Musculoskeletal morbidities among bus drivers in city of Central India

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Research Article

Abstract: **Introduction:** Bus drivers must successfully balance the competing demands of safety, customer – focused service and company operating regulations. Driving frequently involve many risk factors such as prolonged sitting and motor vehicle driving, tight running schedules, reduced rest breaks, rotating shift patterns, traffic congestion, the sedentary nature of job etc. These risk factors are specially important when work demands exceed the physical capacity of the worker. **Objectives: 1)** To study prevalence and pattern of musculoskeletal morbidities amongst M.S.R.T.C. bus drivers. **2)** To study some epidemiological factors related with these morbidities. **Material and Methods:** The present cross sectional study was carried out among 581 bus drivers of M.S.R.T.C. bus depots in Nagpur city. Data gathered with the help of interview technique using predesigned questionnaire. Information regarding musculoskeletal disorders was gathered with the help of Standardized Nordic Questionnaire. Interview was followed by thorough clinical examination and necessary investigations. **Results & Conclusion:** Commonest morbidity was backache present in 340 (58.5%) study subjects, followed by joint pain among 268 (46.1%) and commonest site being lower back in 318 (85%). Musculoskeletal discomfort was found significantly related with age, duration of service, daily average driving (km) and duration of driving (hrs/wk). It was also significantly higher in study subjects with BMI $\geq$ 30 kg/m^2. Musculoskeletal discomfort increased significantly with increase in age, duration of service, daily average driving.

Key Words: Bus drivers, Musculoskeletal morbidities, Standardized Nordic Questionnaire, Low back pain.

Introduction:

Bus drivers must successfully balance the competing demands of safety, customer – focused service and company operating regulations. Driving frequently involve many risk factors such as prolonged sitting and motor vehicle driving, tight running schedules, reduced rest breaks, rotating shift patterns, traffic congestion, the sedentary nature of job etc [1]. These risk factors are specially important when work demands exceed the physical capacity of the worker.

In terms of research interest, it was not until the middle of the 20th century when occupational health into urban bus drivers began. Seminal work published by Morris and colleagues [2]-[4], established the potentially noxious nature of professional bus driving, a fact that remains today [5].

So far, very few studies in India have been conducted among bus drivers. With this background, a study was carried out to study prevalence and pattern of musculoskeletal morbidities amongst bus drivers working in Maharashtra State Road Transport Corporation (M.S.R.T.C.) which was established by Government of Maharashtra and presently running over 16000 buses and 247 bus depots.

Material and Methods:

The present cross sectional study was carried out at four bus depots of M.S.R.T.C. in Nagpur city in central India between March 2009 to Oct 2009. Study population included all bus drivers working in M.S.R.T.C. for more than one year of all four bus depots in the city. There were 587 workers on roll, as on 1st March 2009 and all were working for more than one year.

For deciding the sample size pilot study was carried out in February 2009 in which the prevalence of musculoskeletal discomfort amongst 100 study participants was found to be 54%. Based on this prevalence sample size was determined which came out to be 328. But it was decided to include all 587 bus drivers working in four bus depots of the city.

Ethical clearance was obtained from institutional Ethics Committee at Govt. Medical College, Nagpur.

List of all bus drivers was obtained from depot managers of respective bus depots. A time schedule was prepared for the study participants, so that they could participate in the study conveniently without disturbing their duty pattern.

The pilot study was carried out in the month of Feb. 2009 among 100 study participants with

predesigned questionnaire to check the feasibility and to test the questionnaire, necessary changes in questionnaire were made after pilot study.

The interview technique was used as a tool for data collection followed by thorough clinical examination. Confidentiality of the study subjects was assured and maintained throughout the study. Before personal interview and physical examination, objective of the study was explained to participants and informed consent was taken.

History taking included personal and socio-demographic details, occupational history, presenting complaints, past history, family history. Information regarding musculoskeletal disorders was gathered with the help of Standardized Nordic Questionnaire [6]. Further required investigations and expert opinion was sought at Government Medical College, Nagpur.

Information regarding daily average driving (km), duration of driving (hrs) and total salary including all allowances was gathered from the records maintained with respective depot managers.

Results & Conclusion:

Out of 587 study subjects, finally 581 study subjects were included in analysis as the study subjects who were absent throughout the month of data collection at a respective bus depots were excluded from analysis. All the study subjects were males. Table 1 shows general socio demographic characteristics of the study subjects.

Table 1: General socio-demographic characteristics of study subjects

Variable	Mean	Standard Deviation	Range
Age (Years)	46.90	06.69	28-57
BMI (Kg/m^2)	25.01	03.70	15.9-37.0
Duration of service (Years)	24.47	07.40	03-38
Avg. driving (Hrs/wk)	54.86	8.08	30-72
Daily avg. driving (kms)	235.16	50.22	73-346

Maximum study subjects 470 (80.9%) were above 40 years of age. Among the study subjects, 361(62.1%) were belonging to lower middle, 116 (20%) to upper lower and 104 (17.9%) to upper middle socio-economic class. Duration of service was more than 25 years for maximum study subjects i.e. 297 (51.1%).

It was found that 458 (78.8%) study subjects were driving for average 48-60 hours per week.

Majority, 233 (40.1%) study subjects were driving more than 250 kilometers per day. 191 (32.9%) study subjects were having daily average driving 201-250 kilometers.

Table 2: Distribution of study subjects according to presenting complaints and morbidities

Presenting complaints/morbidities	Study subjects (n= 581)	
	Number	Percentage
Backache	340	58.5
Joint pain	268	46.1
Pain in calves	59	10.2
Spondylosis	52	09.0
Restricted joint movements	23	04.0
Arthritis	19	03.3

Table 2 shows distribution of presenting complaints and morbidities of the study subjects. Backache was the most common presenting complaint, present among 340 (58.5%) bus drivers followed by joint pain (46.1%).

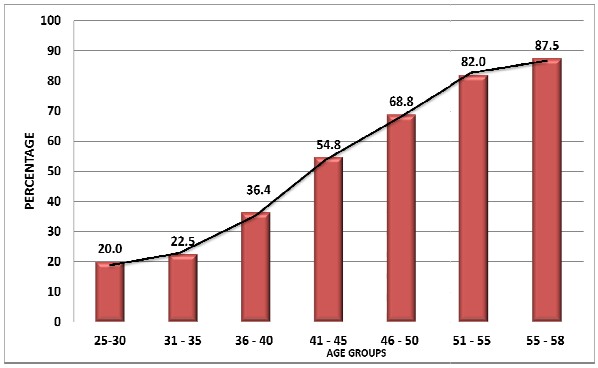
411 (70.7%) were having musculoskeletal symptoms in the last 12 month and 374 (64.4%) were having musculoskeletal symptoms in the last 7 days.

Site wise distribution of study subjects having musculoskeletal discomfort (MSD) in last 12 months and 7 days was shown in table 3. Lower back was the most common site for the musculoskeletal discomfort.

Significant relationship was observed between musculoskeletal discomfort and age, duration of service, daily average driving (km) and duration of driving ($p<0.001$), BMI ≥ 30 ($p<0.05$) (Table 4). Figure 1,2,& 3 shows the observed trend in relationship between musculoskeletal discomfort and age, duration of service and daily average driving.

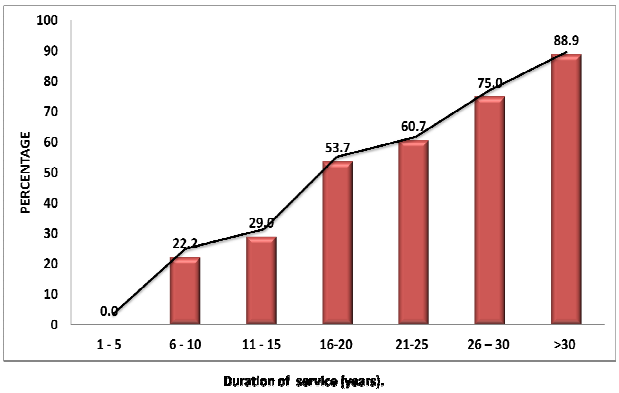
Table 3: Site wise distribution of study subjects having musculoskeletal discomfort (MSD) in last 12 months and 7 days.

Site of musculoskeletal discomfort	Study subjects having MSD in last 12 months (n = 411)		Study subjects having MSD in last 7 days (n =374)	
	Number	Percentage	Number	Percentage
Lower back	340	82.7	318	85.0
Knee	153	37.2	148	39.6
Shoulder	96	23.4	87	23.3
Neck	90	21.9	85	22.7
Upper back	63	15.3	57	15.2
Ankle	33	08.0	30	08.0
Hip	31	07.5	31	08.3
Elbow	13	03.2	12	03.2



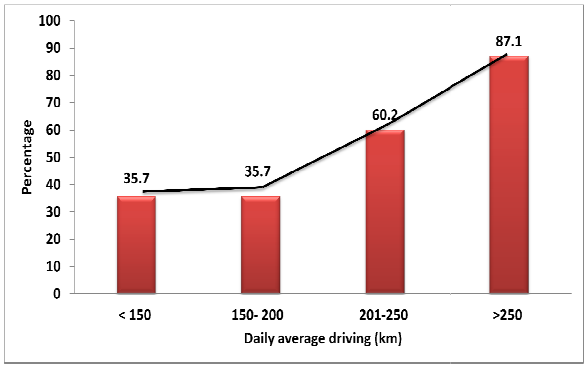
X^2 for linear trend = 92.69 , df = 5 , p = 0.000 ; HS

Fig 1: Observed trend in relationship between musculoskeletal discomfort and age



X^2 for linear trend = 101.5 , df = 5 , p < 0.001; HS

Fig 2: Figure showing observed trend in relationship between musculoskeletal discomfort and duration of service (years)



X^2 for linear trend = 104.2 , df = 3 , p < 0.001 ; HS

Fig 3: Figure showing observed trend in musculoskeletal discomfort and daily average driving (km)

Table 4: Distribution of study subjects with musculoskeletal discomfort according to various variables

Variable	Musculoskeletal discomfort in last 7 days				Total	X^2 Value	P value
	Present		Absent				
	No.	%	No.	%			
Duration of driving (hrs/wk)							
< 48 hrs	00	00.0	11	100.0	11	X^2 =25.30	<0.001*
48 - 60 hrs	279	60.9	179	39.1	458		
>60 hrs	95	84.8	17	15.2	112		
Duration of service (yrs)							
01 - 05	00	00.0	03	100.0	03	X^2 =103.6 X^2 for linear trend = 101.5	<0.001*
06 - 10	06	22.2	21	77.8	27		
11 - 15	18	29.0	44	71.0	62		
16 - 20	43	53.7	37	46.3	80		
21 - 25	68	60.7	44	39.3	112		
26 - 30	135	75.0	45	25.0	180		
>30	104	88.9	13	11.1	117		
Daily avg. driving (km)							
< 150	10	35.7	18	64.3	28	X^2 = 110.43, X^2 for linear trend = 104.2	<0.001*
150- 200	46	35.7	83	64.3	129		
201-250	115	60.2	76	39.8	191		
>250	203	87.1	30	12.9	233		
BMI (kg/m^2)							
≥ 30	55	80.9	13	19.1	68	X^2 = 9.15	<0.05**
< 30	319	62.2	194	37.8	513		
Total	374	64.4	207	35.6	581		

**Highly Significant*
***Significant*

Discussion:

Although many studies have been carried out on health hazards of bus drivers in western countries, there is lack of research on this issue in India

In the present study, mean duration of service was 24.47 ± 7.4 years. This observation was similar to the observations of Bekibele CO et al. (2006) [7] and Maciulyte N (2000) [8]. Other studies showed lower mean duration of service among bus drivers. This higher duration of service in our study and above mentioned studies could be due to higher age group involved in the study.

In the present study, the mean duration of driving (hrs/wk) was 54.86 ± 8.08 hours/wk, which was higher than the norms set under Motor Transport Workers Act, 1961 (48 hrs/wk). It was found similar with the studies carried out by Tamrin S et al. (2007) [9] and Szeto GP (2007) [10].

In the present study, the prevalence of musculoskeletal symptoms in last 12 month was 70.7% and that of musculoskeletal symptoms in last 7 days was 64.4%. The prevalence of low back pain was 58.5%. The prevalence of the low back pain was found highest, 87.5% in the age group ≥ 56 years. These findings were similar to the studies carried out by Tiemessen IJH et al. (2008) [11], Tamrin S et al. (2007) [9], Poulsen KB et al. (2004) [12], Maciulyte N (2000) [13]. While the prevalence of musculoskeletal symptoms was lower than that studied by Taklikar C (2006) [14] in Mumbai city. This difference might be attributed, due to higher traffic congestion and higher stress while driving from congested traffic of Mumbai city.

In the present study musculoskeletal discomfort in last 7 days was found to be significantly related with the age, duration of service, average daily driving (km), average duration of driving (hrs/wk) and BMI ≥ 30 kg/m^2. It was observed that as the age, duration of service, average daily driving (km) and average duration of driving (hrs/wk) goes on increasing, the musculoskeletal discomfort also goes on increasing significantly. These findings were similar to those observed by Tamrin S et al. (2007) [9] and Sadri GH (2003) [15].

Conclusion:

The findings of the study had shown that musculoskeletal discomfort was significantly related with age, duration of service, daily average driving (km) and duration of driving (hrs/wk). It was also significantly higher in study subjects with BMI ≥ 30 kg/m^2. Musculoskeletal discomfort increased significantly with increase in age, duration of service, daily average driving (km). Therefore daily average driving and duration of driving hours should be in accordance with norms set by MSRTC. Also, the periodic health check up is necessary.

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