

TO EVALUATE THE VARIOUS RISK FACTORS RESPONSIBLE FOR ROAD TRAFFIC ACCIDENTS IN PUNJAB – A DESCRIPTIVE STUDY

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ABSTRACT

Objective: Evidence from research suggests that human factors and the road environment are among the most frequent contributors to the occurrence of road traffic accidents (RTAs). Hence, traffic rule and various policies, alike have strengthened their efforts to cope with this public health burden. Yet, still little is known about the factors contributing to the high number of RTAs. In this study, we tried to find out the various risk factors responsible for road accidents in the Punjab region.

Methods: The present study was conducted in Guru Nanak Dev Hospital, Amritsar, involving 1425 patients who were admitted to the Emergency Department from January 1st, 2012, to December 31st, 2012, due to injuries in RTAs.

Results: In our study, it seems that most of the cases were in the age group of 15–44 years. In all the age groups, males were the predominant victims with male-to-female ratio of 5.72:1. Majority of cases belonged to an upper–lower socioeconomic group, according to the Kuppusswamy scale and the major proportion of accidents occurred during the morning and evening busy hours of the day hours. Out of a total of 893 drivers, 858 (96.08%) had no knowledge about the speed limit prescribed for the road or speed.

Conclusion: There appears to be a large number of behavioral issues and a lack of knowledge that contributes significantly to the road accident rates in the Indian states. Hence, there is a need for policy intervention. Most effective measures used to reduce the number of accidents, in descending order of magnitude, are how strictly the traffic police enforce the law, more levels of penalties, and more traffic police, including more speed measuring devices.

Keywords: Risk factors, Road accidents, Tertiary hospital.

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INTRODUCTION

Road accidents have been the eighth leading cause of death globally. Numerous factors can be attributed to the causative factors of road accidents. According to the type of injuries, they are classified as road traffic accidents (RTAs), domestic accidents, industrial accidents, railway accidents, violence, etc. Out of these, RTAs constitute an important cause of preventable morbidity, mortality, and disability [1]. India's contribution in this regard is among the highest in the world with the country accounting for the second-highest number of road accidents globally and the highest number of deaths. India accounts for as high as 6% of the world's RTAs, although it has 1% of the world's vehicles. The RTA rate of 35/1000 vehicles in India is one of the highest in the world and so is the RTA fatality rate of 25.3/10,000 vehicles [2]. By 2020, road traffic death in India will increase by 147% [3]. Reckless driving, defective motor conditions, bad weather, and reckless driving by bus, truck, and car drivers are found to cause road accidents. We further find that the increase in motorization rates and rash driving are the primary causes behind road fatalities, and bad weather plays a major role in causing road fatalities and injuries in urban areas. However, road fatalities are increasing; still, cases of underreporting, lack of proper road safety regulation, improper investigation procedures, increasing vehicle usage, and higher urbanization have made matters quite worse in India [4]. At present, road safety, often linked with transportation growth, is an individual and isolated responsibility of the transport, police, urban development, law, and health sectors. Due to the lack of a clearly defined agency and mechanism at the national and state levels for coordinating, integrating, and monitoring road safety, progress has been limited. Lack of research institutions, skilled manpower across sectors, limited participation of the health sector in prevention, and a resource crunch have also not helped matters. The national- and state-level road

Table 1: Distribution of road traffic accident victims according to their place of residence (n=1425)

Place	Male, n (%)	Female, n (%)	Total, n (%)
Rural	656 (46.03)	114 (8.01)	770 (54.04)
Urban	557 (39.09)	98 (6.87)	655 (45.96)
Total	1213 (85.12)	212 (14.87)	1425 (100)

Table 2: Distribution of road traffic accident victims according to knowledge about speed limit (n=893)

Speed limit knowledge	Frequency, n (%)
No	858 (96.08)
Yes	35 (3.92)
Total	893 (100.00)

Table 3: Distribution of road traffic accidents according to the presence of sign boards on roads (n=893)

Sign	Frequency, n (%)
Present	173 (19.37)
Not present	352 (39.42)
Not seen	368 (41.21)
Total	893 (100.00)

safety councils have been recommendatory bodies and have not taken a comprehensive approach to road safety [5]. In this study, information was taken regarding various factors responsible for roadside accidents

Table 4: Distribution according to the presence of footpaths on city roads in relation to pedestrian's accident victims

Distribution according to the presence of footpaths on city roads in relation to pedestrian's accident victims			
Pedestrians	Yes, n (%)	No, n (%)	Total, n (%)
Crossing	7 (5.6)	29 (23.2)	36 (28.8)
Walk on road	17 (13.6)	72 (57.6)	89 (71.2)
Total	24 (19.2)	101 (80.8)	125 (100)

Table 5: Distribution of road traffic accident victim's mode of transport in relation to socioeconomic status

Socioeconomic status	Pedestrian	Non-motorized vehicle	Two wheeler	>2 wheelers	Total
Lower class (<5)	22	4	31	12	69
Middle class (5-15)	212	79	808	105	1204
Upper class (>16)	11	1	115	25	152
Total	245	84	954	142	1425

such as overspeeding, alcohol driving, non-wearing of a helmet, non-use of seat belt, bad road conditions, and other environmental factors.

METHODS

The present study was conducted in Guru Nanak Dev Hospital, Amritsar. It is a cross-sectional study between January 1, 2017, and December 31, 2017, involving 1425 patients who were admitted to the Emergency Department, due to injuries in RTAs. The investigator visited all the patient's bedsides and information regarding various epidemiological factors was collected. Victims that are referred to another institute, victims who died before the investigator reached, and non-cooperative patients were excluded from the study. RTA victims who were admitted in the Guru Nanak Dev Hospital, Amritsar, in Causality Department attached to Government Medical College, Amritsar, were included in this study. A pre-designed pre-tested semi-structured questionnaire was filled out by the interviewer. Before the interview, informed consent was taken from each participant. Data were entered in a Microsoft Excel sheet and exported and analyzed using SPSS version 15.0 software.

RESULTS AND DISCUSSION

The present study was conducted on 1425 RTA victims, who reported to the Causality Department of Guru Nanak Dev Hospital, Amritsar, of which (54.04%) belonged to rural areas and (45.96%) victims belong to urban areas (Table 1). Almost similar observations were seen [6] when the ratio of victims from urban and rural areas was 47.5% and 52.5%, respectively.

According to NHSTA for drivers involved in fatal crashes, young males are the most likely to be speeding. The relative proportion of speeding-related crashes to all crashes decreased with increasing driver age. In 2011, 39% of male drivers in the 15- to 20-year-old age group and 37% of male drivers in the 21- to 24-year-old age group involved in fatal crashes were speeding at the time of the crash [7]. As shown in Table 2 that out of 893 RTA victims who came to the Causality Department of Guru Nanak Dev Hospital, Amritsar, the majority, 858 (96.08%) had no knowledge about the speed limit prescribed for the road or speed at which they were driving and only 49 (3.92%) had knowledge about the speed limit.

Table 3 depict that out of 893 RTA victims who came to the Causality Department of Guru Nanak Dev Hospital, Amritsar, 352 (39.42%) reported no signboard on roads, 368 (41.21%) reported they did not see the signboard, and 173 (19.37%) reported having sign board present on the roads.

Table 4 shows that out of a total of 125 (100%) pedestrian accident victims, the majority of them 101 (80.8%) reported no footpath was present on the road and 24 (19.2%) had reported footpath on the road. Eighty-nine (71.2%) accidents by pedestrians occurred on the straight road when they walk on the road and 36 (28.8%) accidents occurred while crossing the road.

Table 5: Distribution of road traffic accident driver victims according to the experience of driving

Experience (years)	Frequency, n (%)
0-5	358 (40.09)
6-10	199 (22.28)
11-15	153 (17.13)
16-20	75 (8.40)
21-25	60 (6.72)
>25	48 (5.38)
Total	893 (100.00)

Table 6: Distribution of road traffic accidents episodes according to the time of accident (n=1425)

Time	Frequency, n (%)
Morning (4-12 am)	373 (26.18)
After noon (12-4 pm)	311 (21.82)
Evening (4-8 pm)	575 (40.35)
Night (8 pm-4 am)	166 (11.65)
Total	1423 (100.00)

Table 7: Distribution of road traffic accidents victims according to month of accident (n=1425)

Month of accident	Frequency, n (%)
January	67 (4.70)
February	49 (3.44)
March	38 (2.67)
April	51 (3.58)
June	101 (7.09)
July	118 (8.28)
August	202 (14.18)
September	232 (16.28)
October	109 (7.65)
November	186 (13.05)
December	225 (15.79)
Total	1425 (100.00)

Table 5 shows that when the mode of transport was studied in relation to socioeconomic status according to the Kuppusswamy scale, it was found that in the lower class, mostly were pedestrians 22 (31.88%), two-wheelers 31 (44.92%), non-motorized vehicles 4 (5.79%), and 12 (17.39%), respectively. In the middle class, mostly were two-wheelers 808 (67.10%), pedestrians 212 (17.60%), non-motorized vehicles 79 (6.56%), and more than two-wheelers 105 (8.72%), respectively. The upper class mostly had two-wheelers 115 (75.65%), more than two-wheelers 25 (16.44%), pedestrians 11 (7.23%), non-motorized vehicles 1 (0.65%), and respectively. When the statistical test was applied, it was found highly significant.

Table 6 shows that out of 1425 RTA victims who came to the Causality Department of Guru Nanak Dev Hospital, Amritsar, 575 (40.35%) victims accidents occur in the evening between 4 pm and 8 pm, 373 (29.82%) accidents occur between 4 am and 12 am, 311 (21.82%) accidents occur in the afternoon between 12 am and 4 pm, and 166 (11.65%) accidents occur in night time between 8 pm and 4 am, respectively.

The major proportion of accidents occurred during the morning busy hours of the day when people are rushing for their jobs or to the schools and colleges. Furthermore, the number of accidents is more in the evening hours and the evening time, when people return back in the evening. In the study conducted by Singh *et al.*, [8] most (40.15%) of the RTA's occurred in the evening (6 pm–12 midnight). Sanjeev *et al.*[9] observed that maximum accidents took place between 9 a.m. and 12 pm (24.8%). The majority of the accidents occurred during the day, i.e. between 6 am and 6 pm (68.0%). Jha *et al.* [10] show that a maximum of the incidents occurred either between 12 pm and 3 pm or 6 pm and 9 pm (18 or 23.3%), followed by 9 am and 12 pm (16 or 20.7%)

Table 7 revealed that out of 1425 RTA victims who came to the Causality Department of Guru Nanak Dev Hospital, Amritsar, the majority of accidents had occurred in September 232 (16.26%), December 225 (15.79%), August 202 (14.18%), November (13.05%), and least were seen in the month of March 38 (2.67%), respectively. The study conducted by Jha *et al.* [6] was observed in January and the maximum number of victims was also highest compared to other months. Similar observations were made by Ghosh [11]. There were some increases in RTAs in the month of October, which may be attributed to the rainy season, and therefore, the wet conditions of the road.

CONCLUSION

Road accidents have become a leading cause of fatalities and injuries globally with India being the leading country in this regard. The huge loss of life and attendant economic losses are highly avoidable and require urgent measures to be adopted for effective mitigation. Traffic training and comprehensive safety education may be made an essential part of the school curriculum. NCC, NGOs, and voluntary agencies should be involved in day-to-day traffic management. There should be regular and continuous traffic ongoing safety and awareness programs covering all the media, especially directed toward the education of drivers, pedestrians, and the young population. Even, the driving license should be issued in a more disciplined manner. Hence, there is a need for policy intervention. Most effective measures used to reduce the number of accidents, in descending order of magnitude, are how strictly the traffic police enforce the law, more levels of penalties, and more traffic police, including more speed measuring devices. Emergency health services

should be strengthened with the opening of the trauma center at a territory-level hospital to provide round-the-clock services.

AUTHORS CONTRIBUTIONS

The manuscript writing had accomplished by Dr. Vineet Bal and the data collection and analysis were done by Dr. Tejinder Singh and Dr. Jaswant Kaur. The research was reviewed and edited by Gitanjali Gupta and statistical analysis was done by Dr. Vineet. The manuscript was finalized and submitted for publication by Dr. Jaswant Kaur.

CONFLICTS OF INTEREST

The authors affirm no conflicts of interest.

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