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A Study on the Prevalence of Non-Communicable Diseases, Its Associated Social Factors and Morbidity Pattern among the Registered Bus Drivers in Chennai-Cross Sectional Study

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ABSTRACT

To find out the prevalence of selected non-communicable disease like hypertension, diabetes mellitus and cardiovascular disease and associated social factors contributing to the non-communicable diseases. Currently, owing to growing epidemic of non-communicable diseases (NCDs) are in the limelight replacing communicable diseases, which were the leading cause of death in most countries. Non-communicable disease is the leading cause of death globally. Non communicable diseases (NCDs) kill 38 million people each year. This study aims to estimate the prevalence rate of NCD risk factors among. Further, the bus drivers of Chennai road transport corporation and Tamilnadu state transport corporation who having their depots in Chennai. Further, the adult population and to determine the association between behavioral and metabolic risk factors. This was a descriptive cross sectional study conducted among 415 the bus drivers of Chennai road Transport Corporation and Tamilnadu state transport corporation who having their depots in Chennai. during March to August, 2008 using a semi-structured questionnaire and all the participants were motivated to undergo laboratory investigations. Prevalence of smoking, tobacco form, smokeless tobacco uses and alcohol. NCD risk factors like hypertension, alcohol use was quite high in this fishermen community and it needs further evaluation.

Keywords:
Smokeless tobacco, diabetes, cardiovascular disease and chronic infections.

1.Introduction

Non-communicable diseases (NCDs) are defined as diseases of long duration, and are generally slow in progression. NCDs are the leading cause of adult morbidity and mortality Worldwide [1]. Four main diseases are generally considered to dominate Non-communicable diseases morbidity and mortality, they are cardiovascular diseases (including hypertension), cerebrovascular disease, diabetes, cancers and chronic respiratory diseases [2]. Non-communicable diseases have now reached epidemic proportions in many countries. NCDs hit hardest at the World's low- and middle-income groups and place a tremendous demand on health systems and social welfare, cause decreased productivity in the workplace, prolong disability and diminish resources within families [3-5]. Globally, Non-communicable diseases (NCDs) are estimated to cost more than US$ 30 trillion over the next 20 years, representing 48% of global gross domestic product (GDP) in 2010 [1].Non-communicable diseases are expected to rise substantially in the coming decades, partly due to a growing ageing global population. Further, as urbanization and globalization increase in the developing world and environment, there is likely to be an increase in the prevalence NCDs. Therefore, unless the Non-communicable disease epidemic is aggressively confronted, the mounting impact of Non-communicable diseases (NCDs) will continue unabated and environment [6].

Non-communicable diseases (NCDs) are the leading causes of death globally, killing more people each year than all other causes combined. Contrary to popular opinion, available data demonstrate that nearly 80% of NCD deaths occur in low-and middle-income countries. Despite their rapid growth and inequitable distribution, much of the human and social impact caused each

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year by NCD-related deaths could be averted through well understood, cost-effective and feasible interventions [7-9]. Of the 57 million deaths that occurred globally in 2008, 36million (almost two thirds) were due to NCDs, comprising mainly cardiovascular diseases, cancers, diabetes and chronic lung diseases. About one fourth of global NCD-related deaths take place before the age of 60. NCDs are caused, to a large extent by four behavioral risk factors that are pervasive aspects of economic transition, rapid urbanization and 21st century lifestyles: tobacco use, unhealthy diet, insufficient physical activity and the harmful use of alcohol [8].
Increased trend of cardiovascular and cerebrovascular disease, such as stroke is seen among professional drivers [6]. Occurrence of traffic accidents among professional drivers can be mainly contributed to behavioral factors. The World Health Organization estimates that the number of deaths due to traffic accidents will increase by 65% between the years 2000 and 2020, with this figure expected to be as high as 80% in developing countries [9].
A large proportion of these health risks are attributable to stress related disorders. This will result in loss of productivity and early loss of highly skilled drivers. The impact of cardiovascular events occurring in public transport bus drivers will be enormous on the society at large. This would result in risk to life of passengers, other road users and pedestrians as well as damage to property and vehicles [10]. There has been deterioration in work conditions of bus drivers over the last 20 years. The work conditions are known to be worse in a developing country like India. This deterioration is largely the result of traffic congestion and its associated air and noise pollution but also with the pressures of maintaining a demanding schedule in circumstances that make that task almost impossible [11]. These circumstances damage the health of bus drivers in a way that is unacceptable. There are only few studies being conducted among transport corporation drivers to find out the morbidity due to Non-communicable diseases (NCDs) and its risk factors. Hence this study has been planned to find out the Non-communicable diseases (NCDs) morbidity pattern among transport drivers and also to find out related risk factors and this may helpful to prevent Non-communicable diseases (NCDs) and promote their quality of life and environment [12].

According to recent estimates, in India the cases of cardiovascular diseases are projected to increase from an estimated 29 million in 2000 to as high as 64 million in 2005. There will be increases in the prevalence rates of cardiovascular diseases among the younger adults. Currently, the prevalence of alcohol use varies widely among regions in India. Whereas the prevalence of alcohol in the western state of Gujarat is 7%, it was as high as 75% in the north eastern state of Arunachal Pradesh. Significantly higher use has been recorded among tribal, rural and lower socio-economic urban sections. In Kerala, 13.2% and 10.1% were reported to be using alcohol in urban and rural areas respectively [13]. In a study done in Faridabad, the prevalence of current alcohol consumption was found to be around 25% among men and no women was reported to be consuming alcohol [14]. In India, nearly 62.5 million people drink alcohol and the per capita consumption is around four liters per adult per year. For every six men, one woman drinks alcohol in India. Also, the average age of alcohol consumption in India has been constantly falling by nearly nine years over the past decade. At present, on an average, Indians take their first drink of alcohol at the age of 19 compared to 28 in the 1990s. It has also been suggested by experts that it will soon be reduced to15 years [15]. According to NFHS3; alcohol use was more prevalent among the scheduled tribe than other castes. Cardiovascular diseases (CVD) of professional drivers remain an important issue in occupational health research and clinical practice [64]. High morbidity and mortality related to coronary artery diseases and cerebrovascular events have been found among professional drivers [16-19]. Many factors play

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significant role in development and progression of risk factors as documented by many studies, such as, most drivers have an unhealthy lifestyle, absence of physical exercise and working abnormal hours.

Levi et al has rightly suggested that the health problems among drivers could be explained by a multiple exposure model including physical, ergonomic and organizational stressors. Added stressors in the form of demands and job stress from passengers might be an explanation for higher IHD risk among the drivers of passengers compared with drivers of goods vehicle [20].

2. Materials and Methods

Study Design

A cross sectional, descriptive study was conducted among the registered bus drivers working in Chennai road Transport Corporation and also the drivers working in the Tamilnadu state transport corporation depot situated in Chennai. The study was approved by the institutional ethical committee (Human studies) of the institute.

Study Participants

Inclusion criteria:

Persons those who are willing to participate are included in the study.

Exclusion Criteria:

Persons those who are not willing or un-cooperative individuals are excluded from the study. Person who are on long leave during the period of data collection were excluded.

Study period: six months

Method of collection of data:

A cross sectional study was carried out from March 2008 to August 2008 for a period of 6 months involving a population of transport drivers working in Chennai road transport corporation and Tamilnadu state Transport Corporation depot situated in Chennai. The two depots are only present in Chennai and so two depot drivers were taken as a whole population. Total drivers of two depots were 415, out of which 400 drivers were included in the study as 15 divers were not willing or were on long leave. Before the data collection prior permission from the managing director of the Chennai road transport corporation and the managing director of Tamilnadu state Transport Corporation, Villupuram was obtained. Managing director of the Chennai road transport corporation and branch manager of Tamilnadu road Transport Corporation provided a place in their depot for conducting the study among the drivers. They were requested to share the information by recollecting method on the variables mentioned in the pre-structured questionnaire. Self-reported, usage of medication and lab reports regarding the non-communicable disease was also included in collection of data. The data have collected from participants along with the consent forms and request to sign. No incentives of any kind were offered to the participants. The data was obtained from those who were present at the time of study and the data from those who were not present was collected later after giving prior intimation. The Non communicable diseases were identified by clinical examination and self-reported previous treatment records. The diseases studied were Hypertension, Diabetes mellitus, cardiovascular disease (other than hypertension), musculoskeletal disease and chronic obstructive pulmonary disease (COPD).

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Alcohol consumption: Self-reported alcohol intake data was collected and subjects were classified as present consumer, past consumer and not a consumer.
Tobacco variables: Tobacco questionnaire included data on self-reported duration, frequency and quantity of tobacco consumption. Individuals were classified as ex-smoker, current smoker and smokeless tobacco product consumer. Current smoker: A person who had smoked at least 100 cigarettes over their lifetime, and continued to smoke every day or some days. Ex-smoker or former smoker was defined as a person who had smoked more than 100 cigarettes over their lifetime and who did not smoke every day or some days [21].

Capillary blood glucose:
Study participants were informed to come by one and half hours after taking food to check their post prandial blood sugar. Participants were asked to wash their hands before checking the sugar profile. By the use of lancet middle or ring finger is pricked around the edges finger pad and a drop of blood is drawn into the glucometer strip and the values are noted.
Statistical Analysis: Data was coded and entered in the computer for analyses. Statistical package SPSS (version19.0) was used for the analyses. All analyses were two-tailed and P-value <0.05 was considered statistically significant.

3. Results

Table 1: Distribution of Consumption of Alcohol among study participants

Alcohol consumption	Frequency	Percent
Yes	180	45
No	220	55
Total	400	100

Table 1 shows that nearly 45% of the study populations were consuming alcohol.

Table 2: Distribution of Tobacco usage among study participants

Tobacco consumption	Frequency	Percent
Yes	119	29.8
No	281	70.2
Total	400	100

Table 2 shows that 29.8% of the study populations were consuming tobacco.

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Table 3: Prevalence of non-communicable disease among the study participants

Non- Communicable Diseases	Total Numbers	percentage	Mean	Std. Deviation
Hypertension	91	22.75	6.7982	4.59390
Diabetic Mellitus	80	20	7.3703	4.89978
Cardiovascular disease(Other than hypertension)	10	2.5	6.5000	3.02765
Chronic obstructive pulmonary disease	4	1	16.7500	10.11187
Musculoskeletal disorders	32	8	2.0410	1.75253

Table 3 shows that the prevalence of non-communicable diseases among the study participants, were 22.75% were suffering from hypertension, followed by 20% study participants suffering from diabetes mellitus, nearly 8% were have musculoskeletal disorders. But the overall prevalence of non-communicable disease in the present study was 42.25% it indicates that a single individual can have two or more number of chronic disease.

Table 4: Association between age group and Diabetes mellitus

Age Group (in yrs)	Diabetes mellitus		Total
	Yes	No	
20 – 29	0 0%	16 100%	16 100%
30 – 39	3 2.7%	107 97.3%	110 100%
40 – 49	36	146	182

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	19.8%	80.2%	100%
50 – 59	41 44.6%	51 55.4%	92 100%
Total	80 20%	320 80%	400 100%

Table 4 shows the relation between age group and Diabetes among the study participants, majority of participants 44.6% in between the age group 50– 59 yrs. were suffering from diabetes mellitus whereas the age advances the disease frequency was increased and this was statistically significant as p value was 0.000 ($p<0.001$).

Table 5: Association between diet pattern and Diabetes mellitus

Type of Diet	Diabetes mellitus		Total
	Yes	No	
Vegetarian	12 14%	52 86%	64 100%
Non Vegetarian	5 22.7%	14 77.3%	19 100%
Mixed Diet	87 20.9%	234 79.1%	321 100%
Total	120 20%	280 80%	400 100%

Table 5 shows that 20.9% of participants taking mixed diet were suffering from Diabetes, followed by 22.7% of non-vegetarians and 14.0% of vegetarians. This was not statistically significant.

Table 6: Association between alcohol consumption and Diabetes mellitus

Alcohol	Diabetes mellitus		Total
	Yes	No	
Yes	44 22.8%	126 55.2%	170 100%

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No	39 15.5%	151 82.3%	80 100%
Total	80 20%	320 80%	400 100%

Table 6 shows the interaction between Diabetes and alcohol consumption among the study participants, 22.8% of the alcohol consuming participants were having Diabetes, whereas only 15.5% having Diabetes among those who were not consuming alcohol and this was not statistically significant.

Table 7: Association between Tobacco consumption and Diabetes mellitus

Tobacco	Diabetes mellitus		Total
	Yes	No	
Yes	23 19.3%	96 80.5%	119 100%
No	55 20.3%	234 59.5%	281 100%
Total	80 20%	320 84%	400 100%

Table 7 shows that 20.3% of the study participants without tobacco consuming behavior and 19.3% with tobacco consuming behavior were suffering from diabetes. This was not statistically significant.

4. Discussion

The present study was conducted among the bus drivers of Chennai road transport corporation and Tamil nadu state transport corporation who having their depots in Chennai. The aim of the study was to find out the prevalence of selected non- communicable disease and their social factors [22]. The study was conducted among 400 study participants. This study found out that the habit of tobacco consumption was 29.8% in study population, among them 55.2 % were consuming tobacco in smoking form, 23.5% in chewing tobacco and 19.3% were using both form of tobacco. Average duration of tobacco consumption was 11.5±5 in years. A study conducted by Bhaskara Rao et al found out 23% of the study population were consuming tobacco which is slightly lower than that what was found in present study [54]. A study conducted by Sukumar et al it was 46.5% which was much higher than that what was found in present study [23]. As per the present study alcohol consumption was 45%. A study conducted by Sukumar et al and

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reported that alcohol consumption 56.9% which was much higher than what was found in present study [24]. The dietary pattern of bus drivers in the present study was 80.3% taking mixed diet 39.2% of the study participants were engaged in regular physical activity. A study conducted by Arjun Lakshman et al identified that 39% were doing adequate physical activity which was similar to the result what found in this study [25]. Overweight and obesity was 63% and 11.8% in this present study. A study conducted by Sukumar et al shows that Body Mass Index (BMI) of 35.2% of the study participants was in obese range which was much higher than that of this study. 36.1% were found to be overweight which was much lower than that of present study [24]. This study has found out that prevalence of hypertension was 22.55%, among them more number of hypertension 50% was in the age group of (50-59 yrs), followed by 38 % hypertension were in the age group of (40-49yrs). But the study conducted by Bhaskar Rao et al shows the prevalence rate of hypertension among the male bus drivers was 36% which was found to much higher than that of this study [26]. A study conducted by Arjun Lakshman et al showed that the prevalence of hypertension 41.3% among male occupational bus drivers in north Kerala which was much higher than that of this study [28]. A study conducted by Mohd. Zulkifle et al showed that the prevalence of hypertension among Bangalore metropolitan transport corporation employees was 14.02 % which was lower than that of the results what found in present study [27] This study observed that the prevalence of hypertension was increased as age increases and it was similar to the study conducted by Bhaskar Rao et al and study conducted by Arun et al [29]

The present study has elicited that there is significant association between hypertension and the age, similar results were obtained in the study conducted among male occupational bus drivers in North Kerala [30], and the study conducted by Bhaskara Rao et al [26]. There was no significant association found between the hypertension and dietary pattern as per this study and similar results were obtained in the study conducted among male bus drivers in state road Transport Corporation, Visakhapatnam [26]. This present study did not find any significant association between alcohol and tobacco consumption between hypertension. Similar results were obtained in study conducted by Arjun Laxman et al [29], but there was significant association between hypertension and tobacco consumption was found in the study conducted by Bhaskara Rao et al [27]. There was significant association between body mass index and hypertension according to the present study which is similar to results obtained in the study conducted by Bhaskara Rao et al [26] and the study conducted by Arjun Laxman et al. The present study found out significant association between mental stress and hypertension. This is supported by in the study conducted by Arun Joshi et al [27,31], but the study conducted by Bhaskara Rao et al showed there was no significant association between mental stress and hypertension. The prevalence of diabetes mellitus in this study was 20% and was 41% in the age group of (50-59 yrs). A study conducted by Hamid Saberi et al, Gadekar et al showed the prevalence of diabetes was 5% and 10.4% which was lower than that of this study. A study conducted by Andrej Marcinkiewicz et al among road transport drivers showed the prevalence of diabetes 45.5 % which was much higher than that of this study [31-32].

This study showed there is a significant association between diabetes and age that age increases diabetes increases and similar results were obtained in the study conducted by Andrej marcinkiewicz et al there is significant association between diabetes and body mass index (BMI). More number of diabetes were found in overweight 15.5% and obesity 51.1% which was similar to the results of study conducted by Andrej marcinkiewicz et al among road transport drivers. The prevalence of musculoskeletal disorder was 8% and there is significant association with age

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and alcohol consumption, but there is no significant association between physical activity, Body Mass Index and mental stress. A study conducted by Akinpelu et al among the occupational drivers in Ibadan, Nigeria shows that 89.3% of the study participants reported experience musculoskeletal pain in at least one part of the body during 12 months prior to the study which was very much higher than that of this study [32-33]. This marked difference may be due to variation in race. The prevalence of both hypertension and diabetes was 8%. Though hypertension and diabetes was different clinical entity, the prevalence of both hypertension and diabetes will increase the risk of morbidity and mortality by several folds. In this study attempts were made association between hypertension and diabetes. Statistically significant association was found between age group, body mass index (BMI), and mental stress were obtained but not with other variables. Study conducted among male occupational bus drivers shows in north Kerala shows that there is no significant association between hypertension and diabetes [27]. The magnitude of cardiovascular disease other than hypertension in the present study was 2.5% and for chronic obstructive pulmonary disease (COPD) was1%. For cardiovascular disease there was a significant association found between age group and obesity in present study. For chronic obstructive pulmonary disease there was no association between its risk factors it may be due to low prevalence rate in present study.

The study was conducted among transport corporation of government bus drivers in Chennai with the objectives, to find out the prevalence of certain non-communicable disease like hypertension, diabetes mellitus and obesity, to find out the magnitude of reported or diagnosed other non-communicable disease like cardiovascular disease, chronic obstructive pulmonary disease (copd), musculoskeletal disease, and to estimate associated social factors contributing to the non-communicable diseases. All drivers belong to two depots present in Chennai was taken as sample size. Thedata for this cross sectional study was collected from 150 drivers of Chennai road Transport Corporation and 250 drivers of Tamilnadu state road transport corporation depot situated in the Chennai. The consent from the respective participants was taken before starting the survey. The data were entered in computer and statistical analysis was done by using SPSS version 19. The prevalence of non-communicable diseases among the study participants, were 22.55% were suffering from hypertension, followed by that 20% study participants suffering from diabetes mellitus, nearly 8% were have musculoskeletal disorders. But the overall prevalence of non-communicable disease was 42.25% it indicates that a single individual can have two or more number of chronic disease.

5. Conclusion

The present study has noted that considerable proportion of non-communicable diseases like hypertension and diabetes mellitus are accounted in bus driver population. This proportion may increase in near future that would reduce their quality of life as well as efficiency of expected skill from the drivers which protect the larger number of lives and environment. The factors like overweight and obesity are associated with hypertension and diabetes which may be very effectively can be prevented. Hypertension and diabetes should be controlled among the drivers as they may cause sudden collapse while they are diving. NCD risk factors like hypertension, alcohol use was quite high in this bus drivers and it needs further evaluation.

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Ethical approval: The study was approved by the Institutional Ethics Committee

6. Conflict of Interest

The authors declare no conflict of interest.

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