

ROAD ACCIDENTS AND SAFETY STUDY OF RAJSHAHI CITY IN BANGLADESH

Nur-E Ferdus Monika Matin¹ and Md. Masud Rana²

¹Department of Civil Engineering, RUET, Bangladesh, e-mail: nf.monika29n@gmail.com

²Department of Civil Engineering, RUET, Bangladesh, e-mail: masud.ce08@gmail.com

ABSTRACT

Road accident is an exquisite problem in highway transportation system which consistently related to a lot of deaths, injuries and property damages. Approximately 1.3 million individuals die in road fatalities each year, every day around 3,287 deaths occur all over the world. Further, even 20-50 million are injured or disabled. Low and middle-income countries are the main victim of this problem. The rate of an accident in Bangladesh is 13.6 per 100,000 people. With respect to road accidents Rajshahi, a northern city of Bangladesh is in very severe condition. In last 7 years, about 200 people died, and more than 100 People injured very utterly. This research work presents an overview of the accident rates, involved vehicles, type of collisions, time of the accident, and age of the victims' of the accidents in the highways, regional roads and city roads of Rajshahi city. The detail of the accident data was collected from, a popular local newspaper (Sonali Sangbad). Some additional data was collected from the metropolitan police station. The analysis shows that Natore-Rajshahi-Nawabganj highway (N6) is the most hazardous road in Rajshahi city and head on collision is the leading reason for accident in this road. The rate of death is also very high on city roads. About 46% of the total victims were between ages 21 to 30 years old. In more than one third of the total analyzed accidents pedestrians are the victims including deaths and fatalities. About 50 % of the total casualties occurred, either motorcycle or truck are involved.

Keywords: Traffic, road accident rate, head on collision, pedestrian, death.

1. INTRODUCTION

The problem of road accidents is an alarming issue which is internationally recognized. Road traffic accident occurs when a vehicle is moving along a roadway collides with another vehicle or object. Traffic collisions often result in injury, property damage and even death. Road traffic accidents and injuries are global problem and safety situation is severe in developing countries like Bangladesh. Road traffic injuries are the top reason for death among middle-income people. Also, road crashes lead to the global economic losses as estimated in road traffic injury costs of US\$518 billion per year. In developing countries, the costs are expected to be US\$100 billion, twice the annual amount of development aid to developing countries (Saha,2007). In a research study, WHO has identified that road accidents would be the third leading cause of death in the world by 2020. Accident death rates in developed countries are much lower (at least 50 times) than in developing countries. Even 90% of the world's fatalities on the road occur in low and middle-income countries.

In Bangladesh average, eight people die every day. According to the record of police (2015), in last 21 years 84000 road accidents occurred, 56000 died and 63000 injured (Paul, 2007). But the actual number is more significant than that because all the harmed people don't make a general diary in the police station. It is not possible for the police to keep records of all road accidents. The Same case happens in other countries also. Official results and information from other sources do not match. For example, in the Philippines, only one out of five medically reported road deaths are included in police statistics. In Indonesia, insurance companies report almost 40 percent more deaths than the police (Banik, 2011). With the increase in population, the rate of road accidents is increasing day by day.

Transport is an essential part of Bangladesh economy. But unfortunately, the authority can't pay proper attention to traffic and transportation due to the higher growth rate of the population as well as increasing transport problems. Traffic roads are expanded dynamically without any planning and control due to the rapid socioeconomic changes and to fulfill the demand of growing population.

Although traffic safety has improved in the recent years, the number of road fatalities is still unsatisfactorily high. In fact, the road safety problem in Bangladesh may be much worse than the official statistics. Main causes of the accident should be identified, to develop safety condition. Effective strategies and well-prepared design should be applied to minimise those causes. The Accident Research Centre (ARC) was launched in the Bangladesh University of Engineering and Technology in 2002 with the aim to research accidents and their remedies. There is a scope of training for the professionals in ARC. Lack of safety awareness is one of the major causes of a road accident. Driver fatigue, the absence of additional road facilities like dividers, bus bays, hard shoulders, helpful signals markings, etc. are also responsible for this problem(Ogden,1996).

Rajshahi is an important divisional city of Bangladesh. The internal communication system in this town is well organized. Vehicle entering into Rajshahi increases the possibility of accident occurrence. Traffic engineering and proper transport planning methods are required to reduce accident occurrences together with related records by technical studies. Widespread research works about traffic accidents in Rajshahi city has not been carried out except studies on some particular intersections (Mamun, 2015). Therefore, the aim of this study is to make a detail study on road accidents and losses of life and assets.

2. METHODOLOGY

2.1 Selection of Study Area

National, regional and city highways in Rajshahi zone especially Rajshahi district connected with Rajshahi city are studied in this research (Table 1). Internal roads of the city are also considered in this study although these roads are not incorporated in RHD Rajshahi zone. But the rate of accidents on city roads is very high, so these are taken into consideration.

Table 1: Road network under study

Road no.	Name of the road	Length (km)
N6	Kashinathpur-Dasuria-Natore-Rajshahi-Nawabganj-Kansat-Sona	76
	Masjid-Baliadighi Border Road	
N603	Rajshahi Town By-Pass Road	21
N605	Rajshahi Greater Road	3
R685	Rajshahi (Bindur More)-Nawhata-Chowmasia Road	66
R682	Rajshahi-Nawabganj Road Old Section	1

Including the City roads

2.1.1 Study Area

A partial portion of the roads (mentioned in Table 1) which are within the city are observed with respect to road accidents. Most other parts of the country are connected to Rajshahi via the N6 national highway. Rajshahi Town By-Pass Road and Rajshahi Greater Road are two major road sections of the city. R685 is the connecting road from Rajshahi to Naogaon. other City roads also play important role in the transportation system of Rajshahi.

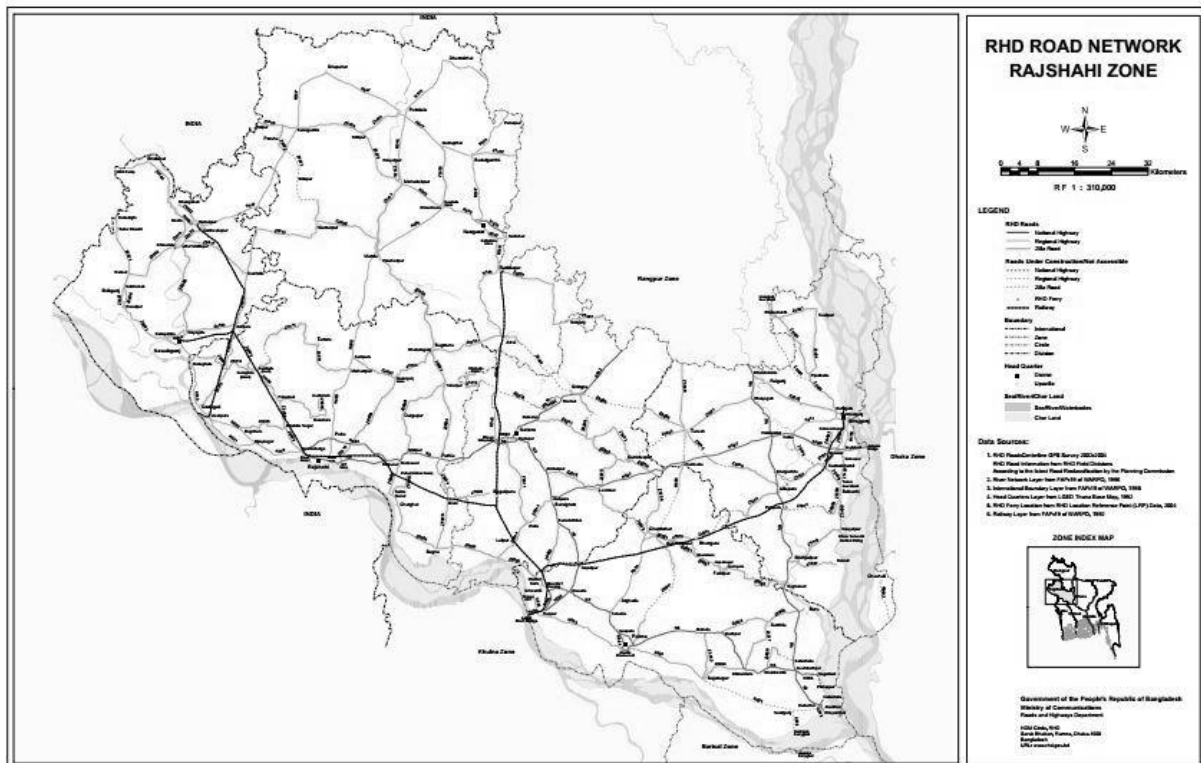


Figure 1. Map of Study Area.
(Source: Roads & Highway Department, Rajshahi, Bangladesh)

2.2 Data Collection

Proper and sufficient data is needed for accurate analysis. Essential road geometric data is collected from the official website of Roads and Highway Department (R&HD). The accident information was obtained from a reliable and popular divisional newspaper the daily “Sonali Sangbad”. The time duration of recorded data is from January 2017 to June 2017. The daily newspaper has been chosen rather than other sources for the following reasons:

1. Insufficient data about road accident from the police station.
2. Victims of spot death accident and the simple injured patient never go to the hospital.
3. Inactivity of related non-government Organizations in this region.
4. The newspaper is the mirror of society, so it represents social aspects of a country.

3. DATA ANALYSIS AND RESULTS

The collected data is analyzed for the age of victims, type of vehicles involved, accident-related collisions of different roads and the roads subjected to a higher frequency of casualties.

3.1 Accident Casualties in Six Successive Months

Different types of accident cases such as casualty, severity, single type crash and corresponding no. of accidents are investigated in Rajshahi city under this research work that is shown in Figure 2. It is evident from the figure that a large number of crashes occurred between April and May. It means in hot weather rate of accident is comparatively large than in cold weather.

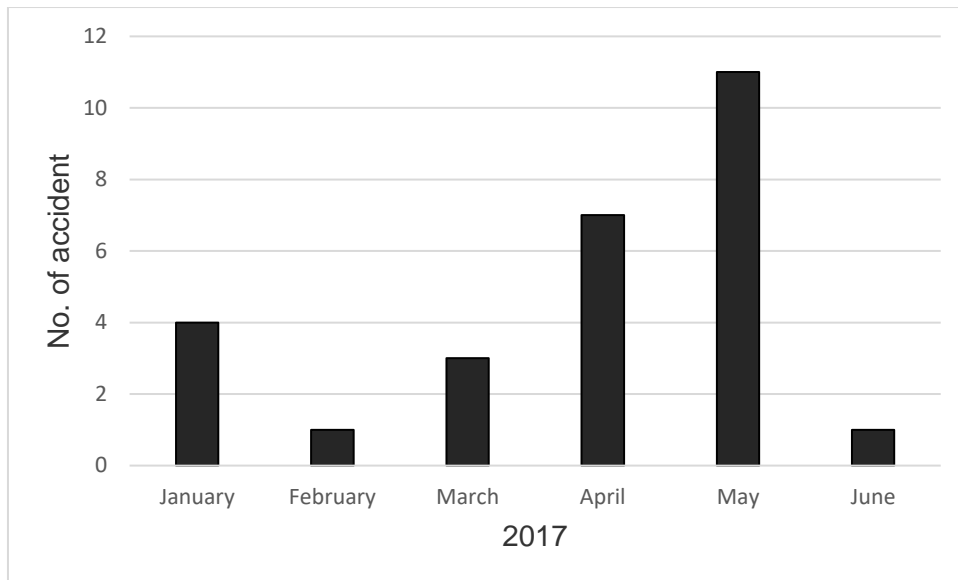


Figure 2: Accidents in different months of 2017

3.2 Age Range of Victims

In Figure 3, a variation of the age of the victims is presented as abscissa concerning the percentage of death and injuries due to the accidents. It is shown that most of the suffered people are within 21 to 30 year old. Death rate between 11 to 20 years old is also high(33%). It means young generation is the ultimate victim of a road accident. Here evidence shows that a large no. of middle-aged people also suffer much.

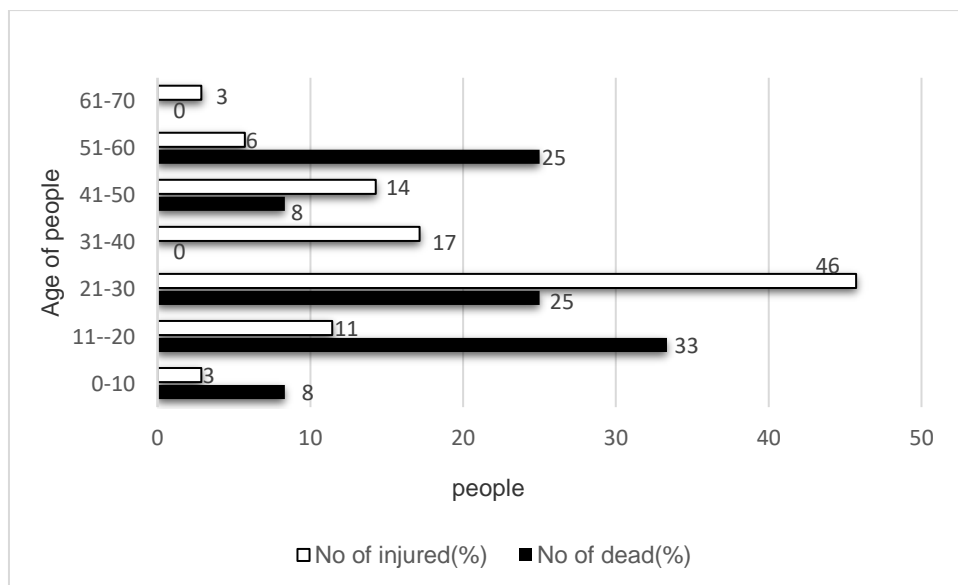


Figure 3: Accident Fatalities of different age people

3.3 Accident Fatalities on Different Roads of the city

Figure 4 represents the percentage of accidents and fatalities in different roads of Rajshahi city. The Natore-Rajshahi national highway (N6) is at high risk according to this statistics. About 38% of total investigated accidents (January 2017 to June 2017) occurred on this road. It is also the busiest road of Rajshahi city. The condition of internal city roads is also not so well. Summation of the deaths in these streets is equal to the no. of death in N6. Accident fatalities on other national highways and regional roads are comparatively less than N6.

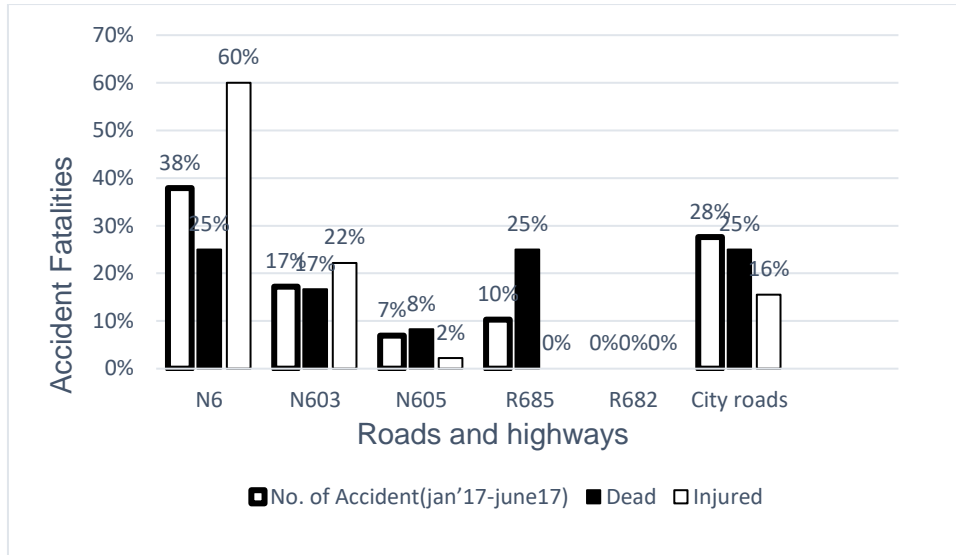


Figure 4: Accident Fatalities on different roads

3.4 Major Causes of Road Accident

Significant causes of road accident are a head-on collision, carelessness of pedestrians during the crossing, fatigue of driver, damaging of the road due to weather effect, expired vehicles, etc. we discussed earlier that Rajshahi is not a planned city. So widening roads and installing divider to reduce head-on collision is not easy. Further, the actual road facilities cannot be experienced by the road users because of illegal interposition. Even in many places almost half of the road width is blocked by roadside trading, kitchen market and parking of vehicles illegally. It is also necessary to mention that adequate footpath is not introduced in many roads. The small pathway may be the reason behind the sufferings of pedestrians. Other causes are lack of proper training of drivers, erosion of pavement, lack of maintenance of roads, small shoulder; heavy vehicles of additional loading, etc.

3.4.1 Type of Collision

Analysis of Collision type shown in Figure. 5, showed 'head-on collision' as the dominant accident type both in the city, about 45 percent accidents are account for this type involvement in fatal accidents. Head on means head to head collision. Pedestrians suffer due to 31 percent accidents. pedestrian involvement happens during unaware road crossing or during walking outside the footpath. Other type of collisions are obstacle(3%), rear end(10%), side collision(7%), overtaking(3%). An obstacle collision is a type of single-vehicle accident that occurs when a vehicle clashes with any roadside object. Whereas Rear end means collision of the rear end of a slow moving vehicle with the front of other relatively fast moving vehicle.

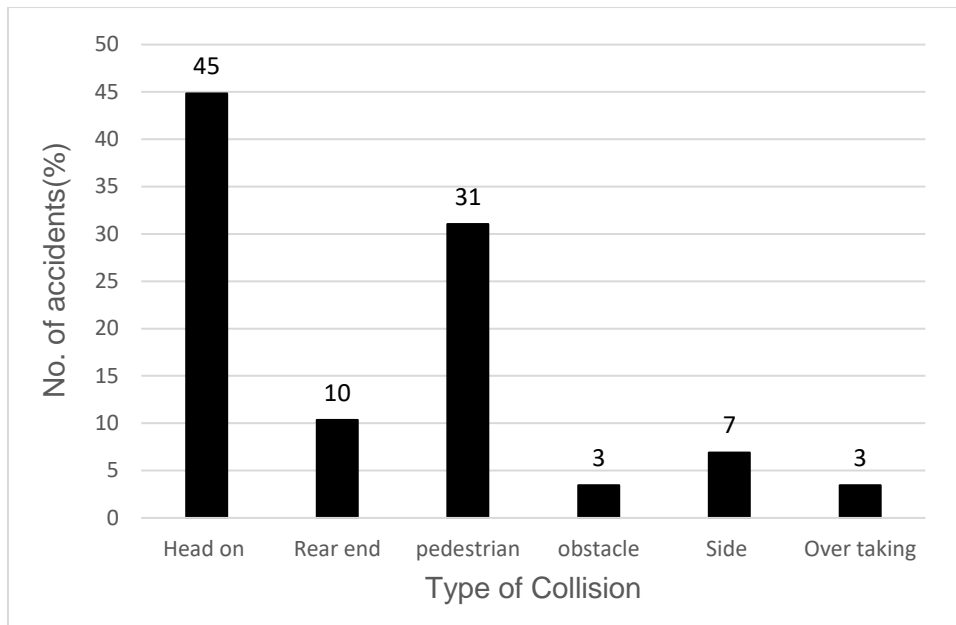


Figure 5: Type of accident in different accident

3.4.2 Involved Vehicles

The chart in figure 6 represents that motorcycle is involved in most of the roadway accidents (26%). Truck is a responsible vehicle for about 24 percent of total accidents occurred during the observation period. On the other hand, auto-rickshaw, cycle-rickshaw, bicycle are at risky zone for fatality and property damage due to a road accident.

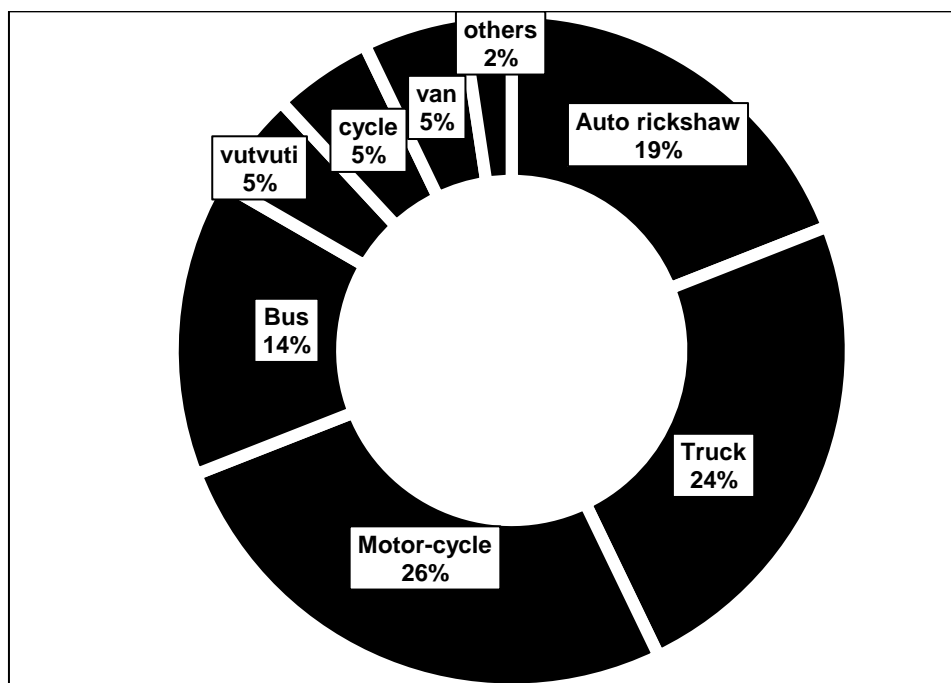


Figure 6: Involved vehicles in road accidents

4. CONCLUSIONS

Following suggestions have come out after the completion of the study:

1. Head on collision is the main reason for road accident, so divider should be introduced in hazardous roads and adequate width should be provided.
2. Awareness of the ordinary people can reduce the sufferings of pedestrians. Electronic media can be used for this purpose.
3. Strict laws of punishment should be made for the convict of the accident, and its application should be ensured. The mobile court can be installed on every road to check the rules and regulations.
4. Particular medical service can reduce the death rate due to a road accident. To implement this idea, primary treatment service can be installed beside the road.
5. Overloaded vehicles damage pavement layer. So these should be avoided. There is a proverb, "a stitch in time saves nine". So checking at regular intervals and proper maintenance will save time and cost of road repair.
6. Adequate numbers of speed breakers, footpath, traffic signals, Zebra crossings, light posts with streetlights are to be constructed.
7. More research and in-depth analysis should be carried out regarding the situation of road accidents of Rajshahi city with the exertion of government. Then more ideas will be found out to confirm safety for the road users.

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