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Original Research Article

Study of socio-demographic factors and morbidity profile of traffic policemen in Solapur city of Maharashtra

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ABSTRACT

Background: The traffic policemen are engaged in controlling vehicular traffic and exposed to higher concentrations of air pollution as well as noise pollution daily. Hence they are at a risk of developing various health problems due to their occupation.
Methods: The aim of study was to study socio-demographic characteristics and morbidity profile of traffic policemen. A cross sectional study was carried out on 114 traffic policemen form the traffic control branch of the city from the police headquarter of the city. History regarding symptoms experienced at the workplace, history of present illness, past history, personal history and family history was obtained and clinical examination was done. Statistical analysis was done with the help of percentages, Chi-square test.
Results: Majority (89.47%) of the traffic policemen were married. Nuclear family type was seen in majority (64.91%) of traffic policemen. Annoyance to noise (51.75%) and eye irritation (32.46%) were most common symptoms experienced at work place by the traffic policemen. Obesity was a major health problem in the study subjects (63.16%). Respiratory morbidity like URTI (14.91%) and chronic rhinitis (14.04%) were found significantly more in the traffic policemen.
Conclusions: Annoyance to noise and eye irritation were most common symptoms experienced at work place by the traffic policemen. Respiratory morbidity like URTI, chronic rhinitis and chronic bronchitis were most common.

Keywords: Morbidity, Auditory, Respiratory symptoms, Traffic policemen

INTRODUCTION

In India, the sources of air pollutants include vehicles, industries, domestic sources and natural sources. Historically, air pollution problem has typically been high levels of smoke and sulphur dioxide arising from the combustion of sulphur-containing fossil fuels such as coal for domestic and industrial purpose. However, now the major threat to clean urban air is posed by vehicular emission.[1]

Traffic congestion is yet another problem leading to high vehicular emissions, besides causing loss of time and productivity, traffic congestion increases fuel consumption and carbon monoxide and hydrocarbon emissions per vehicle-km by 200% or more. Several studies have shown that maintenance is a significant factor in vehicular emissions.[1] A variety of pollutants are emitted by petrol and diesel-engine motor vehicles which are hazardous to human health.

The traffic policemen are one of the people with outdoor occupations in urban areas. They are engaged in controlling vehicular traffic at various squares and busy roads of the city and are typically exposed to higher concentrations of transport related air pollution as well as noise pollution daily for about 8 hours.

A pilot project on the environmental burden of disease in Europe showed that 3–7% of the standard WHO discounted age-weighted burden of disease was associated with nine selected environmental stressors in the six participating countries. Among these nine stressors air pollution had the highest public health impact, followed by second-hand smoke and traffic noise.[2]

Every year 800,000 people die prematurely from lung cancer, cardiovascular and respiratory diseases caused by outdoor air pollution and 4.6 million lost life-years each year around the globe. Other adverse health effects include increased incidence of chronic bronchitis and acute respiratory illness, exacerbation of asthma and coronary disease, and impairment of lung function. The burden of ill-health is not equally distributed as approximately two-thirds of the deaths and lost life-years occur in developing countries of Asia.[3] A review of several studies indicates that a long-term, repeated exposure to air pollution increases the cumulative risk of chronic pulmonary and cardiovascular disease and even death.[4]

The Honourable Supreme Court has also identified seventeen cities which had pollution problems namely Agra, Ahmedabad, Bangalore, Chennai, Delhi, Faridabad, Hyderabad, Jharia, Jodhpur, Kanpur, Kolkata, Lucknow, Mumbai, Patna, Pune, Solapur and Varanasi. Enormous increase in number of vehicles has resulted in increased emission of air pollutants and, as a result, levels of air pollutants such as respirable suspended particulate matter are found to exceed the prescribed standards in these cities.[5]

Hence it is a little attempt to study the socio demographic characteristics and morbidity profile of traffic policemen and to suggest the measures for control and prevent the morbidity due to their work related exposures.

METHODS

A cross sectional study was carried out on 114 traffic policemen form the traffic control branch of the city in the study period from 1st Jan. 2011 to 30th Sept. 2011. Written permission was obtained from Commissioner of Police of the city.

All traffic policemen who are actually engaged in controlling vehicular traffic at 40 different places like squares and roads of the city were included in the study and traffic Policemen who were not engaged in actual controlling of vehicular traffic and women Traffic police as they were in very small number (n=2) were excluded from the study. Total 114 traffic policemen were eligible out of 126 traffic policemen staff of traffic control branch of the city. Remaining 12 traffic policemen were engaged only in office work. A list of all eligible traffic policemen was prepared and stratified into four age groups i.e. 20 to 30 years, 30 to 40 years, 40 to 50 years and ≥50 years. Separate list of eligible study subjects was prepared according to these age groups.

Pre-designed proforma for examination of the study subjects was developed and tested by conducting pilot study on 15 traffic policemen. Necessary changes were made in the proforma. Time schedule of examination of study subjects was done according to their duty hours and with permission of the police authorities.

The examination of the study subjects was done at Urban Health Center of the Medical College which is nearby the Police Commissioner Office. Written consent was taken and the purpose of the study was explained before examination.

Data was collected with the help of pre-designed pre-tested proforma. Statistical tools used for analysis of data were percentages, Z test for difference between two proportions and Chi-square test.

RESULTS

The present study was carried out on 114 traffic policemen of a city. All the participants were interviewed with 100% response. Table 1 shows that all the traffic policemen were between 20 to 57 years of age. Mean age was 37.75 (±10.16) years. Majority of the traffic policemen i.e. 37 (32.46%) were in age group 20 to 30 years, followed by 33 (28.95%) were in age group 40 to 50 years, 23 (20.17%) were in age group 30 to 40 years and minimum 21(18.42%) were in the age group above 50 years of age. It was also observed that out of 114 traffic policemen, 102 (89.47%) traffic policemen were married and only 12 (10.53%) traffic policemen were unmarried. All the unmarried traffic policemen were between 24 to 27 years of age. Out of 114 traffic policemen, 74 (64.91%) traffic policemen belonged to nuclear family followed by 29 (25.44%) traffic policemen belonged to joint family and only 11 (9.65%) traffic policemen were belonged to third generation family. Majority of the traffic policemen 55 (48.25%) were graduates, followed by 30 (26.32%) traffic policemen were educated up to HSC, 20(17.54%) traffic policemen were educated up to SSC, 6 (5.26%) were educated up to middle school and only 3 (2.63%) traffic policemen were postgraduates. According to modified B.G. Prasad's socioeconomic classification it was observed that, majority of traffic policemen 55 (48.25%) were in class III socioeconomic status followed by 53 (46.49%) traffic policemen were in class IV socio economic status and only 3 (2.63%) traffic policemen were from class II and class V socioeconomic status each.[6, 7] Not a single traffic

policeman was found from class I socio economic status. Socio-demographic factors such as marital status, type of family, educational status and socio-economic class were statistically significant (Table 1).

Table 1: Socio-demographic factors of traffic policemen.

Socio-demographic factors		Number	Percentage	Test statistics
Age in years	20 to 30	37	32.46	X^2=6.28 df=3 p>0.05
	30 to 40	23	20.17	
	40 to 50	33	28.95	
	≥ 50	21	18.42	
	Total	114	100	
Marital status	Married	102	89.47	Z=8.41 p<0.01
	Unmarried	12	10.53	
	Total	114	100	
Type of family	Nuclear family	74	64.91	X^2=55.42 df= 2 p<0.01
	Joint family	29	25.44	
	Third generation family	11	09.65	
	Total	114	100	
Educational status	Post graduate	03	02.63	X^2 =77.67 df=4 p<0.01
	Graduate	55	48.25	
	HSC	30	26.32	
	SSC	20	17.54	
	Middle school	06	05.26	
	Total	114	100	
Socio-economic status	II	03	02.63	X^2=91.33 df=3 p<0.01
	III	55	48.25	
	IV	53	46.49	
	V	03	02.63	
	Total	114	100	

Table 2: Distribution of study subjects according to personal habits.

Habit	Number	%	Test statistics
Smoking	08	07.02	X^2=51.9 df=3 p<0.01
Tobacco chewing	25	21.93	
Alcohol intake	21	18.42	
No. of study subjects without habits	60	52.63	
Total	114	100	

Table 3: Distribution of study subjects according to symptoms experienced at the workplace.

Symptoms	No. of study subjects	%
Annoyance to noise	59	51.75
Eye irritation	37	32.46
Sneezing	31	27.19
Cough	29	25.44
Throat irritation	28	24.56
Joint pain	26	22.81
Nasal irritation	24	21.05
Backache	23	20.18
Itching in the groin	22	19.30
Tinnitus	19	16.67
Difficulty in breathing	17	14.91
Tiredness	17	14.91
Headache	16	14.04
Itching all over body	15	13.16

In the Table 2, it was observed that 54 (47.37%) traffic policemen had habit of smoking or tobacco chewing or alcohol consumption. When individual habit wise compared, it was observed that, 7.02% traffic policemen were current smokers, 21.93% traffic policemen had habit of tobacco chewing and 18.42% traffic policemen were used to take alcohol as a habit.[8] Number of traffic police, who were without habits, were maximum than traffic policemen with habits which was statistically significant (p<0.01) (Table 2).

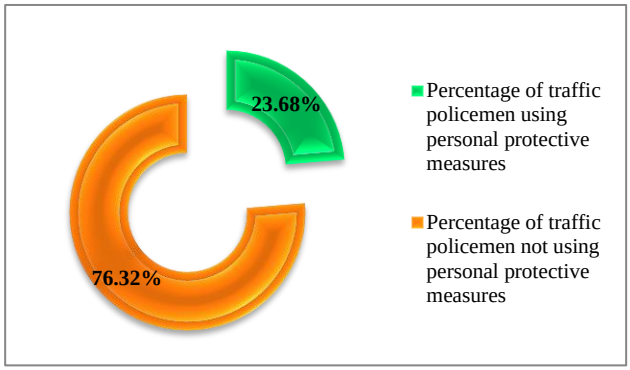

Figure 1: Pie diagram showing distribution of study subjects according to use of personal protective measures at the work place.

Z=5.61, p<0.01.

In the pie diagram, it was showed that, majority of traffic policemen 87 (76.32%) were not using any personal protective measure at the work place which was statically significant (p<0.01) whereas only 27 (23.68%) traffic policemen were using personal protective measures like goggles, handkerchief at the work place while controlling vehicular traffic in the city (Figure 1).

In the Table 3, it was observed that, while on the duty, near about half of the traffic policemen (51.75%) had annoyance to noise particularly due to horns and vehicular noise. 51.75% traffic policemen experienced tinnitus. Second most common symptom was eye irritation, experienced by 37 (32.46%) traffic policemen sometimes associated with watering and eye redness. Nearly half of the traffic policemen (50.88%) experienced respiratory symptoms at the work place. Itching all over the body was experienced by 15 (13.16%) traffic policemen (Table 3).

In the Table 4, obesity (63.16%) was found the major health problem in traffic policemen. Second major health problem found was hypertension. Hypertension was found in 29.82% traffic policemen. The URTI was observed in 17 (14.91%) traffic policemen. Similarly chronic rhinitis was found in 14.04% traffic policemen. The chronic bronchitis was observed in 13.16% traffic policemen. Urticaria was found in 15 (13.16%) traffic policemen. Diabetes mellitus was found in 10 (8.77%) traffic policemen (Table 4).

Table 4: Morbidity pattern among study subjects.

Diagnosis	No. of study subjects	%
Obesity	72	63.16
Hypertension	34	29.82
URTI	17	14.91
Chronic rhinitis	16	14.04
Chronic bronchitis	15	13.16
Urticaria	15	13.16
Acute peptic disease	13	11.40
Fungal infection	12	10.53
Diabetes mellitus	10	08.77
Sub mucous fibrosis	09	07.89
Hemorrhoids	08	07.02
Hydrocele	03	02.63
Hernia	02	01.75
IHD	02	01.75

DISCUSSION

Age wise distribution of traffic policemen (Table 1) in the present study showed that the mean age of traffic policemen was 37.75 (±10.16) while in the study carried out by Carbelli et al, it was found that the mean age of traffic policemen was 41.5 (±7.5) years in total 139 traffic policemen from Rome, Italy.[9] In the study conducted by Ingle, it was found that the mean age of traffic policemen was 40 (±15) years in total 60 traffic policemen in Jalgaon city, Maharashtra, India.[10]

Pal et al carried out a study in Pondicherry, on 30 traffic policemen in which it was found that the mean age of traffic policemen was 38.83 (±1.17) years.[11] In the study carried out by Gupta et al the mean age of traffic policemen was 39.8 (±5.80) years in total 100 traffic policemen of Patiala, India which was nearly same as found in the present study.[12]

As the minimum age limit for recruitment of policemen is 18 years and the retirement age is 58 years.[13] In the present study all the subjects were in the age group between 20 to 57 years.

Regarding marital status of the study subjects in the present study, out of 114 traffic policemen, 102 (89.47%) traffic policemen were married and only 12 (10.53%) traffic policemen were unmarried.

In the present study, distribution of study subjects according to type of family (Table 1) showed that, out of 114 traffic policemen, 74 (64.91%) traffic policemen belonged to nuclear family followed by 29 (25.44%) traffic policemen belonged to joint family and only 11 (9.65%) traffic policemen were belonged to third generation family. According to NFHS-3 (2005-06), the percentage of nuclear family in urban population of India was 63%.[14] In the present study, the percentage of nuclear

family was found 64.91% nearly same as that was reported in NFHS-3. The traffic policemen were serving in the urban area so they had to live in the urban area away from their native place this may be the cause of majority of traffic policemen belonged to nuclear families.

Regarding educational status of the study subjects (Table No. 1) in the present study, the traffic policemen were found to be educated from middle school to postgraduate level of education. According to the Police manual minimum educational qualification required for the post of police constable was amended from time to time and from year 2000 onwards minimum educational qualification required for the post of constable is HSC (12^{th} Standard).[15] Though the minimum educational qualification required for the post of police constable was HSC, it was observed that majority of the traffic policemen were graduates 55 (48.25%) and some postgraduates 3 (2.63%) also.

According to modified BG Prasad classification for socio economic status (Table 1) majority of the traffic policemen were belonged to class III and class IV socio economic status. However only 3 traffic policemen each were belonged to class II and class V socio economic status. Depending on total family members, duration of service, earning members in the family, the per capita income varied hence in the present study the traffic policemen were found belonging to different socio economic classes.

Distribution of study subjects according to personal habits in the present study (Table 2) showed that, out of the total study subjects 47.37% traffic policemen had habit of smoking or tobacco chewing or alcohol consumption. When individual habit wise compared, it was observed that, 7.02% traffic policemen were current smokers while 21.93% traffic policemen had habit of tobacco chewing and 18.42% traffic policemen were used to take alcohol as a habit.[8] When compared with other studies conducted on traffic policemen by Thippanna G. and Lakhtakia, Volpino et al and Karita et al it was observed that 37% to 43% traffic policemen were current smokers, which was more than that observed in the present study (7.02%).[16-18] In the study carried out by Charles et al it was observed that 12.9% male police officers were current smokers and 79.4% male police officers were used to take alcohol.[19] In the study carried out by Shabana et al it was found that 22.6% policemen had habit of smoking, 8.5% policemen had habit of tobacco chewing and 31.1% policemen had habit of alcohol intake.[20]

Regarding the use of personnel protective measures at the work place in the present study (Figure 1), out of total 114 traffic policemen, majority (76.32%) traffic policemen were not using any personnel protective measure at the work place where as only 23.68% traffic policemen were using personnel protective measures like goggles, handkerchief at the work place while controlling vehicular traffic in the city.

Regarding the symptoms experienced by the study subjects at the workplace in the present study (Table 3), it was observed that auditory symptoms like annoyance to noise (51.75%) and tinnitus (16.67%) was experienced commonly by traffic policemen and may be due to the exposure of traffic policemen to the vehicular noise while controlling vehicular traffic. In the study carried out by Tripathi and Tiwari in Ahmedabad, it was observed that 11.6% traffic policemen complained of regular tinnitus.[21]

Nearly half of the traffic policemen (50.88%) experienced respiratory symptoms at the work place which was nearly same as observed in the study carried out in Hyderabad and Secunderabad twin city by Thippanna and Lakhtakia, in which 54.4% of traffic constables had respiratory symptoms at the work place where as in the study carried out by Khare found high prevalence of respiratory symptoms (91.3%) among traffic policemen which was more than found in the present study.[16,22]

It was observed that, at the work place, cough was experienced by 19% to 25% of traffic policemen in the studies carried out by Wongsurakiat et al, Karita et al and Ingle et al which was same as observed in the present study i.e.25.44%.[10,23,24]

Breathlessness or difficulty in breathing was observed in 10%, 20%, 22% and 25% traffic policemen in the studies carried out by Ingle et al, Zang et al, Gupta et al and Karita et al respectively while in the present study difficulty in breathing was experienced by 14.91% traffic policemen.[10,12,24,25]

Irritation in respiratory tract was observed in 29% and 36% of the traffic policemen in the studies conducted by Ingle et al and Gupta et al respectively.[10,12] In the present study it was observed in 24.56% traffic policemen.

In the present study symptoms like annoyance to noise, tinnitus and respiratory symptoms like sneezing, cough, throat irritation and difficulty in breathing and symptom like itching all over body were found to be more common in traffic policemen probably due to exposure of traffic policemen to the road traffic noise and traffic related air pollutants when they were on duty of controlling vehicular traffic on busy roads and squares of the city.

Regarding the morbidity pattern among the study subjects in the present study (Table 4), obesity was found the major health problem in traffic policemen i.e. 63.16%. Similar to the finding observed in the study carried out at Pondicherry, India by Pal et al on traffic policemen.[11] While in the cross-sectional study carried out at Buffalo, New York by Charles et al it was observed that 41.27% police officers were obese and in the studies carried out by Satapathy et al and Saha et al it was observed that

8.5% traffic policemen were obese.[19,26,27] While in the present study we observed that 63.16% traffic policemen were obese.

The classification of obesity was done according to Misra et al for Asian Indians, in which the cut-off point for defining obese was taken as BMI equal to or more than 25 kg/m^2.[28] Hence the percentage of obese subjects in traffic policemen were found more in the present study.

Second major health problem found was hypertension in the traffic policemen. In the present study 29.82% traffic policemen were found with hypertension which was more than that observed in 16% and 25% traffic policemen in the studies carried out by Volpino et al and Satapathy respectively.[17,26]

The URTI was observed in 17 (14.91%) traffic policemen. Chronic rhinitis was found in 14.04% traffic policemen. The chronic bronchitis was observed in 13.16% traffic policemen. In the studies carried out by Wongsurakiat et al, Khare et al and Karita et al it was observed that, the traffic policemen had higher prevalence of respiratory diseases as well as in the studies conducted by Tamura et al and Satapathy it was observed that 13% and 16% of traffic policemen had respiratory disorders respectively.[22-24,26,29] In the present study, the respiratory disorders were found more in traffic policemen which may be because of their exposure to vehicular exhaust and road traffic related air pollution.

CONCLUSION

In a cross sectional study carried out on traffic policemen form the traffic control branch of the city it was observed that majority of the traffic policemen were not using personal protective measures like mask, ear plugs or ear muffs, goggles etc. at the workplace. Annoyance to noise and eye irritation were most common symptoms experienced at work place by the traffic policemen. Respiratory morbidity like URTI, chronic rhinitis and chronic bronchitis were most common.

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