



ORIGINAL ARTICLE

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Epidemiological Study of Rickshaw Drivers Health Status and Accident Encounters in Towns of Karachi

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ABSTRACT

Attempt has been made to analyze the health status and accident encounters by rickshaw drivers statistically and graphically with especial reference to fatality index of Karachi, Pakistan city due to rickshaw accidents. This is the cross section study carried out by questionnaires/ interviews from the rickshaw drivers in Gulshan-e-Iqbal Town, Bin Qasim Town and Gulbarg Town, Karachi, Pakistan. About 8 million vehicles ply on Karachi roads which are responsible for air and noise pollution that causes health problems and heavy traffic and poor infrastructure of roads leads accident encounters in Karachi city. The major health problems are respiratory infection, cardiac problems, headache, fatigue, stress, back pain and blood pressure. The study design for this research was kept simple aiming to obtain maximum knowledge from subjects. The Outcome of this 105 analyzed subjects 25 were cigarette smokers, 37 subjects complained about air and noise pollution, while rests of them were unaffected. The total fatality index of accidents was 0.16341 showing the alarming situation in Karachi, Pakistan.

Keywords: Fatality index, Karachi, Rickshaw, Health, Accident

Received 12.07.2015

Revised 23.08.2015

Accepted 28.09.2015

INTRODUCTION

Today with the mass population exposure the demand of transport system also accelerates. In developing countries traffic problems and its accident recognized as the raising issue of public health concern [1-4]. It has been reported that developing countries facing more accidents as compare with western countries [5]. The road accidents also been recorded for unfitness, uneducated, physiological and ergonomic problems of drivers, which cause death, economic loss or disability [6-7] particularly in young people by using motor bikes [8].

Karachi is the most developed metropolitan city of Pakistan, contribution around 23.7 million population in 2014 and about 8 million vehicles play on roads which include Motorcycles, Auto rickshaws, Cars, Wagons, Mini-buses & buses, Trucks, Tractors, Water tankers and Bulldozers. All of them are major sources of uncontrolled traffic growth, leading to air and noise pollution [9]. Traffic condition in Karachi is getting worst with every passing day due to the great urban population with a huge amount of vehicle owners and citizens who transact businesses from one part of the city to another [10-11]. The Government allocate rickshaw schemes to reduce unemployment and introduce number of rickshaws day by day on roads, which contributes major role in traffic jams and accident. It has also been most of the rickshaw drivers do not follow the traffic rules and drive carelessly, create alarming and tabulate situation in Karachi, Pakistan during the past years [12].

Most of the Health problems in today's era are associated with environmental pollution [13]. Depletion of the environment (air, soil, water etc), mainly air is a major cause of these health problems. Previous studies showed us that, the air pollution is responsible for the acute or even chronic illness of respiratory track. The long term exposure to polluted air can cause decreases in pulmonary function and various other health problems reported in past epidemiological studies. Vehicular air pollution includes a variety of pollutants among which major components are particulate matter, sulfur dioxides, nitrogen oxides, ozone, lead and carbon monoxide [14-15].

The rickshaw drivers are on the great risk of health problems because of their nature of occupation, lack of awareness to use Personal Protective Equipment and also they are exposed to vehicular emissions on

roads for long durations [16]. Hence in this study the rickshaw drivers are focused because of their long term exposure in congested traffic, a major source of air as well as noise pollution.

MATERIAL AND METHODS

Data collection

A questionnaire was developed to evaluate the primary health status of rickshaw drivers in Karachi city and the factors which were considered to be the contributor to illness were studied. Data from questionnaire/interviews (for those who cannot read) was collected by rickshaw drivers in three main towns of Karachi city namely Gulshan-e-Iqbal town, Gulberg town, and Bin Qasim town. Questionnaire comprises of questions related to their present health status, exposure to environmental pollution and also about the personal protective equipment.

Previous studies were also cited and the number of rickshaws on the roads of Karachi were estimated which was then used to predict the number of accidents due to rickshaws encountered per day. The sampling was done in six months duration starting from June to December 2014. A total of 105 subjects (rickshaw drivers) were interviewed through questionnaire during this study in order to gain optimum amount of data for interpretation. Selective areas in Karachi were observed and studied during this survey including Gulshan-e-Iqbal town, Gulberg town and Bin Qasim town.

Statistical analysis

Data was analyzed statistically to get a clear picture of health status of rickshaw drivers and the factors which were contributing to their health. Mean and standard deviation were calculated through Microsoft Excel Software.

Data for estimating the number of accidents from a particular type of vehicle was taken from reviewing literature [17] i-e; fatality index was applied:

$$F/V=0.00078 (V/P)^{-0.44}$$

Whereas,

F = road fatalities

V = number of vehicles

P = population

Fatality index is statistically significant at the 1 percent level. Its unit is fatalities per million. Thereby using the above statistical model the total fatality index of accidents in Karachi is 0.16341 per million populations

RESULT AND DISCUSSION

Socio-demographic characteristics

A total of 105 auto rickshaw drivers were studied from three different towns of Karachi (Gulshan-e-Iqbal town, Bin Qasim Town and Gulberg town). Statistically 37 (35.23%) subjects were belonging to Gulshan-e-Iqbal town, 34 (32.38%) subjects were belonging to Bin Qasim town and 34 (32.38%) subjects were belonging to Gulberg town. The age range was varied from 16-59 Years. All 105 subjects in the present study were male. 35 (33.33%) subjects were married and 70 (66.66%) subjects were bachelor. 25 (23.80%) subjects had secondary education, 38 (36.19%) subjects had primary education and 42 (40%) subjects were uneducated.

Occupational Characteristics

Daily working hours were range from 6-12 hours. 28 (26.66%) subjects were working in morning time, 55 (52.38%) subjects were working in morning-evening time, 18 (17.14%) subjects were working in evening time and 4 (3.80%) subjects were working in evening-night time. The earnings of subjects were ranging from 5000-18000 per month.

Tobacco Consumption

25 (23.80%) subjects were used to consume some forms of tobacco in form of smoke, while rest 80 (76.19%) were not consuming any tobacco smoke.

Studied Factors

The studied factors were included air pollution, noise pollution and smoking habits. 24 (22.85%) subjects were affected from air pollution while rest 81 (77.14%) subjects were not affected. 17 (16.19%) subjects were affected from noise pollution while rest 88 (83.80%) subjects were not affected.

Health Effects

The health effects were included headache, stress, fatigue, back pain and blood pressure. 29 (27.61%) subjects were suffering from headache and 76 (72.38%) subjects were not suffering. 22 (20.95%) subjects were suffering from stress and 83 (79.04%) were not suffering. 35 (33.33%) subjects were suffering from fatigue and 70 (66.66%) were not suffering. 28 (26.66%) subjects were suffering from back pain and 77 (73.33%) subjects were not suffering. 8 (7.6%) subjects were suffering from high blood

pressure while 4 (3.8%) subjects were suffering from low blood pressure and 93 (88.57%) were not suffering having normal blood pressure.

Table 1 Summarized table showing the characteristic impacts and studied factors.

STUDY AREA	SUBJECTS ANALYSE	AGE	STUDIED FACTORS			IMPACTS						ACCIDENT ENCOUNTER	MASK
			AIR POLLUTION EXPOSURE	NOISE POLLUTION EXPOSURE	SMOKING HABBITS	HEADACHE	STRESS	FATIGUE	BACK PAIN	BLOOD PRESSURE			
										HIGH	LOW		
GULSHAN-E-IQBAL TOWN	37	17-59 years	21.62%	10.81%	27.0%	21.6%	32.4%	16.21%	24.32%	8.1%	2.7%	5.4%	2.7%
BIN QASIM TOWN	34	16-40 years	20.58%	23.52%	23.52%	29.4%	8.82%	41.17%	29.41%	8.8%	5.8%	14.7%	2.7%
GULBERG TOWN	34	18-45 years	26.47%	14.70%	20.58%	32.3%	20.5%	44.11%	26.47%	5.8%	2.7%	20.5%	N/A

Table 2 Statistical Analysis of given health related issues in drivers.

Statistical analysis	Air pollution complains (%)	Noise pollution complains (%)	Smoking habits (%)	Headache	Stress	Fatigue	Back pain	Blood Pressure		Accident Encounter	Mask
								High	Low		
Mean	22.89	16.34	23.7	27.7	20.5	33.83	26.73	7.56	3.73	13.53	2.7
Median	21.62	14.7	23.52	29.4	20.5	41.17	26.47	8.1	2.7	14.7	2.7
Standard deviation	3.14	6.51	3.21	5.53	11.79	15.33	2.55	1.56	1.78	7.61	0

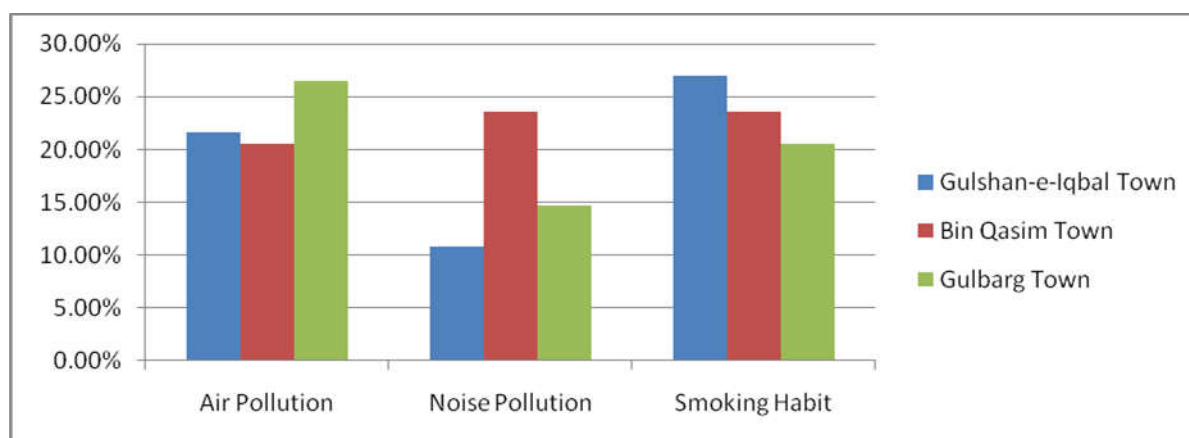


Fig.1 Graphical presentation of studied factors of all towns.

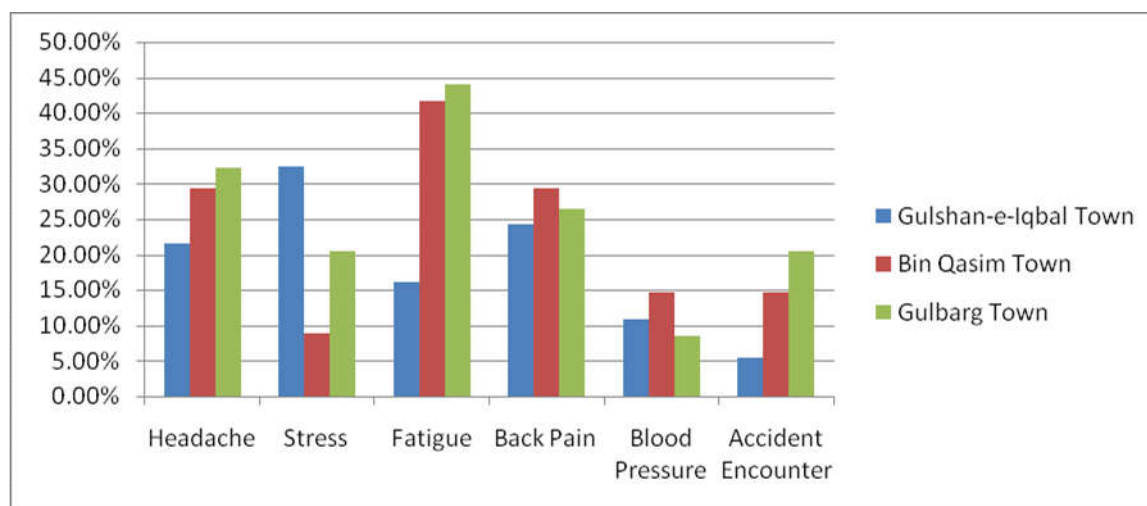


Fig.2. Town wise Comparison of impact of rickshaw drivers.

Karachi city is one of the most polluted and congested city as far as traffic is concerned. Encroachment in busy markets and huge traffic on roads causing congestion, which has made life miserable for drivers and pedestrian. In the business hours this condition going so worst that vehicular moving at snail's pace increase the fuel consumption and high rate of exhausted emission, which mostly effects the drive than any other because the longtime of exposure. The above result shed some light that how the rickshaw schemes effects the human health. Among all the above statistical result 32% of drivers were facing stress condition in Gulshan-e-Iqbal town, as it is the most busy road because of having Universities, offices and shopping malls. In the same ways Bin Qasim town and of Gulberg town, rickshaw drivers encounter the problems of fatigue.

The rickshaw drivers are exposed to air and noise pollution that causes the health impacts such as respiratory infection, cardiovascular problem, elevated blood pressure, hearing loss, fatigue, headache, stress and back pain. The result of this study also state that more than 50% of the population working hours greater than 8 to 12 hours, both in night and morning shift as there are more susceptible to facing more pollution then other shifted based drivers. It has been reported that professional vehicular drivers who spend 8-10 hours regularly in traffic pollution are at higher risk of lung disease [14]. It has also been stated that CO (Carbon monoxide) are the major contributor of producing lung disorder [14]. Only 2.7 % of driver using masks during their working hours which also associated to accelerate the congenital infection. In high populated urban areas where people frequently experience high traffic and proximity close to each other, received high number of virus and other pathogens [18]. The heavy traffic, damaged roads, poor infrastructure and mismanagement of traffic lead to accident encounters. Auto Rickshaw generates a noise level up to 100 to 110 dB. It ultimately affects the hearing of auto rickshaw drivers.

Calculation of fatality index of accidents in Karachi by the help of equation and the data was taken from the report of Road Traffic injury Research & Prevention Centre 2011. The total fatality index of accidents in Karachi by using rickshaw was 0.16341, while according to the previous study, the overall fatality rate of Pakistan during the year 1988-1989 was 6.1/10,000 people and in motorization this rate was 0.49/10,000 people during the same duration of year [5].

CONCLUSION

It is conclude from the present study that respiratory functions and other health impacts of auto rickshaw drivers who are continuously exposed to emissions from vehicles were significantly reduced as compared to past study because of the petrol rickshaws conversion into CNG engine that is mostly environment friendly, but increased number of vehicles in Karachi, damaged roads, construction of bridges, road side encroachment, poor infrastructure and mismanagement of traffic controls leads worst situation in Karachi, Pakistan that causes the fatigue, headache, stress, nausea, back pain etc. and also leads the accident encounters injuries and road fatalities. With especial consideration of future people will be face worst circumstance regarding traffic if no serious and affected step taken. Hence, we also recommended here for proper management of traffics roles as this is directly and indirectly impact the physiology, health status and economy.

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CITATION OF THIS ARTICLE

Omm-e-Hany, Sarang M, Asia N, Aamir A and Kanza A. Epidemiological Study of Rickshaw Drivers Health Status and Accident Encounters in Towns of Karachi. *Bull. Env. Pharmacol. Life Sci.*, Vol 3 [12] November 2015: 55-59