

# **A STUDY ON OCCUPATIONAL HEALTH HAZARDS AMONG AUTOMOBILE WORKERS IN A TRUCK MANUFACTURING COMPANY IN CHENNAI**

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## **ABSTRACT**

The aim of the study is to study the health status and occupational health hazards among automobile workers in a truck manufacturing company. To assess the health status of the automobile workers in the study area. To assess the utilization of personal protective equipments among the automobile workers. To study the association between occupational hazards and certain systemic health problems among the automobile workers. The prevalence of various systemic health problem and occupational hazards are high in the study area. These various health problems among the automobile workers will reduce only if all the gaps are identified and intensive interventions are done and proper training regarding the utilisation of personal protection equipment must be implemented.

## **Keywords**

Automobile, occupational hazards, fatal work and alcohol drinkers.

## **Introduction**

Motor vehicles have become essential part of today's life. Vehicles manufacturing, repair and maintenance need has led to the emergence of a large sectors, so called automobile industries. These are formal large size enterprises where as there are small and medium size enterprise, which includes workshops and service stations. Automobile industries are labor -intensive sector, and its size of enterprise, number of workers and job characterization vary considerably. 1 The automobile sector is providing occupation to number of peoples. Occupation is the main source of income for many families to meet the needs and to lead a happy life. And occupational health is essentially a preventive medicine. Occupational health should aim at the promotion and maintenance of highest degree of physical, mental and social well being of workers in all occupation. 2

The report, entitled ' The Prevention of Occupational Diseases', issued for the World Day for Safety and Health at Work, the International Labor Organization said that despite the fact that occupational diseases kill 6 times as many people, accidents attract greater attention. Of the estimated 2.34 million annual work - related deaths, the vast majority – approximately 2.02 million – are due to work-related diseases. This represents a daily average of 5,500 deaths. The ILO also estimates that 160 million cases of non- fatal work-related diseases and 317 million non- fatal occupational accidents occur annually. This means that, every 15 seconds, 1 out of 151 workers dies with a work-related accident.3-5

Report shows that the Occupational safety and health problems are becoming a major challenge. This is because of unsafe working environment, congested workplace, lack of supervision, monitoring and training, negligence in the government inspection, ignorance as well as carelessness of the workers and employers, use of old or outdated machine or equipment, lack of regular repair and maintenance of tools, machine and equipments, bad house - keeping practices, lack of safety equipments of standard quality, violation of safety rules and unsuitable conditions. Hence to achieve and maintain the optimum standard of occupational safety and

health at workplace, it is important to have an overall knowledge on baseline picture of the present worksite scenario, various hazards and their probable health outcomes. 6-9

Policies or measures for delivering health and safety services to factory workers are limited in India. This not only limits their access to information and training opportunities but also places the workers at a greater risk to occupational injuries and diseases. Furthermore, factory workers lack the knowledge on proper use of protective measures and are least aware of health effects emanating from the activities and materials in their work environments.10

In order to overcome the information gap on occupational hazards and its awareness among automobile industry workers in India, this study planned to assess the health status, utilization of Personal Protective Equipment and the occupational hazards among the auto mobile workers in one of the largest automobile ( truck chasis) manufacturing company in Chennai. The company is manufacturing truck for past 70 years and currently they are manufacturing 116 trucks per day, total number of workers working daily in the company is 2106. The company is located in Ennore, Chennai, the total buildup area is 136 acres. The study findings may help to design the interventions for the targeted groups, thus promoting and upholding better health and environment with safety standards.11

In our study area the auto mobile workers are working in four major units ( Production, heat treatment, Assembly and Inspection/ maintenance) and the occupational hazards in these units are exposure to chemicals, working with machinery tools, not using the personal protection equipment and working in both day and night shift. These occupational hazards will leads to various systemic health problems among the automobile workers . 12 Hence this study was done to assess health status and to figure out the association between theses occupation hazards and systemic health problems among the automobile workers in a truck manufacturing company, Chennai. Various researchers all over the world, has studied the occupational hazards among the automobile workers. However there are not many studies done in Tamilnadurelated to these aspects. This study would give an insight to fill the gap existing in the occupational health system and the various ways to bridge this gap.

## **MATERIALS AND METHOD**

### **STUDY DESIGN:**

This study is a cross – sectional descriptive study conducted in a automobile industry in Chennai.

### **STUDY AREA:**

This study was conducted in a automobile industry (Ashok leyland) in Chennai. It is one of the largest automobile truck manufacturing company in India. Manufacturing around 100 truck chasis per day and the study area is located around 30 kms from our institution.

### **STUDY POPULATION:**

The automobile mechanics in the truck company were the study population. They are employed from geographical areas in and around Chennai. They are usually transported from different location by the company owned transport facilities and also by their own transport facilities.

### **INCLUSION CRITERIA:**

The inclusion criteria for the study were the workers who had automobile mechanic work experience for more than 10 years and those who were willing to participate in the study.

### EXCLUSION CRITERIA:

The automobile workers those who didn't give consent to participate in the study, were excluded from the study.

### ETHICAL APPROVAL:

The study proposal was presented and approval from Institutional Ethics Committee was obtained prior to the pretesting. The approval letter is enclosed in [Annexure -1].

### STATISTICAL ANALYSIS:

The statistical analysis of data was done using descriptive and analytical statistics. The descriptive statistics analysed were presented as frequency distribution and percentage. The analytical statistics used were Chi – square, Odds Ratio and Confidence Interval. The association of occupational hazards with health problems was assessed. P value <0.05 was considered as statistically significant value. Data was entered in Microsoft excel and analysed using the software SPSS, version 22 software.

## RESULTS

**Table 1: Smoking habit of the workers Table 1 ( a):**

Smoking	Frequency ( N=310)	Percentage (%)
Yes	118	38.1
No	192	61.9

**Table 1 ( b):**

Types of Smoking	Frequency ( n=118)	Percentage (%)
Cigarette	118	100
Others	0	0

### Alcohol drinking habit of the workers

Table 1 shows the alcoholic drinking habit of the workers. Among the workers participated in the study 178 ( 57.4%) were alcohol drinkers and 132 ( 42.6%) were non alcohol drinkers [table 1(a)]. Among the drinkers most of them 75 ( 42.1%) were drinking brandy, 41 (23%) were drinking whisky, 33 ( 8.51%) were drinking beer and 29 (16.2 %) were drinking rum [table 1(b)].

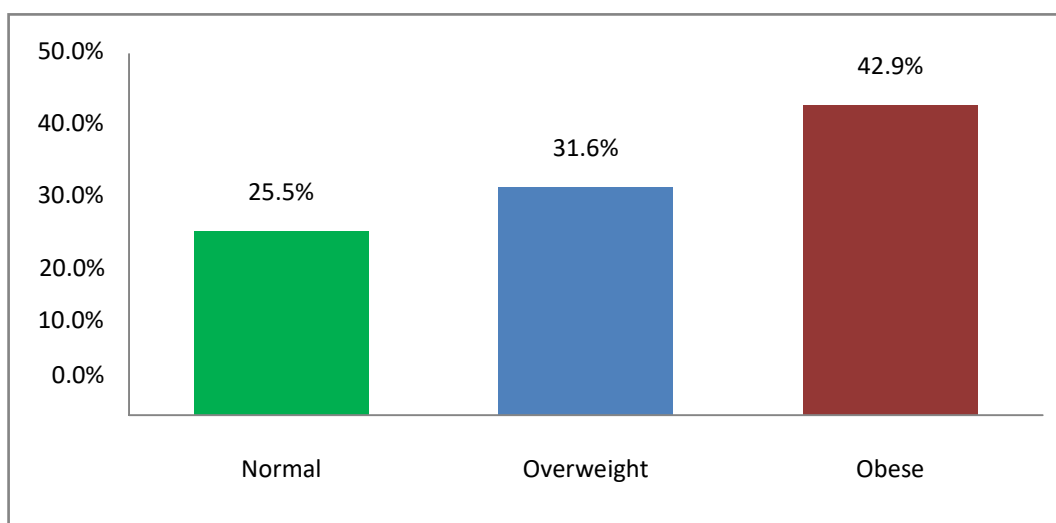
**Table 2: Alcohol drinking habit of the workers Table 2( a):**

Alcohol	Frequency ( N=310)	Percentage (%)
Yes	178	57.4
No	132	42.6

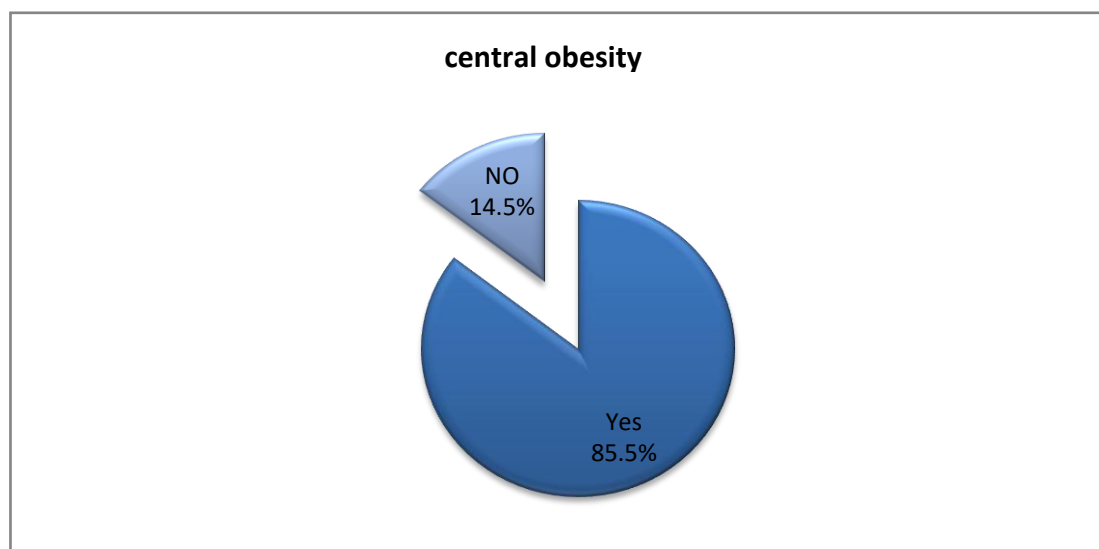
**Table 2 ( b):**

Alcohol Type	Frequency ( n=178)	Percentage (%)
Whisky	41	23
Brandy	75	42.1
Rum	29	16.2
Beer	33	18.5

Table 2 shows the tobacco chewing habit of the workers. Among the workers participated in the study 44 ( 14.2%) were tobacco chewers and 266 (85.8%) were non tobacco chewers [table 2(a)]. Among the tobacco chewers most of them 41 ( 93.2%) were chewing hans/gutka, and 3(6.8%) were chewing beetal nut [table 2( b)].



**Figure 1: BMI classification of the workers**



**Figure 2: Prevalence of central obesity among the workers**

**Table 3: Prevalence of SHT, DM and any surgeries**

Past History	Frequency ( N=310)	Percentage (%)
Nil	158	51
HT	46	14.8
DM	58	18.7
HT/ DM	42	13.5
Past Surgery ( Not CABG)	6	1.9

Table 3 shows the prevalence of external injury during work among workers. Among the workers participated in the study 219 ( 70.6%) had external injury during work and 91 ( 29.4%) did not have external injury during work.

**Table 4: External injury during work**

External Injury during work	Frequency ( N=310)	Percentage (%)
Present	219	70.6
Absent	91	29.4

**Figure 3: External injury during work**

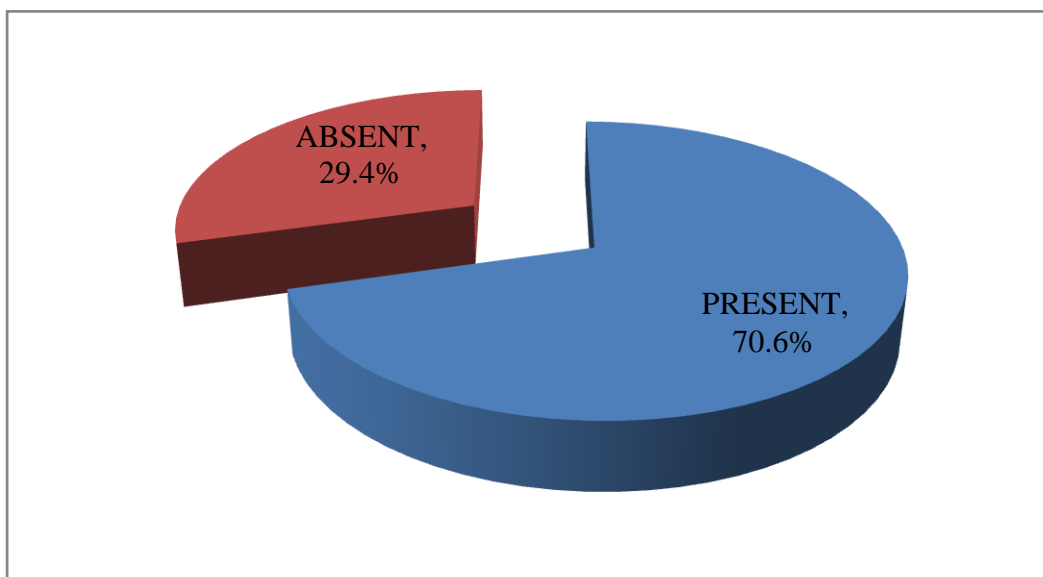


Table 5 shows the prevalence of ocular problems among the workers. Among the workers participated in the study 130 ( 41.9%) did not have any ocular problem, 131 (42.3%) had defective vision, 26 ( 8.4%) had headache and 23 (7.4%) had watering of eyes.

**Table 5: Ocular disorders**

Ocular	Frequency ( N=310)	Percentage (%)
Normal	130	41.9
Defective Vision	131	42.3
Headache	26	8.4
Watering Of Eyes	23	7.4

**Table 6: Gastro-intestinal system disorders**

Gastro Intesitnal System	Frequency ( N=310)	Percentage (%)
Normal	188	60.6
Abdominal Pain	8	2.6
Gastritis	106	34.2
Constipation	8	2.6

Table 7 shows the prevalence nervous problems among the workers. Among the workers participated in the study 296 ( 95.5%) did not have any nervous problem, 9 ( 2.9%) had numbness and 5 ( 1.6%) had seizure.

**Table 7: Nervous system disorders**

Nervous System	Frequency ( N=310)	Percentage (%)
Normal	296	95.5
Numbness	9	2.9
Seizure	5	1.6

**Table 8: Association between occupational hazards and musculoskeletal problem**

S.No	Occupational Hazard	N=310	Musculoskeletal Problem		Odds ratio	95% CI	Chi square	P Value
			n=187	%				
1	<b>Exposure to chemicals</b>							
	Yes	12	10	83.3	3.418	0.73-15.87	1.852	0.174
	No	298	177	59.3				
2	<b>Working with machinery tools</b>							
	Yes	269	172	63.9	3.074	1.55-6.08	11.123	0.001*
	No	41	15	36.6				
	<b>Not using personal protection equipment</b>							
	Yes	92	62	67.3		0.92-		

3	No	218	125	57.3	1.538	2.56	2.731	0.098
4	<b>Working Shift</b>							
	Day and night	205	117	57.1	0.665	0.4-1.08	2.67	0.102
	Day	105	70	66.7				

**\* P< 0.05, Statistically significant at 95% CI ( confidence interval)**

**Association between occupational hazards and skin problem**

Table 9 shows the association between occupational hazard and skin problem. Among the study participants who were exposure to chemicals 66.6% had skin problem and among the study participants who were not exposed to chemicals 20.8% had skin problem. There was a statistically significant association between exposure to chemicals and skin problem ( P< 0.05, X<sup>2</sup>= 11.379) with an odds ratio of 7.613 ( 95% CI 2.22 -26.1). The other occupational hazard like working with machinery tools, not using PPE, working shift were not statistically significant with skin problem ( P> 0.05).

**Table 9: Association between occupational hazards and skin problem**

S.No	Occupational Hazard	N=310	Skin problem		Odds ratio	95% CI	Chi square	P Value
			n=70	%				
1	<b>Exposure to chemicals</b>							
	Yes	12	8	66.6	7.613	2.22-26.1	11.379	0.001*
	No	298	62	20.8				
2	<b>Working with machinery tools</b>							
	Yes	269	57	21.2	0.579	0.28-1.19	2.251	0.134
	No	41	13	31.7				
3	<b>Not using personal protection equipment</b>							
	Yes	92	16	17.4	0.639	0.34-1.18	2.015	0.156
	No	218	54	24.8				
4	<b>Working Shift</b>							
	Day and night	205	43	20.9	0.767	0.44-1.33	0.892	0.345
	Day	105	27	25.7				

**\*P< 0.05, Statistically significant at 95% CI ( confidence interval)**

The objectives of the present study are to assess the health status, to assess the utilization of PPE among the automobile workers and also to identify the association between occupational hazard and systemic health problem among the automobile workers. Even though several studies have focused on health status of the auto mobile workers, there is scanty literature on the occupational hazard causing health problems. Thus this study attempts to fill this gap. In the following study socio demographic details, health problems and its association with certain

occupational hazard and the utilization of PPE among the automobile workers are discussed in comparison with other studies conducted elsewhere.

## DISCUSSION

In this study majority of the study participants i.e. 53.9% belonged to 51 - 58 years of age, 41.6% belonged to 41 -50 years of age and 4.5% belonged to 31 - 40 years of age. In a study by Selvithangaraj et al only 18% of the workers were more than 40 years of age. 33 And in a study by Johnson OE et al also only 20.5% of the workers were more than 40 years of age. 15 This age difference may be due do in our study we have taken only the workers who had work experience more than 10 years.

In this study most of the study participants 88.7% were hindus, 8.4% were Christians and 9 (2.9%) were muslims. In a study bySelvithangaraj et al most of the workers 88% were Muslims and only 12% were Hindus. 33 In this study majority of the study participants were from urban 70.6%, this is because the truck manufacturing company is situated in urban Chennai and most of the workers were also residing in the urban Chennai.16,17

In this study 48.7% study participants had an education up to high school, 27.4% of the were graduates, 1.9% had an education only up to primary school and no illiterates. In a study by Kamble MS et al 1.9 % had primary school education which is similar to our study. 44 In a study by Selvithangaraj 19.3% of the workers were illiterate which is in contrary to our study this is due to our study area. 33 In our study area (truck manufacturing company) only the workers who had at least primary education, were given the appointment to work in the company. 18-21 In this study majority of the study participants 75.2% were from nuclear family, 10% were from joint family, 14.8% were from three generation family. Around three fourth of them are from for nuclear family because most of the workers were leaving their parents and other relation while migrating for the work. In this study 48.7% of the workers were migrated for work from their native place.22

In the present study among the study participants the prevalence of musculoskeletal problem is 60.3%. Similar findings in the study done by Shinde PP et alandSelvithangaraj et al 23,24were the prevalence of musculoskeletal problem is 54.9% and 62% respectively. In the other studies done by Nasarudden AF et al34 ,Akter S et al 25 and Philip et al 22 the prevalence of musculoskeletal problem is 87.4%, 77% and 44.3% respectively. Auto mobile workers are using the machinery tools in various posture during their work time which is a physical risk factor leads to discomfort and pain in various joints of the body. In this study the workers who were working with machinery tool which is a

In the present study among the workers participated in the study 70.3% were using at least any one of the personal protection equipment ( PPE). Among the workers who were using the PPE 45% were using eye goggles, 25.7% were using face mask, 71.6% were using hand gloves, 41.3% were using apron and 72.5% were using safety boot. In a study done by Elenwo EI et al 60% were using at least any one of the PPE. 53 In the study done by Philip et al 31.1% were using the PPE. 22 In a study done by Tahaet al 42% were using the eye goggle which is similar to our study. 26,27 In a study done by Selvithangaraj et al 15.26%, 3.89%, 22.5%, 2.29%, 13.6% were using eye goggles, face mask, hand gloves, apron, safety boot respectively. 33 In our study the workers are having the rule of compulsory utilisation of the PPE in spite of that around 30% of the study participants are not utilizing a single PPE. The reason for not using PPE among the workers is they are showing their opposition to the management by not obeying the rules.



## CONCLUSION

This study assessed the health status, the utilisation of personal protection equipment and the association of occupational risk with the health problem among the automobile workers in a truck manufacturing company Chennai, Tamil Nadu. Among the study participants 3.9% were exposed to chemicals, 86.8% were working with machinery tools, 66.1% are working in both day and night shift, 70.3% were using any one PPE, 38.1% were smokers, 57.4% were alcoholics and 14.2% were tobacco chewers. Among the study participants the major health problem is external injury during work (70.6%) followed by musculoskeletal problems (60.4%), ocular problems (58.1%), gastro intestinal problems (39.4%), respiratory problems (38.1%), oral cavity problems (32.2%), skin problems (22.6%), mental health problems (19.7%), cardiovascular problems (14.2%), genito urinary problems (13.9%), ENT problems (8.1%), and nervous problems (4.5%).

In this study external injury during work is significantly associated with hazard of working with machinery tools and not using the PPE, Respiratory problem is significantly associated with hazard of exposure to chemicals, Gastro intestinal problem is statistical significantly associated with working shift (day and night), Mental health problem is significantly associated with working shift (day and night), Musculoskeletal problem is significantly associated with the hazard of working with machinery tools and Skin problem is statistical significantly associated with the hazard of exposure to chemicals. Certain health problems like ocular problem, oral cavity problem, ENT problem, Cardiovascular problem, nervous and genito urinary problem are not statistically significant associated with the occupational hazards. These health problems may be due to other factors like socio demographic and personal habits.

From the findings of the study, it can be concluded that the utilization of the personal protection equipment among the workers is less. The prevalence of various systemic health problem and occupational hazards are high in the study area. These various health problems among the automobile workers will reduce only if all the gaps are identified and intensive interventions are done and proper training regarding the utilisation of personal protection equipment must be implemented.

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

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

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