detection is still the best insurance against the development of potentially dangerous complications with the passage of time.*

Key Words: *knowledge, Practices, Traffic police personnel, Respiratory problems.*

1. INTRODUCTION:

Health is not something that one possesses as a commodity but rather connotes a way of functioning within one's environment (work, recreation, and living). The work environment constitutes an important part of man's total environment, so health to a large extent is affected by work conditions. Though several types of environment exist, it is the physical environment that plays an important bearing on health. Air, noise, heat, radiation, etc., are the main sources of environmental pollution, and this is more so in urban areas. A report says that by 2020, lung diseases will become the second biggest killer globally. Occupational health is the promotion and maintenance of the highest degree of physical, mental, and social well-being of workers in all occupations by preventing departures from health, controlling risks, and adapting work to people and people to their jobs. This involves surveillance of the factors in the working environment and working practices that may affect workers' health. Environmental pollution triggers varied and

widespread allergies and disorders in the general population and affects every system of the human body, thereby affecting the quality of human life. Environmental factors are believed to play a significant role in the development of allergic respiratory diseases, such as asthma and rhinitis. The presence of various particles and gases from vehicular emission, like carbon dioxide, carbon monoxide, sulfur, benzene, lead, nitrogen dioxide, nitric oxide, and black smoke, etc., may play a role in the pathogenesis of respiratory diseases. The toxic chemicals and gases released from vehicular emissions produce irritation and allergies in the lungs and air passages of individuals who are exposed to them for a long time. The traffic police are one of the major groups of the population that are constantly exposed to automobile exhaust. They work in the busy traffic signal areas and get exposed to the vehicular emissions for years together. The fumes, chemicals, and particles present in the emission are reported to be damaging to the lung functions of these individuals. The aim is to find out whether the traffic police have the knowledge about prevention aspects of respiratory problems, which they suffer from prolonged exposure to the pollution. Traffic police are exposed to air pollution hazards routinely for 8-10 hours of duty. Analysis of various studies across the country has revealed a high prevalence of respiratory illness among these workmen. Lack of awareness about the hazards in their workplace is a reality. Periodical medical examination is an unknown entity. Usage of PPE (masks) is a rarity. The police department, apart from providing suggestions to ease traffic congestion and provision of PPE to these workmen, has done very little on their health. Occupational health and safety issues of traffic police are common in most Indian cities. As India is a fast-growing developing country, primarily it needs the expansion of transportation and traffic facilities. No countries can grow without industries and supporting systems like transportation of resources. For this purpose we must use different vehicles, and ninety-nine percent of them are using fossil fuels for energy. In our country the cities carry eighty-five percent of the vehicle population. And our major metropolitan cities carry sixty percent of the above. So the risk of environmental pollution is very high in the large cities. Hence, with all the above statistical references, the traffic police are the key population to get affected by respiratory problems, so the researcher felt the need to do the research on their knowledge and attitude regarding the prevention of respiratory problems.

2. LITERATURE REVIEW:

Vimercati L, Gatti MF, Baldassarre A, Nettis E, Favia N, Palma M, Martina GL, Di Leo E, and Musti M (2015) have done a study on occupational exposure to urban air pollution and allergic diseases in a selected city of Italy. The objective of this study was to investigate allergic diseases in 111 traffic wardens compared to a control group of 101 administrative employees. The study design was comparative research design. It is noted that a higher percentage of allergic subjects in the group of workers exposed to outdoor pollutants than in the controls. These results suggest that allergological tests should be included in the health surveillance protocols for workers exposed to outdoor pollutants.1

A study was conducted by Chen YC, Hsu CK, Wang CC, Tsai PJ, Wang CY, Chen MR, and Lin MY (2015) on allergic sensitization, a health surveillance on urban pollution in a selected city of China. The objective of the study was to evaluate the exposure concentrations of particulate matter (PM) in the police station near a highway. Under different traffic volumes, traffic types, and shift times, as well as periods when the wind blew from the highway toward the police station and when the wind speed was greater than or equal to 0.5 m/s, PM2.5, UFP (ultrafine particles), and PM-pahs (particulate matter-polycyclic aromatic hydrocarbons) concentrations in the police station and an upwind reference station were measured. The study design was a cohort research design. Results indicate that PM2.5, UFP, and PM-PAH concentrations in the police station can be on average 1.13, 2.17, and 5.81 times more than the upwind reference station concentrations, respectively. The highest exposure level for PM2.5 and UFP was observed during the 12:00 PM-4:00 PM shift, while the highest pahs concentration was found in the 4:00 AM-8:00 AM shift. Thus, special attention needs to be given to protect police officers from exposure to high PM concentration. 2

A study was conducted by Singh V, Sharma BB, Yadav R, and Meena P (1992) on respiratory morbidity attributed to auto-exhaust pollution in traffic policemen of Jaipur, India. The objective of the study was to evaluate pulmonary effects of traffic pollution on traffic police. The study design was a comparative study done between two groups, i.e., between smokers and non-smokers. The conclusion of the study was that the respiratory morbidity with respect to lung function tests is observed more in groups working in heavy traffic than in the control group. 5

A study was conducted by Pal P, John RA, Dutta TK, and Pal GK (Oct 2010) on pulmonary function tests in traffic police personnel in Pondicherry. The objective of the study was this study was taken up to assess the effect

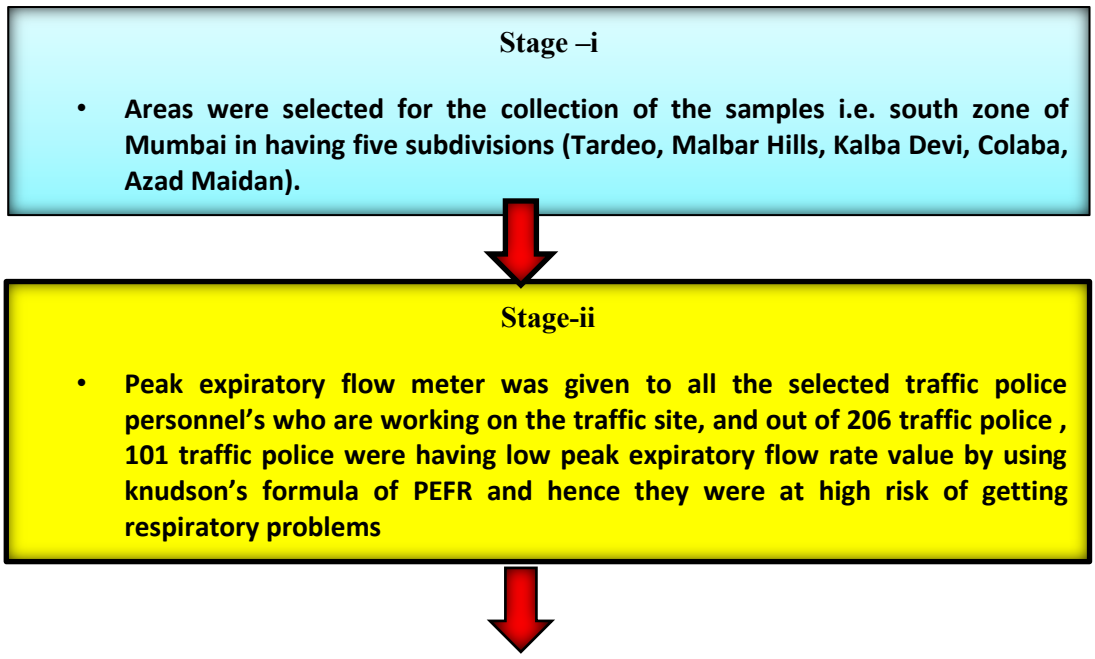
of traffic air pollution on their pulmonary functions. PFT parameters were recorded in age- and BMI-matched 30 traffic police personnel (study group) and 30 general police personnel (control group) of male gender. As chronic smoking is known to be a critical factor in altering lung function, PFT parameters were compared between the smokers as well as non-smokers of both groups. In non-smokers, there was a significant decrease in VC ($P < 0.05$), FEV1 ($P < 0.01$), FEF-25 ($P < 0.05$), and PIF ($P < 0.05$) in the study group compared to the control group. In smokers, there was a significant decrease in VC ($P < 0.05$), FEV1 ($P < 0.0001$), PEF ($P < 0.0001$), MVV ($P < 0.0001$), FEF-25 ($P < 0.0001$), and PIF ($P < 0.01$) in the study group compared to the control group. The conclusion of the study was the changes indicate restriction to the lung expansion, obstruction, and narrowing of the airways in traffic police personnel compared to the general police personnel. This may be due to exposure to vehicular pollution for several hours in a day for many years, causing decreased functional capacity of the lungs, and chronic smoking worsens the condition. 4

A study was conducted by detoni A1, Larese Filon F, and Finotto L (July 2005) on respiratory diseases in a group of traffic police officers; it was a 5-year follow-up in a selected city of Italy. The objective of the study was to investigate respiratory symptoms and pulmonary function in traffic police officers in a 5-year follow-up. The study design was a cross-sectional study design. In this study a 5-year follow-up on FEV1 (forced expiratory volume in one second), FVC (forced vital capacity), and respiratory symptoms was performed on 290 traffic policemen (90.9% participation rate, mean age 39 +/- 8.3 years, seniority of work 11.4 +/- 8.2 years). Results of the study revealed that upper respiratory symptoms were reported by 28% of traffic policemen assigned to traffic control and by 11% of administrative workers ($p = 0.006$). Neither in the 1st control (orc 1.1; IL 95% 0.6-2.3) nor in the follow-up did ORL evaluation show any difference between the two groups after having controlled for smoking habits (Mac Nemar test $p > 0.05$). The follow-up on FEV1 and FVC did not show an accelerated decline in traffic policemen assigned to traffic control as compared to administrative police workers. Hence, it is noted that there is a need to follow up with this cohort, evaluating symptoms and respiratory function for a longer period of time, in order to better understand the role of road traffic pollution in inducing respiratory diseases. 3

3.OBJECTIVES OF THE STUDY:

- To find out the prevalence of respiratory problems among traffic police personnel and group them into high-risk populations.
- To find out the knowledge and to assess the practices regarding prevention of respiratory problems among identified high-risk traffic police personnel.

4. RESEARCH METHODOLOGY:



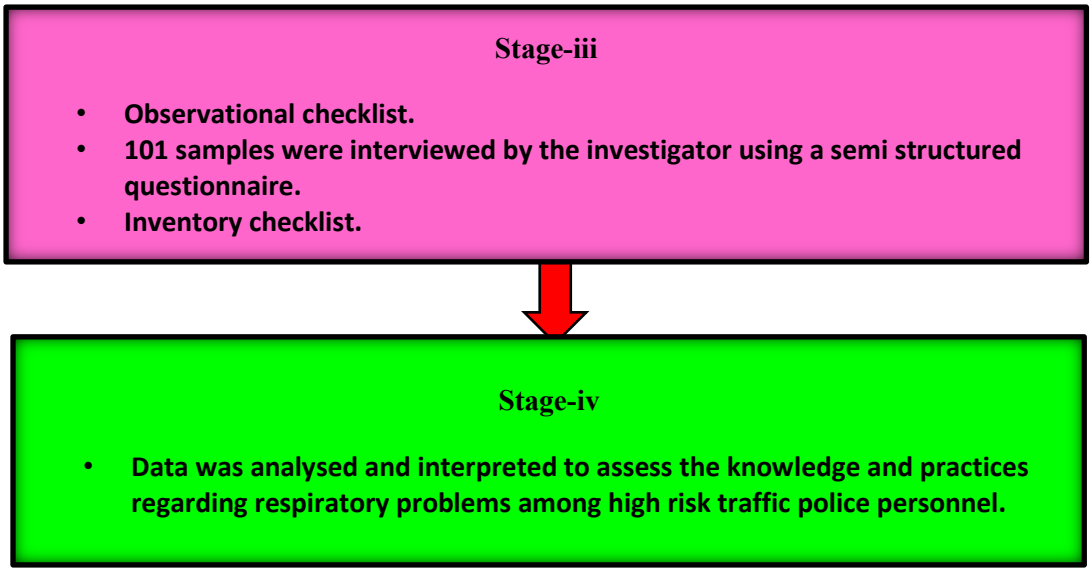


Table i: research design

RESEARCH DESIGN: Peak expiratory flow rate value by using Knudson's formula of PEFR, an observational checklist, and a semi-structured questionnaire and inventory checklist were used.

RESEARCH APPROACH: Exploratory descriptive approach.

RESEARCH DESIGN: Non-experimental research, i.e., survey design, was selected.

SETTING OF THE STUDY: This study was conducted in the south region of traffic police divisions of Mumbai city, which includes six traffic police divisions (Azad Maidan, Colaba, Kalba Devi (Charni Road), Tardeo (Mumbai Central), Malabar Hills, and Byculla Traffic Police Training Institute).

POPULATION AND SAMPLE: High-risk traffic police personnel with low peak expiratory flow rate values are those who worked as traffic police personnel in the field and who fulfill the inclusion criteria.

SAMPLE SIZE: 206 traffic police personnel

SAMPLING TECHNIQUE: Multistage sampling technique

CRITERIA FOR SAMPLE SELECTION:

Inclusion criteria
• Traffic police who are willing to participate in the study.
• Traffic police who can read and write Hindi/English.
Exclusion criteria
• Traffic police who are on night duty.
• Traffic police who are involved with administrative work.

TOOL AND TECHNIQUE:

Tool: Peak exploratory flow meter, structured questionnaire, inventory checklist, and observational checklist.

Technique: Self-reporting cum interviewing.

VALIDITY OF TOOL: Tool validity was done by 17 experts in the field, i.e., 13 nursing experts and 3 associate professors of chest medicine.

DATA GATHERING PROCESS:

The data-gathering process began after the finalization of the tool from 22 July 2016 to 30 August 2016. Prior to the commencement of the study, the investigator obtained permission to conduct the study from the concerned authorities of the traffic police, i.e., the main head office of traffic police at Worli, Mumbai. The investigator visited the traffic police stations, i.e., all five police stations (Kalbadevi, Colaba, Azad Maidan, Malabar Hills, and Tardeo), informed the senior inspector of all five divisions of the south zone regarding the purpose of the study, and sought their cooperation. Also, the permission letter has been submitted to the head of the police station.

5. DATA ANALYSIS:

Inter-rated reliability was spearman rho for the observational checklist of the peak expiratory flow meter. The formula used for internal consistency was Cronbach's alpha for internal consistency of the semi-structured questionnaire. There is a weak correlation between knowledge and practice among the scores obtained by high-risk traffic police personnel, which is P=0.0625. The correlation between the knowledge and practices is r=0.0625, P>0.01. The calculated t-value for the comparison between knowledge and practices among the high-risk traffic police personnel was seen to be 0.161.Which was not significant at the 0.01 level of significance. Thus, the research hypothesis (H1) is rejected, and the null hypothesis (H0) is accepted. The result shows that there is not any significant difference between age, knowledge, and practices among high-risk traffic police personnel.

Table-ii: Distribution of traffic police with regard to their prevalence of respiratory problems

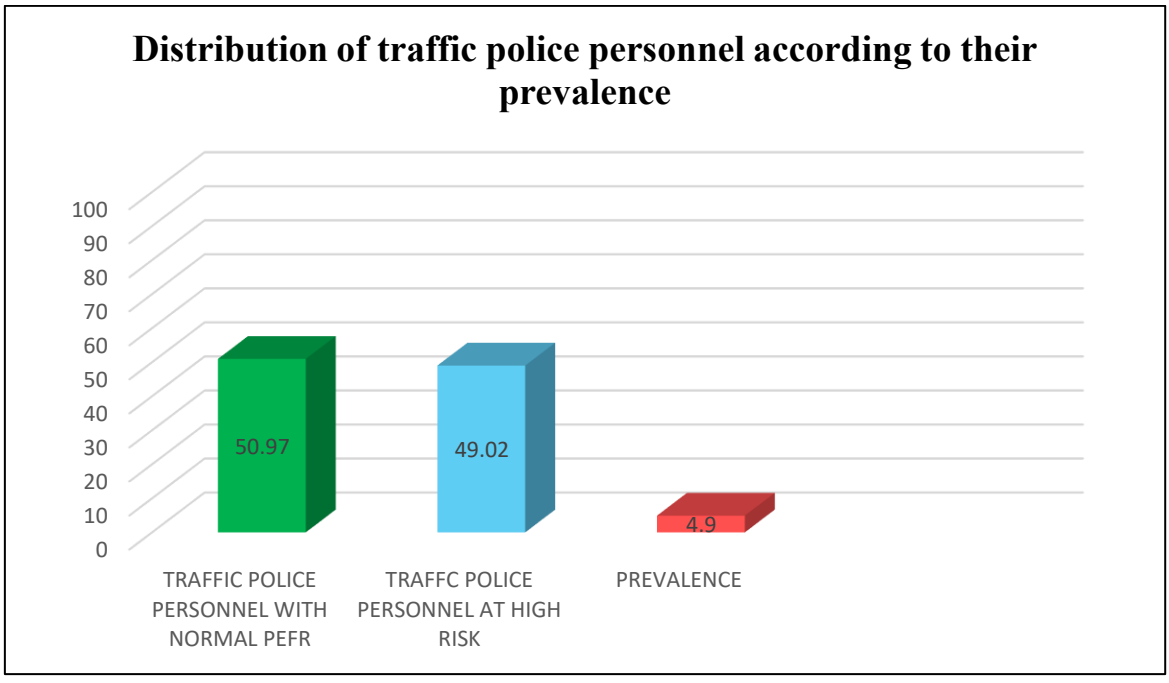


Table -iii: Distribution of practices of high risk traffic police according to their on duty and off duty practices.

Sr.No.	Particulars	Maximum score	Obtained score	Mean	Percentage	Grade
I.	On Duty Practices	9X101=909	570	5.64	63	VG
II.	Off Duty Practices	14X101=1414	479	4.74	34	G

Table-iv: The grading of the scores was done as follows:

Sr. No	Grades	Percentage
1.	POOR(P)	0-25%
2.	GOOD(G)	25-50%
3.	VERY GOOD(VG)	50-75%
4.	EXCELLENT(E)	75-100%

Table-v: Distribution of high risk traffic police as per their off duty practices:

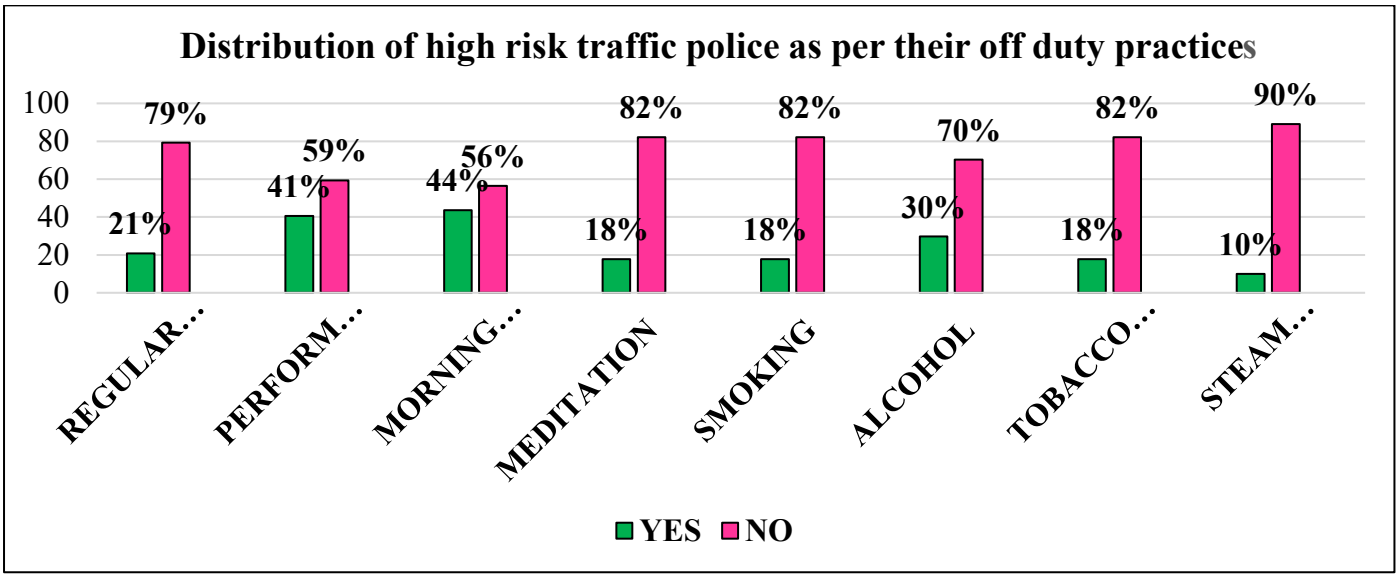
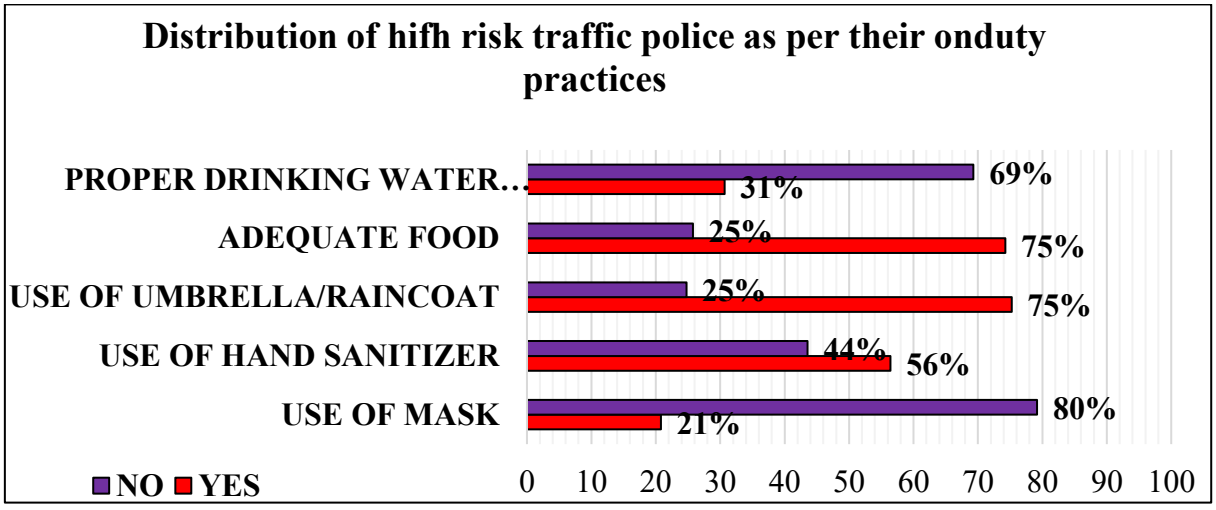


Table-vi: Distribution of high risk traffic police as per their on duty practices:



6. DISCUSSION:

Traffic police are always more focused when it comes to the traffic pollution. They should get proper PPEs to protect them. Also duty hours should get reduced; umbrellas and drinking water facilities should be provided by the government, as they are at very high risk of getting respiratory problems. Hence, the investigator did the study to assess the knowledge and practices of high-traffic police personnel to prevent respiratory problems.

7. LIMITATIONS: Findings of the study cannot be generalized, as the population under study was small and was in one zone of Mumbai city.

8. PERSONAL EXPERIENCE:

The entire study was a fruitful and rich experience for the investigator. It helped her to develop her knowledge regarding research methodology. The study was an important learning experience that enabled the investigator to develop her skills in dealing with different people. Conceptual clarity of research as a whole was strengthened. At every stage from the very beginning, the investigator received guidance and support from her guide, Mrs. Devita Nalawade, Assistant Professor at SNDT Women's University, Churchgate, Mumbai. This boosted her confidence to go ahead and carry out planned activities. However, in this process of data collection, the investigator had difficulties in tracing the addresses and convincing the sample. But because of cooperation from the study samples, the investigator could complete her study; hence, their cooperation was appreciated.

9. SUGGESTIONS FOR IMPROVEMENT OF STUDY:

- The study could have been done for a larger sample size and a longer duration.
- A similar study can be done using different methodology and research dynamics.

10. RECOMMENDATIONS FOR FURTHER STUDY:

- An interventional study can be done by selecting samples that are under high risk of getting respiratory problems.
- Planned teaching can be done to improve knowledge of traffic police personnel.

11. IMPLICATIONS OF THE STUDY:

Implications are meaningful conclusions for the body of nursing knowledge, theory, and practice. Implications are based on conclusions but are more specific than conclusions, and they provide specific suggestions for implementing findings.

NURSING SERVICE:

The findings of the study can be utilized to give health education to the traffic police personnel who are suffering from respiratory problems to prevent further complications like asthma, COPD, and pulmonary tuberculosis.

NURSING EDUCATION:

A nurse educator can also impart this knowledge to her students and clinical nurses to educate the traffic police personnel regarding prevention of respiratory problems.

NURSING RESEARCH:

No profession can exist without research to develop its body of knowledge. Further research on this topic can be done by taking a large sample size under the study for an extensive period in collaboration with hospitals. This can help to trace the traffic police personnel who are suffering from respiratory problems and who are at high risk of getting respiratory problems.

COMMUNITY NURSING:

The community health nurse can create awareness among traffic police personnel and educate them. High-risk status and the effect of air pollution and harmful gases from vehicles can cause respiratory problems. She can also go to the police stations and can conduct an extension program to provide health education.

12. CONCLUSION:

Conclusion is the synthesis of the findings. The investigator needs logical reasoning and creative information of a meaningful whole from pieces of information obtained through the data analysis. The findings from previous studies helped in finding subtle clues in the data and consideration of alternative explanations of the data. It can be concluded that the number of samples who reported a high risk of getting respiratory problems was not significant.

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2. Https://en.wikipedia.org/wiki/Respiratory_disease
3. Http://www.lung.org/lung-health-and-diseases/lung-disease-lookup/asthma/living-with-asthma/managing-asthma/measuring-your-peak-flow-rate