

Assessment of Host Factors in Road Traffic Accidents among Victims Attending a Tertiary Care Hospital in Jodhpur

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Abstract

Background: Road traffic accidents are an important public health problem and a major cause of preventable morbidity and mortality. Human-related factors such as unsafe driving practices, non-use of protective devices, intoxication, medical conditions and poor compliance with traffic rules play an important role in the occurrence and severity of road traffic injuries.

Aim: To study the host-related risk factors among road traffic accident victims presenting to a tertiary care hospital in Jodhpur.

Material and Methods: This hospital-based cross-sectional study was conducted in the Accidental Emergency Department and Department of Community Medicine of a tertiary care hospital, Jodhpur, from November 2020 to January 2021. A total of 200 road traffic accident victims who presented within 24 hours of the accident were included. Data were collected using a semi-structured proforma after informed consent. Information regarding socio-demographic profile, role of victim, driving experience, helmet and seat belt use, driving licence, intoxication and medical conditions was recorded. Data were analysed using MS Excel and Epi Info software.

Results: Most victims belonged to the 10–29 years age group, 91 (45.5%), followed by 30–49 years, 71 (35.5%). Males constituted 166 (83.0%) cases. Drivers were the most common victims, 81 (40.5%), followed by pedestrians, 58 (29.0%). Among two-wheeler victims, 47 (48.5%) were not wearing helmets. Among four-wheeler victims, 16 (59.3%) were not using seat belts. Intoxication was present in 14 (7.0%) victims, while medical conditions were reported in 52 (26.0%), with refractive error being the most common.

Conclusion: Young males, drivers and pedestrians were commonly affected. Strengthening helmet and seat belt use, licensing, drink-driving control and driver health screening may reduce road traffic injuries.

Keywords: Road traffic accidents, host-related factors, helmet use, seat belt, driving licence, intoxication, Jodhpur.

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Introduction

Road traffic accidents are a major public health problem and an important cause of preventable morbidity and mortality worldwide. They affect not only the injured person but also the family and society through loss of productivity, disability, treatment cost and premature death. Road traffic accidents follow an epidemiological pattern, where

the host, agent and environment interact to produce injury. Among these, the host or human factor plays a very important role because many road traffic accidents are linked to unsafe road-user behaviour and lack of protective practices. [1,2] Human-related factors include use or non-use of helmet and seat belt, role of the victim at the time

of accident, driving experience, possession of driving licence, alcohol intake, fatigue, medical condition and distraction during driving. Young adults and males are more commonly involved in road traffic accidents, probably due to greater outdoor exposure, occupational mobility and risk-taking behaviour. [3] Non-use of helmets and seat belts increases the risk of severe and fatal injuries, while mobile phone use, alcohol intake and poor driving experience further reduce judgement, attention and reaction time. [2,4]

In this paper, we discuss only the host-related risk factors among road traffic accident victims. The study focuses on the human side of road traffic accidents, including safety practices, driver behaviour, licence status, driving experience, role of the victim and distraction-related factors among victims attending the emergency department of a tertiary care hospital in Jodhpur.

Material and Methodology

This hospital-based cross-sectional study was conducted in the Accidental Emergency Department and the Department of Community Medicine of a tertiary care hospital in Jodhpur. The study was carried out over three months, from November 2020 to January 2021. The study included road traffic accident victims who came to the emergency department for treatment within 24 hours of the accident.

The sample size was calculated at 95% confidence interval with 7% absolute allowable error by using the formula for estimation of a single sample proportion. The expected proportion of victims who did not use helmet at the time of accident was taken as 36.7%, as reported by Puneet Misra et al. [4] The calculated sample size was 190, which was rounded off to 200 road traffic accident victims. All eligible cases reporting during the study period were included.

The study was started after approval from the Institutional Ethics Committee. Written informed consent was taken from the victim or attendant before collecting information. Data were collected using a semi-structured proforma. Whenever possible, the victim was interviewed directly. In cases where the victim was unconscious or unable to respond, information was obtained from the attendant present at the time of accident or from the ambulance driver. For admitted cases, only those admitted within the last 24 hours were included. Records available at the trauma centre were also used to complete any missing details.

This paper mainly focused on human-related factors responsible for road traffic accidents. Information was collected regarding use of helmet or seat belt, role of the victim at the time of accident, years of driving experience, possession of

valid driving licence, intoxication, and medical condition at the time of accident and distraction during driving. Basic socio-demographic details such as age, sex, residence, education and occupation were also recorded. Age was noted in completed years. Residence was classified as urban or rural according to Rajasthan state government norms. The role of the victim was recorded as driver, passenger, pillion rider or pedestrian.

All patients of any age and either gender with a history of road traffic accident within the previous 24 hours were included. Patients brought dead or moribund, whose details could not be obtained, were excluded. Any mass casualty involving six or more people was also excluded from the study.

The collected data were entered in Microsoft Excel and compiled as a master chart. Statistical analysis was done using Epi Info software. Categorical variables were presented as frequency and percentage, while continuous variables were expressed as mean and standard deviation. Chi-square test was used for categorical variables and Student's t-test was used for continuous variables. A p value of less than 0.05 was considered statistically significant.

Results

A total of 200 road traffic accident victims were included in the study. Most of the victims belonged to the younger age groups. The highest proportion was seen in the 10–29 years age group, 91 (45.5%), followed by 30–49 years, 71 (35.5%). Victims aged 50–69 years constituted 31 (15.5%), while only 5 (2.5%) were aged 70 years and above. Male predominance was observed, with 166 (83.0%) males and 34 (17.0%) females. Most victims were from urban areas, 153 (76.5%), while 47 (23.5%) belonged to rural areas. According to occupation, 80 (40.0%) victims were employed, followed by 53 (26.5%) students, 38 (19.0%) unemployed individuals, 20 (10.0%) housewives and 9 (4.5%) retired persons (Table 1).

Regarding the role of victims at the time of accident, 81 (40.5%) were drivers, followed by 58 (29.0%) pedestrians, 37 (18.5%) pillion riders and 24 (12.0%) passengers. Among those who were driving at the time of accident, most had 5–15 years of driving experience, 36 (44.4%), followed by less than 5 years of experience, 34 (42.0%). Only 5 (6.2%) drivers had 16–25 years and 6 (7.4%) had 26–35 years of driving experience (Table 2).

Use of protective measures was variable among the victims. Among motorised two-wheeler victims, 50 (51.5%) were wearing helmets, while 47 (48.5%) were not wearing helmets at the time of accident. Among four-wheeler victims, 11 (40.7%) were wearing seat belts, whereas 16 (59.3%) were not using seat belts. Among drivers of motorised

vehicles, 59 (79.7%) had a valid driving licence and 15 (20.3%) did not have a driving licence. Intoxication at the time of accident was reported in 14 (7.0%) victims. Any medical condition at the time of accident was present in 52 (26.0%) victims, while 148 (74.0%) did not report any medical condition (Table 3). Among the 52 victims who had a medical condition at the time of accident, refractive error was the most common condition, reported in 34 (65.4%) cases. Hypertension and hypertension with diabetes mellitus were reported

in 7 (13.5%) cases each. Cataract and seizures were reported in 2 (3.8%) cases each (Table 4). Overall, the findings show that road traffic accidents were more common among young adult males, particularly those who were employed or students. Drivers formed the largest group of victims, and a considerable proportion of drivers had relatively less driving experience. Non-use of seat belt, non-use of helmet, absence of driving licence, intoxication and medical conditions were important host-related factors observed in this study.

Table 1: Socio-demographic profile of road traffic accident victims

Variable	Category	n	%
Age group	<10 years	2	1.0
	10–29 years	91	45.5
	30–49 years	71	35.5
	50–69 years	31	15.5
	≥70 years	5	2.5
Gender	Male	166	83.0
	Female	34	17.0
Residence	Urban	153	76.5
	Rural	47	23.5
Occupation	Employed	80	40.0
	Student	53	26.5
	Unemployed	38	19.0
	Housewife	20	10.0
	Retired	9	4.5

Table 2: Distribution of victims according to role and driving experience

Variable	Category	n	%
Role of victim at the time of accident	Driver	81	40.5
	Pedestrian	58	29.0
	Pillion rider	37	18.5
	Passenger	24	12.0
Driving experience among drivers	<5 years	34	42.0
	5–15 years	36	44.4
	16–25 years	5	6.2
	26–35 years	6	7.4

Note: Role of victim was assessed among all 200 victims. Driving experience was assessed only among 81 victims who were driving at the time of accident.

Table 3: Distribution of victims according to selected host-related risk factors

Risk factor	Category	n	%
Helmet use among motorized two-wheeler victims	Yes	50	51.5
	No	47	48.5
Seat belt use among four-wheeler victims	Yes	11	40.7
	No	16	59.3
Driving license among drivers of motorised vehicles	Yes	59	79.7
	No	15	20.3
Intoxication at the time of accident	Yes	14	7.0
	No	186	93.0
Any medical condition at the time of accident	Yes	52	26.0
	No	148	74.0

Note: Helmet use was assessed among 97 motorised two-wheeler victims, seat belt use among 27 four-wheeler victims, driving licence among 74 drivers of motorised vehicles, and intoxication/medical condition among all 200 victims.

Table 4: Medical conditions reported at the time of accident

Medical condition	n	%
Refractive error	34	65.4
Hypertension	7	13.5
Hypertension with diabetes mellitus	7	13.5
Cataract	2	3.8
Seizures	2	3.8
Total	52	100.0

Note: Percentages were calculated among 52 victims who had a medical condition at the time of accident.

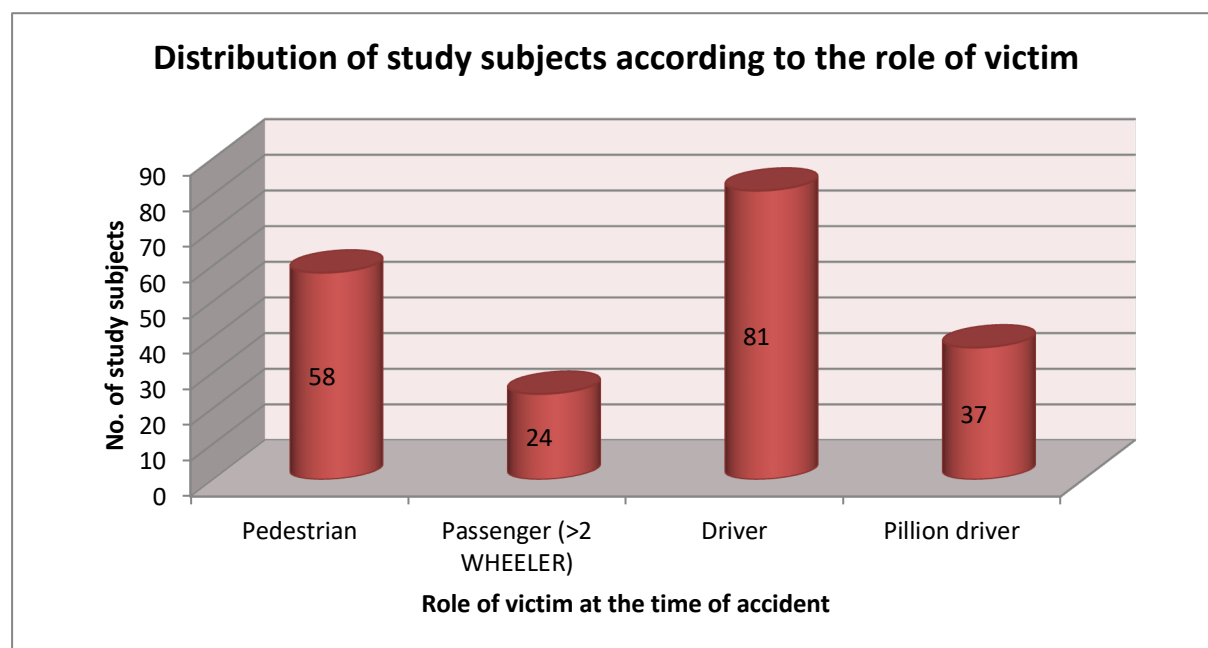


Figure 1: Distribution of study subjects according to the role of victim

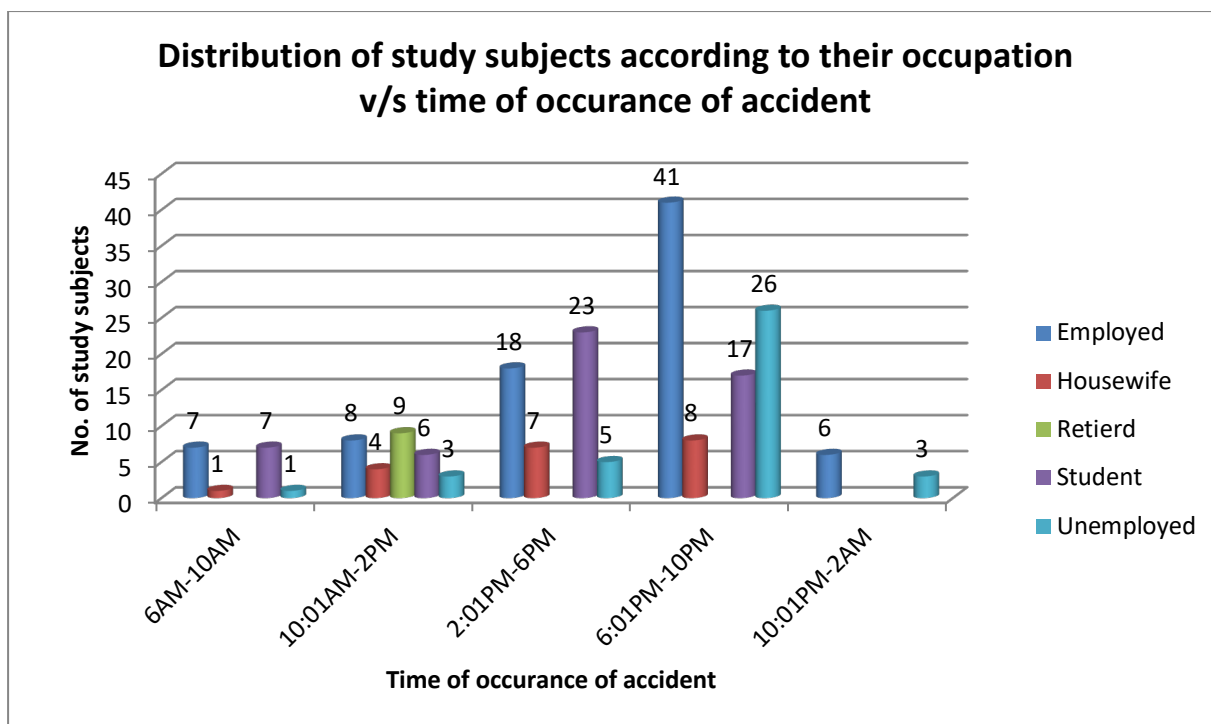


Figure 2: Distribution of study subjects according to their occupation v/s time of occurrence of accident

Discussion

Road traffic accidents are influenced by multiple human-related factors, and the present study highlights the important role of age, gender, occupation, victim role, driving experience, use of protective devices, licence status, intoxication and medical conditions. In the present study, the majority of victims were young adults, with 91 (45.5%) belonging to the 10–29 years age group and 71 (35.5%) belonging to the 30–49 years age group. This finding is comparable with D'Souza et al. [5], who reported that the most commonly affected age group was 21–30 years. Similar observations were also reported by Singh R et al. [6], Vaanathi Ra et al. [7] and Abhishek Varun et al. [8], where young adults formed the major proportion of road traffic accident victims. This pattern may be due to greater mobility, occupational exposure, risk-taking behaviour and frequent use of vehicles among young adults.

Male predominance was marked in the present study, with 166 (83.0%) males and 34 (17.0%) females. This is in agreement with Pramita Muntode Gharde et al. [9], who observed male predominance among RTA victims, and Bhanu Awasthi et al. [10], who reported that 82.42% of RTA victims were males. Abhishek Varun et al. [8] also reported male predominance of 85.3%. The higher involvement of males may be because they are more frequently involved in outdoor work, driving, travel-related activities and occupational mobility. In the present study, 80 (40.0%) victims were employed and 53 (26.5%) were students,

suggesting that the economically productive and active population was more commonly affected.

The role of the victim at the time of accident showed that 81 (40.5%) victims were drivers, followed by 58 (29.0%) pedestrians, 37 (18.5%) pillion riders and 24 (12.0%) passengers. This finding shows that active road users, especially drivers and pedestrians, were more vulnerable. Pathak SM et al. [11] also reported that a large proportion of victims were driving at the time of accident. Matheka DM et al. [12] and Patel A et al. [13] observed that pedestrians and cyclists were at high risk of grievous injuries. In the present study, among drivers, 36 (44.4%) had 5–15 years of driving experience and 34 (42.0%) had less than 5 years of experience. Lin Hu et al. [14] found that drivers with 6–10 years of experience contributed to a high number of accidents, while Pathak SM et al. [11] reported that many casualties had less than 5 years of driving experience. These findings suggest that both inexperienced drivers and routinely exposed drivers may be vulnerable.

Use of protective devices was not universal in the present study. Among motorised two-wheeler victims, 50 (51.5%) were wearing helmets, while 47 (48.5%) were not. Among four-wheeler victims, 16 (59.3%) were not using seat belts. Mahajan N et al. [15] reported low seat belt use and helmet use in their study, while Pathak SM et al. [11] noted that negligence and overconfidence were common reasons for not using headgear. Md. Kamran UI Baset et al. [16] also found that a large proportion of motorcyclist RTI victims did not use safety

devices. Ranbir Pal et al. [17] emphasized that seat belts and helmets substantially reduce fatal and serious injuries. In the present study, 15 (20.3%) drivers of motorised vehicles did not possess a driving licence, indicating a preventable legal and behavioural risk factor.

Intoxication was reported in 14 (7.0%) victims in the present study. Although this proportion was lower than that reported by Rajesh Neeluri et al. [18] and Papalimperi et al. [19], alcohol remains an important preventable factor because it impairs judgement, reaction time and vehicle control. Medical conditions were present in 52 (26.0%) victims, with refractive error being the most common, 34 (65.4%).

This finding suggests the need for periodic health and vision screening among drivers. Overall, the findings show that host-related factors are highly relevant in road traffic accidents and can be addressed through road safety education, strict enforcement of helmet and seat belt use, licensing regulations, alcohol control and regular health screening of drivers.

Conclusion

Road traffic accidents were more common among young adults, males, employed individuals and students, with drivers and pedestrians forming the major victim groups. Non-use of helmets and seat belts, absence of driving licence in some drivers, intoxication and medical conditions such as refractive error were important preventable host-related factors. Therefore, road safety education should be focused on young and working populations. Strict enforcement of helmet, seat belt, licence and drink-driving rules, along with periodic vision and health screening of drivers, is recommended.

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