



Cross-sectional Study of Health Status of Auto Rickshaw Drivers in Vashi, Navi Mumbai, India

¹Virendra J Mahadik, ²Prasad Waingankar, ³Seema Anjenaya, ⁴Sunila Sanjeev, ⁵Kiran Mali

ABSTRACT

Introduction: It is observed that auto rickshaw drivers are prone to musculoskeletal, respiratory, and gastrointestinal disorders and also to injuries and substance abuse.

Objective: To study the health status, disease profile, and substance abuse among auto rickshaw drivers in Navi Mumbai, Maharashtra, India.

Materials and methods: Participants in this cross-sectional observational study were drivers plying rickshaws registered at Regional Transport Office (RTO), Vashi, Navi Mumbai, India. Considering 1,500 registered auto rickshaws, a 10% random sample was planned. Questionnaire was designed to collect data by trained doctors including sociodemographic factors, occupational details, perceived stress scale, Nordic Musculoskeletal Questionnaire (NMSQ), addiction details, current symptoms, and significant history of past illness as well as general and systemic examination findings. Bone mass density (BMD) testing and random blood glucose levels were done. Data were analyzed using Microsoft Excel and Epi Info.

Results: Totally, 159 drivers participated. Majority [82 (51.6%)] belonged to socioeconomic class III, 37 (23.3%) to class IV, while 40 (25.1%) to class II. Among those, 54 (33.9%) drivers were in the profession for 10 to 19 years, while 36 (22.7%) were driving for 20 years or more. Only 19 (11.9%) drivers were asymptomatic, while 140 (88.1%) had one or more complaints. The commonest complaint was musculoskeletal pain in 95 (59.9%) of the study participants. Generalized fatigue, acidity, and headache were other common complaints. Ninety seven (61.1%) drivers had osteopenia. This had significant association with age and the number of years in profession. Substance abuse was found in 95 (59.7%) of the study participants.

Conclusion: Auto rickshaw drivers are very susceptible to health-related problems and there is need for monitoring on an ongoing basis and institutionalization of measures to prevent it.

Keywords: Addiction, Morbidity, Occupational health, Osteopenia, Rickshaw driver.

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INTRODUCTION

Auto rickshaw driving involves prolonged sitting in a fixed posture and also exposes the driver to a number of harmful elements such as vibrations, noise, glare and which over the period of time may lead to one or more of the occupational disorders. They are also exposed to significant amounts of air pollutants in their work like carbon monoxide, sulfur dioxide, diesel fuels with carcinogenic properties, etc., which can damage the respiratory tract leading to morbidity and mortality due to diseases like chronic obstructive pulmonary diseases, asthma, bronchitis,¹⁻⁴ headache, sore eyes, and ear problems. Prolonged hours of work result in insufficient sleep,^{5,6} less time spent with family members and friends, insufficient leisure time, less physical activity, and less time for preparation of food.⁶ It is also observed that transport-related sitting is one domain of sedentary behavior that has been linked to increased risks of chronic diseases.⁶

Several studies have shown that lengthy commuting perpetuates conditions that compromise individual's health, like stress caused by traffic congestion, searching for parking, interacting with other drivers, and safety concerns (phenomena characterized as "travel impedance").⁶

Navi Mumbai is an urban conglomerate which has come up in the last 30 years where auto rickshaws constitute major means of private transport, unlike neighboring metro city of Mumbai where taxis are the main mode of private transport. Currently, approximately 1,500 drivers plying rickshaws are registered with RTO of Vashi in Navi Mumbai.

This study was conducted with the aim to examine the health status, disease profile, and substance abuse among auto rickshaw drivers in Navi Mumbai.

MATERIALS AND METHODS

A cross-sectional study was conducted among auto rickshaw drivers working in Navi Mumbai in the year 2014 in January and June at two sites. The first site was at the auto rickshaw parking place near Vashi railway station where they stop to pick passengers and also use it as a resting place. Most of the auto rickshaws of city come to Vashi railway station daily. The second site was

¹Associate Professor and Medical Superintendent, ²Associate Professor, ³Professor and Head, ^{4,5}Senior Resident

¹⁻⁵Department of Community Medicine, MGM Medical College & Hospital, Navi Mumbai, Maharashtra, India

Corresponding Author: Prasad Waingankar, Associate Professor, Department of Community Medicine, MGM Medical College & Hospital, Navi Mumbai, Maharashtra, India, Phone: +919324714313, e-mail: wprasad67@gmail.com

the testing ground near RTO at Vashi where they gather for vehicle testing and driving tests and wait for variable period for their turn for the test. So this sample size was well representative of the whole city of Navi Mumbai.

Two hundred and seven auto rickshaw drivers were approached randomly. No specific sampling technique was used. In order to eliminate impact of association of age with the occurrence of chronic diseases and chronic conditions, those of the age of 55 years and above were excluded. All were males and were plying auto rickshaw for more than 1 year with a valid driving license. Their willingness to participate in the study was confirmed.

A questionnaire was designed to collect the data regarding the sociodemographic factors, occupational details, perceived stress scale, addiction details if any, current symptoms, and significant history of past illness. Nordic Musculoskeletal Questionnaire⁷ was used to identify musculoskeletal disorders (MSDs). The prestructured questionnaire was tested on 20 auto rickshaw drivers to rule out interpretational errors. After taking an informed consent, each participant was interviewed and the data were collected using this pretested and prestructured questionnaire.

A detailed clinical examination was done including measurement of weight, height, and blood pressure. Significant general and systemic examination findings were recorded. All participants were subjected to random capillary blood glucose (RCBG) estimation using Optium Xceed Meter of Abbott Diabetes Care Ltd, Witney, UK. As per the recommendation of Madras Diabetes Research Foundation,⁸ the cut-off value of RCBG of <110 mg/dL was considered normal and those in excess of cut-off value were recommended to undergo further diagnostic evaluation. Quantitative ultrasound (QUS), which is a reliable and cost-effective method⁹⁻¹⁰ to check the BMD, was performed using calcaneal QUS (BMD SONOST 3000) machine. To calculate BMD, QUS of calcaneus (right heel) was used. Machine converted the BMD values into T-score.⁹

All those who needed medical interventions, based on history and examination findings, were treated at the data collection points immediately and those who required specialty care were referred to Mahatma Gandhi Mission Medical College & Hospital for further management.

Data were entered in Microsoft Excel and analyzed using Excel and Epi Info (a public domain statistical software for epidemiology). The proportions and medians were calculated to describe respondent's characteristics. For categorical variables, proportions were compared using Chi-square tests; t-test was used for quantitative data. Correlation and regression analysis was done to identify the independent effects of associated factors.

Approval from the Institutional Ethical Committee and Deputy Regional Transport Officer, Vashi, Navi Mumbai, India, was obtained before commencing the study.

RESULTS

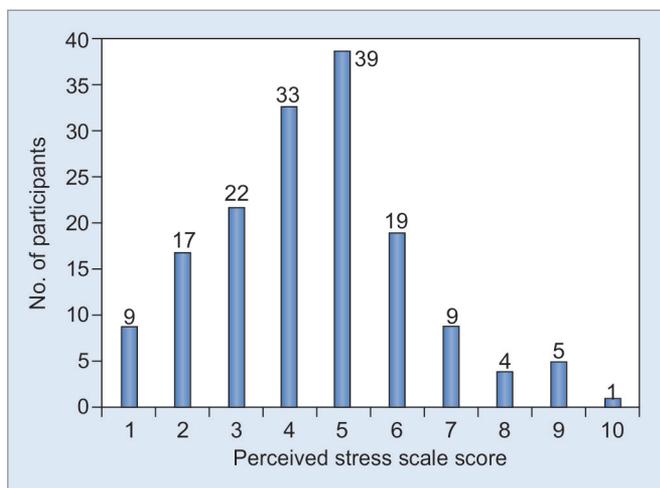
Sociodemographic Profile

The study subjects were in the range of 19 to 54 years of age. The mean age was 36.3 [standard deviation (SD) \pm 8.7] years and median age was 36 years. Out of total 159 participants, 13 (8.2%) were below the age of 25 years, 58 (36.5%) between 25 and 34 years, 55 (34.6%) between 35 and 44 years, and 33 (20.7%) were between 45 and 54 years. Among the participants, 131 (82.4%) were married; 146 (91.8%) were Hindus, while 13 (8.2%) were Muslims. Among the 159 drivers, 114 (71.7%) belonged to Maharashtra state, 39 (24.5%) were from Northern states, and 6 (3.8%) were from Southern states; 135 (84.9%) were from urban community, while 24 (15.1%) were from rural community. The 129 (81.1%) drivers were staying in pucca houses, while 30 (18.9%) had kutcha houses. Eight (5.0%) drivers had not received any formal education, while 18 (11.3%), 123 (77.4%), and 10 (6.3%) drivers had received primary, secondary, and graduation level of education respectively. Fifty four (33.9%) participants had joint family. Maximum number of family members was 15, with average family size of 4.26 (Median: 4).

In 126 (79.3%) families, the participant was the sole earning member while in 26 (16.3%) families there were two earning members and in 7 (4.4%) families there were three earning members. Total monthly family income ranged from Rs. 5,000 to Rs. 60,000 (mean Rs. 1,538.79, median Rs. 15,000, Q3 Rs. 20,000). The mean per capita income was Rs. 4,473.10 (median Rs. 3333.33, Q3 Rs. 5,000). As per Kuppuswamy scale for socioeconomic class (SEC)¹¹ based on education, occupation, and income (scoring range updated for Consumer Price Index 2014), the majority [82 (51.6%)] belonged to Class III, 37 (23.3%) to Class IV, and 40 (25.1%) to Class II.

Occupational Details

All the drivers were driving compressed natural gas-based rickshaws. Mean age to start driving auto rickshaw was 23.5 years with range of 18 to 41 years (median 22 years). Age-group wise the mean age to get into the profession was 18.6 years in the age group below 25 years, 22.8 years in the age group of 25 to 34 years, 24.3 years in the age group of 35 to 44 years, and 24.5 years in the age group of above 45 years. Majority of the drivers, [54 (33.9%)] were in the profession for 10 to 19 years, while 36 (22.7%) were driving for 20 years or more. Moreover, 37 (23.3%) drivers were plying rickshaw for 5 to 9 years



Graph 1: Perceived occupational stress scoring done by auto rickshaw drivers

and 32 (20.1%) for less than 5 years. The working hours ranged from 4 to 16 hours. The mean working hours were 10.3 (median 10 hours, Q3 12 hours). About 90 (56.4%) drivers ply rickshaw daily on an average for 10 hours or less, and 69 (43.6%) for more than 10 hours.

All except one stated that they feel occupationally stressed. On the scale of 1 to 10, the mean perceived stress was 4.4 (median 4, Q3 5). Out of 158, 81 (51.6%) had felt stress up to scoring level of 4, while 77 (48.4%) felt stress level score of 5 or more (Graph 1). The stress score is significantly associated with socioeconomic class (Table 1).

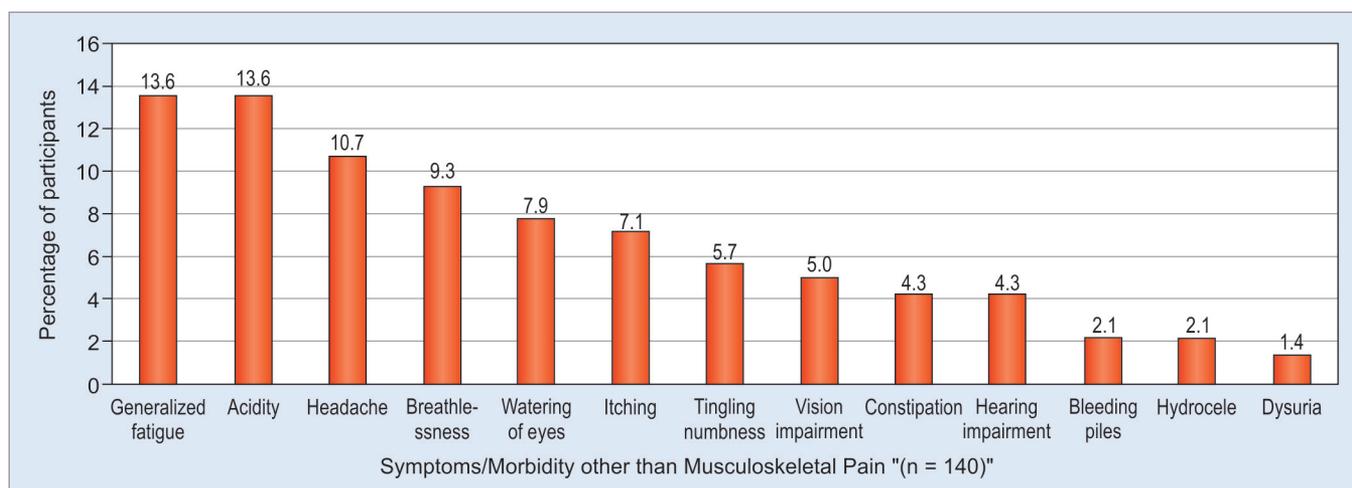
Morbidity Profile

Among the 159 study participants, 19 (11.9%) were asymptomatic, while 140 participants (88.1%) had one or more complaints. The commonest complaint was musculoskeletal pain in 95 (59.74%). Generalized fatigue, acidity, and headache were the common complaints other than musculoskeletal pain (Graph 2). The musculoskeletal pain assessed by NMSQ has shown low back pain in 80 (50.3%) auto drivers followed by knee pain in 36 (22.6%). However, medical care was sought by only 5% for lower back pain and only 14% for knee pain. Treatment-seeking behavior varies as per site of pain (Graph 3). There was significant relationship found between presence of musculoskeletal pain and working for more than 10 hours daily (Table 1).

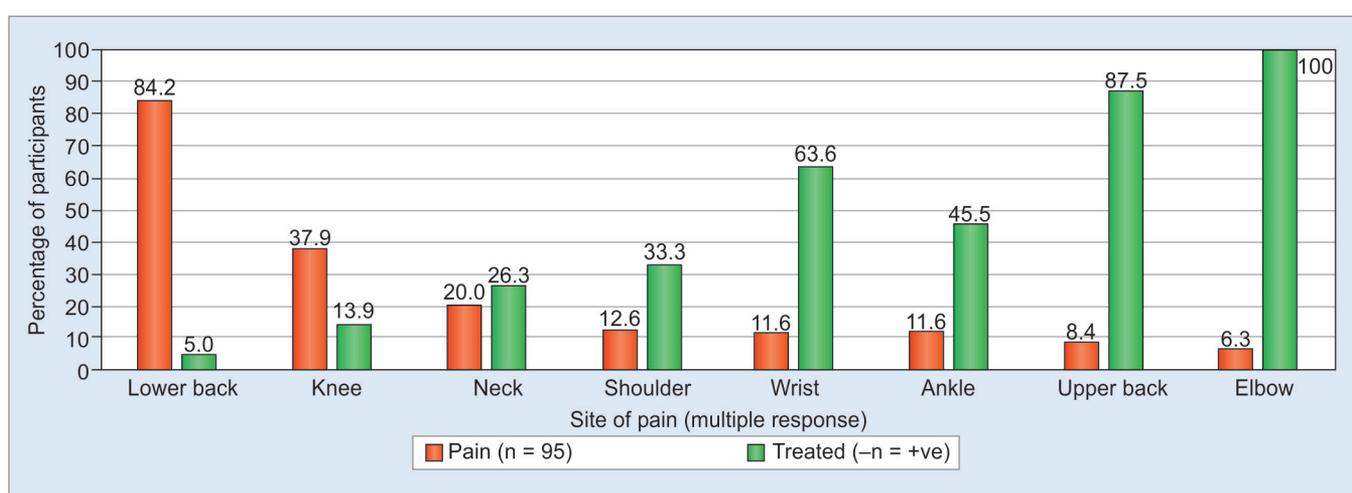
In the past, 22 (13.4%) had visual impairment, 10 (6.3%) were suffering from diabetes, 7(4.4%) from hypertension, 6(3.8%) from impaired hearing, and 1 (0.6%) had asthma. All of them were under treatment either from government or from private sources. Mean body mass index (BMI) of the study participants was 25.4 (SD ± 4.11). Preobesity (BMI 25–29.99) was seen in 66 (41.5%) auto drivers, 15 (10.1%) were in Class I obesity (BMI 30–34.99) and 3 (1.9%) were in Class II obesity (BMI 35–39.99) category. Body mass index was normal (18.5–24.99) in 75 (47.1%) of the auto drivers. The mean systolic blood pressure (SBP) and diastolic blood pressure (DBP) were 124.27 (SD ± 12.01) mm Hg and 78.90 (SD ± 7.39) mm Hg

Table 1: Risk factors of musculoskeletal pain, osteopenia, and stress

Chi-square test result	Group characteristics		Musculoskeletal pain +ve		Osteopenia +ve		Perceived stress score >4	
	No.	%	No.	%	No.	%	No.	%
Age (years)	df = 3		p>0.05		p<0.05		p>0.05	
<25	13	8.2	8	61.5	6	46.1	7	58.3
25–34	58	36.5	36	62.1	28	48.3	33	56.9
35–44	55	34.6	31	56.4	40	72.7	23	41.8
45–54	33	20.7	20	60.6	23	69.7	14	42.4
Years in profession (years)	df = 3		p>0.05		p<0.05		p>0.05	
1–4	32	20.1	15	46.9	14	43.8	18	58.1
5–9	37	23.3	28	75.7	19	51.4	20	54.1
10–19	52	32.7	32	61.5	34	65.4	26	50.0
20 and above	38	23.9	20	52.6	30	78.9	13	34.2
Daily working hours	df = 1		p<0.05		p>0.05		p>0.05	
10 or less	90	56.6	47	52.2	57	63.3	41	46.0
More than 10	69	43.4	48	69.5	40	57.9	36	52.2
Kuppuswamy SEC	df = 2		p>0.05		p>0.05		p<0.05	
Class II	40	25.1	22	55.0	24	60.0	13	32.5
Class III	82	51.6	49	59.7	49	59.8	46	56.8
Class IV	37	23.3	24	64.9	24	64.8	18	48.6
BMI	df = 2		p>0.05		p>0.05		p>0.05	
24.99 or less	75	47.2	41	54.7	46	61.3	40	54.1
25.00–29.99	66	41.5	42	63.6	42	63.6	27	40.9
30.00 or more	18	11.3	12	66.6	9	50.0	10	55.6



Graph 2: Symptoms mentioned by auto rickshaw drivers



Graph 3: Musculoskeletal pain and treatment taken by auto rickshaw drivers

respectively, except in 7 known hypertensives. Blood pressure was normal (<120 SBP/<80 DBP mm Hg) in 37 (24.3%) of the 152 study subjects. Prehypertension (120–139 mm Hg SBP or 80–90 mm Hg DBP) was seen in 90 (59.2%) auto drivers, hypertension stage I (140–159 SBP or 90–99 DBP mm Hg) in 23 (15.1%), and hypertension stage II (>160 SBP or >100 DBP mm Hg) in 2 (1.3%). The overall occurrence of hypertension in the study group was 20.1% (7 + 23 + 2 = 32/159).

The mean RCBG value among the 149 nondiabetic drivers was 95.86 mg/dL. Among them, 116 (77.8%) drivers had normal blood sugar (RCBG <110 mg/dL). Among those who were suspected to be diabetic based on RCBG cut-off value, 24 (16.1%) had RCBG in the range of 110 to 140 mg/dL, while 9 (6%) had RCBG >140 mg/dL.

When examined for BMD, it was found that 97 (61.1%) drivers had osteopenia and 1 (0.6%) had frank osteoporosis. This has significant association with age and number of years in profession (Table 1).

Personal Habits

Mean sleeping hours were 7.4 (median 8 hours). Only 18 (11.3%) were vegetarian, while remaining 141 (88.7%) use to take mixed diet. Substance abuse was found in 95 (59.7%) of the study participants. Current tobacco users were 78 (49.05%) and 2 were past tobacco users. The pattern of type of tobacco consumption was chewing [61 (78.20%)], cigarette smoking [21 (26.92%)], Mishri and Gutka [12 (15.38%)], and bidi smoking [4 (5.12%)]. Overall smokeless consumption was found in 53 (67.94%) participants, smoking in 13 (16.66%), and both forms in 12 (15.38%). History of alcohol consumption was found in 61 (38.36%). Among them, only 9 (14.75%) take alcohol every day, 15 (24.59%) once a week, and the rest 37 (60.66%) occasionally (Table 2).

DISCUSSION

Sociodemographic Profile

The subjects in this present study were in the range of 19 to 54 years of age. The majority 82 (51.6%) belonged to

Table 2: Addictions in auto rickshaw drivers

	<i>Age of onset</i>	<i>Duration</i>	<i>Frequency</i>	<i>Quantity</i>
<i>Tobacco chewing (n = 61)</i>				
Mean	24.26 years \pm 1.11	11.61 years \pm 1.14	4.5 times/day \pm 0.39	9.09 gm/day \pm 0.60
Median	23 years	10 years	4 times/day	10 gm/day
Mode	23 years	10 years	Once a day	10 gm/day
<i>Gutka (n = 6)</i>				
Mean	20.16 years \pm 1.42	6.33 years \pm 1.20	5.5 times/day \pm 1.83	25 gm/day \pm 7.18
Median	21 years	5 years	4 times/day	20 gm/day
Mode	21 years	4 years	–	20 gm/day
<i>Mishri (n = 6)</i>				
Mean	17.33 years \pm 2.8	24.5 years \pm 5.61	1.33 times/day \pm 0.21	16.16 gm/day \pm 5.16
Median	15.5 years	30 years	Once a day	11.5 gm/day
Mode	–	30 years	Once a day	7 gm/day
<i>Cigarette smoking (n = 21)</i>				
Mean	26.57 years \pm 1.26	7.28 years \pm 1.62	2.9 times/day \pm 0.53	2.9/day \pm 0.53
Median	26	5 years	2 times/day	2/day
Mode	22	4 years	Once a day	1/day
<i>Bidi smoking (n = 4)</i>				
Mean	24.21 years \pm 6.9	9.3 years \pm 6.9	6.2 times/day \pm 1.3	6.2/day \pm 1.3
Median	18 years	3.5 years	5.5 times/day	5.5/day
Mode	18 years	–	–	–
<i>Alcohol consumption (n = 61)</i>				
Mean	25.11 years \pm 0.75	9.39 years \pm 1.38	6.16 times/month	531.31 mL per instance \pm 81.09
Median	25 years	1 year	Once a month	300 mL per instance
Mode	25 years	1 year	Once a month	650 mL per instance

Class III. Similar sociodemographic profile was reported by Singh et al¹² in the auto rickshaw drivers of Agra city.

Occupational Details

The mean age to start driving was 23.5 years. Majority of the drivers in the study [90 (56.6%)] were in the profession for more than 10 years. The working hours ranged from 4 to 16 hours with the mean working hours of 10.3. Out of 158, 81 (51.6%) had felt stress up to scoring level of 4, while 77 (48.4%) had felt it 5 or more. The stress score was significantly associated with socioeconomic class. Sinha and Shasikala¹³ from the study in Bengaluru reported that 412 (85.8%) of the auto rickshaw drivers work for more than 10 hours and stress was significantly associated with number of years in profession but not with the socioeconomic class.

Morbidity Profile

In the present study, only 19 (11.9%) auto drivers did not have any complaint at the time of examination, while the rest all had complained either MSD or some other systemic symptoms. Kartikeyan et al¹⁴ showed 13.9% tempo drivers were asymptomatic, while Singh et al¹² reported that 42.0% auto rickshaw drivers in Agra were asymptomatic. It shows that majority of professional drivers seem to have had at least one or more health complaints consistently in the studies referred.

Musculoskeletal pain was the major complaint in 95 (59.74%) auto rickshaw drivers. Majority (50.3%) had lower back pain followed by knee pain (22.6%). A study among urban taxi drivers in Ghana¹⁵ reported a prevalence of MSDs as 70.5%, with low back pain in 34.3% and knee pain in 10.0%. In a study at Guntur city,¹⁶ low backache was the main complaint in 63.66%, followed by knee pain in 52.33% of the auto rickshaw drivers. Several studies have reported objective evidence of vertebral pathology related to an occupation as a professional driver. Whole body vibration and posture adopted in driving like sitting in driving position over a long period of time exert considerable forces on the spine and can cause backaches, neck problems, pulled muscles, and general stiffness.^{17,18} In the present study, more than 10 working hours a day has been found to be significantly associated with musculoskeletal pain. Drivers are exposed to constant noise and vibration from their own vehicles and also other vehicles in their vicinity, which may impair their hearing and also contribute to disorders of the cardiovascular, nervous, and digestive systems and reduce their productivity which is compounded by MSDs. Noise also has an adverse effect on the nervous system leading to stress and increased blood pressure. A study in India has reported association between high noise levels to which drivers are exposed and high abnormal audiograms.¹⁹ Present study of morbidity profile reaffirms this.

Based on T-score of BMD study, it was found that the 61.1% auto drivers were having osteopenia in this study. Sridhar et al²⁰ have reported that 6% of apparently healthy Indians <50 years have osteopenia. Rao et al²¹ found that in the age group of 31 to 40 years, 29.16% males were having osteopenia, while 3.63% males were osteoporotic. Though the role of genetics and nutrition was emphasized in the above studies mentioned, the high proportion of osteopenia significantly associated with duration of profession needs further evaluation.

The overall prevalence of hypertension in the present study group was 20.1%, similar to the reported pooled prevalence of about 16 to 20% in India.²² Lakshman et al²³ reported that 41.3% bus drivers were found to be hypertensive and 41.9% had BP in prehypertensive range. Another study on transit vehicle operators in India deals with hypertension among auto rickshaw drivers of Nagpur,²⁴ among whom the reported prevalence was 35.1%. The alarmingly high proportion of prehypertensives (59.2%) found in this study is a matter of concern and indicates need of advocacy of preventive measures.

Personal Habits

Tobacco use was reported in 78 (49.05%) of the present study subjects and was predominantly smokeless, chewing and Mishri. Rahaman et al²⁵ showed that the overall prevalence of smoking was 75.9% and concluded that the prevalence of smoking among rickshaw pullers is very high compared with that of the general population. Sudhir et al²⁶ found that 87.2% auto rickshaw drivers in Jaipur were using tobacco products in one form or the other, and only 12.8% never used tobacco products. Smokeless tobacco is more common in auto drivers (81.7%). Chaudhary et al²⁴ reported that 71.28% auto rickshaw drivers consume some form of tobacco, while 28.7% did not.

The prevalence of alcohol consumption in the present study was 61 (38.36%), which is slightly lower than the prevalence of 43.6% reported by Girish et al²⁷ from the study conducted among the auto rickshaw drivers in Kannur, Kerala. A multicentric study conducted by Thankappan et al²⁸ also reported a prevalence of alcohol use to be 40 to 50% in urban men.

LIMITATIONS OF THE STUDY

Time given by auto rickshaw drivers for the health examination and interview was variable and at times inadequate in view of their preoccupation. There is need for more engagement to combine knowledge, attitude, and practice with health examination for auto rickshaw drivers.

CONCLUSION

Auto rickshaw drivers are susceptible to various health-related problems and there is need of monitoring on an ongoing basis. Many perceive high occupational stress. Musculoskeletal pain is very common. However, the treatment-seeking behavior has gaps, for which long daily working hours over many years is a contributory factor. The presence of osteopenia at an early age is also alarming. There is a need of institutionalization of health monitoring of this relatively unorganized sector to address these issues.

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