

A Study on Knowledge and Attitude in Relation to Noise Exposure Among Traffic Police in Chennai City

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Abstract - India is one among the developing country its road ways and vehicle count are increasing day to day. We all are updated into technological world but still illiterate on noise and its hazard on environment and health. On accounting our busy lifestyle, we all are failed to focus on our health and cause of illness. This study aims to investigate the Knowledge and Attitude in relation to noise exposure among traffic police in Chennai city. A questionnaire was developed focusing on objectives of the study. After each response, a set of free ear protective Device were distributed in a counselling program to increase the knowledge on need and benefits of EPD. The result shows that traffic police have less knowledge on noise and its health hazards, on the other they are still in backwardness on need and benefits of ear protection devices.

INTRODUCTION

Noise is an any unwanted auditory, electric or other signal that interferes with detecting or discrimination of other signals (Kartz). Sound is one of the most common occupational hazards. Exposure to excessive noise is the major avoidable cause of permanent hearing impairment. worldwide 16% of the hearing disorders among adults is attributed to occupational noise. The National Institute of Occupational Safety and Health (NIOSH) sets the limit at 85 dBA.

Noise Induced Hearing Loss (NIHL) gradually develops after months or years of continuous exposure to noise levels that are higher than 85db. Noise over stimulation causes temporary or permanent damage to sensory cells (hair cells) and their synapses, resulting in temporary or permanent threshold shifts on hearing (Lieberman and Kujawa 2017). Structural changes in conductive mechanism and in the organ of corti is common in NIHL. Either shows conductive, sensorineural in nature or occasionally it may be a combination of both. Usually, it is bilateral and symmetrical and affects high frequencies.

World Health Organization (WHO), 2011 says that annoyance and sleep disturbances are the most widespread and well-documented subjectively reported effects of environmental noise. Other early symptoms like difficulties in understanding normal/ telephone conversation, tinnitus. Other major health effects are cardiovascular disease, cognitive impairment, sleep disturbance, lack of concentration, fatigue, headache. The degree of hearing loss and damage to the ears varies on intensity of sound, duration of exposure to noise and the individual susceptibility to NIHL.

In one or the other way everybody is a road user. The present transport system has minimized the distances but on the other way increased the risk of life. In India, the transportation rate is increasing rapidly on the other side count of vehicles on roads increasing at a fast rate, further on polluting the environment through traffic noise.

The Central Pollution Control Board (CPCB) tracks noise-levels through monitoring stations spread across India's major cities. Chennai is one of the top most noisiest metropolitan city in the country and violates decibel levels throughout the year. In 2018 Chennai was the noisiest among India's six metros. Across the city's 10 stations, the average noise levels during the day were 67.8 decibels (dB), much higher than the equivalent figure for Delhi (61). Since decibels are measured on a logarithmic scale, a 10 dB increase actually translates to a doubling in perceived loudness making differences between cities more significant.

As per the data, the noisiest place is Guindy, where decibel levels constantly clocked 76-77 dB (A) during the day and 73-75 dB (A) at night. Among commercial areas monitored, T Nagar is the worst with noise levels remaining higher than standard limit all 12 months of the year. The limit for commercial area is 65 dB (A) during the day and 55 dB (A) at night and the recorded

level in T Nagar was in the range of 74 to 77 during the day and 67 to 71 at night.

Traffic noise prove to be a significant risk factor for other health effects like diabetes (Zare Sakhvidi et al. 2018) and stroke (Sorensen et al. 2011). Traffic police are at high risk of developing NIHL, who work all day in a traffic noise for hours. But their knowledge, awareness and the attitude towards the effects of noise and ear protective devices is still low so, this study focus on to investigate the knowledge about the effects of noise and EPD's among traffic police.

To avoid the prevalence of NIHL traffic police should be educated on, lifestyle modifications and compliance issues related to hearing health, use of ear protective device, periodic examinations or hearing screening and early treatment.

REVIEW OF LITERATURE

Jamalizadeh, Variani, Ahmadi & Asivandzadeh (2018) investigated prevalence of the violations caused by road traffic noise exposure in Qazvin, Iran. The results says that traffic noise exposure is a significant influential factor in the increased rate of driving violations. Equivalent sound pressure level in taxies was observed to be above of the limit for occupational comfort based on NR 17 standard, which may affect driving behaviours.

Rizi & Hassanzadeh (2013). examined noise exposure and blood pressure. They concluded that Prolonged exposure to industrial noise is related with high blood pressure as a risk factor of cardiovascular diseases. Therefore, it is recommended that training programs be held for workers, preventive measures for noise exposure at workplace be taken, blood pressure of workers be attended to and special care be given to workers with a history of hypertension.

Izadi, Sadeghi & Saraie (2015) investigated effect of noise on professional drivers' health and hearing loss in Tehran, Iran. Hearing loss in older drivers was more and this was due to the long exposure to noise pollution. The rates of hearing loss in high audiometric frequencies were more than at low audiometric frequencies.

Gilani & Mir (2021) investigated on association between road traffic noise exposure and prevalence of coronary artery disease. The analysis revealed, being sensitive to noise, belonging to a higher age group,

reporting higher stress levels, and poor sleep quality were associated with higher risk. The study also provides evidence that exposure to noise levels greater than 60 dB(A) is associated with the prevalence of coronary artery disease in adults.

Amoatey, Omidvarbona, Baawain, Al-Mayahi, Al-Mamun & Al-Harthy (2020) determined traffic noise levels in residential areas, including the assessment of its annoyance and health effects based on the people's perception and reportage in Sultanate of Oman. Results revealed high noise levels and the prevalence of annoyance and health effects among the exposed population. Therefore, immediate action is required to tackle the current noise levels.

Syigna, Aasvang, Aamodt, Oftedal, & Krog (2014) examined relationship between road traffic noise, self-reported sleep quality and mental health in Oslo, Norway. Results suggest that road traffic noise may be associated with poorer mental health among subjects with poor sleep. Individuals with poor sleep quality may be more vulnerable to effects of road traffic noise on mental health than individuals with better sleep quality.

Dreger, Meyer, Fromme & Bolte (2015), investigates influence of different environmental noise sources at children's homes on incident mental health problems in school-aged children. Results suggest that exposure to noise at children's home is associated with mental health problems such as emotional symptoms, conduct problems and hyperactivity.

METHODOLOGY

AIM:

This study aims to investigate the knowledge and attitude in relation to noise exposure among traffic police.

OBJECTIVE:

- To determine the knowledge and attitude on effects of noise exposure.
- To determine the knowledge on ear protective devices, government schemes, and occupation noise level.
- To compare the year of experience and the level of knowledge.

The present study was done in two phases.

PHASE - 1: PREPARATION OF QUESTIONNAIRE

A set of 15 closed ended questions was developed. The questionnaire is given for Validation process to 5

Speech and Language professionals who are currently in a practice. The first of the questionnaire consists of demographics. The second section consists of 15 closed ended questions with 2- point rating scale (Yes/ No). The questions are about knowledge and attitude in relation to noise exposure.

PHASE -2: PARTICIPANTS WITH INCLUSION AND EXCLUSION CRITERIA:

30 Male in the mean age of 41.67 were participated in this study. All the participants where certified Traffic police from the Tamil Nadu Police Academy. Participants are currently working in Chennai city. The unlicensed and police in training were excluded from the study.

SIGNIFICANCE OF THE STUDY:

Traffic police exposed to longer period of traffic noise are prone to high risk of developing Noise induced hearing loss. This study focuses on knowledge and

effects of noise induced hearing loss among traffic police. A set of disposable Ear Plugs provided as a freebie to make them aware of uses and the benefits of EPD's.

PROCEDURE:

The above list of questionnaires was circulated to Traffic police and explained the need of study to get appropriate response for the questions addressed.

STATISTICAL ANALYSIS:

The collected data were summarized by using the Descriptive Statistics: frequency and percentage. To find the association between knowledge and years of experience, the Likelihood ratio test was used. The p value < 0.05 was considered as significant. Data were analysed by using the SPSS software (SPSS Inc.; Chicago, IL) version 26.0.

RESULT AND DISCUSSION

Table 1: Frequency Outcome of Knowledge and Prevalence

(n = 30)	Yes		No	
	Frequency	%	Frequency	%
Can continuous exposure of noise cause hearing loss?	11	36.7	19	63.3
Are you wearing Ear protective device on your working hours?	4	13.3	26	86.7
Does continuous exposure to noise reduce your quality of work?	21	70	9	30
Is hearing loss due to prolonged exposure of noise is reversible?	9	30	21	70
Does noise cause physiological problems like increased heart rate, sleep disturbances, digestive problems, Etc?	12	40	18	60
Giddiness, vomiting sensation or ringing sounds inside the ear, can be due to noise exposure?	4	13.3	26	86.7
Are there qualified professionals to perform hearing conservation program?	4	13.3	26	86.7
Can periodic hearing evaluation help in identifying the noise induced hearing loss at the earlier stages?	5	16.7	25	83.3
Is it necessary to protect your ears from noise exposure?	17	56.7	13	43.3
Are you aware of ear protective device?	5	16.7	25	83.3
Are there different types of ear protective devices available in India?	0	0	30	100
Is there any occupational noise level limits?	7	23.3	23	76.7
Are there any standards to measure the automobile noise in India?	10	33.3	20	66.7
Is there any government benefits available for individuals with hearing impaired due to noise exposure?	5	16.7	25	83.3
Are ear protective devices useful?	21	70	9	30

Figure 1: Frequency Outcome of Knowledge and Prevalence

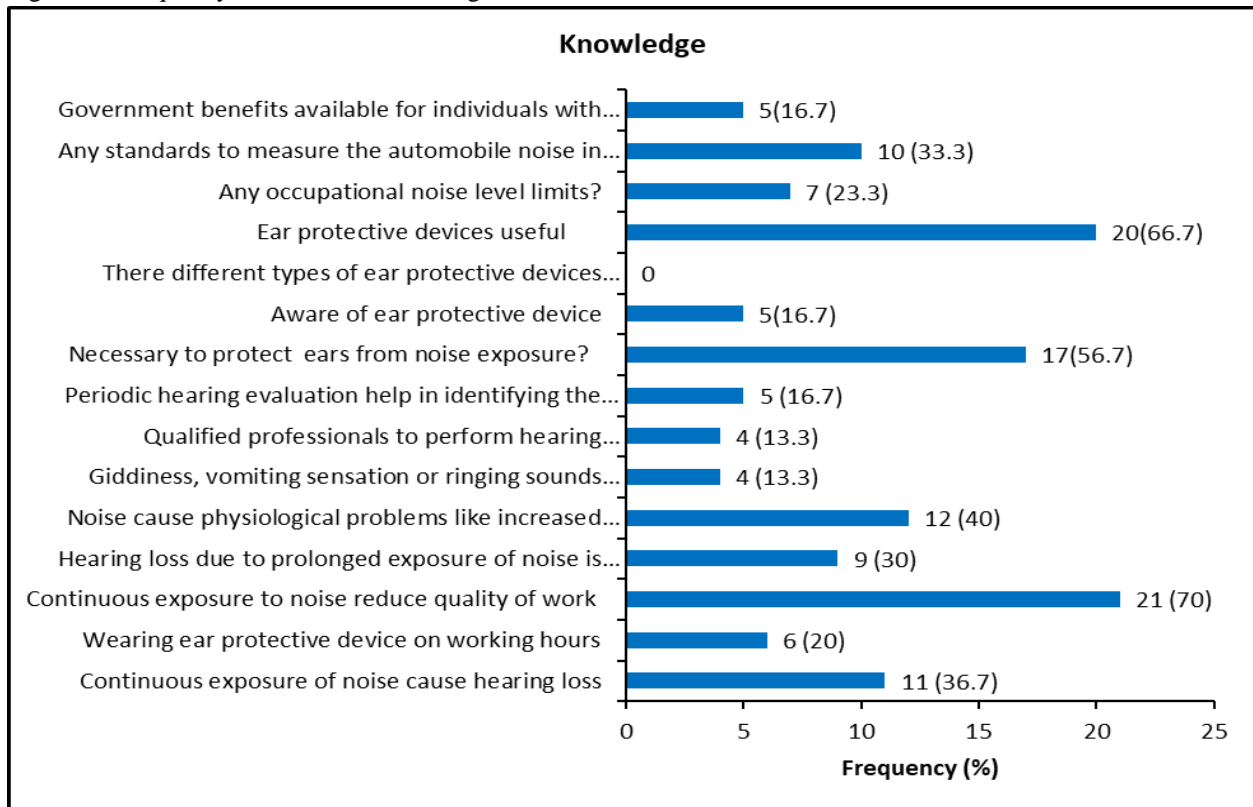


Table 1 explains the frequency and percentage of the target participants on knowledge in various aspects of noise exposure and its outcomes. 63.3% of traffic police were not knowing that continuous exposure of noise can cause hearing loss, 83.3% of police were not aware of ear protective devices among them 13.3 % of police were using ear protective devices. 100% of police were not aware of types of EPD's, 43.4% of participants were not aware that they should protect their ears from noise exposure, 70% of participants accepts that continuous exposure to noise reduce their quality of work, 30% were not aware that hearing loss due to prolonged exposure is non- reversible, 60% were aware that noise will cause physiological problems, 86.7% were not aware that giddiness, vomiting sensation, ringing sound inside the ear can be due to noise exposure, 86.7% were still in backwardness that qualified professionals perform hearing conservation program, 83.3% were not aware that periodic hearing evaluation helps in identifying NIHL in early stage, 76.7% of participants were not aware on existing of occupational noise levels, 66.7% were not aware on standards to measure noise. 83.3% were not aware of government benefits for individuals with NIHL.

In a next phase, counselling has been provided regarding hearing conservation program and all the participated traffic police were recommended to wear EPD's by proving a set of EPD as freebie. After trialling EPD, 70 % of participants accepts the benefits and felt comfortable on their ears.

Table 2: Subjects Age, Year of experience on their field and the duration of noise exposure per day

(n = 30)		Frequency	%
Age (Years)	25-35	6	20
	36-45	15	50
	46-55	5	16.7
	> 55	4	13.3
Years of experience	< 5	10	33.3
	6-10	16	53.3
	> 10	4	13.3
Noise Exposure/ day (Hours)	< 5	5	16.7
	6-10	25	83.3

The above table shows that on selected population, 83.3% of traffic police are expose to 6 to 10 hours of traffic noise per day. Other 16.7 % is exposed to less than 5 hours of traffic noise per day. Under experience 33.3% of traffic police has less than 5 years of experience, 53.3% experience 6 to 10 years, 13.3% experience more than 10 years of experience.

Table 3: Comparison on knowledge and years of experience

Questionnaire		Years of experience						Likelihood ratio	p value
		< 5		6-10		> 10			
		n	%	n	%	n	%		
Can continuous exposure of noise cause hearing loss?	Yes	3	30	7	43.8	1	25	0.783	0.676
	No	7	70	9	56.3	3	75		
Are you wearing Ear protective device on your working hours?	Yes	1	10	2	12.5	1	25	0.503	0.777
	No	9	90	14	87.5	3	75		
Does continuous exposure to noise reduce your quality of work?	Yes	7	70	14	87.5	0	0	12.378	0.002*
	No	3	30	2	12.5	4	100		
Is hearing loss due to prolonged exposure of noise is reversible?	Yes	2	20	7	43.8	0	0	4.714	0.095
	No	8	80	9	56.3	4	100		
Does noise cause physiological problems like increased heart rate, sleep disturbances, digestive problems, Etc.?	Yes	4	40	5	31.3	3	75	2.547	0.280
	No	6	60	11	68.8	1	25		
Giddiness, vomiting sensation or ringing sounds inside the ear, can be due to noise exposure?	Yes	0	0	4	25.0	0	0	5.566	0.062
	No	10	100	12	75.0	4	100		
Are there qualified professionals to perform hearing conservation program?	Yes	2	20	2	12.5	0	0	1.496	0.473
	No	8	80	14	87.5	4	100		
Can periodic hearing evaluation help in identifying the noise induced hearing loss at the earlier stages?	Yes	3	30	1	6.3	1	25	2.836	0.242
	No	7	70	15	93.8	3	75		
Is it necessary to protect your ears from noise exposure?	Yes	5	50	12	75.0	0	0	9.196	0.010*
	No	5	50	4	25.0	4	100		
Are you aware of ear protective device?	Yes	4	40	0	0	1	25	9.075	0.011*
	No	6	60	16	100	3	75		
Are there different types of ear protective devices available in India?	No	10	100	16	100	4	100	--	--
Is ear protective device being comfortable and useful?	Yes	7	70	11	68.8	3	75	0.061	0.970
	No	3	30	5	31.3	1	25		
Are there any occupational noise level limits?	Yes	0	0	7	43.8	0	0	10.666	0.005*
	No	10	100	9	56.3	4	100		
Are there any standards to measure the automobile noise in India?	Yes	3	30	5	31.3	2	50	0.554	0.758
	No	7	70	11	68.8	2	50		
Are there any government benefits available for individuals with hearing impaired due to noise exposure?	Yes	2	20	2	12.5	1	25	0.470	0.790
	No	8	80	14	87.5	3	75		

(* Significant)

The Likelihood ratio test was used to find the association between knowledge and years of experience. There was a significant difference ($p < 0.05$) for questions like, does continuous exposure to noise reduce your quality of work? Is it necessary to

protect your ears from noise exposure? Are you aware of ear protective device? Are there any occupational noise level limits? With years of experience. Other questions show no significant differences.

Table 4: Comparison on Age, Duration of noise exposure per day with Years of experience

		Years of experience						Likelihood ratio	p value
		< 5		6-10		> 10			
		n	%	n	%	n	%		
Age (Years)	25-35	5	50	1	6.3	0	0	13.653	0.034*
	36-45	4	40	10	62.5	1	25		
	46-55	1	10	2	12.5	2	50		
	> 55	0	0	3	18.8	1	25		
Noise Exposure/ day	< 5 Hours	3	30	1	6.3	1	25	2.836	0.242
	6-10 Hours	7	70	15	93.8	3	75		

(* Significant)

The Likelihood ratio test was used to find the significant difference among age, duration of noise exposure per day with years of experience. There was an association ($p < 0.05$) between age and years of experience.

DISCUSSION

This study aimed to examine the knowledge on Ear protective devices, noise causing changes and noise induced hearing loss in traffic police and to examine the knowledge on NIHL government schemes. On the target participants, maximum of traffic police work in traffic noise for mean 7.51 hours per day for a mean of 6.58 years. However, traffic police are exposure to high level of traffic noise for a longer duration but still as per the results, traffic police have less knowledge that is 44% on the above aspects assessed.

CONCLUSION

The study concluded that traffic police are still in backward on knowledge and effects of noise. So, the study focused on to extent the awareness and knowledge on noise and its effects on health and to improve the knowledge on hearing conservation programs and on ear protective devices, which will prevent the traffic police from the risk of noise induced hearing loss. By understanding the need of study, Future steps to be taken to reduce traffic noise which will uplift the health and environment.

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