Prevalence of hypertension in bus drivers in Kolkata, West Bengal and associated health related behaviours

Monojit Das*

AkashMallick**

Abstract

Bus drivers, a vulnerable occupational group, are exposed to adverse workplace environmental conditions which play major role in developing hypertension among them. Health issues of bus drivers are the principle concern for safety of community and people. The issues of hypertension and health-related behvaiours among the bus drivers in India are not adequately addressed.Present study was carried out in Kolkata to find out the prevalence of hypertension among bus drivers and its relationship with health-related behaviours.Study involved 120 adult bus drivers working under Calcutta State Transport Corporation (CSTC) in West Bengal. Self-administered questionnaire was used following standard protocol to collect data on health-related behaviours of bus drivers and blood pressure measurement. Statistical analysis was done using PASW software.Prevalence of smokers and alcohol consumers among bus drivers were high. Tobacco chewing was low. Most participants slept less than 6 hours per day. Prevalence of hypertension was low among the drivers. Most of the participants were pre-hypertensive. Study indicated that prolonged exposure to smoking, alcohol, street food intake and working overtime may augment the chance of developing hypertension. Prevalence of pre-hypertension among is a matter of concern for the safety of bus drivers as well as of community.

Keywords:

Hypertension
Bus drivers
Health-related behaviour
Smoking
Occupational health

Author correspondence:

AkashMallick,
Senior Research Fellow, Biological Anthropology Unit
Indian Statistical Institute
Email: akashmallick123@gmail.com

1. Introduction

Bus drivers are a vulnerable occupational group who deal with adverse workplace conditions like prolonged driving hours, shift duties, traffic congestions, air and sound pollution, unbalanced diet as well as passenger complaints etc. (Richter et al., 1998; Hirata et al., 2012). Bus drivers develop job stress by this complex environments (Albright et al., 1992) and develop several behavioural outcomes like tobacco use,

*Department of Anthropology, West Bengal State University

**Biological Anthropology Unit, Indian Statistical Institute

alcohol intake (Ragland et al., 1995; Cunradi et al., 2003), smoking (Bovenzi and Zadini, 1992), and drug use (Tse et al., 2006) to deal with the situation. However, these behaviours sometime play a major role of developing hypertension among bus drivers (Tuchsen et al., 2006; Siu et al., 2012).

Worldwide, hypertension has become a major health burden among bus drivers in recent decades due to many occupational stressors such as.

Also in India, several studies found significant association between hypertension and smoking, alcohol intake (Udayar et al., 2015), tobacco chewing (Satheesh and Veena, 2013) among bus drivers. However, India is a nation with large transport network within and around states. Metropolitan cities like Kolkata, Delhi, Mumbai and Chennai involves a vast network of transport services in and around the cities itself majorly covered by bus services (Both public and governmental services). Therefore, the health issues of bus drivers always remain a concern for the safety of community.

Nevertheless, to the best of our knowledge, not much emphasis has been given on the issues of hypertension and its association with health-related behaviours among bus drivers of Kolkata, a metropolitan city in India.

Objective of the study

The objective(s) of the present study was to find out the prevalence of hypertension among bus drivers and its association with selected health-related behaviours.

2. Research Method

Present cross-sectional study was carried out in the suburban Kolkata involving bus drivers engaged as employee under Calcutta State Transport Corporation under the district of North 24 Parganas, West Bengal, India. Two bus depots (Route 201 and L238) were chosen for the convenience of fieldwork due to (1) prior rapport with the depot authorities and (2) time and funding limitation. Prior to data collection, bus drivers were informed about the purpose of the study.

Total enumeration was done instead ofstatistical sampling was not attempted because of (1) absence of adequate literatures providing prevalence of hypertension among Kolkata bus drivers and (2) to avoid growing suspicion upon selective choice of participants. Initially, 138 adult bus drivers who were engaged in the driving for at least one year and had a full-time job voluntarily agreed and persuaded to participate in the study with written consent. Bus drivers, who either reported medication for maintaining blood pressure or stated vigorous physical exercise, smoking, tobacco use or drinking alcohol/tea/coffee within thirty minutes prior to blood pressure measurements (approx. 18 bus drivers) were excluded from the study. Finally, data were collected from 120 adult bus drivers by a single investigator/measurer (MD).

Data on health-related behaviour of bus drivers such as sleep duration per day and habit of smoking, tobacco chewing, alcohol intake and meal intake were collected using a self-administered questionnaire. Auscultatory method was used for blood pressure measurement with a mercury sphygmomanometer and a stethoscope. Two readings of systolic blood pressure (SBP) and diastolic blood pressure (DBP) were taken at an interval of 30 minutes for accuracy of the reading. All the records were written by the investigator/measurer himself to avoid error.

Before analysis, bus driver's present age was classified into 2 categories viz. '<35 years' and '≥35 years'. Smoking status was grouped into 2 categories viz. 'Smoker' and 'Non-smoker'. Habit of tobacco chewing among bus drivers was grouped into 'Present' and 'Absent'. Alcohol consumption was also grouped into 'Present' and 'Absent'. Subsequently, sleep duration per day was grouped into two categories using median value as '<6 hours' and '≥6 hours'. Lastly, habit of milk intake was grouped into two categories i.e. 'Homemade' and 'Street food'.

Categories of blood pressure were made following the classification cut-off point of JNC-7 (Chobanian et al., 2003). Individuals with SBP<120 mmHg and DBP <80 mmHg were considered as 'Normotensive'. Individuals with SBP 120-139 mmHg or DBP 80-89 mmHg or with both were considered as 'Pre-hypertensive'. Subsequently, Individuals having SBP of 140-159 mmHg and DBP 90-99 mmHg were considered as 'Stage 1 Hypertensive' and those who had SBP ≥160 mmHg or DBP ≥100 mmHg or both were considered as 'Stage 2 Hypertensive'.

Binary logistic regression was performed to calculate odds ratio (OR) to find out the effects of selected health-related behaviours of bus drivers on hypertension. All the statistical analysis was done using statistical package PASW (Predictive Analytics Software) version 18.0.

Table 1. Frequency distribution of private bus drivers of Kolkata interms of their health-related behaviour

Variable		Bus drivers (*n*=120)
Age - years (Mean±SD)		39.79±6.17
Smoking status	Smoker	96 (80.0%)
	Non-smoker	24 (20.0%)

Tobacco chewing	Present	24 (20.0%)
	Absent	96 (80.0%)
Alcohol consumption	Present	102 (85.0%)
	Absent	18 (15.0%)
Sleep time/day (h)	<6	88 (73.3%)
	≥6	32 (26.7%)
Meal intake	Homemade	8 (6.7%)
	Street food	112 (93.3%)

Table 2. Categories of the bus drivers on the basis of JNC-7 (blood pressure) classification

Categories of Blood pressure (Cut-off point)	Bus drivers (n = 120)	
	n	%
Normotensive (SBP<120; DBP <80)	11	9.2
Pre-hypertensive (SBP 120-139 and/or DBP 80-89)	89	74.2
Stage 1 hypertensive (SBP 140-159; DBP 90-99)	17	14.1
Stage 2 hypertensive (SBP ≥160; DBP ≥100)	3	2.5

Table 3. Results of binary logistic regression analysis of hypertension in respect of bus drivers characteristics

Independent variables		Binary logistic regression method	
		OR (95% CI)	p
Smoking status	Smoker	1.924 (0.372-9.943)	0.435
	Non-smoker	Reference group	
Tobacco-chewing	Present	0.469 (0.088-2.496)	0.375
	Absent	Reference group	
Alcohol consumption	Present	1.315 (0.244-7.083)	0.750
	Absent	Reference group	
Sleep duration/day (h)	<6	0.940 (0.245-3.611)	0.928
	≥6	Reference group	
Meal intake	Homemade	Reference group	
	Street food	1.715 (0.295-9.987)	0.548
Nagelkerke R^2		0.11	
Model correctly predicted		83.3	

3. Results and Analysis

Table 1 depicted the distribution of private bus drivers in Kolkata in terms of their age and health-related behaviours. Mean age of bus drivers was 39.79±6.17 years. Almost 80.0% of the study participants were smokers compared to only 20.0% who were non-smokers. Prevalence of tobacco chewing was as low as 20.0% among them while 80.0% of them reported that they never chewed tobacco. Approximately 85.0% of the study participants were alcohol consumers. A large number of participants (73.3%) slept less than 6 hours per day. Almost all of them (93.3%) took meal outside during their working hours. Only 6.7% of them took homemade food.

Table 2 showed the frequency distribution of private bus drivers in categories of hypertension based on the classification of JNC-7. Only 9.2% of the study participants were considered as 'Normotensive' with SBP<120 mmHg and DBP<80 mmHg. Most of the participants were categorised into 'Pre-hypertensive' group with SBP 120-139 mmHg and/or DBP 80-89 mmHg. Around 14.1% of the participants were considered as 'Stage 1 hypertensive' group with SBP 140-159 mmHg and/or DBP 90-99 mmHg. A few of them (2.5%) belonged to 'Stage 2 hypertensive' group with SBP ≥160 mmHg and/or DBP ≥100 mmHg.

Table 3 showed the results of binary logistic regression analysis on hypertension in respect of selected health-related behaviour. Reference categories were 'Non-smoker', 'Absence of tobacco chewing', 'Absence of alcohol consumption', '<14 hours driving time/day', '<6 hours sleep duration/day' and 'Homemade meal intake'. Results indicated that bus drivers who were smoker (OR = 1.924) and alcohol consumers (OR = 1.315) were more likely to show hypertension compared to their counterpart groups. Meal intake from street (OR = 1.715) also showed indication of developing hypertension compared to the counterpart groups.

Present study was carried out among bus drivers of Kolkata, one of the metropolitan cities in India to find out the prevalence of hypertension and its concomitants in the backdrop of inadequate literatures on hypertension. Study protocol was uniformly followed for each and every participants.

Alcohol consumption in present study group was relatively high compared to the findings of Borle and Jadhao (2015), Udayar et al. (2015), Makanjuola et al. (2007) where around 40-50% of bus drivers were found as alcohol consumers. In contrast to the present study, Tobin et al. (2013) and Odeyinka and Ajayi

(2017) found low responses of smoking. However, only 20% of the bus drivers in Kolkata reported on chewing tobacco compared to bus drivers of Andhra Pradesh (Udayar et al., 2015).

Prevalence of hypertension among the study participants was consistent with many earlier literatures which showed less than 25% prevalence of hypertension among bus drivers (Satheesh and Veena, 2013; Backman, 1983; Katti et al., 2009). Nevertheless, many others reported high prevalence of hypertension among bus drivers (Wang et al., 2001; Borle and Jadhao, 2015). The differences in prevalence may have occurred due to lifestyle differences of bus drivers from different region. However, pre-hypertensive individuals in the present study was around 74.2%. The proportion is much greater than bus drivers in Londrina, Brazil (Hirata et al., 2012) as well as than in Andhra Pradesh [23.05%] (Udayar et al., 2015) and Kerala [41.9%] (Lakshman et al., 2014). This could be an important issues to address as the progression of pre-hypertension towards hypertension increases the risk of cardio-vascular disease.

Present study further revealed that,although not significant, smokers were more likely to develop hypertension compared to non-smokers. This finding corroborates with Lakshman et al. (2014). In contrast, Nasri et al. (2006) and Virdis et al. (2010) found a significant association between smoking and hypertension. Present study also found that alcohol consumers were more likely to develop hypertension unlike the findings of Malhotra (1971), Erhiano et al. (2015) and Jayarajah et al. (2017). Habit of tobacco chewing was not significantly associated with hypertension among present study group unlike the findings of Satheesh and Veena (2013).

Taking street food during work is a common phenomenon among bus drivers. Inappropriate dietary habit of bus drivers are one of the main factors of developing hypertension (Odeyinka and Ajayi, 2017). However, present study found no such association.

In summary, present study found that none of the selected characteristics (occupational and behavioural) of bus drivers were significantly responsible for developing hypertension. However, the study indicates that smoking, alcohol consumption, inappropriate diet outside home may lead to hypertension among the study population. It is not apparent in the present findings though. Moreover, the pre-hypertensive individuals may be at risk of developing hypertension in near future.

4. Conclusion

Professional bus drivers, engaged as a full time employee, are one of those major groups who are frequently exposed to many stressors without any awareness or protection. Majority of them serve in the nation to make transport service more reliable to community and people. Therefore, the health of bus drivers are of concern not only for the sake of themselves but for the safety of people in community. Behavioural outcomes of bus drivers seemed to be responsible for blood pressure elevation among them. Hence, it is important to further study the behavioural domain of bus drivers to get better insight into the problem. It would have been better to incorporate several other concomitants which were not possible to include in such a small study. Future studies in this area should fill the lacuna and design their study problem considering various environmental traits in order to get better insight on present issue.

References

The main references are international journals and proceedings. All references should be to the most pertinent and up-to-date sources. References are written in APA style of Roman scripts. Please use a consistent format for references – see examples below (9 pt):

[1] Albright, C. L., Winkleby, M. A., Ragland, D. R., Fisher, J., & Syme, S. L. (1992). Job strain and prevalence of hypertension in a biracial population of urban bus drivers. *American Journal of Public Health, 82*(7), 984-989.

[2] Backman, A. L. (1983). Health survey of professional drivers. *Scandinavian Journal of Work, Environment & Health, 9*(1), 30-35.

[3] Borle, A. L., & Jadhao, A. (2015). Prevalence and associated factors of hypertension among occupational bus drivers in Nagpur city, Central India - A cross sectional study. *National Journal of Community Medicine, 6*(2), 423-428.

[4] Bovenzi, M., & Zadini, A. (1992). Self-reported low back symptoms in urban bus drivers exposed to whole-body vibration. *Spine, 17*(9), 1048–1059.

[5] Chobanian, A. V., Bakris, G. L., Black, H. R., Cushman, W. C., Green, L. A., Izzo, J. L., Jr., . . . Roccella, E. J. (2003). Seventh report of the Joint National Committee on prevention, detection, evaluation, and treatment of high blood pressure. *Hypertension, 42*(6), 1206-1252. doi:10.1161/01.HYP.0000107251.49515.c2

[6] Cunradi, C. B., Greiner, B. A., Ragland, D. R., & Fisher, J. M. (2003). Burnout and alcohol problems among urban transit operators in San Francisco. *Addictive Behaviors, 28*(1), 91–109.

[7] Erhiano, E. E., Igbokwe, V. U., El-Khashab, M. M., Okolo, R. U., & Awosan, K. J. (2015). Prevalence of hypertension among commercial bus drivers in Sokoto, Sokoto State Nigeria. *International Journal of Medical Science and Public Health, 2*(3), 34-39.

[8] Hirata, R. P., Sampaio, L. M., Filho, F. S., Braghiroli, A., Balbi, B., Romano, S., ... De Oliveira, L. V. (2012). General characteristics and risk factors of cardiovascular disease among interstate bus drivers. *The Scientific World Journal, 1*, 1-7. doi:10.1100/2012/216702

[9] Jayarajah, U., Jayakody, A. J., Jayaneth, J. M., & Wijeratne, S. (2017). Prevalence of hypertension and its associated factors among a group of bus drivers in Colombo, Sri lanka. *International Journal of Occupational and Environmental Medicine, 8*(1), 58-59. doi:10.15171/ijoem.2017.986

[10] Katti, S. M., Joshi, A. V., Mallapur, M. D., & Wantamutte, A. S. (2009, February 10). Prevalence of Hypertension among Bus Drivers of Belgaum Division. Lecture presented at 36th National Conference IAPSM in Maharasthra, Aurangabad.

[11] Lakshman, A., Manikath, N., Rahim, A., & Anilakumari, V. P. (2014). Prevalence and risk factors of hypertension among male occupational bus drivers in North Kerala, South India: A Cross-sectional study. *ISRN Preventive Medicine, 2*, 1-9. http://dx.doi.org/10.1155/2014/318532

[12] Makanjuola, B. A., Oyeleke, S. A., & Akande, T. M. (2007). Psychoactive substance use among long distance vehicle driver in Ilorin. *Nigerian Journal of Psychiatry, 5*(1).

[13] Malhotra, S. L. (1971). Studies in arterial pressure in the North and South India with special reference to dietary factors in its causation [Abstract]. *The Journal of the Association of Physicians of India, 19*(3), 211-224.

[14] Nasri, H., & Moazenzadeh, M. (2006). Coronary artery disease risk factors in driving versus other occupations. *ARYA Journal, 2*(2), 75-78.

[15] Odeyinka, O. T., & Ajayi, I. O. (2017). Prevalence of hypertension and diabetes and their determinants among commercial drivers in Ibadan metropolis, South-Western Nigeria. *Nigerian Journal of Cardiology, 14*(2), 75-83. doi:10.4103/njc.njc_11_17

[16] Ragland, D. R., Greiner, B. A., Krause, N., Holman, B. L., & Fisher, J. M. (1995). Occupational and nonoccupational correlates of alcohol consumption in urban transit operators. *Preventive Medicine, 24*(6), 634–645.

[17] Richter, P., Wagner, T., Heger, R., & Weise, G. (1998). Psychophysiological analysis of mental load during driving on rural roads- a quasi-experimental field study. *Ergonomics, 41*(5), 593-609.

[18] Satheesh, B. C., & Veena, R. M. (2013). A study of prevalence of hypertension among bus drivers in Bangalore city. *International Journal of Current Research and Review, 5*(17), 90-94.

[19] Siu, S. C., Wong, K. W., Lee, K. F., Lo, Y. Y., Wong, C. K., Chan, A. K., . . . Lam, C. L. (2012). Prevalence of undiagnosed diabetes mellitus and cardiovascular risk factors in Hong Kong professional drivers. *Diabetes Research and Clinical Practice, 96*(1), 60-67.

[20] Tobin, E. A., Ofili, A. N., Asogun, D. A., Igbinosun, P. O., Igba, K. O., & Idahosa, A. V. (2013). Prevalence of hypertension and associated factors among inter-city drivers in an urban city in South-South Nigeria. *International Journal of Research in Medicine, 2*(3), 5-12.

[21] Tse, J. L., Flin, R., & Mearns, K. (2006). Bus driver well-being review: 50 years of research. *Transportation Research Part F: Traffic Psychology and Behaviour, 9*(2), 89-114. doi:10.1016/j.trf.2005.10.002

[22] Tüchsen, F., Hannerz, H., Roepstorff, C., & Krause, N. (2006). Stroke among male professional drivers in Denmark. *Occupational and Environmental Medicine, 63*(7), 456-460.

[23] Udayar, S. E., Sampath, S., Arun, D., & Sravan, S. (2015). Epidemiological study of cardiovascular risk factors among public transport drivers in rural area of Chittoor district of Andhra Pradesh. *International Journal of Community Medicine and Public Health, 2*(4), 415-420.

[24] Virdis, A., Giannarelli, C., Neves, M. F., Taddei, S., & Ghiadoni, L. (2010). Cigarette smoking and hypertension. *Current Pharmaceutical Design, 16*(23), 2518-2525.

[25] Wang, P. D., & Lin, R. S. (2001). Coronary heart disease risk factors in urban bus drivers. *Public Health, 115*(4), 261-264.

[26] Zulkifle, M., Ansari, A. H., Shakir, M., & Akmal, M. (2012). Hypertension scenario in Bangalore Metropolitan Transport Corporation (BMTC) employees – A study. *International Journal of Advanced Ayurveda, Yoga, Unani, Siddha and Homeopathy, 1*(1), 1-5.