

NOISE EXPOSURE AMONG TRAFFIC POLICE OFFICERS IN KHARTOUM LOCALITY, SUDAN

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Abstract

Background: This study reports noise exposure among traffic police officers in Khartoum locality, Sudan. In this study, noise exposure was measured among Traffic Police Officer in Khartoum Locality, Sudan, in May 2010. **Objectives:** This paper addresses the noise levels, and their negative effects on traffic police officers resulting from its exposure to road traffic noise. **Materials and Methods:** We conducted a cross-sectional study in twenty two streets points along the Khartoum locality roads. The Khartoum locality roads have heavy traffic during the day, and the noise exposure level among traffic policemen was measured during the time period from 9:00 am to 9:00 pm on working day using a noise dosimeter which reads the noise exposure of a person. Also, 46 traffic police officers working in these points were selected as the study population. **Results:** The level of noise was ranged from 74.5 to 86.7 dBA. 52.2% have mood characteristic as annoyance, while 26.1% have tinnitus. **Conclusion:** It was observed that at all points, the level of noise was higher. Major effects of noise among traffic police officer include annoyance and tinnitus. All Traffic Police officers did not used hearing protection devices.

Keywords: Noise, Exposure, Traffic Police officer, Annoyance

Introduction:

The auditory effects of noise on people have been quite well known for some decades. However, becoming a relatively accessible personal need, cars are invading the urban landscape increasingly. Thus, this contributes to a higher level of noise pollution than any other manpower (Djamel Ouis,

2002). Engine Noise pollution is now recognized worldwide as a major problem for the quality of life in urban areas (Zennin et al., 2001). Noise effects include various impacts on mental and physical health, and the disturbance of daily activities (Picoolo et al., 2005). Noise exposure is associated with a number of health effects. Therefore, we can distinguish psychosocial responses such as; annoyance, sleep disturbance, disturbance of daily activities and performance, from physical responses such as; hearing loss and hypertension (Elise et al., 2002). Since noise develops annoyance, irritation and fatigue in man also results to disturbance during communication. This eventually damages his hearing ability. However, noise can be called a health hazard, like air and water pollution (Singal, 2005). There is little doubt that annoyance from noise adversely affects human well-being (Marisol et al., 2004). In addition, the degree of annoyance appears to be related to the energy content of the noise (Menkiti, 2001). A study by the National Institute of Occupational Safety and Health stated that 79% of workers with noise induced hearing loss complain of tinnitus compared to 6% of adults without noise exposure (Anne, 2003). However, the routine use of properly selected and fitted HPDs, such as muffs and plugs, can effectively prevent and reduce such damages (Patel et al., 2001).

Material and Methods:

The present study was conducted to determine the noise levels of road traffic at Khartoum locality, Khartoum state, the capital of Sudan. This work was focused on one of the busy and the most crowded squares in the locality center. Also, its 22 streets across the roads were selected, which have heavy traffic during the day. Traffic noise exposure level among traffic policemen was measured during the time period of 9:00 am to 9:00 pm on working day at twenty two traffic points using dosimeter (model B & k type 4428, made in Denmark) which reads the noise exposure of a person. This was directly used with the microphone, and was kept 1.2m above the ground. Also, the 46 traffic police officers working in these points which were selected as the study population were interviewed personally. The first stage of the questionnaire considers their perception towards noise exposure at different traffic point. Thus, the second stage focused on the use of protecting device, and finally considered the level of annoyance.

Results:

Table (1): The evaluation questionnaire of traffic police officers in Khartoum Locality, Sudan.

How old are you?	1- Less than 20 years (2.2%) 2- 21 to 40 years (89.1%) 3- 41 and more (8.7%)
Is there high noise level in your	4- Yes (87.0%) 2- No (13.0)

work area?	
What is your official duty employment status?	1- One (52.2%) 2- Two (30.4%) 3- Three (17.4%)
Use of protective device - earplugs/earmuff	1- Yes (0.0%) 2- No (100.0%)
Self-evaluate mood characteristics	1- Annoyance (52.2%) 2- Not concentrate (21.7%) 3- Nothing (26.1%)

Table (2): The level of noise dose (LAeq) in traffic police officers in different traffic across streets in Khartoum Locality, Sudan.

Points	Location	Sound LAeq (dBA)
1	Abdul Moneim Mohammed St across Sayed Abdul Rahman Ave (Al qandool roundabout)	77.8
2	El Baladiya across UN St	78.0
3	Gamma Ave cross Abdul Moneim Mohammed St	79.0
4	Nile St across Ali Abdul Latif	82.5
5	El Baladiya Ave across El Gasr Ave	74.5
6	El Baladiya Ave cross Atbara St	77.5
7	Gamma Ave across Othman Digna Ave	81.2
8	Gamma Ave across El Meke Nimir Ave	84.3
9	Nile St across Abu Groun	84.0
10	Army Ave across Gamma Ave	84.0
11	El Meke Nimir Ave across El Baladiya	81.2
12	Army Ave across EL Huriya Ave	81.0
13	Sayed Abdul Rahman Ave across El Gasr Ave	74.8
14	Pio Yokwan St across El Tabia St	77.8
15	El Tabia St across Suadaldeen St	80.5
16	El Baladiya Ave across El Sheid Dafa ala St	82.2
17	Tutui Bridge roundabout	86.2
18	Nile St across Army Ave	86.7

Figure (2): Tinnitus among Traffic Policemen in Khartoum Locality, Sudan.



Discussion:

The average noise level which traffic police officers are exposed to during work, varies between 74.5 to 86.7 dB (A) . However, all traffic police officers works without any protective equipment. Among all the traffic police officer, 87.0% felt that the noise level at the points was high. Those

living near busy roads could not hear each other, and thus, were unable to make contact for propagation (Deutsche Presse-Agentur, 2003). Consequently, our findings were lower than the results of the traffic noise survey conducted in Karachi and Hyderabad. Sheikh et al. (1987, 1997) shows that the levels of traffic noise vary in the range of 61 to 97 dB(A). In addition, our findings were lower than the results of noise levels measured during the daytime in a fast developing semi-urban area of Nepal (Krishna Murthy et al., 2007). However, the results indicate high noise levels. Overall, minimum and maximum noise levels for the Main Road are 60.1dB (A) and 110.2 dB (A), respectively. Noise in the field experiment caused psychological and physiological stress effects in half of the subjects (Ising and Michalak, 2004). This is in agreement with our findings: 52.2% have mood characteristic, and 26.1% of sample respondents exposed to noise pollution report occurrence of tinnitus. Furthermore, this also agrees with Shrestha et al. (2011) who reported that twenty six (23.6%) had tinnitus. In situations where noise cannot be eliminated, workers should be advised to wear hearing protection. The two most commonly used types of protection are earplugs or earmuffs (Clark 1999). Hence, this disagrees with our results 100.0% because Traffic Police officers do not use hearing protection devices. Hearing protection is very necessary to protect workers when they are exposed to noise at above 85 dBA, sustained for more than 8 h (Lin, 2005).

Conclusion:

High noise levels were observed at all measurement points. Major effects of noise among traffic police officer include annoyance and tinnitus. All Traffic Police officers do not used hearing protection devices.

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References:

- Anne M B (2003). The effectiveness of a hearing conservation program for fourth grade students, Master of Arts, Miami University, Ohio, Oxford, USA.
- Clark, WW (1999). Effects of noise on hearing, Journal of American medical association, 1999; 17(280): 1656 – 1659.
- Deutsche, Presse-Agentur (2003). Noisy cities make them dumb. Business Line, May 10 (2003).
- Djamel Ouis (2002). Annoyance caused by exposure to road traffic noise: An update: Noise Health 2002;4:69 - 79

- Elise E M., Kempen M V., Hanneke K., Boshuizen H C., Ameling C B., Staatsen B A M and De Hollander A E M (2002). The Association between Noise Exposure and Blood Pressure and Ischemic Heart Disease: A Meta-analysis. *Environmental Health Perspectives*, 2002, 110(3); 307 – 317.
- Ising H., Michalak R (2004). Stress effects of noise in a field experiment in comparison to reactions to short-term noise exposure in the laboratory. *Noise Health*, 2004, 6; 1-7.
- Krishna Murthy V, Ahmad Kamruzzaman Majumder, Sanjay Nath Khanal, Deepak Prasad Subedi (2007). Assessment of traffic noise pollution in banepa: A semi urban town of Nepal. *Kathmandu university journal of science, engineering and technology*, i(iv), august, 2007.
- Marisol Concha-Barrientos., Diarmid Campbell-Lendrum, and Kyle Steenland (2004). Occupational noise: Assessing the burden of disease from work-related hearing impairment at national and local levels, *Environmental Burden of Disease Series*, No 9. World Health Organization, Geneva.
- Menkiti, Al (2001). Analyses of noise bother by survey method, *Global journal of pure and applied sciences*, 7(3); 545 - 551; 4 ref.
- Patel, D S, Witte K, Zuckerman C, Murray-Johnson L (2001). Understanding barriers to preventive health actions for occupational noise-induced hearing loss, *Journal of Health Communication*, 2001, 6, ; 155 - 168.
- Piccolo A., Plutino D., Cannistraro G., (2005). Evaluation and analysis of the environmental noise of Messina, Italy. *Appl. Acoust.*, 66 (4): 447-465
- Shaikh G H., Ahmad N and Shaikh Q (1997). Traffic Noise in Karachi, Part-II, *Pak. J. Sci. Ind. Res*, 1997, 34:51-54.
- Shaikh G H., Khan N A., Yaqoob M., Khan A W and Rizvi S S H (1987). Traffic Noise in Karachi. *Pak. J. Sci. Ind. Res*, 1987, 30: 197-200.
- Singal S.P (2005). Noise Pollution and Control Strategy, *Norosa*, 2005, p. 81 – 196.
- Zannin, P H. T., Calixto A., Diniz F B., Ferreira J A C (2003). A survey of urban noise annoyance in a large Brazilian city: the importance of a subjective analysis in conjunction with an objective analysis. *Environ. Impact. Assessment. Rev.*, 2003, 23; 245–255.
- Shrestha I, Shrestha BL, Pokharel M, Amatya RCM, Karki DR (2011). Prevalence of Noise Induced Hearing Loss among Traffic Police Personnel of Kathmandu Metropolitan City, *Kathmandu University Medical Journal*, vol.9 , no. 4 , issue 36 ,oct - dec 2011.