Road safety and Road Accidents: An Insight

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Abstract

India is a growing country. With the increasing population, the number of vehicles has expanded in the country during the last one decade. Though road networks also improved, mounting pressure on roads from expanded vehicle population has aggravated safety issues. Authentic data about road accidents is not available, still, preliminary data indicate that Indian roads are witnessing higher incidence of road accidents. It is a well known fact that Health of the Nation is more important than the wealth of the Nation". Hence, Road safety is an important public health concern and attention must be given on Road safety measures. Strict adherence to road safety measures reduces road accident injuries and road accidents. Road related accidents are undoubtedly the most frequent and, overall, the cause of the most damage. The main reasons for this are the extremely dense road traffic and the relatively great freedom of movement given to drivers. In today's modern era road and transport has become a central part of every human being. Every body is a road user in one way or the other. The present transport system has reduced the distances but it has on the other hand increased the life risk of road accidents. Every year road accidents lead to loss of lakhs of lives and serious injuries to crores of people. In India itself about eighty thousand people are killed in road crashes every year which is 13% of the total fatality all over the world. The person behind the wheel plays an important role in most of the road accidents. In most cases, road accidents occur either due to carelessness or due to lack of road safety awareness of the road user. Therefore, road safety education is as essential as any other basic skills of survival. In this paper, we will briefly focus on the various aspects of road safety important for reducing road accidents.

Key words: Road accidents, Road safety, Education, Awareness.

Introduction

An accident is defined as an unplanned and uncontrolled event in which action and reaction of an object or person results in personal injury or damage to the property. A traffic accident may be explained as failure of the road-vehicle-driver system to perform one or more operations necessary for completing a trip without any injury or loss. Road accidents are mainly due to insufficient maintenance of the road network and lack of efficient and systematic enforcement [1]. Necessary and sufficient cause of an accident is a combination of simultaneous and sequential factors, each of which is necessary but none of which is by itself sufficient. The objective of ensuring safe traffic on the urban roads in India is difficult mainly because of mix of slow and fast moving vehicles, sharing the same carriage way. If accidents are caused by anyone, surely the ones responsible for them could be identified and approximate remedial measures could be developed and implemented to the extent feasible [2].

Global scenario

Road deaths and injuries are a global problem of massive proportions. Road transport is the most complex and the most dangerous transportation system. In recent years, some important and major studies on the subject of road accidents and fatalities carried out by World Bank, World Health Organization (WHO), Transport Research Laboratory (TRL), and others have highlighted the growing significance of road crashes as a cause of death particularly in developing and transitional countries [3]. Road accidents are one of the major causes of death, injury and disability in all over the world both in developed and developing countries. With a broad estimate, in every 1 min, 2 people are killed and 95 people are severely injured or permanently disabled in traffic accidents worldwide. Traffic accident related deaths and injuries lead not only substantial economic losses but also serious physical and mental sufferings. The developing countries are much more affected from traffic accidents rather than developed countries. According to the world health organization (WHO) statistics, 75% of deaths resulted from traffic accidents occurring in developing countries, although they own only 32% of the motor vehicles in the world. While the annual fatality per 10,000 vehicles ranges from 20 to 200 in low or middle income countries, it varies between 1.5 and 5 in industrialized countries. The estimated global economic cost of traffic accidents is $518 billion per year. The share of the developing countries

is $100 billion which accounts for 1 to 3% of their gross national product [4]. Road deaths and injuries are a global problem of massive proportions. In recent years, some important and major studies on the subject of road accidents and fatalities carried out by World Bank, World Health Organization (WHO), Transport Research Laboratory (TRL), and others have highlighted the growing significance of road crashes as a cause of death particularly in developing and transitional countries [3]. According to the World Health Organization, in many developing countries, increase in number of traffic accidents and related economic and social outcomes in Turkey force authorities to develop new alternative transportation policies for reducing traffic accidents. From 2006 to 2008, all over the country approximately 2.5 million traffic accidents were recorded and nearly 14,000 people lost their lives and more than 541,000 people got injured. In other words, each year in the last three years, an average of 4,622 persons were killed and about 181,000 persons were injured on Turkish highways. Fatality and injury rates due to traffic accidents in Turkey are 2 to 5 times higher than those in most European countries. This is an apparent result of concentration of freight and passenger transportation on highways in Turkey. In fact, the share of freight and passenger transportation 5 on highways increased from 29 to 91% and from 50 to 95%, respectively, between 1950 and 2007. A rapid increase in the number of vehicles is also another major reason behind road traffic accidents and fatalities in the country. The number of vehicles increased from 2.5 to 10.5 million (more than threefold increase) between 1986 and 2005, while the population of the country increased from 52 to 72 million (only 38.5% increase) during the same period [5].

Status of road accidents in India

It is found that India is leading China in number of road accidents. One road accident occurs in every one minute and 16 people die in one hour. 40 percent of road accident occurs due to truck and two-wheeler [6]. As per the report on accident death and suicide (2010), l4, 61,757 number of traffic accidents have occurred in India in which 4, 30,654 road accidents, 2,843 rail road accidents and 28,260 other railway accidents. 73.3 per cent of road accident occurs in Nagaland, 66.5 per cent in Jammu and Kashmir, 53.5 per cent in Bihar and 53.5 per cent in Uttar Pradesh occurred. Deaths in road accident have increased by 5.5 per cent during 2010 compared to 2009 in India. A large number of accident occurred in Tamil Nadu. In Delhi city 25 per cent deaths of

bicycle riders, 18.8 per cent death of pedestrians, 16.6 per cent death of two-wheeler rider and 9.2 per cent deaths of three-wheeler roads accidental occur. Road accidents in India are 37.2 per cent [7].

Meaning and Importance of Accident Prevention

The meaning of accident prevention needs explanation because its necessity can hardly be exaggerated. We can rightly say it is an objective of any type of industry. Accidents are met with either by the fault of drivers and road users or failure of the vehicle [8-11]. Talking about human failure depends on the driver fault or the injured persons fault, the intoxicated state of the driver, fatigue [12], the careless driving and not following the speed regulation ends with an accident and the lack of awareness and the injured are not following the road rules cause damage to life. On the technical side, the vehicles must be inspected by experts during the interval of every trip. Each vehicle has to be out into maintenance service for every 15,000, 30,000 and 45,000 kms besides the regular check up. In a nutshell it can be concluded that the importance of prevention of accidents, purely depend on ill disciplined behaviour of the road users and the lack of technical surveillance of the vehicles. While analyzing road traffic injuries Martha Hijar et al (2004) strongly states that it is important not to forget that the public health problem has clear and profound repercussions in daily life as a cause of death and also generating consequences and disabilities, since in most cases, the victims do not die, but will need to adapt the changes in rules and in their daily activities during several weeks or months, and in some cases permanently as a consequence of the accident [13.]

Road Safety

Road safety is a result of deliberate and systematic efforts on the part of many sectors of society-Government and non-Government agencies alike, once these sectors acknowledge it to be an important and valuable public good, and have developed policies and programmes to support and maintain it. The ever increasing and alarming rate of road accidents is a matter of serious concern for all of us. Corresponding to the tremendous increase in the vehicle population in the recent years, the recent new comers being mini buses, share autos omni buses and minidors, the number of accidents are also on the rise. But for a few roads, in general, all our roads are pretty bad. Poor maintenance and the unscientific transport system combat the evil. In spite of several

measures to reduce accidents and to improve road safety, the problems have continued to grow over the years. The economic and social effort of reducing highway accidents cannot be over emphasized in developing countries as the severity of the problem is highly pronounced. Heavy vehicles, like trucks and buses are the causes for over 50 percent of the total road accidents in India. In India one accident occur every 2.75 minutes [14]. In response to growing concern about road traffic injuries, the World Health Organization (WHO) has conducted World Health Day (WHD) every 51 year specially to create awareness on road safety. According to a WHO report, wearing a helmet reduces chances of death by 40% and that of severe injury by 70%. As per WHO report, using child restraints reduces likelihood of a fatal crash by 70 per cent among infants and up to 80 per cent in young children. Wearing a seatbelt can reduce fatal injuries by 50 per cent for front seat occupants and up to 75 per cent for those sitting in rear seats [15]. Eighty five percent of the deaths caused by road accidents are the share of developing countries and nearly half of that belongs to Asia-pacific region. India accounts for about 10 percent of road accident fatalities worldwide [16]. Any road accident is an unpredictable mishappening but not unavoidable. Road safety involves a highly complex unit of many factors viz., technical and physical, even social and cultural [17].

Road safety has been identified as an essential component which should be integrated in road management system. The first image of road safety coming to mind may be the number of accidents happening on roads [18]. Road safety refers to reduce the risk of a person in accident. Road safety provides safe environment to all road users. Government organizes different programs regarding road safety such as driver safety programs, pedestrian safety, child and teenager‟s safety programs, drink and driving related programs and speed management programs. These programs are organized to make people aware of causes of road accidents but these programs fail to create awareness, modify abnormal behaviour of drivers, and poor enforcement of driving law. Road safety considers risk factors related to the road and its environment, the road user, the vehicle and emergency services [19]. Road safety is to be achieved to decrease in crash occurrences with safer vehicle and roadway designs as well as road user behaviour modification programs. The injury risks of individuals in traffic crashes are influenced by a multitude of factors including vehicle features, roadway designs, poor law of enforcement, driver characteristics, type of collisions and environmental conditions [20]. Road safety can be improved by use of education, engineering and enforcement [21]. Road safety entails safe roads,

safe drivers, safe building, safe engines, safe vehicles, safe environment, safe mind, safe infrastructure, healthy eyes, healthy ears, and healthy bodies, healthy senses, and a whole milieu of variables that will reduce the high road accident and death [22]. Road safety is considered important for road users. The road authorities and road safety agencies employ some type of road safety management program, designed to improve the road safety performance for the system users. Safety management programs consist of various initiatives, such as a road improvement program, vehicle maintenance testing programs, campaigns to stop drinking and driving, speed enforcement programs, the development of road or vehicle safety standards, a road safety research program, or other various road safety programs [23]. Road safety can be managed by five E‟s such as (i) Education, (ii) Enforcement, (iii) Engineering, (iv) Environment and (v) Emergency Service in road safety [22].

Education

Drivers‟ behaviour can be improved through safety educational programs [24]. Education and awareness are used to provide the information regarding road safety and different media are used by the host country [25]. The Government plays an active role in conducting awareness among road users by improving road safety through campaigns and educational programs [26]. Road safety education and awareness for children and rural people is an effective tool for improving the behaviour of road users [21]. Education provides the good senses to all the road users resulting into improved driver behaviour [27]. Non-Government organization‟s road safety policies and programs play an important role in reducing road accidents and injuries. They appoint a legislator for raising awareness about road safety generally and support a specific legislative change [28].

Enforcement

Road accidents can be prevented by use of helmets, seat belts and enforcement of safety law. These factors are involved in promoting road safety and decreasing collision between vehicles and others [24]. Enforcement of law on use of helmets, wearing of seat belts, and detection of drunken driving and prevention of plying of over loaded vehicles are helpful to reduce the road accidents [25]. Enforcement can be effective by increasing restraints on the use of child. Enforcement can reduce the number of road deaths. Enforcement of alcohol diminishing laws is more effective to achieve risk of detection [19]. Enforcement of law is helpful to reduce the

accidents [27]. Legislation is an effective way to discourage risky behaviour and increase road safety. Driving under the influence of alcohol is an important risk factor for road traffic injuries and deaths. Enforcement is a key in identifying and reducing the potential of the road network that lead to road crashes [29].

3 Engineering

Design of roads and vehicles contribute to prevent the road accidents [24]. Vehicle maintenance prevents accidents and also save the occupants and other road users coming in contact with vehicle [25]. Engineering provide most scientific design to make the roadway safe for all the users [27]. Planning and implementation of road safety designs is work of National Highway Authority of India (NHAI). All the work related to design of highways is completed by the consultants meeting all relevant geometric and safety standards which include provisions for flyovers, by passes, railway over/under bridges, bus/truck lay-byes, service roads, junction improvements, overhead signs, cautionary/regulatory/regulatory/informatory retro-reflective sign boards, crash barriers, medians, thermoplastic road markings, traffic lights and delineators. The policy is made to avoid the conflicts through the traffic with provide by-passes for roads passing through busy towns [30.]

Environment

Norman et al. [31] have identified that environmental factor plays an important role in reducing road traffic accidents. Drivers‟ risk taking behaviour remains unchanged in environment situation that result into road accident. Banik et al. [32] have described that most of road accident occurred in rainy season as compared to winter season. 4.0 per cent of road accident occurs in rainy season. Most of road becomes slippery and tending to muddy non-paved road in rainy season and drivers‟ lose the control on vehicle due to stormy weather. Treat et al. [33] have found that 4.7 per cent road accidents occur due to the environment factors. Caird et al. [34] have identified that the characteristics of the vehicle and the environment influence pedestrian and driver behaviour in ways that lead to accidents. Road user behaviour is equally influenced by environment and vehicle. Stanton and Salmon [35] have found that there are many environment factors such as surface condition, lighting, traffic density, atmospheric conditions, responsible in road accidents. Infrastructure related factors that are fixed and do not change with the

environment such as traffic way flow, traffic control device, locality, road way alignment and relation to junction. This infrastructure does not work properly or is not sufficient to control the vehicle and is not in proper condition to provide the information to the drivers that result into road accidents. 29 percent of road accidents occurred due the environment and infrastructure problems. Dorn and Brown [36] have described that variables of road accidents differ from country to country, however they seems to be common. One of the most significant causes is animal related accidents that result from serious injuries to death. It is responsibility of the driver to drive safe but some time drivers face the problem related to other animals and dogs. Some times road accidents occur due to not fairly predicting the movement of animal and drivers lose the control on vehicles. McKnight and McKnight [37] found that inability to adjust driving behaviour according to road environment condition is a main contributor factor of road accidents. Road accidents occur due to poor hazard recognition, poor visual search and attention, and an inappropriate speed selection. Brodsky and Kizner [38] have described that environment factor is beyond human control such as weather condition. Environment factor such as visibility and road condition affect the drivers‟ performance. It is also found that road accidents 2 per cent to 3per cent increases in rainy season as compared to dry season. Risk of road accident increases when drive the vehicles after a long period on wet road.

Emergency Services

Emergency response services can be helpful to increase the road safety. The government of India is doing efforts to provide trauma care facilities to citizens of India. There are many trauma care schemes going on in India such as: ¬ National Highway Trauma Care Project (NHTCP) ¬ National Highways Accident Relief Services Scheme (NHARSS) ¬ NHAI – Incident Management System (IMS) ¬ Emergency Medical Service Systems (EMSS) [24].

Conclusion

Transportation is not only playing a pivotal role in modern life but also become critical and resourceful. Increase of traffic inflow is unavoidable but the out come has to be seriously viewed in the context of causing accidents. It is remarkable to note that increase of accidents demands safety. Road traffic accidents are an important cause of death and serious injuries in developed societies. Road traffic injuries are a major but neglected global public health problem, needing

conservative efforts for effective and sustainable prevention. Of all the systems that people have to deal with on a daily basis, road transport is the most complex and dangerous one. Road Safety management seeks to maintain and improve the existing safety of a road network by reducing crashes and providing a safe road environment for its users to enable its continued use in an effective and safe manner. It concerns the implementation of road safety policies, management and organisation in the authorities responsible for the reduction of road crashes and fatalities.

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