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RESEARCH ARTICLE

ROLE OF HUMAN BEHAVIOURAL RISK FACTORS IN ROAD TRAFFIC ACCIDENT CASES IN A TERTIARY CARE HOSPITAL IN JAMMU

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ABSTRACT

Background: Road Traffic Accidents (RTAs) have become an issue of national concern. With just 1% of the total vehicles in the world, India contributes to 6% of the global RTAs. Thus, there is an urgent need to have quality data on the various factors associated with RTAs in order to take appropriate action.

Aim: To study the various human behavioural risk factors associated with road traffic accidents. Methods: A cross-sectional questionnaire based study on various human behavioural factors leading to RTAs was performed on 500 victims of RTA who reported to Government Medical College and Hospital, Jammu and their responses were noted in the interview schedule and the data was analysed.

Results: Majority of the victims in this study were drivers (42.4%), followed by passengers (38.6%) and pedestrians (19%). Out of 240 motorized two wheeler drivers and passengers, 78 (32.5%) were wearing helmets and out of 80 car drivers and passengers, 26 (32.5%) were wearing seat belt at the time of accident. Out of 307 drivers and pedestrians, 69 (22.48%) were alcoholics. Out of 27 victims who were under the influence of alcohol or any drug at the time of accident, 12 (44.44%) succumbed to their injuries. Only 5 cases (6.49%) out of 77 victims, who were not under the influence of alcohol or any drug proved to be fatal. A large proportion of the drivers (44.81%) had a driving experience of 1 to 5 years, followed by 31.13% having experience between 5 to 10 years. Out of 212 drivers, only 21 (9.91%) had received formal training in driving and 116 (54.72%) had a valid driving license.

Conclusion: The current study reveals that human factors have a very important role to play in the occurrence of RTAs which are preventable by creating awareness about driving rules and regulations.

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INTRODUCTION

The World Health Organization (WHO), defines Accident as an "unpremeditated event resulting in recognizable damage". (Kumar and Srinivasan, 2013) Road Traffic Accident (RTA) can be defined as "An accident that occurred on a way or street open to public traffic; resulting in persons being killed or injured and where at least one moving vehicle was involved". (Gupta *et al*., 2014) Ms. Mary Ward was the first documented victim of automobile accident that took place on 31st August, 1869 and since then, RTAs have increased rapidly and have emerged as one of the leading causes of morbidity and mortality (Singh *et al*., 2014). Accidents may be interpreted as resulting from the total forces involved in the competition between man and his environment, and the epidemiological method thus offers a scientific approach to the prevention of RTAs. (Norman, 1962) Nearly half (46%) of those dying on roads are at risk road users, like pedestrians, cyclists and motorcyclists. (Park, 2015) One of the main reasons motorcyclists are killed in crashes is because the motorcycle itself provides virtually no protection in a crash. Approximately 80 percent of motorcycle crashes and 20 percent automobiles crashes result in injury or death. Motorcyclists must place greater reliance on their helmets, eye protection, and clothing to increase riding comfort and to reduce the severity of injury, should they become involved in a crash (U.S. 2007). The global road traffic fatalities have increased to about 1.24 million per year and for every death, there are as many as 20-50 non-fatal injuries and 10-20 serious injuries requiring long periods of expensive care, nursing and treatment (Park, 2015). India has just 1% of the total vehicles in the world but it contributes to 6% of the global RTAs (Raza *et al*., 2013). Human behavioural factors like negligent and rash driving, unchecked speed of vehicles on

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road, drunk driving, lack of alertness and diversion of mind are the most important contributors to occurrence of RTAs. (Sharma, 2016) Use of alcohol contributes to traffic injuries by impairing driving capabilities and thus increasing the risk of crash involvement (Osoro *et al.,* 2015). Thus, considering the gigantic social and economic impact of RTAs, the present study is a pioneer effort which attempts to visualize the current scenario of behavioural risk factors associated with RTAs in cases attending casualty of Government Medical College and Hospital (G.M.C.H.), Jammu.

MATERIALS AND METHODS

The present study is a cross- sectional study performed in Government Medical College and Hospital, Jammu, the only tertiary care hospital in Jammu division after seeking ethical clearance from the Institutional Ethical Committee (IEC). The information was collected from victims of RTA presenting to the emergency ward of Government Medical College & Hospital, Jammu. The data was collected till 500 road traffic accident (RTA) victims were interviewed, beginning from 1st November, 2015 up till 31st July, 2016. After reviewing available literature, an interview schedule based on human behavioural factors was constructed to collect information from the respondents, which was pre-tested. The investigator visited the emergency ward on alternate days of the week, starting from either Monday or Tuesday, which was decided on the first day of every week by tossing a coin. Before starting the interview, victims of RTA or their attendants were first briefed about the purpose of the study, in a language they could understand and *informed verbal consent* was obtained from those willing to participate in the study. The attendants or Police personnel or any other person accompanying the victim in the casualty, who has seen the accident happening or has visited the site of accident were interviewed to obtain information, in case the patient was not in a condition to answer. Clinical case files of RTA victims were also studied to obtain relevant information. For RTA cases brought dead to the casualty, information was obtained from autopsy surgeon or autopsy records. Inclusion criteria: 1) Sufferers of RTAs presenting to the emergency ward of G.M.C, Jammu, irrespective of the severity of injuries or outcome. 2) Sufferers of RTA brought dead to the hospital for autopsy. Exclusion criteria: RTA victims or their attendants, who refused to give consent for answering the questions in the schedule. The data was entered in a master chart in Microsoft Excel 2007 spreadsheet and all the variables were studied and comparisons done in terms of numbers and proportions. To find the statistical significance of apparent associations, chi square test was employed using Epi Info and OpenEpi statistical softwares.

RESULTS

A total of 500 cases of RTA were interviewed during the study period with 27 deaths, i.e. mortality rate of 5.4%. Majority of the victims in this study were drivers (42.4%), followed by passengers (38.6%) and pedestrians (19%) as shown in Table 1. Out of total 240 motorized two wheeler drivers and passengers, 78 (32.5%) were wearing helmets and out of 80 car drivers and passengers, 26 (32.5%) were wearing seat belt at the time of accident as can be seen from Table 2a and 2b. Table 3 shows that out of 307 drivers and pedestrians, 69 (22.48%) were alcoholics, 15 (4.89%) were addicted to tobacco and 20 (6.51%) had a habit of taking both alcohol and tobacco. 203 (66.12%) victims did not report to have any such addiction.

Table 1. Distribution of drivers, pedestrians and passengers among RTA victims

Victim's role	Number	Percentage
Driver	212	42.40
Pedestrian	95	19.00
Passenger	193	38.60
Total	500	100.00

Table 2a. Distribution of victims according to the use of protective gear at the time of accident

Motorized two- wheeler drivers and passengers wearing helmets	Number	Percentage
Yes	78	32.5
No	162	67.5
Total	240	100.00

Table 2b. Distribution of victims according to the use of protective gear at the time of accident

Car drivers and passengers wearing seat belts	Number	Percentage
Yes	26	32.5
No	54	67.5
Total	80	100.00

Table 3. Distribution of Drivers and Pedestrians according to their Addictions

Type of addiction	Number	Percentage
Alcohol	69	22.48
Tobacco	15	4.89
Both alcohol and tobacco	20	6.51
None	203	66.12
Total	307	100.00

All those patients who admitted that they consume alcohol (89 patients as seen in Table 4)

Table 4. Distribution according to frequency of alcohol consumption of the victims

Frequency of alcohol consumption	Number	Percentage
Daily	19	21.35
Twice a week	4	4.49
Weekly	7	7.87
Occasionally	59	66.29
Total	89	100.00

Table 5. Distribution according to usual amount of alcohol consumption of the victims

Amount of alcohol consumption (ml/ day)	Number	Percentage
< 60 ml	73	82.02
> 60 ml	16	17.98
Total	89	100.00

were further asked about their frequency of alcohol consumption. Out of 89 patients, 59 (66.29%) reported that they consume alcohol occasionally, 21.35% daily, 7.87% weekly and 4.49% twice a week. 73 patients (82.02%) reported that they consume less than 60 ml at a time while more than 60 ml consumption was reported by 16 patients (17.98%) as shown in Table 5. A victim with smell of alcohol from breath or mouth along with clinical evidence in form of motor in coordination and verbal aberration was considered for some evidence of alcohol consumption. Table 6 shows that out of 27

Table 6. Distribution showing the presence of influence of alcohol or any drug at the time of accident among drivers and pedestrians

Influence Of Alcohol Or Any Drug	Fatal	Non- Fatal	Total
Yes	12	15	27
No	5	72	77
Total	17	87	104

$\chi 2 = 21.0555$, p value < 0.00001

victims who were under the influence of alcohol or any drug at the time of accident, 12 (44.44%) succumbed to their injuries. Only 5 cases (6.49%) out of 77 victims who were not under the influence of alcohol or any drug, proved to be fatal (χ^2 = 21.0555, p value < 0.00001).

Table 7. Distribution according to number of years of driving experience

Driving Experience (In Years)	Number	Percentage
1 to ≤ 5	95	44.81
5 to ≤ 10	66	31.13
10 to ≤ 15	22	10.38
15 to ≤ 20	22	10.38
20 to ≤ 25	2	0.94
25 to ≤ 30	1	0.47
30 to ≤ 35	3	1.42
Total	212	100.00

Table 8. Distribution showing RTA victims possessing valid driving licence and formal training in driving

Valid Licence	Formal Training		Total
	Yes	No	
Yes	11	105	116
No	10	86	96
Total	21	191	212

Table 7 and Figure 1 show that a large proportion of the drivers (44.81%) had a driving experience of 1 to 5 years, followed by 31(13%) having experience between 5 to 10 years and 10.38% each with an experience of 10 to 15 years and 15 to 20 years.

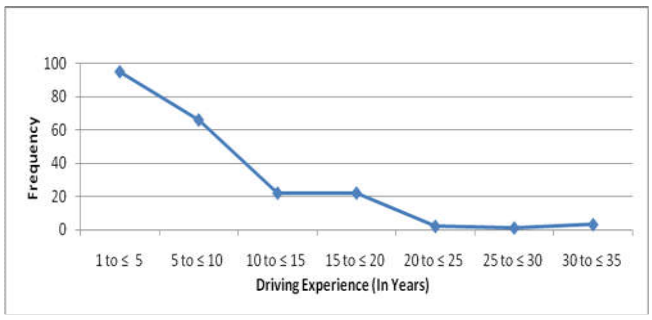

Figure 1. Distribution according to number of years of driving experience

As seen in Table 8, out of 212 drivers, only 21 (9.91%) had received formal training in driving while 191 (90.09%) had not and 116 (54.72%) had a valid driving license while 96 (45.28%) did not. 11 out of 212 victims (5.18%) possessed valid driving licence and had also received formal training in driving while 105 victims (49.52%) out of 212 possessed valid driving licence but had not received formal training in driving.

DISCUSSION

In the current scenario, Road traffic accidents have materialized to become an important consequence of urbanization in Jammu region.

The present study endeavoured to study the various human behavioural risk factors associated with RTAs so that, important recommendations could be made for lowering the occurrence of road accidents which would also have a great impact in decreasing the hospital load and socio-economic burden in the region. Majority of the victims in the present study were drivers (42.4%), followed by passengers (38.6%) and pedestrians (19%). Similar findings have been reported by (Shah and Jarwani, 2014) and (Boniface *et al*., 2016). In the current study, 96 out of 212 drivers (45.28%) did not have a valid driving license. This percentage is higher than that reported by (Patil *et al.,* 2008), (Singh *et al*., 2011) and (Shah and Jarwani 2014). Out of total 240 motorized two wheeler drivers and passengers, 78 (32.5%) were wearing helmet at the time of accident.

This figure is lower than that reported by (Boniface *et al.,* 2016) which is 43.3% but much higher than that reported by (Shah and Jarwani 2014) in 8.33% cases. Out of 80 car drivers and passengers, 26 (32.5%) were wearing seat belt at the time of accident. This figure is higher than that reported by both (Shah and Jarwani, 2014) and (Boniface *et al.,* 2016). The low rate of use of protective gear as well as low rate of possession of driving licence and formal training reflects poor and weak implementation of policies and laws and calls for enhanced development of appropriate regulations, legislation, and enforcement of traffic rules for the protection of vulnerable road users. Out of 500 victims, 27 were found to be under the influence of alcohol or any drug at the time of accident. This is somewhat similar to the results of (Singh *et al.,* 2011) and (Shah and Jarwani, 2014). However, the number is much lower than that reported by (Mishra *et al.,* 2010), (Gupta *et al*., 2014) and (Boniface *et al.,* 2016).

Conclusion

The human loss and suffering that occurs due to road traffic deaths and injuries is preventable. The lack of laws for road safety and insufficient law enforcement are factors that are placing people at increased risk of road traffic accidents. According to the present study, the important aspects that need attention are drink-driving, inappropriate use of helmets and seat belts, non- possession of valid driving licence and driving without receiving formal training. The government needs to allocate financial and human resources to address the problem. The laws employing seat-belts and child restraints for all motor vehicle occupants; requiring riders of bicycles and motorized two-wheelers to wear helmets; enforcing blood alcohol concentration limits for drivers, with random breath testing at sobriety checkpoints should be put into practice. The rising number of road traffic accidents can be curtailed by creating awareness about road safety through workshops and seminars as well as educating children by incorporating basic road safety lessons in their syllabus right from the outset. The government needs to prepare a road safety strategy and plan of action for which political will and commitment are essential and without them little can be achieved.

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