

Knowledge of Factors Affecting Road Traffic Accidents among Medical Students of Islamabad: A Cross-Sectional Study

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Abstract

Background: Road Traffic Accidents (RTAs) are a major concern globally, causing 1.24 million deaths and injuring up to 50 million people each year. This highlights the urgent need to address road safety issues.

Objective: To assess the knowledge and perceptions of the medical students studying in Islamabad about contributing risk factors associated with road traffic accidents.

Methodology: This descriptive cross-sectional study was conducted from December 2023 to February 2024 and included 342 study participants from six medical colleges in Islamabad. Data on knowledge and perceptions of participants about factors affecting road traffic accidents were collected using a self-designed questionnaire. The analysis of collected data was done by using SPSS version 25. Chi-square test was applied by considering p-value ≤ 0.05 as significant.

Results: Out of 342 participants, 153 (44.7%) were male students. Regarding knowledge of participants about the role of environmental factors in RTAs, most accidents occur on Highway 221 (64.6%), during night time 169 (49.4%), and during foggy weather 258 (75.4%). Regarding vehicle factors; motorbikes 234 (68.4%) and 157 (45.9%) were considered old vehicles commonly involved. Regarding human factors affecting RTAs, 321 (93.9%) participants believed that the health of drivers, 261 (76.3%) thought poor eyesight, 200 (58.5%) believed that young age, and the majority 325 (95%) agreed on the influence of drugs in causing RTAs. Poor road conditions were perceived by 330 (96.5%) as the cause of RTAs.

Conclusion: Participants in the study demonstrated a high level of knowledge about factors influencing road traffic accidents, such as environmental, human, road, and safety measures.

Keywords: Knowledge, Perceptions, Road traffic accidents, Medical students

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Introduction

Road traffic accidents (RTAs) are one of the major global issues resulting in injuries that lead to temporary or permanent disabilities and hospitalization. Road accidents cause the deaths of 1.24 million people, injure as many as 50 million people annually, and cost approximately \$500 billion globally.¹ Globally, Pakistan has the worst record in managing road accident issues.² According to the WHO report 2018, it was estimated that in Pakistan, RTAs result in 14.3 deaths per 100,000 population, which manifests road accidents as a serious issue that needs to be addressed.³

Road crashes are a leading cause of death in children and young adults aged between 15 to 29 years.^{4,5,6} Most of the fatal injuries caused by RTAs are attributed to low and middle-income underdeveloped countries, and it is estimated that if serious steps are not taken, RTAs will be among six major causes of death globally by 2030.⁵ RTAs are

caused by the association of various pre-accident variables such as human-based, vehicular, and environmental factors.^{7,8,9} As the number of road users and vehicles has increased due to industrialization, advancing economic growth, growing population, and urbanization, statistics of road accidents indicate a drastic surge in accidents.¹⁰⁻¹³

A number of factors, including people's ignorance, speeding, overtaking, drinking while driving, overconfidence of drivers, and tiredness, are underlying causes of road accidents, with the rising accident rate in Iran.⁸ In addition to the above factors, meteorological factors such as extreme climate also intensify the severity of road accidents. On the basis of a study that was done in Wales, England, about RTAs' correlation with geographical variations, a substantial relationship was found between foggy, rainy, and snowy days and the number of road accidents.⁹

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Having knowledge of risk factors contributing to road traffic accidents is significant for formulating interventions and action strategies that can lower the risk associated with these factors.¹²⁻¹⁴ The objective of this study was to assess the knowledge and perceptions of the medical students in Islamabad, Pakistan, towards contributing risk factors associated with road traffic accidents (RTAs).

Methodology

The study was a descriptive cross-sectional study conducted at 6 medical colleges in Islamabad, Pakistan, over a period of approximately two months from December 2023 to February 2024. A convenient sampling technique was employed for the selection of participants of this study, which consisted of only MBBS students from six medical colleges in Islamabad. Students from programs other than MBBS, i.e., BDS, B.S. Nursing, DPT, and D Pharmacy, as well as professors, associate professors, assistant professors, and other medical staff were excluded from this study. Informed consent was taken from the participants, and the objective of the study was explained. The study was approved by Institutional Review Board (F.1/IUIC-ANMC/IRBC-270/2024) of Al Nafees Medical College and Hospital, Islamabad.

The questionnaire was comprised of basic demographic details, environmental factors affecting RTAs, vehicles involved in road accidents, and human factors in the occurrence of RTAs. The environmental factors section included most likely weather conditions responsible for RTAs, types of roads, motorway closures during foggy weather, and the role of road signs and installed road reflectors. The vehicular section comprised factors such as the type of vehicle, the age of the vehicle, and the vehicle's safety features for the prevention of accidents. The analysis of collected data was done by using the Statistical Package for Social Sciences (SPSS) software version 25. The chi-square test was applied, with a p-value of ≤ 0.05 considered significant.

Results

The total number of participants in this study was 342, of whom 153 (44.7%) were male students and 189 (55.2%) were female students. These students

were from 6 medical colleges of Islamabad, Pakistan. The aim of study was to assess the knowledge and perceptions of these participants about factors affecting RTAs, three sections were formed: environmental factors, vehicular factors, and the human's role in RTAs.

Table I: Knowledge of Participants about the Role of Environmental Factors in Road Traffic Accidents

Variable		Number	Percentage
Most Accident Occurs at	Highways	221	64.6
	Motorways	50	14.6
	Rural Roads	62	18.1
	Parking Lots	9	2.6
Time of Accidents	Morning	27	7.9
	Afternoon	22	6.4
	Evening	58	17.0
	Night	169	49.4
	No Effect	66	19.3
Weather Conditions	Rain	61	17.8
	Fog	258	75.4
	Sandstorm	10	2.9
	Hail	5	1.5
	Other	3	0.9
	No Effect	5	1.5
Season	Summer	32	9.4
	Spring	4	1.2
	Winter	208	60.8
	Fall	14	4.1
	No Effect	84	24.6
Motorway Closing	Yes	298	87.1
	No	44	12.9
RTA reduction due to motorway closure	Yes	301	88
	No	41	12
Possible solutions for the reduction in RTAs	Restrict traveling during the day or the afternoon	38	11.1
	Decrease the number of vehicles during the night	55	16.1
	Alternate routes for unnecessary vehicles	119	34.8
	Ensuring fog lights installation	130	38
Any role of Road signs	Yes	256	74.9
	No	86	25.1
Installation of road reflectors	Yes	320	93.6
	No	22	6.4
Role of the Condition of the road	Yes	330	96.5
	No	12	3.5

Table-I shows the knowledge of participants about the role of environmental factors in road accidents. According to the study subjects, most accidents occur on Highway 221 (64.6%) rather than on Motorway 50 (14.6%), rural roads 62 (18.1%), or parking lots 9 (2.6%). Most of the accidents occur during night time 169 (49.4%) and during foggy weather 258 (75.4%). Rainy weather 61 (17.8%) may also be the reason of most accidents, but some participants thought that there was no effect of weather conditions, season, or time of day on the incidence of accidents.

The winter season has the highest road accident rate, as per participants' perceptions, 208 (60.8%). Most participants 301 (88%) agreed that the frequency of road accidents decreased by closing the motorways during foggy conditions, and they believed that drivers should install fog lights 130 (38%) or should use alternate routes for unnecessary vehicles 119 (34.8%).

Road signs have a significant role in reducing RTAs by representing clear guidelines to travelers, according to most participants 256 (74.9%). Most of the participants 320 (93.6%), had given positive responses regarding the installation of road reflectors as they thought that these reflectors increase visibility (50.3%) or they may alert drivers (43%). The condition of the road is an important factor affecting RTAs, as per most of the participants' perceptions 330 (96.5%). They thought that roads with uneven bumps (53.2%) and roads with potholes (27.8%) are the most dangerous for driving.

Table-II is about vehicular factors affecting RTAs. The most common vehicle exposed to the bulk of accidents is motorbikes 234 (68.4%). About 158 (46.2%) of participants were convinced of the use of seat belts, and 127 (37.1%) agreed on usage of air bags for safety purposes and 189 (55.5%) of participants believed that manual vehicles are most likely to be involved in the accidents, and 157 (45.9%) considered old vehicles which have been driven for more than 5 years to be commonly involved. Working headlights have great significance as 308 (90.1%) of participants were strongly convinced of using them.

Table II: Knowledge of Participants about the Role of Vehicle Factors in Road Traffic Accidents

Variable		Frequency	Percentage
Type of vehicle involved	Motorbikes	234	68.4
	Rickshaws	14	4.1
	Cars	53	15.5
	Buses/Coaches	31	9.1
	Pickup Trucks	10	2.9
Safety Feature	Air bags	127	37.1
	Child lock	8	2.3
	Seat belts	158	46.2
	Brake assist	34	9.9
	Back-Up camera	10	2.9
	Others	5	1.5
Vehicles involved	Manual	189	55.3
	Automatic	61	17.8
	Self-Driving	92	26.9
Age of Vehicles	New <5 Years	66	19.3
	Old >5 Years	157	45.9
	No Effect	119	34.8
Role of Working Headlights	Yes	308	90.1
	No	34	9.9

Table III: Knowledge of Participants about the Role of Human Factors in Road Traffic Accidents

Variable		Frequency	Percentage
Role of the driver's health	Yes	321	93.9
	No	21	6.1
Aspect of health	Eyesight	261	76.3
	Epilepsy	53	15.5
	Stroke	11	3.2
	Color blindness	17	5.0
Knowledge about factors affecting RTAs	Good	163	47.7
	Bad	24	7.0
	Poor	30	8.8
	Moderate	125	36.5
Age group most likely involved in RTAs	18-25	200	58.5
	25-32	63	18.4
	32-45	8	2.3
	45-60	19	5.6
	Age Has No Effect	52	15.2
Gender	Male	176	51.5
	Female	90	26.3
	Unspecified	76	22.2
Drug influence	Yes	325	95
	No	17	5

Table-III shows human factors affecting RTAs. In this study, 321 (93.9%) participants believed that the health of drivers plays an important role in road accidents, and 261 (76.3%) participants thought that people with eyesight issues are most likely to be involved in accidents. The majority of participants 163 (47.7%) mentioned that they had good knowledge about factors affecting RTAs, and 125 (36.5%) of individuals mentioned that they had moderate knowledge about these factors. It was found that 200 (58.5%) believed that young adults aged 18-25 years are mostly involved in RTAs. Males have a higher ratio of road accidents than females, according to 176 (51.5%) participants. The majority 325 (95%) agreed on the influence of drugs in causing RTAs.

Discussion

We undertook this study in Islamabad to assess the knowledge and perceptions of medical students regarding environmental, vehicular, and human factors influencing RTAs. In the present study, according to most people's knowledge, most accidents occur on Highway 221 (64.6%) rather than Motorway 50 (14.6%). About 169 (49.4%) of students believed that major accidents occurred during nighttime. A similar study, which was conducted by Marzieh Mansoori et al, showed that, although most accidents occurred in daylight, the maximum proportion of accidents causing life-changing injuries and death had occurred during night time.¹¹ The reason behind this may be poor visibility at night and drivers falling asleep due to tiredness. It might also be possible that, as road signs are not clear due to faint lights installed on roads, there may be an increase in the number of RTAs. According to the present study, 258 (75.4%) participants agreed on the incidence of RTAs in foggy weather. It could be due to reduced visibility in these conditions, which could make it difficult to travel. It is one of the reasons; motorways are usually closed during foggy weather to reduce the incidence of RTAs in accordance to the majority of participants 301 (88%). About 256 (75%) of participants thought that road signs had a significant role in guiding the travelers, thus resulting in a reduction of the prevalence of road accidents. Similar results were found in a study which showed about 80.3% participants were of the view that road signs should be followed strictly.¹² Nearly 330 (96%) of participants reported that road conditions have a great impact in causing crashes,

with more than 50% of participants considering roads with uneven bumps as the most dangerous road for traveling. In a study conducted by Randah Helal et al., in which participants were asked to choose the most important cause of road traffic injuries, nearly half of them (46.9%) cited bad road conditions as an important cause of RTAs.¹⁵

The motorcyclists are most vulnerable to road traffic accidents in accordance with the majority of participants' perceptions 234 (68.4%). It may be due to the instability of motorbikes as compared to other vehicles and their reduced visibility to other drivers, thus having far less protection in road crashes. According to a study conducted by Ali Kemal Erenler et al., the death rate was much higher in tractor drivers, but the injury rate was higher in motorcyclists (85%).¹³ Seat belt is a significant safety feature on which nearly half of the participants were convinced. About 37.1% of individuals also reported airbags as an important safety feature to reduce RTA's incidence, and these findings were consistent with the study conducted by Chavin D. Gopaul et al., in which participants were asked about the use of seat belts, and about 60.8% strongly agreed about its usage.¹⁴

Manual vehicles are more prone to RTAs, according to most participants 189 (55%). The reason behind this may be having an extra pedal, making it difficult to shift gears in heavy traffic for an inexperienced driver. The vehicle's condition had a great impact on the number of accidents. While 157 (46%) of participants believed that vehicles older than 5 years are at a higher risk of meeting an accident, some contradicted with the opinion that the age of the vehicle has no effect. So, it can be concluded that it's not the age of the vehicle that matters, but rather the condition of the vehicle. The same variable was questioned in a study by Randah Helal et al., about the most important reason for road traffic injuries, and 35.4% participants considered a car's bad condition as the significant cause.¹⁵ Approximately 308 (90%) participants were in favor of using working headlights to facilitate driving at night. Considering the factor of driver's health in causing RTAs, more than 321 (93%) participants gave a positive response, believing that eyesight problems influence more road accident incidences as compared to other health issues. About 325 (95%) of participants agreed that drugs also have a great effect on the occurrence of road accidents, which was proven by Azam Saei et al.¹⁶ in a study. Knowledge of the

majority of participants about factors affecting RTAs was good or of a moderate level (85%). According to Chavin D. Gopaul et al., about 79% of participants' knowledge was of a moderate level.¹⁴ More than 176 (51%) of participants were of the view that the ratio of accidents was much higher in males as compared to females. Similar results were also reported by Ali Kemal Erenler et al., in which men exposed to accidents had 40 times more injuries than women.¹³ More than 75% RTAs occurred in males, according to the WHO report.¹⁷ In another study done by Dinesh M Fernando et al., it was reported that out of 579 RTAs over a 5 year period, 72% of individuals involved were males and 28% were females.¹⁸ About 200 (58.5%) participants were of the view that RTAs are more common in the age group of 18-25 years. These results were consistent with a study by Peden et al., which reported that road traffic injuries are a major cause of death among 15-19 year old and the second leading cause among children of 5-14 years of age.¹⁹ The limitation of our study is its restriction to MBBS students from only six medical colleges in Islamabad.

Conclusion

The overall knowledge about factors affecting road traffic accidents was high amongst participants. Most participants were aware of environmental factors such as weather conditions, seasons, the time of occurrence of most accidents, the role of road signs, and road reflectors. The majority of them were convinced about the importance of using seat belts. According to their knowledge, they considered motorbikes to be a riskier vehicle as compared to other types of vehicles, and there is a significant role of working headlights for driving at night. About human factors affecting RTAs, they knew that a driver's health has a great impact on road traffic accidents, and the driver's drug history also has an impactful role in causing road crashes. Awareness, orientation sessions, and other interventions should be conducted among students periodically as a part of their training to reduce the incidence of accidents.

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work, Acquisition and Analysis of data and Drafting. **IY:** Acquisition and Analysis of data, Interpretation of data and revising. **AJC:** Design of work, Acquisition and Analysis of data, **MWH:** Design of work, Acquisition and Analysis of data, **AJ:** Design of work, Acquisition, **UFB:** Design of work, Acquisition and Analysis of data and revising.

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