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Original Research Article

A study on occupational health hazards and morbidity profile of the bus drivers and conductors working in government bus depots of South Kolkata

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ABSTRACT

Background: Health has always been closely linked with occupation. Occupational hazards have become more prominent in the post-industrial societies and includes a never-ending list of diseases. The current study was an attempt to explore the physical health hazards and their possible risk factors among the bus drivers and conductors employed in south Kolkata bus depots under the West Bengal transport corporation.
Methods: A cross-sectional study had been conducted in two governmental bus depots under Calcutta state transport corporation (WBTC) of south Kolkata, West Bengal. All the bus drivers and conductors were interviewed after taking informed consent with a pretested predesigned semi-structured questionnaire.
Results: The major physical health problems among the drivers were related to musculoskeletal system (37.8%) and followed by endocrinal system (26.66%), cardiovascular system (17.78%), anorectal system (10%), eye (7.78%), occupational injuries (7.78%), liver and biliary system (6.66%). Among the conductors, majority (42.02%) had musculoskeletal problem, followed by endocrinal (34.09%), cardiovascular (27.27%), respiratory (15.91%), dermatological (12.5%), gastro-intestinal (9.10%), eye (9.10%), orthopaedic (7.95%) and liver-biliary problem (6.82%). Multivariate analyses revealed that participants aged less than 44 years and who served their occupation for less than 6 years had higher odds of not suffering from musculoskeletal morbidities and those who were aged less than 44 years and who served their occupation for less than 6 years had higher odds of low morbidities.
Conclusions: Preplacement and periodic health check-ups at frequent intervals with supportive health promotional activities can uplift the physical health of the study population.

Keywords: Bus drivers, Conductors, Health hazard, Kolkata, Morbidity, Occupation.

INTRODUCTION

Occupational health deals with all aspects of health and safety in the work place and has a strong focus on primary prevention of the same. The health of the workers has several determinants both in working and family or personal environment.[1] Effects of occupational hazards mainly depends on the period of exposure and concentration of the offending materials or substances present in occupational environment. The site of occupational hazards is the working environment where the worker is present at least 8 hours a day, 300 days in a year in the whole working life of 40 years. If the working environment is not conducive to the psycho- physiology of the worker, then the said environment is likely to have harmful effect on the health of the workers.[2] Excessive work load, stress, rotating shifts, tight schedule, less

resting time generates unhealthy effects and hence affects quality of life of these professionals.[3]

Every occupation carries its own risk and same in the case of bus driving and conducting. Conducting frequently involves known risk factors like prolonged standing, whole body vibration, strenuous workload, prolonged working time, skin to skin contact with the passengers, and exposure to the air borne diseases like tuberculosis where the main route of infection is droplet form. There are also some risk-factors such as reduction in place of reduce, pressure for selling tickets which leads to impaired mental health.[4] Driving involves risk factors like prolonged sitting, heat exposure, proneness to accidents, poor cabin comfort, exposure to air borne diseases, decrease rest durations, irregular food habit, stress or pressure for the safety of the passengers etc. Other than these there are some diseases which is related to this occupation like work related musculoskeletal diseases, hypertension, diabetes, eye (vision) related problems, ear (hearing) related problems and some mental problems like depression, anxiety, stress etc.[5]

The physical and psychological health of the bus drivers and conductors is a critical factor in the driving and conducting performances. Any impairment could lead to undesirable consequences for the passengers.[5] Long-distance driving involves repetitive tasks, such as handling, bending, prolonged sitting, which may place excessive stress along the kinetic chain and affect the driver's personal and social life.[6]

Acknowledging that bus is one of the most popular modes of public transport worldwide, and, that the strong likelihood of this transport endurable for the foreseeable future, there is clearly a need to actively address the physiological and psychosocial environment of the bus drivers and conductors. In India, working condition for drivers and conductors is very poor and stressful; however, this problem has not been investigated adequately, specifically in eastern zone. With this background this study had been taken up with the objectives to find out the prevalence of physical health hazards and its determinants among the bus drivers and conductors of south Kolkata.

METHODS

A cross-sectional study had been conducted among the bus drivers & conductors from government bus depots of South Kolkata between January to March 2020. All the government bus depots were included by complete enumeration or census method in this study provided permission of research had been obtained from concerned authority. Only two bus depots (Lake depot and Kasbah depot) out of 5 in south Kolkata could be included as per permission obtained. All the bus drivers and conductors of those two depots were included in the study who had given informed written consent and had minimum 3 years of working experience. The drivers and conductors who were working in those depots, fulfilled the inclusion criteria, but were absent on the day of the survey were excluded from the study. Ethical clearance had been obtained from institutional ethics committee.

Study tool was a pretested predesigned semi-structured questionnaire which was used for interview of the participants. The questionnaire was first prepared in English. Then it was translated into Bengali by a linguistic expert keeping semantic equivalence. To check the translation, it was re-translated into English by two independent researchers who were unaware of the first English version. Face validity of each item had been checked from previous researches in the presence of public health experts. They also decided the content validity of each domain. Reliability was checked by test-retest method (r=0.9). Pretesting followed by pilot testing was conducted. Necessary corrections and modifications of the questionnaire were done accordingly. One to one interview had been conducted with the final corrected schedule. Besides that, sample Nordic questionnaire had been used to assess the musculoskeletal morbidity.[7]

Data entry was done in MS-excel and analyzed SPSS 20.0 version. Scoring of dependent variables had been done to do advanced analysis as following. To find out total morbidity score, presence or absence of any morbidity in last 12 months related to a specific system had been scored as 1 and 0 respectively. All the personal health practices (outside food consumption, smoking, smokeless tobacco use, alcohol intake, hand hygiene, daily sleep for 6-7 hours, carrying drinking water from home/depot source) had been scored as 1 (healthy practice) and 0 (unhealthy practice). All the scores had been then added up to find out total personal health practice score with higher scores indicating good health practice. Total morbidity score and total personal health practice score then divided dichotomously by median value for further analyses. Descriptive and inferential statistics were used as applicable. All analyses were two tailed with p value<0.05 being significant.

RESULTS

The study revealed that majority of the study population belonged to the age group of 50-60 years (36.5%) with the mean age of 45.8 (10.12) years. All of them were male. Majority belonged to the general caste (64.6%), nuclear family (53.4%) and were Hindu (82%), currently married (87.1%). Regarding educational qualification and socio-economic status majority of them had passed middle (48.9%) level and belonged to upper (41.6%) socio economic class respectively. The study population consisted of drivers (50.6%) and conductors (49.4%). Majority of them were working for minimum 10 hours per day (52.8%) with the daily mean working period of 10.11 (1.37) hours. Regarding period of service, most of them had work experience of <10 years (51.7%) with a mean (SD) of 15.42 (12.16) years. Majority of them were not working in any night shift (93.8%) and among

workers who did night shifts, majority had worked at night for 2 days/week (63.64%) (Table 1).

Regarding general survey, majority of the drivers had normal (55.55%) BMI with the mean (SD) of 24.6 (3.35); while 44.32% of each of conductors had normal BMI and overweight 44.32% with the mean BMI of 25.3 (3.17). Regarding blood pressure most of the drivers had normal (72.22%) BP with the mean (SD) of 119/76 (10.41/7.53); while majority of the conductors had normal (80.69%) blood pressure with the mean (SD) of 122/78 (13.87/8.0) mm/Hg. Majority of drivers and conductors had no pallor (95.56% and 86.36%), cyanosis (100% each), jaundice ((98.89% and 98.86%) or vitamin deficiency signs (96.67% and 96.58% respectively).

Table 1: Distribution of study population according to socio-demographic and occupation related characteristics (n=178).

Variables	Frequency (n)	Percent (%)
Age (years)		
20-30	9	5.1
30-40	44	24.7
40-50	51	28.7
50-60	65	36.5
≥60	9	5.1
Mean (SD)	45.8 (10.12)	
Minimum	21	
Maximum	61	
Sex		
Male	178	100.0
Caste		
General	115	64.6
SC	53	29.8
ST	1	0.6
OBC	9	5.1
Religion		
Hindu	146	82.0
Muslim	31	17.4
Buddhist	1	0.6
Marital status		
Married	155	87.1
Unmarried	21	11.8
Divorced	2	1.1
Type of family		
Joint	83	46.6
Nuclear	95	53.4
Education		
Middle	87	48.9
Secondary	51	28.7
Higher secondary	27	15.2
Graduate	13	7.3
Socio-economic status*		
I	74	41.6
II	34	19.1
III	61	34.2
IV	8	4.5
V	1	0.6
Designation		
Driver	90	50.6
Conductor	88	49.4
Working hours per day		
8	36	20.2
10	94	52.8

Continued.

Variables	Frequency (n)	Percent (%)
12	48	27.0
Mean (SD)	10.11(1.37)	
Period of service (years)		
<10	92	51.7
10-20	7	3.9
20-30	45	25.3
30-40	33	18.5
≥40	1	0.6
Mean (SD)	15.42 (12.16)	
Minimum	3	
Maximum	41	
Night shift		
No	167	93.8
Yes	11	6.2
Night shift per week (n=11) (Day/week)		
1	1	9.09
2	7	63.64
3	3	27.27

Table 2: Distribution of study population according to personal health practices in drivers (n=90).

Variables	Drivers		Conductors	
	Frequency (n)	Percent (%)	Frequency (n)	Percent (%)
Food				
Outside food				
Yes	56	62.22	64	72.73
No	34	37.78	24	27.27
Type of outside food (n=56)				
Breakfast	24	42.85	27	42.19
Lunch	30	53.57	32	50
Dinner	01	1.79	00	0.00
Breakfast and lunch	01	1.79	05	7.81
Frequency of outside food (n=56) (day/week)				
Daily	08	14.29	05	7.81
4-6	33	58.92	43	67.19
1-3	15	26.79	16	25
Addiction				
Tobacco (smokeless)				
Yes	25	27.78	10	11.36
No	65	72.22	78	88.64
Smoking				
Yes	54	60	54	61.36
No	36	40	34	38.64
Alcohol				
Yes	52	57.78	35	39.77
No	38	42.22	53	60.22
Sleep pattern				
Sleep daily 6-7 hours				
Yes	73	81.11	72	81.82
No	17	18.89	16	18.18
If no, then how many days/week (n=17)				
Daily	07	41.18	10	62.5
1-3	00	0.00	02	12.5
4-6	10	58.82	04	25

Continued.

Why (n=17)				
Habituated	04	23.52	03	18.75
Tension for duty	09	52.94	07	43.75
After an accident	01	5.88	0	0.0
Unknown	03	17.64	06	37.5
Hand hygiene				
Wash before taking any food				
Yes	88	97.78	86	97.73
No	02	2.22	02	2.27
Wash with (n=88)				
Only water	38	43.18	30	34.88
With soap water/hand wash	50	56.82	56	65.12
If no wash, then why (n=2)				
Habituated	01	50	02	100
Shortage of time due to tight duty schedule	01	50		
Drinking water				
Carry from home	37	41.11	46	52.28
Depot water source	21	23.34	21	23.86
Any roadside water point	32	35.55	21	23.86

Table 3: Determinants of personal health practices of the study population: Multivariate analyses(n=178).

Variables	Personal health practice score		Test of significance	OR (95% CI)	AOR (95% CI)
	Good (≥5) * (n) (%)	Poor (0-4) n (%)			
Age (years)					
<44*	49 (56.3)	38 (43.7)	Chi square=5.008, df=1, p=0.025	1.970 (1.085-3.578)	1.393 (0.410-4.730)
≥44	36 (39.6)	55 (60.4)			
Religion					
Hindu	74 (50.7)	72 (49.3)	Chi square=2.798, df=1, p=0.094	1.962 (0.883-4.360)	2.397 (0.976-5.883)
Others	11 (34.4)	21 (69.6)			
Caste					
General	51 (44.3)	64 (55.7)	Chi square=1.510,	0.680 (0.367-1.260)	0.693 (0.350-1.371)
Others	34 (54.0)	29 (46.0)			
Marital status					
Married	75 (48.4)	80 (51.6)	Chi square=0.193, df=1, p=0.660	1.219 (0.504-2.946)	2.045 (0.751-5.570)
Unmarried/divorced	10 (43.5)	13 (56.5)			
Type of family					
Joint	39 (47.0)	44 (53.0)	Chi square=0.036, df=1, p=0.849	0.944 (0.524-1.703)	0.719 (0.359-1.437)
Nuclear	46 (48.4)	49 (51.6)			
Designation					
Driver	47 (52.2)	43 (47.8)	Chi square=1.458, df=1, p=0.227	1.438 (0.797-2.596)	0.838 (0.377-1.863)
Conductor	38 (43.2)	50 (56.8)			
Education					
Middle*	46 (52.9)	41 (47.1)	Chi square=1.789, df=1, p=0.181	1.496 (0.828-2.702)	1.803 (0.841-3.865)
Sec and above	39 (42.9)	52 (57.1)			
Night shift					
No	83 (49.7)	84 (50.3)	Chi square=4.109, df=1, p=0.043	4.446 (1.013-21.2)	6.226 (1.165-33.269)
Yes	2 (18.2)	9 (81.8)			
Daily duty hours			Chi square=0.085, df=1, p=0.771	1.118 (0.529-2.360)	1.415 (0.615-3.259)
<10*	17 (50.0)	17 (50.0)			
≥10	68 (47.2)	76 (52.8)			
Period of service (years)					
<6*	47 (58.0)	34 (42.0)	Chi square=6.286,	2.146 (1.177-3.914)	1.312

Continued.

≥6	38 (39.2)	59 (60.8)	df=1, p=0.012		(0.377-4.558)
Socio economic status**					
Class II* and above	57 (54.8)	47 (45.2)	Chi square=4.990, df=1, p=0.025	1.992 (1.085-3.660)	2.068 (0.719-5.949)
Class I	28 (37.8)	46 (62.2)			

*median, ** assessed by modified B.G. Prasad scale 2019, [Hosmer Lemeshow test: p=0.396, Nagelkerke R^2=0.357]

Table 4: Determinants of Musculo-skeletal morbidities of the study population: multivariate analyses (n=178).

Variables	Musculoskeletal morbidity		Test of significance	OR (95% CI)	AOR (95% CI)
	Yes n (%)	No n (%)			
Age (years)					
<44*	65 (74.7)	22 (25.3)	Chi square=16.241, df=1, p=0.000	3.603 (1.908-6.805)	1.739 (1.137-5.632)
≥44	41 (45.1)	50 (54.9)			
Religion					
Hindu	86 (58.9)	60 (41.1)	Chi square=0.141, df=1, p=0.707	0.860 (0.391-1.891)	0.899 (0.369-2.188)
Others	20 (62.5)	12 (37.5)			
Caste					
General	66 (57.4)	49 (42.6)	Chi square=0.629, df=1, p=0.428	0.774 (0.412-1.457)	0.854 (0.423-1.726)
Others	40 (63.5)	23 (36.5)			
Marital status					
Married	90 (58.1)	65 (41.9)	Chi square=1.100, df=1, p=0.294	0.606 (0.236-1.557)	0.961 (0.328-2.816)
Unmarried/divorced	16 (69.6)	7 (30.4)			
Type of family					
Joint	49 (59.0)	34 (41.0)	Chi square=0.017, df=1, p=0.896	0.961 (0.527-1.750)	0.615 (0.299-1.263)
Nuclear	57 (60.0)	38 (40.0)			
Designation					
Driver	56 (62.2)	34 (37.8)	Chi square=0.539, df=1, p=0.463	1.252 (0.687-2.280)	1.233 (0.531-2.863)
Conductor	50 (56.8)	38 (43.2)			
Education					
Middle*	47 (54.0)	40 (46.0)	Chi square=2.159, df=1, p=0.142	0.637 (0.349-1.164)	0.560 (0.253-1.242)
Secondary and above	59 (64.8)	32 (35.2)			
Night shift					
No	99 (59.3)	68 (40.7)	Chi square=0.081, df=1, p=0.776	0.832 (0.234-2.953)	0.703 (0.175-2.818)
Yes	7 (63.6)	4 (36.4)			
Daily duty hours					
<10*	18 (52.9)	16 (47.1)	Chi square=0.762, df=1, p=0.383	0.716 (0.337-1.519)	0.792 (0.344-1.821)
≥10	88 (61.1)	56 (38.9)			
Period of service (Year)					
<6*	61 (75.3)	20 (24.7)	Chi square=15.323, df=1, p=0.000	3.524 (1.852-6.708)	1.848 (1.147-6.246)
≥6	45 (46.4)	52 (53.6)			
Socio economic status**					
Class II* and above	73 (70.2)	31 (29.8)	Chi square=11.761, df=1, p=0.001	2.926 (1.571-5.449)	1.519 (0.552-4.178)
Class I	33 (44.6)	41 (55.4)			

*median, ** assessed by modified B.G. Prasad scale 2019, [Hosmer Lemeshow test: p=0.517, Nagelkerke R^2=0.289]

Table 5: Determinants of overall morbidities of the study population: multivariate analyses (n=178).

Variables	Total morbidity score		Test of significance	OR (95% CI)	AOR (95%CI)
	Low(<median) n (%)	High (≥median) n (%)			
Age (Years)					
<44*	42 (48.3)	45 (51.7)	Chi square=34.329, df=1, p=0.000	9.683 (4.186-22.399)	3.600 (1.197-14.128)
≥44	8 (8.8)	83 (91.2)			
Religion					
Hindu	40 (27.4)	106 (72.6)	Chi square=0.193,	0.830	1.190

Continued.

Others	10 (31.2)	22 (68.8)	df=1, p=0.661	(0.362-1.906)	(0.437-3.245)
Caste					
General	35 (30.4)	80 (69.6)	Chi square=0.884, df=1, p=0.347	1.400 (0.693-2.827)	1.743 (0.758-4.010)
Others	15 (23.8)	48 (76.2)			
Marital status					
Unmarried/Divorced	11 (47.8)	12 (52.2)	Chi square=5.093, df=1, p=0.024	2.726 (1.114-6.672)	1.529 (0.524-4.465)
Married	39 (25.2)	116 (74.8)			
Type of family					
Joint	26 (31.3)	57 (68.7)	Chi square=0.806, df=1, p=0.369	1.349 (0.701-2.598)	0.742 (0.327-1.685)
Nuclear	24 (25.3)	71 (74.7)			
Designation					
Driver	30 (33.3)	60 (66.7)	Chi square=2.478, df=1, p=0.115	1.700 (0.875-3.302)	1.173 (0.440-3.127)
Conductor	20 (22.7)	68 (77.3)			
Education					
Middle*	24 (27.6)	63 (72.4)	Chi square=0.021, df=1, p=0.884	0.952 (0.495-1.832)	0.905 (0.360-2.272)
Secondary and above	26 (28.6)	65 (71.4)			
Night shift					
No	48 (28.7)	119 (71.3)	Chi square=0.167, df=1, p=0.683	1.815 (0.378-8.711)	1.287 (0.215-7.696)
Yes	2 (18.2)	9 (81.8)			
Daily duty hours					
<10*	6 (17.6)	28 (82.4)	Chi square=2.269, df=1, p=0.132	0.487 (0.188-1.260)	0.521 (0.174-1.565)
≥10	44 (30.6)	100 (69.4)			
Period of service (year)					
<6*	40 (49.4)	41 (50.6)	Chi square=33.363, df=1, p=0.000	8.488 (3.867-18.630)	2.218 (1.115-8.549)
≥6	10 (10.3)	87 (89.7)			
Socio economic status**					
Class II* and above	43 (41.3)	61 (58.7)	Chi square=21.763, df=1, p=0.000	6.747 (2.824-16.119)	1.690 (0.450-6.348)
Class I	7 (9.5)	67 (90.5)			

Regarding personal health practices, majority of the drivers and conductors used to eat food from outside (62.22% and 72.73%); of which lunch was the commonest (53.57% and 50%) and they were taking outside foods for 4-6 days/week (58.92% and 67.19%). While majority of drivers and conductors (72.22% and 88.64%) were not using any smokeless tobacco currently, most of them (60% and 61.36%) used to smoke currently. Regarding alcohol consumption, though majority of drivers (57.78%) used to drink currently, 60.22% of conductors were non-drinker. Majority of the drivers and conductors (81.11% and 81.82%) used to sleep 6-7 hours/day. Frequency of not sleeping among those who did not sleep 6-7 hours/day was 4-6 days/week (58.82% and 62.5%) for drivers and conductors respectively and amongst them 52.94% of drivers and 43.75% of the conductors informed that the cause behind the same was tension for duty. Regarding hand washing most of the drivers and conductors (97.78% and 97.73%) of used to wash hand before taking food, though only 56.82% and 65.12% of them used to wash hand with soap water/hand wash respectively and those who did not wash their hands, either the cause was tight duty schedule or not having a habit of the same. But majority of the drivers and conductors (41.11% and 52.28%) were using drinking water which they were carrying from home (Table 2).

Regarding morbidities, 37.78% drivers and 42.04% of the conductors had some form of musculoskeletal problems within last 12 months. The common problems faced by the drivers were joint pain (67.64%), body ache (16.66%), muscle pain (16.66%), muscle cramps (16.66%); while in case of conductors the common problems were joint pain (54.05%), body ache (35.15%), restriction of joint movements (5.40%), muscle cramps (2.70%), muscle pain (2.70%). Regarding affected parts of the body, majority of drivers had problem in lower back (38.23%), knee (17.65%), shoulder (14.70%), ankle (5.88%), both lower back and knee (5.88%); while conductors had faced problems commonly in knee (43.24%), lower back (21.62%), neck (16.22%). Among the drivers 17.65% have faced problem during last 7 days, joint pain being the commonest problem (50%) and only 50% were taking medicine for that while 24.32% of the conductors had faced problem during last 7 days and majority of them had joint pain (60%) and 70% of them were taking medicine for that. Though 32.23% of the drivers had faced problem to do normal work due to pain in last 12 months, only 5.88% had problem in last 7 days;

while 35.14% of the conductors had faced the same in last 12 months, but only 13.51% had that in last 7 days. Regarding respiratory problems, only 5.56% and 15.91% of drivers and conductors respectively had some sort of respiratory problems. While bronchial asthma (80%) was commonest among drivers, bronchial asthma and COPD (35.71% each) both had been equally recognized as commonest among conductors. Regarding cardio-vascular diseases, 17.78% 27.27% of drivers and conductors respectively had some sort of CVD problems, hypertension being the commonest problem. Regarding neurological problems, only (1.11% and 2.27%) of the drivers and the conductors respectively had some neurological problems in last 12 months. Regarding gastro-intestinal problems, only (2.22% and 9.10%) of the drivers and the conductors respectively had some form of GI problems in last 12 months. Gastritis or peptic ulcer was the commonest problem. Regarding ophthalmological, ENT, urological, orthopaedic, dermatological problems; 7.78%, 3.33%, 2.22%, 13.33%, 3.33% of the drivers and 9.10%, 3.4%, 4.55%, 7.95%, 12.5% of the conductors had some sort of eye, ENT, urological, orthopaedic, dermatological problems respectively in last 12 months. Regarding Endocrinal/ metabolic problems, 26.66% of the drivers and 34.09% of the conductors had some sort of problems within last 12 months and majority of them who suffered, had diabetes (70.83% and 76.66% respectively). Only 2.22% of the drivers and 1.14% of the conductors had suffered from dengue & malaria respectively in last 12 months. Around 10% of the drivers and 9.10% of the conductors had suffered from piles and inguinal hernia in last 12 months respectively. Regarding occupational injuries, only 7.78% of the drivers had suffered occupational injuries ever in his occupational lifetime and of those who suffered majority (57.14%) had fracture. Among conductors only 4.55% had suffered, some sort of occupational injuries ever in their occupational life and of those who suffered, majority had either fracture (50%) or internal injuries (50%).

Multivariate analyses revealed that participants who used to do night shifts had higher odds of having good personal health practice score (Table 3).

Multivariate analyses revealed that participants aged less than 44 years and who served their occupation for less than 6 years had higher odds of not suffering from musculoskeletal morbidities (Table 4).

Multivariate analyses revealed that participants aged less than 44 years and who served their occupation for less than 6 years had higher odds of low morbidities (Table 5).

DISCUSSION

This study was an attempt to find out prevalence of different work-related morbidities mainly and its determinants among government bus drivers and conductors of South Kolkata. The major physical health problems among the drivers were related to musculoskeletal system (37.8%) and followed by endocrinal system (26.66%), cardiovascular system (17.78%), anorectal system (10%), eye (7.78%), occupational injuries (7.78%), liver and biliary system (6.66%), respiratory system (5.56%), ear-nose-throat (3.33%), skin (3.33%) and gastro-intestinal system (2.22%). Among the conductor's majority (42.02%) had musculoskeletal problem, followed by endocrinal problem (34.09%), cardiovascular problem (27.27%), respiratory problem (15.91%), dermatological problem (12.5%), gastro-intestinal problem (9.10%), eye problem (9.10%), orthopedic problem (7.95%) liver and biliary problem (6.82%), occupational injuries (4.55%), and ENT problems (3.40%). These findings were more or less consistent with the findings of Bhatt B et al Regarding musculoskeletal morbidities, though studies by Rugbeer.[5] et al, Chavan et al reported similar findings, but the percentages were not similar; while in South Africa it was (22%), in Maharashtra by Chavan et al it was as high as 62%.[8,9] Studies in Mangalore by Kumar et al and Kurbett et al. in Karnataka also revealed similar morbidity patterns like the current study among bus drivers and conductors respectively.[10,11] Regarding personal health practices studies by Bhatt et al. and Bathija et al. revealed similar results.[5,12] Regarding site of involvement related to musculoskeletal system, commonest affected was lower back in current study, though it was upper back as found by Rugbeer et al.[8]

Regarding determinants of musculoskeletal discomfort, Borle et al found that it was significantly related with age, duration of service, daily average driving (km) and duration of driving (hrs./wk.).[13] It was also significantly higher in study subjects with BMI≥30 kg/m^2 in consistence with present study finding except the fact that the current study did not found association of musculoskeletal morbidity with daily average driving (km), duration of driving (hrs./wk.) or BMI.

The study had faced some limitations like it had been conducted in only two government bus depots in south Kolkata as permission could not be obtained for the other ones. The private depots could have been included to compare the health status of the bus drivers and conductors with those working in government depots, but due to lack of time and scarcity of manpower the same could not be done. Therefore, the study might not be able to reflect the actual scenario of drivers and conductors of Kolkata. The data collected were fully dependent on verbal responses of the study population which might have led to bias in results.

CONCLUSION

The study had revealed that a significant portion of drivers and conductors were suffering from musculoskeletal morbidities, while age and duration of service remained as significant determinants of not only musculoskeletal, but overall morbidity. Regarding

personal health practices majority were taking food from outside and having habit of smoking. These malpractices could further jeopardize their physical health.

Working as a bus driver and conductor is mainly either a sedentary or stressful job or both. Bad road conditions with dusts, increasing air pollution is complicating the situation. Most people would feel too tired to go for regular exercise. Besides, health of bus drivers and conductors are a serious business industry issue now. It is likely for them to do work in odd hours from early morning to late night trips, so it could be tempting to grab fast foods, rather than eating a well-balanced diet leading to gastro intestinal, endocrinal and metabolic and cardiovascular disorders in turn compared to other occupations. Occupational environment is very much related to domestic environment and some morbidity cannot be specified by only one environment as they are interdependent. Similarly, physical and mental health both has complex interactions. It is therefore of utmost importance to take holistic approaches for betterment of health of this population. Their health is needed to be protected because they are not only taking the responsibility of safe transport of huge numbers of passengers per day but also the road users. Health promotion by IEC, BCC, pre-placement and periodic health check-ups, provision of health services at free of cost, periodic recreational activities could have been some measures to protect these workers from departures of health. Further researches should be done to study the health status of bus drivers and conductors working under private companies. Mental health is also needed to be explored, both of government and private bus drivers and conductors.

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