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Road traffic accidents in India- A theoretical framework

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Abstract
The road accident situation in India is vibrating. Records from year 2014 show that there is one death at every 3.75 minutes because of road accidents. The high accident rate is largely considered to the inadequacy of the highways and other main road to meet the traffic in heavy wealth loss to the country. Pedestrians, bicyclists, motorcyclists, and non-motorised vehicle occupants are often the most vulnerable. Compared with vehicle occupant casualties pedestrians sustain more multiple injuries, with higher injury severity scores and higher mortality rates.
Due to this, road accidents in India have a disproportionate impact on the poor and vulnerable in society. The risks for the road users exists because of the traffic mix highways experience relatively higher road traffic accidents because of lack of regulatory control, high speed, indiscipline, Overloaded vehicles and the like. The present study is a theoretical framework in respect of Road Traffic Accidents in India.

Keywords: Collision, road traffic accident, road user category

Introduction
Road accident is most unwanted thing to happen to a road user, though they happen quite often. The most unfortunate thing is that we don't learn from our mistakes on road. Most of the road users are quite well aware of the general rules and safety measures while using roads but it is only the laxity on their part which causes accidents and crashes. Main cause of accidents and crashes is due to human errors. Some of the common errors of people which result in accident are:

1. Over speeding.
2. Drunken driving.
3. Distractions to driver.
4. Red light jumping.
5. Not using safety gears like seat belts and helmets.
6. Non-adherence to lane driving.
7. Overtaking in a wrong manner.

Road traffic accidents are amenable to remedial action. Many a countries have curbed the menace of road accidents by adopting a multipronged approach to road safety that encompasses broad range of measures, such as, traffic management, design and quality of road infrastructure, application of intelligent transport system, safer vehicles, law enforcement, effective and quick accident response and care etc. The Government alone cannot tackle road safety problems. There is a need for active involvement of all stake-holders to promote policy reform and implementation of road safety measures.

Classification of Persons by Injury Severity
The purpose of this classification is to describe the most severe injury to any person involved in a road vehicle accident. Categories: There are four mutually exclusive categories for classification of injured persons. In order of precedence, these are:

- Person with Fatal Injury
- Person with Grievous Injury

- Person with Minor Injury
- Person with no injury

Classification of Road Vehicles by Damage Severity
- Disabling damage to motor vehicle
- Functional damage to motor vehicle
- Other motor vehicle damage
- No damage to motor vehicle

Other Road Vehicles
In order of precedence, other road vehicle categories by severity of damage are:
- Disabling damage to other road vehicle
- Functional damage to other road vehicle
- Other other-road-vehicle damage
- No damage to other road vehicle

Accident Classification by Vehicle Type
- Motorized two Wheeler accident
- Motorized three wheeler accident
- Car/Jeep/Van/Taxi accident
- Bus Accident
- Light Transport Vehicle accident
- Heavy Articulated Transport Vehicle accident
- Tractor with Trolley accident
- Bicycle/Pedestrian accident
- Animal/Hand Drawn Cart accident

Accident Classification by Injury Severity
- Fatal accident
- Grievously injured
- Minor Injury
- No injury accident

Accident Classification by Damage Severity-Motor Vehicle Accidents
Motor vehicle accident categories, in order of precedence, are:
- Disabling damage accident
- Functional damage accident
- Other motor vehicle damage accident
- Other property damage accident
- No damage accident

Classification of Road Vehicle Accidents by Number of Vehicles
- Single-vehicle accident
- Two-vehicle accident
- Three-vehicle accident
- And so on

Motor Vehicle Accidents: Motor Vehicle Accident Categories are Collision Accident
- Collision involving pedestrian
- Collision involving motor vehicle in transport
- Collision involving parked motor vehicle
- Collision involving bicycle
- Collision involving animal
- Collision involving fixed object
- Collision involving other object

Non-collision Accident
- Overturning accident
- Other non-collision accident

Other-Road-Vehicle Accidents
Other-road vehicle accident categories are

Collision Accident
1. Collision involving pedestrian.
2. Collision involving other road vehicle in transport
3. Collision involving parked motor vehicle
4. Collision involving animal
5. Collision involving fixed object
6. Collision involving other object

Non-Collision Accident
1. Overturning accident
2. Other non-collision accident

Types of Injuries

1) Simple Injury

One which is neither extensive nor serious and which would heal rapidly without living any permanent deformity or disfiguration without living any permanent deformity or disfiguration **(Deshpande, 2014)**.

2) Grievous Injury: (Sec 320 IPC)
1. Emasculation
2. Permanent Privation Of Either Eye
3. Permanent privation of either ear
4. Privation of nay member (part, organ or limb) or joint.
5. Permanent disfiguration of head or face
6. Fracture or dislocation of a bone or a tooth,
7. Destruction or permanent impairing of powers of any member or joint
8. Any hurt which endangers life, or which causes them suffer to be, during the space of 20days, in sever body pain or unable to follow his daily routine.

Review of Literature

Bhaswati Bora (2018) [5] feels that the Road traffic accidents (RTAs) have become a serious problem worldwide as they incur losses of around 2% of a country's gross domestic product (GDP). RTAs are one of the major causes of death and injury in developing countries like India. To enable governments to take policy decisions on road safety, it is necessary that good research is undertaken to estimate the cost of accidents. This kind of study will help governments make important decisions on investment in traffic safety, improvement of roads and other facilities. On the other hand, evaluation and estimation of the costs of RTAs will help governments ascertain economic feasibility of policy decisions given limited economic resources. Apart from humanitarian losses, the contribution to economic losses from RTAs is alarmingly high, as most people involved in accidents are from the most economically active and productive age groups of a society.

Anup Kharde (2018) [2] Road traffic accidents (RTA) are a pandemic in current era, which destined to rise in the future, due to increase in a number of vehicular population in addition to increase in a number of aggressive road users. Most of RTAs are due to unawareness to road traffic rules. This could result into poor attitude and practices while driving. The study found Unawareness about maximum permissible blood alcohol level while driving and minimum distance between two vehicles. Majority of drivers followed poor driving practices such as drinking and driving, over

speeding, and use of mobile phone while driving (Anup Kharde, 2018).

(Bishnu P. Choulagai, 2015) nearly 1.3 million people die each year as a result of Road Traffic Accidents (RTAs). More than nine in every ten (91%) of the world's RTA fatalities were from low and middle income countries such as Nepal. This study aimed to describe epidemiology of RTAs and reasons for delayed post-crash response in one of the major highways in Nepal. This study employed a cross-sectional design including both quantitative and qualitative techniques of data collection. The study area was Nagdhunga to Narayangadh road segment of Prithvi Highway.

Data collection included key informant interviews, observation of the sites and inventory of road traffic accidents for the years 2011 and 2012. Qualitative data were analyzed through content analysis while quantitative data were analyzed using MS Excel software. Truck, trippers and scooters were vehicles involved in majority of accidents. Roads with severe turning, lack of adequate street lighting and the festival seasons were main reasons for RTAs. Establishing trauma centres and strengthening trauma units of tertiary care hospitals, establishing rescue teams at every 10-kilometer long road segment of the highway and formation of effective coordination committees at local level would strengthen post-crash response **Invalid source specified.**.

Md Mazharul Islam (2019) [7] assess the impact of climate change on RTAs in Saudi Arabia and to recommend some climate change mitigation and adaptation policies to make roads safe for all.

The potential costs of road traffic accidents (RTAs) to society are immense. Yet, no study has attempted to examine the impact of climate change on RTAs in Saudi Arabia, though RTA-leading deaths are very high, and the occurrence of climatic events is very frequent. This study employed annual data from 13 regions of Saudi Arabia, from 2003 to 2013. The findings show that temperature, rainfall, sandstorms, and number of vehicles were statistically and significantly responsible for RTAs in Saudi Arabia in the study period. This study also found that RTAs both inside and outside cities significantly caused injuries, but only RTAs inside cities significantly caused death. Furthermore, the death from RTAs injuries was found to be statistically significant only for motor vehicle accidents **Invalid source specified.**.

Ashis Das (2012) [4] observes that India reported the highest number of road traffic crashes, related injuries, and deaths among all countries in the world, with 105,725 road traffic fatalities and 452,922 nonfatal road traffic injuries in 2007. In this report we present a systematic review of available literature on the use of psychoactive substances (alcohol and drugs) among road users, particularly those involved in road traffic crashes (RTCs). A significant proportion of injured or killed road users in India had used alcohol before the accident. However, the existing studies cannot be used to estimate the risk of accident involvement among drunk drivers. There is a need for more rigorous research and capacity building on substance use vis-`a-vis road traffic crashes (Ashis Das, 2012).

Mohit Goyal (2018) [8] Road traffic accidents (RTAs) have emerged as an important public health issue which needs to be tackled by a multi-disciplinary approach. The trend in RTA injuries and death is becoming alarming in countries like India. The number of fatal and disabling road accident happening is increasing day by day and it is a real public health challenge for all the concerned agencies to prevent it. This article is intended to create awareness among the health professionals about the various modalities available to prevent road accidents and also to inculcate a sense of responsibility towards spreading the message of road safety.

Abhinav Rishinav (2016) [1] Road traffic accidents (RTAs) are the major cause of preventable injury, consuming a large share of public health resources. A lack of trauma registry leads to ineffective predictive models. To study in detail parameters that describe nature and severity of injury along with demographic details for nonfatal RTA cases which can be used to develop the better prediction models to reduce morbidities and a more effective allocation of resources. A retrospective study including all the nonfatal RTA cases presenting at our institute for 3 months duration, from January 2015 to March 2015.A total of 1047 patients were studied This study helped us in finding out certain characteristics which may be useful for planning preventive strategies and redirect public investment in preventive strategy and educational inputs for better safety measures **Invalid source specified.**.

Reasons for road accidents

Every day, hundreds of road traffic accidents occur across the country. In fact, statistics show that there are more than 10 motor vehicle-related deaths per day in California alone, many of which are preventable. Significant percentage of the motorists are underinsured or no auto_insurance at all.

Road accidents occur for a variety of reasons. Often, drivers are distracted while behind the wheel, taking their focus away from the road. In other cases, drivers can become tired after spending multiple hours at the wheel, resulting in preventable errors.

Sometimes, accidents occur for a combination of reasons, from bad visibility to unsafe road design, or other drivers lack caution. While the causes of accidents can vary, the consequences are often the same, resulting in everything from vehicular and property damage to serious injuries.

Below, we've listed five of the most common reasons for road accidents in the United States, both for cars and commercial vehicles.

Distracted Driving

Distracted driving is the most common cause of road accidents in the United States, resulting in more crashes every year than speeding, drunk driving, and other major accident causes.

Drivers can become distracted behind the wheel for a variety of reasons. Some of the leading causes of distracted driving accidents include using a cellphone while driving, as well as eating food or drinking from a mug or bottle while behind the wheel.

Speeding

Speeding is the second most common cause of road accidents in the United States. Since car and truck accidents that involve speeding typically occur at high speeds, it's also a major cause of fatal road injuries.

Driving above the speed limit is a common practice for many motorists. It's also illegal behavior that vastly increases the risk of losing control of a vehicle and causing

an accident. The faster a vehicle travels, the longer it takes to slow down in the event of an obstacle.

Even a small increase in speed can result in a much higher risk of being involved in a collision or other type of accident. As such, it's essential for motorists to be aware of the speed at which they're traveling and stay within the legal limits.

Drunk Driving

Drunk driving is another major cause of accidents, particularly on weekends and holidays. When people drive after consuming alcohol, their response time and ability to focus on the road can be hugely reduced, increasing the risk of an accident.

All 50 states have a .08 blood alcohol concentration (BAC) limit, after which drivers are driving while under the influence of alcohol (DUI). For many motorists, even a small amount of alcohol can be enough to produce a significant increase in accident risk. Drunk driving accidents are easily preventable, making it important to avoid alcohol if you need to drive or go out with a designated driver if you plan on consuming alcohol.

Reckless Driving

Speeding, changing lanes without looking, tailgating other motorists and ignoring road signs are all classic signs of reckless driving. It is an illegal driving habit that's now the fourth most common cause of road accidents in the United States.

Reckless driving usually involves a motorist that's less concerned about other road users than themselves. Often, it's performed in combination with DUI, by an intoxicated motorist impatient to get to their destination.

Rain

Believe it or not, rain is one of the leading causes of road accidents in North America. When the road becomes overly wet, cars can lose their grip on the road and slide across the road surface, reducing control for motorists and increasing the risk of an accident occurring.

Rain-related driving risks are often amplified by poor car maintenance, such as tires that don't provide a deep enough grip or aren't properly inflated. Sometimes, an inexperienced driver can panic in rainy weather, resulting in the loss of control of the vehicle.

Because of the safety risks associated with driving in intense rain, it's important to be alert and aware of road conditions, speed limits and traffic during rainy weather.

Haddon Matrix

Table 1: Haddon Matrix

Phase	Human	Vector (Vehicle)	Physical Environment	Socioeconomic Environment
Pre-Injury	Alcohol intoxication	Instability in vehicle	Poor visibility of road hazards	Lack of knowledge regarding injury risks
Injury	Not wearing seat belt	No airbag	Tree too close to the road	Lack of enforcement of safety belt legislation
Post-Injury	Elderly, pre- existing medical condition	Rapidity of energy	Slow Emergency medical response	Lack of funding for emergency medical services and rehabilitation services

Recommendations for Policy Making

The following recommendations are made for policy making:

1. Countries are encouraged to develop policies designed to reduce social disparities in road accident risk, to the extent that these are regarded as unjust.
2. A systematic use of traffic calming in residential areas for the purpose of reducing social disparities in road accident risk is encouraged.
3. Policies aimed at modifying unsafe road user behaviour associated with low social status should be developed.

Addressing Inequality in Prevention Work

The effects of wider social factors on injury have large implications for road safety activities, although there can be considerable difficulties in addressing inequality and deprivation. Road safety education generally deals with preventing one of the results of inequality and deprivation rather than targeting the 'upstream' causes. Whilst there is research which demonstrates how and why socioeconomic status contributes to the risk of injury, there are relatively few published evaluations of programmes that have tried to reduce injury inequality.

However, road safety interventions can be designed to address the effects that inequality can have on injury risk, and can measure any changes as part of the evaluation. Conversely, failure to consider the issues identified in this policy can increase injury inequality between the highest and lowest socioeconomic groups. In order to address inequalities in health, packages of measures may be more successful than single initiatives.

It has been suggested. That the following are characteristics of successful initiatives for tackling inequalities in road traffic injuries:

- The use of multi-faceted approaches that include educational, engineering and enforcement strategies,
- Engineering measures providing quantifiable cost-effective reductions in injuries,
- The inclusion of partners from multiple sectors and disciplines,
- The engagement and involvement of the community,
- Local data to identify patterns in pedestrian injuries, to target interventions to areas of high risk and to enable evaluation,
- addressing barriers to physical activity through transport policies, making walking and cycling attractive alternatives,
- integrated guidance from different government departments, and
- Flexibility at the local level allowing for the possible joint funding of initiatives between departments and agencies, as well as creative thinking encompassing a range of perspectives and experiences.

Problems and Obstacles Faced in the Development of Traffic Police Officers' Knowledge

The development of traffic police officers' knowledge remains problematical. To combat this, several proposals for training are given in this section.

1) Training

Police officers should receive training in every respect of traffic law before taking on traffic duties. Currently, training offered to police cadets is nonspecific, which results in officers responsible for traffic law enforcement not being fully trained in the relevant regulations and laws.

2) In-Service Training Programs

According to the data collected, training courses provided for traffic officers during operations have faced similar problems. For example, most officers have not been trained in traffic law enforcement on a regular basis. Moreover, the selection process for training is not based on experience. Usually, officers who have the least responsibilities are chosen for training by supervisors. Interestingly, trainees asked for more support in terms of practice relating to new traffic laws.

National Road Safety Council (NRSC) is the apex body for road safety established under Section 215 of MV Act, 1988. It gives directions on implementation of road safety policies. Department of Road Transport and Highways, Government of India is the nodal agency for road safety in the country.

A Road Safety Policy prepared by the Ministry in the year 1992 and adopted by the National Road Safety Council in 1994 contained the following:

- Classification of the causes of accidents and preventive action in terms of vehicle, driver, and engineering factors
- List of safety features for vehicle design (e.g. safety belt, air bags, collapsible steering, braking performance etc.)
- Fitness certification and maintenance of vehicles
- Proper training and effective licensing for drivers
- Road design and geometric improvements to compensate for inadequacies of road users
- Warning signs for road users
- Accident black spot investigation and rectification through road design
- Design of road junctions
- Design of roads in built up and residential areas, etc.
- Traffic guidance, road signs, speed limit posts, and other traffic control devices
- Road pavement markings, construction of footpaths/cycle tracks, bus bays, truck parking complexes, and other way side amenities, etc.
- Traffic education and campaign on traffic discipline-inclusion of traffic education in school curriculum, promotion of defensive driving, etc.
- Enforcement of maximum speed limits, and campaign on helmet use and seat belt use, curbing alcohol consumption among drivers, etc.
- Emergency medical service with emphasis on saving the lives of victims etc.

Conclusion

Trends in Road Accidents, Injuries, Fatalities, Motor Vehicles & Road Network Road accidents are an outcome of the interplay of various factors, some of which are the length of road network, vehicle population, human population and adherence/enforcement of road safety regulations, etc. Higher exposure to road accident risk may be mitigated by behavioral standards by adhering to road safety regulations and policy interventions.

Delays in detecting and providing care for those involved in a road traffic crash increase the severity of injuries. Care of injuries after a crash has occurred is extremely time-sensitive: delays of minutes can make the difference between life and death. Improving post-crash care requires ensuring access to timely pre-hospital care, and improving the quality of both pre-hospital and hospital care, such as through specialist training programmes.

References

1. Abhinav Rishidev SD. Profile of Nonfatal Injuries in Road Traffic Accidents Cases Treated at a Tertiary Level Trauma Centre A. International Journal of Scientific, 2016.
2. Anup Kharde AJ. Study on awareness of road traffic rules among drivers of rural area: A cross-sectional study. International Journal of Medical Science and Public Health, 2018, 972-969.
3. Arora KL. Women Entrepreneurship: An Overview of Indian Scenario. International Journal of Enterprise Computing and Business Systems, 2017, 1-8.
4. Ashis Das HG. Alcohol, Drugs, and Road Traffic Crashes in India: A Systematic Review. Traffic Injury Prevention. 2012; 13:544-553.
5. Bhaswati Bora VL. Socio-economic costing of road traffic accidents: evidence from Nagpur city, Maharashtra, India. Research Articles Current Science, 2018, 1275-1283.
6. Bishnu P, Choulagai NW. Road Traffic Accident and its Characteristics in Kathmandu Valley, 2016.
7. Md. Mazharul Isla MA. The Impacts of Climate Change on Road Traffic Accidents in Saudi Arabia, 2019, 1-13.
8. Mohit Goyal DD. Study of epidemiology of road traffic accidents. International Archives of Integrated Medicine, 2018, 23-28.
9. Bishnu P, Choulagai UR. Jhaukhel-Duwakot Health Demographic Surveillance Site, Nepal: 2012 follow-up survey and use of skilled birth attendants, 2015.
10. Brussoni M *et al*. Evaluation of the Department for Transport Neighbourhood Road Safety Initiative Literature review Deprivation and Road Traffic Injury Risk: Vulnerable Groups, 2008.
11. Deshpande P. Road Safety And Accident Prevention In India: A Review. Pawan Deshpande, International Journal of Advanced Engineering Technology. 2014, 64-68.