

# Risk Factors Associated with Fatality in Road Traffic Accidents in Lahore



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## Abstract

**Background:** The objective of the study was to analyze the epidemiology of risk factors associated with fatal road traffic accidents in Lahore-Punjab, Pakistan.

**Methods:** An Analytical cross-sectional study was conducted in Lahore, between July 2019 and September 2019. Data of 290 road traffic accidents was collected from office of Rescue 1122. To collect data systematic Random Sampling technique was used. Data was collected on preformed pretested questionnaire. Data was entered and analyzed in SPSS version 23. Chi-square test of significance was applied, p-value of less than 0.05 was considered as significant.

**Results:** Mean age of victims of RTA was 31.4±14.7. About 28.3% of the total accidents were observed among 20-29 years age group. Out of total 290 victims, 239 (82.4%) were males. Majority, 228(78.6%) of the accidents involved Motorcyclists. Significant association was found between fatal accidents and injury to head (p-value = 0.00), Concussion (p-value=0.00), with No fractures of limbs (p-value= 0.04) and critical condition of victim (p-value=0.00).

**Conclusion:** Road Traffic Accidents were more common among males of 20-29 years age. Most of the victims were motorcyclists. Head Injuries, concussion and critical conditions of victims has significant association with fatality.

**Keywords:** Road traffic accidents, risk factors, injuries, fatality

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## Introduction

Globally statistics show that 1.25 million people end up dying every year as a result of road traffic crashes (1). It is expected that RTA injuries will be the 4th leading cause of global disease burden in the year 2030 (2). Road traffic injury death rate is highest in the African region being 26.6 per 100,000, in 2013 (3,4). Only Asia-Pacific region contributes to about 60% of global death rates despite of the fact that it accounts for only 16% of the world's vehicles (5). In the Eastern Mediterranean Region, the mortality rate of RTA's is 26.4/100,000 (6). Worldwide statistics show that most of the road traffic accidents occur is South-East Asia (6). Road traffic accidents are the top most cause of death in people aged 15-29 years (4). According to WHO, low and middle income countries account for approximately 90% of the total RTA's (5). These Road traffic accidents constitute about 2.1% of global mortality (5). Increase in population and its demands for more vehicles has been one of the root cause of the increasing incidence of road traffic accidents worldwide (7). Male gender, per capita GDP, mental distress, under age driving, ignorance of the traffic rules, lack of use of helmets by the motorcyclists, being among pedestrians and drug abuse are the

other risk factors for these RTAs (8).

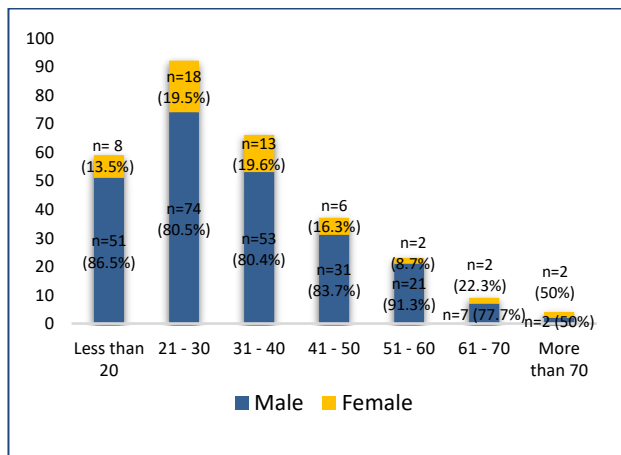
Pakistan reports, approximately 7000 RTA (per annum) severities.(9) Pakistan loses an average of 5 people daily in RTA's (6). In recent reports, estimated 41,000 road traffic accident fatalities occur each year in Pakistan, 24% of all in Eastern Mediterranean Region (EMR) (9). In last 10 years' data, an average of 1500 people died in the country every day, due to road traffic accidents (7). Distribution at provincial level showed that 29,524 people died in 51,715 accidents in Punjab, 9,639 were killed in 13,965 accidents in Sindh, 9,494 died in 27,939 RTAs in KPK and 2,250 lost their lives in 4,085 RTAs in Baluchistan (7). In Lahore, the huge increase in traffic load, led to a total of 132,504 victims of Road Traffic Accidents reported from 2005 to 2010 (6). These road traffic accidents cause a suggested loss of 3-4 % of GNP (10). Despite of being a major Public Health issue contributing significantly towards high mortality & disability. This area is neglected in local research. Very few studies are conducted in Pakistan. The rationale of this study is to do in depth analysis of factors contributing towards Road Traffic Accident. This study aims to analyze the risk factors associated with fatal road traffic accidents in Lahore-Punjab, Pakistan.

### Methodology

An Analytical cross-sectional study was conducted in Lahore, between July 2019 and September 2019. After conception of the study, permission was taken from office of Rescue 1122. Consent form, from regional director of Rescue 1122 was signed & than research proposal was submitted to institutional review board of Akhtar Saeed Medical & Dental College. No direct subject was involved in data collection and only record handling was done. So, individual consents were not taken. After clearance from IRB, data of 290 road traffic accidents was collected from office of Rescue 1122. Systematic Random Sampling technique was used to collect data from registers of Rescue 1122. Every 5th entry of road traffic accidents was included in sample from the selected Quarter of 2019. All accidents related to fire, fall, violence, explosion, building collapse & train collision were excluded. And cases of suicides based on poisoning & strangulation and all medical emergencies were also excluded. Data was collected by using a structured questionnaire. It was pretested in a pilot study & was modified accordingly. The data was entered into Statistical Package for Social Sciences (SPSS) version 23 for analyses after cleaning & coding. Descriptive statistics are presented in form of tables and graphs. Chi square test of significance was applied between qualitative variables and p value was fixed at 0.05 to find statistical association.

### Results

Component graph of age groups with gender distribution (Figure. 1) showed that 82(28%) individuals belonged to the age group of 21-30 years out of which majority, 74(80.5%) were male and 18(19.5%) were female.



**Figure 1: Age and Gender Distribution of victims in Road Traffic Accidents**

Most of the accidents 190 (65.5%) took place in daytime. Day distribution showed that maximum number of accidents (27.6%) were reported on Friday. 132(45.5%) in August. From 290, 93 (32.1%) accidents happened on Ferozpur Road. Out of total accidents, majority, 228(78.6%) involved Motorcycles, 172(59.3%) RTAs involved more than 2 vehicles. And 152 (52.4%) involved only one victim. (Table No. 1)

**Table 1: Accident-Related Indicators**

Time	Frequency (n)	Percentage (%)
Day	190	65.5
Night	100	34.4
Days	Frequency (n)	Percentage (%)
Monday	43	14.8
Tuesday	31	10.7
Wednesday	32	11
Thursday	50	17.2
Friday	80	27.6
Weekend	54	18.6
<b>Total</b>	<b>290</b>	<b>100</b>
Month	Frequency (n)	Percentage (%)
July	90	31
August	132	45.5
September	68	23.4
Area	Frequency (n)	Percentage (%)
Thokar Niaz Baig	36	12.4
Canal Road	58	20
Mall Road	35	12
DHA	42	14.5
Ferozpur Road	93	32.1
Multan Road	26	9
Type of Vehicle	Frequency (n)	Percentage (%)
Motorcycle	228	78.6
Bicycle	27	9.3
Rikshaw	14	4.8
Car	15	5.2
Bus	2	0.7
Truck	4	1.3
No. of Vehicle	Frequency (n)	Percentage (%)
1-2	118	40.7
More than 2	172	59.3
No. of victims	Frequency (n)	Percentage (%)
One	152	52.4
Two	28	9.7
Three	5	1.7
More than three	105	36.2

Bivariate analysis of other injury indicators and outcome of injury showed significant association between fatal accidents and injury to head (p-value = 0.00), Concussion (p-value=0.00), with No fractures (p-value= 0.04), critical condition of victim (p-value=0.00). (Table No. 2)

**Table 2: Bivariate analysis of Fatal and Non-Fatal Road Traffic Accidents with Indicators of Injury**

Variable	Fatal	Non-Fatal	Total	P value
Site of Injury				
Head	54 (60.7%)	35 (39.3%)	89	0.00
Spinal	3 (42.9%)	4 (57.1%)	7	
Chest	1 (4.0%)	24 (96.0%)	25	
Abdomen	2 (7.1%)	26 (92.9%)	28	
Limbs	1 (1.5%)	67 (98.5%)	68	
Eye	1 (100%)	0 (0%)	1	
Face	1 (9.1%)	10 (90.9%)	11	
Nature of Injuries				
Fracture	21 (25.3%)	62 (74.7%)	83	0.00
Bruise	6 (5.7%)	98 (94.2%)	104	
Sprain	1 (20.0 %)	4 (80.0%)	5	
Concussion	38 (73.1%)	14 (26.9%)	52	
Organ System Injury	6 (17.1%)	29 (82.9%)	35	
Dislocation	1 (11.1%)	8 (88.9%)	9	

Number of Fractures				
No	30 (27.2%)	80 (72.7%)	110	0.04
Single	8 (12.3%)	57 (87.7%)	65	
Multiple	14 (35.8%)	25 (64.2%)	39	
Severity of Injury				
Mild (only first aid)	2 (2.8%)	69 (97.2%)	71	0.00
Moderate (Hospitalization)	19 (12.9%)	128 (87.1%)	147	
Critical	39 (66.1%)	19 (33.9%)	59	
Response time of Rescue 1122				
within 30 Minutes	50 (22.7%)	167(75.9%)	220	0.06
More than 30 Minutes	22 (30.9%)	49 (69.01)	79	
Distance to nearby Hospital				
Within 1kilometre	0 (0%0)	6 (100%)	6	0.41
1-5kilometres	13 (14.4%)	73 (81.1%)	90	
6-10kilometres	23 (23.7%)	72 (74.2%)	97	
11-15 kilometers	12 (28.6%)	28 (66.7%)	42	
> 15 kilometers	14 (27.5%)	36 (70.6%)	51	

## Discussion

According to this study out of 290, majority, 81(28%) individuals belonged to the age group of 21-30 years of age out of which 74(80.5%) were male. The possible reason of male being in majority is greater exposure to traffic of the males compared to females as drivers, riders and travelers (11). Similarly, in India male-female ratio is 4:1-5:1 for road traffic accidents (12). Results of this study showed that majority of road traffic accidents were reported in day time which constituted 65.5% of the total accidents. The most probable reason is high traffic load in this case but a study conducted in Iran showed that night time road crashes occurs usually due to intake of alcohol, slow response time and poor visibility (13).

According to this study maximum number of accidents occurred on Friday 27.6% and on weekend 18.6%. Whereas, a study in South East Iran showed last three working days of the week (Wednesday, Thursday, Friday) had the highest rates of RTA (14). In this study, maximum number of accidents were seen in the month of August (45.5%). Compared to Africa where most accidents occurred in June (14.33%) possibly as these months mark the beginning and the end of trips (15). In this study, it was observed that in most cases of road traffic accidents the vehicle used was motorcycle(78.6%). Similarly in a study conducted in India, 61.33% of the victims were two-wheel riders (16). This study revealed that in most of the accidents more than 2 vehicles were involved that is 59.3%.

A study of north west Iran had shown the same result where in majority of road traffic accidents, more than two vehicles were involved indicating the lack of efficient laws and their implementation (17). Among patients admitted to hospitals in this study, head injuries were reported maximum comprising 30.7% with maximum risk of fatality (p-value=0.00). Similarly, a study conducted in India showed that head injuries were higher among people not wearing seat belts/helmets and head injuries were the most common cause of death in road traffic injuries (18). This study showed that nature of injury having association with fatality

was Concussions (p-value=0.00). Similarly, a study of Nepal showed most common injuries associated with fatality were concussions, brain injuries or haemorrhages (19).

Out of 290, 69.9% had single fracture and 30.1% had more than one fractures and dislocations were least comprising only 3.1%. In contrast, a study in Saudi Arabia showed 47.22% of patients having fractures due to road traffic accidents had multiple fractures (20). This study shows that out of 290 road traffic injuries nearly 24.5% injuries required first aid facilities, 52% of patients sought care in departments of tertiary care facilities while 20.3% were critically injured and 3.1% succumbed to death. Similarly, in Kenya majority, 45% victims affected in road traffic accidents were admitted in the hospital (21).

The road traffic accidents rate in China showed significant decline between 2006-2016 by implementation of existing traffic prevention and management policies, which played vital role in decreasing the number of accidents, but not definitely reduced the number of casualties. Therefore, influencing factors for road traffic casualties are still an important issue of concern to the government and academia (22). Improved continuous surveillance is thus essential for policy-making and its implementation in order to reduce this expected escalation in road disease burden in a developing country like Pakistan. Moreover, according to the results shown in this study, preventing measures focussing on head injuries and proper medical management of critical cases can decrease the mortality rate caused by RTAs.

## Conclusion

Road Traffic Accidents were more common among 20-29 years age group in males. Most frequently motorcycle accidents occurred. Most of the participants had head injuries specifically Concussions that were associated with high fatality. Most of the victims had fracture of one side only. Accident rates were higher during day time and more cases were reported on weekend. More accidents happened on Ferozpur Road and most cases were reported in August.

## References

1. Ali MA, Arif MM, Arif A, Fatima T. Roads traffic accidents: An epidemiological study of road traffic accidents in tertiary care hospital. *APMC*. 2016; 10(3): 157-161. <http://www.apmcfmu.com/index.php/apmc/article/view/283>
2. Global, regional, and national life expectancy, all-cause mortality, and cause-specific mortality for 249 causes of death, 1980-2015: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet*. 2016; 388(10053): 1459-544. doi: 10.1016/s0140-6736(16)31012-1
3. Adeloye D, Thompson JY, Akanbi MA, Azuh D, Samuel V, Omoregbe N, et al. The burden of road traffic crashes, injuries and deaths in Africa: a systematic review and meta-analysis. *Bulletin of the WHO*. 2016;94(7):510-15. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4933140/>
4. Rad M, Martiniuk ALC, Moghaddam AA, Mohammadi M, Rashedi F, Ghasemi A. The Pattern of road traffic crashes in South East Iran. *Glob. J. Health Sci*. 2016; 8(9): 149-158. [https://www.tandfonline.com/doi/full/10.1080/17457300.2020.1823996?casa\\_token=SWZdBJK50EAAAAAA%3A8U7W5A4pNihgdclP\\_vH77ck\\_0Zb063yqbgCtZ\\_6evm68cmklSvblshq\\_UOMWAK6T\\_MueuTH9EL00yA4](https://www.tandfonline.com/doi/full/10.1080/17457300.2020.1823996?casa_token=SWZdBJK50EAAAAAA%3A8U7W5A4pNihgdclP_vH77ck_0Zb063yqbgCtZ_6evm68cmklSvblshq_UOMWAK6T_MueuTH9EL00yA4)
5. Hordofa GG, Assegid S, Girma A, Weldemariam TD. Prevalence of fatality and associated factors of road traffic accidents among victims reported to Burayu town police stations, between 2010 and 2015, Ethiopia. *J. Transp. Health*. 2018;10:186-93. <https://www.sciencedirect.com/science/article/pii/S2214140517309520>

6. Zia AS, Awana MT, Omar N, Abjd I, Liaquat A, Khan AA, etal. Epidemiological distribution of road traffic accidents in tertiary care setups of Lahore, Pakistan. *Biomedica*. 2018; 34(2): 102-107.
7. Chaudhry DR, Javed DM, Abid DKJ. Epidemiological study of road traffic accidents attending Orthopedic OPD of Ch.Rahmat Memorial Trust Hospital, from Jan 2015 to Dec 2015. *IJRMR*. 2017;4:2482-5.
8. Jafari, S., Jabbari, A., Esmailnasab, N., Moradi, G. and Sohrabi, S., 2018. An epidemiological survey of traffic accidents in Kangavar, Iran, in 2014. *J. Chronic Dis*. 6(4), 159-164.  
<http://cdjournal.muk.ac.ir/index.php/cdj/article/view/327>
9. Farooq U, Bhatti JA, Siddiq M, Majeed M, Malik N. Road traffic injuries in Rawalpindi City, Pakistan. *EMHJ*. 2011;17(9):647-653.  
<https://apps.who.int/iris/handle/10665/118134>
10. Islam MB, Kanitpong K. Identification of factors in road accidents through in-depth accident analysis. *IATSS research*. 2008 Jan 1;32(2):58-67.  
<https://www.sciencedirect.com/science/article/pii/S0386111214602090>
11. Aarts L, van Schagen I. Driving speed and the risk of road crashes: a review. *Accid Anal Prev*. 2006. 38, 215–224.  
<https://www.sciencedirect.com/science/article/abs/pii/S0001457505001247>
12. Verma PK, Tiwari KN. Epidemiology of road traffic injuries in Delhi: Result of a survey. *Reginal Health Forum*. 2004.8; (1): 6-14
13. Mehmandar M, Soori H, Amiri M, Norouzirad R, Khabzkhooob M. Risk factors for fatal and nonfatal road crashes in iran. *Iranian Red Crescent medical journal*. 2014 Aug;16(8).e10016  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4221994/>
14. Rad M, Martiniuk AL, Ansari-Moghaddam A, Mohammadi M, Rashedi F, Ghasemi A. The pattern of road traffic crashes in South East Iran. *Global journal of health science*. 2016 Sep;8(9):149.  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5064071/>
15. Alain CM, Julius A, Jean GT, Clovis FA, Marcelin NN. A prospective pilot cohort analysis of crash characteristics and pattern of injuries in riders and pillion passengers involved in motorcycle crashes in an urban area in Cameroon: lessons for prevention. *BMC Public Health*. 2015;-15:915-8.
16. Shehzad S, Razak JA, Rashid J, et al. initial results of Pakistan's 1st road traffic injury surveillance project *Int J inj Contr Safe Promot* 2011;18:213-7
17. World Health Organization. Road traffic injuries. Available from: [www.who.int/violence\\_injury\\_prevention/road\\_traffic/en/](http://www.who.int/violence_injury_prevention/road_traffic/en/).
18. Honnungar RS, Aramani SC, Kumar AG, Kumar TS, Jirli PS. An epidemiological survey of fatal road traffic accidents and their relationship with head injuries. *Journal of Indian Academy of Forensic Medicine*. 2011;33(2):135-7  
<https://www.indianjournals.com/ijor.aspx?target=ijor:jiafm&volume=33&issue=2&article=009>
19. Jha S, Yadav BN, Karn A, Aggrawal A, Gautam AP. Epidemiological study of fatal head injury in road traffic accident cases: a study from BPKIHS, Dharan. *Health Renaissance*. 2010;8(2):97-101.  
<https://www.nepjol.info/index.php/HREN/article/view/4420>
20. Sadat-Ali M, Alomran AS, Azam Q, Al-Sayed HN, Al-Dhafer BA, Kubbara AF, AlShaikh SH. Epidemiology of fractures and dislocations among urban communities of eastern Saudi Arabia. *Saudi Journal of Medicine and Medical Sciences*. 2015 Jan 1;3(1):54-8.
21. Osoro ME, Ng Z, Oundo J, Omolo J, Luman E. Factors associated with severity of road traffic injuries, Thika, Kenya. *Pan African medical journal*. 2011;8(1).1-8
22. Wang L, Ning P, Yin P, Cheng P, Schwebel DC, Liu J, Wu Y, Liu Y, Qi J, Zeng X, Zhou M. Road traffic mortality in China: analysis of national surveillance data from 2006 to 2016. *The Lancet Public Health*. 2019 May 1;4(5):e245-55