International Research Journal of MMC (IRJMMC)
Open Access
Volume 3(3) ISSN 2717-4999 (Online) 2717-4980 (Print)

Factors Affecting Road Traffic Accidents in the Kathmandu valley

Raju Bhai Manandhar[1]

[1]Ph.D. Scholar, Faculty of Management
Tribhuvan University, Kathmandu, Nepal
Email: raju.pyc@gmail.com

Citation: Manandhar, R. B. Factors Affecting Road Traffic Accidents in the Kathmandu valley. *International Research Journal of MMC, 3*(3), 82–90. https://doi.org/10.3126/irjmmc.v3i3.48639

Abstract

Road traffic accidentis defined as an accident which takes place on the road between two or more objects, in which one is any kind of moving vehicle and the other a human being. The major objective of the study is to determine the factors affecting the road accident in Nepal. Respondents were targeted drivers of two-wheeled and four-wheeled vehicles. 98 respondents were selected through convenience sample technique. Quantitative data as nature and primary data as sources of information were considered for the study. Primary data were collected and analyzed in systematic way to derive the findings. A well-structured survey questionnaire was administered to collect the data. In this study, data were analyzed using mean, median, mode, standard deviation, variance and trend analysis. Based on the Likert scale question, poor road condition was considered as the first important cause, drunk driving was considered as the second important cause, and over speed was considered as the third important cause influencing the road accident in the Kathmandu valley.

Keywords: Drunk driving and over speed, poor road condition, road traffic accidents

1. INTRODUCTION

1.1 Background

Accident can be defined as an unanticipated and detrimental event, a misfortune unexpected and with no obvious cause (Gulzar, Yahya, & Zafar, 2012). It was originated that speed limits have a substantial effect on security equally in urban and rural areas (Fieldwick& Brown, 1987). Drinking, less traffic sense, lack of knowledge, tendency to be adventurous and show off are the main leading causes of accidents among adolescents. It affects the world in general but the human beings specifically (Kohli, Aathi, &Sethi, 2014). Road traffic accident (RTA) is defined as an accident, which takes place on the road between two or more objects because of moving vehicle and a human being (Miahra, Sinha, Sukhla, & Sinha, 2010). Similar concept of road traffic accident is mentioned by Jha, Srinivasa, Roy, and Jagdish, (2004). Globally, road traffic accidents (RTA) are common public health problem and isestablished as the eighth leading cause of death. It has similar impact as other communicable and non-communicable diseases.

Around 1.24 million people have unnatural deaths and 20 to 50 million people suffer from non-fatal injuries due to road traffic injuries in the world. The global trends of road traffic accidents will become a fifth leading cause of death by 2030. The global economic burden caused by RTA was 518 billion USD. However, status paper on road safety in Nepal depicts that fatality rate has dropped from 17 to 12 per 10,000 registered vehicles from 2009 to 2012. According to WHO, report in 2011, injuries due to RTA in Nepal constitutes 1.7% of total mortality. Similarly, the country has lost 0.8% of GDP due to road traffic accident (Shrestha, Bhatta, Shrestha, GC, &Poudel, 2017). There are several technical roads faulty and it could lead towards the occurrences of road accident (Harith& Mahmud, 2018). Road traffic injuries are a major but neglected global public health problem, requiring concerted efforts for effective and sustainable prevention. The weather causes all sorts of wear and tear to road surfaces, by wiping away road makings and wearing away the top layer of the road that helps with the traction of tires (Srinivasa Kumar & Srinivasan, 2013).

Road traffic accidents (RTAs) are a major cause of death and injury globally. Human factors are the commonest cause followed by environmental factors and road conditions, mechanical factors and others. Of the human factors, careless and reckless driving was the major cause followed by drunk-driving, not giving the right way and over speeding (Wangdi, et al., 2018). Death and injuries refer to the status of the RTAs victim as reported in the police records. The causes of RTAs from police records were categorized into four groups: human factors, environmental factors, mechanical factors and others.

1.2 Literature Review

There is tremendous rise in RTAs due to increase in vehicular volume on roads, incredible speeding of the vehicles, poor driving skills, drunk driving, bad roads, poor traffic control, and lack of public awareness, rampant indiscipline, incompetent authorities and lack of implementation of existing law to tackle the menace of disrespect to law and rules (Sharma, 2016).The maximum number of accidents occur due to the lack of traffic knowledge, negligence of drivers, and the vulnerable condition of roads (Dhakal, 2018).Road traffic accidents results from a combination of factors related to the components of the system comprising roads, the environment, vehicle and road users, and the way they interact (Shantajit, Kumar, &Zahiruddin, 2018). Road traffic accident (RTA) is defined as a situation caused by the collision of one or more motorized vehicles, such as cars and motorcycles. The consequences of RTAs can be injuries, property damages, death, and congestion, disruption, and delays to public transport. Alam, &Alharthi (2019) investigated the impacts of sandstorms, temperature, and rainfall on road traffic accidents.

Srinivasa, Kumar and Srinivasan (2013) found thatmore (60.7 percent) accidents, and bright light favored for 78.1 percent of accidents and this could be because of the bad condition of roads due to rains and density of traffic in day light respectively. Sherstha (2013) explored causes of RTAs and deaths due to that, the reports show negligence, over speed, drinking and driving, poor condition of the vehicles, overtaking as major causes. Drinking and driving is also found to have significant space in RTAs and deaths. Though less significant in comparison to the aforesaid causes, poor condition of the vehicles and overtaking are also found to have caused many RTAs and deaths. Dhakal (2018) stated that the negligence of the driver to the weather condition and the condition of road. Despite the dense presence of government and its bodies, the study showed that maximum number of road traffic accidents occur in Kathmandu valley. Youngsters riding bikes and driving cars involved in accident are found maximum in number. Islam, Alam and Alharthi (2019) examined that temperature, rainfall, sandstorms, and numbers of vehicles were statistically and significantly responsible for RTAs in Saudi Arabia in the study period. The findings will assist policymakers in taking the right courses of action to mitigate the negative impacts of climate change through understanding climate influence on RTAs.

Distribution of driving license has not been transparent and traffic rules and regulations have not been made effectively. Maximum bus accidents occur due to being overloaded. Lack of proper coordination among the stake-holders and boozing habit of drivers are also the possible causes of accidents. In the Nepalese context, there are few researches done on the factor affecting road traffic accidents in Nepal, so this study will be important to fulfill this gap. The research is directed towards answering following questions:

1. What are the factors affecting road traffic accidents in the Kathmandu valley?
2. Which is the most influencing factor affecting road traffic accident in the Kathmandu valley?
3. What is the number of male and female involvement in road traffic accidents in the Kathmandu valley?

1.3 Research Objectives

The main objective of this study is to identify the factors affecting road traffic accidents in Nepal. The specific objectives of the studies are as follows:

a. To determine the factors affecting road traffic accidents in Nepal.

b. To explore the most influencing factor affecting road traffic accidents in Nepal.

c. To identify the number of male and female involvement in road traffic accidents in Nepal

2. MATERIALS AND METHODS

The research designed employed in this study was quantitative and descriptive research designs. Descriptive research is to provide an accurate portrayal or account of characteristics of a particular individual, situation or group; these studies are a means of discovering new meaning, describing what exists, determining the frequency with which something occurs and/or categorizing information (Dulock, RN, & DNS, 1993). The descriptive research design had selected for the study to describe the factors that affect road traffic accidents in Nepal.

The population of this study was all the drivers of two-wheeled and four-wheeled vehicle of Kathmandu, Nepal. However, considering all the population was impossible, so the convenience sampling method was used to select the sample for the convenience of the study. 98 respondents were selected throughconvenience sample technique. A well-structured questionnaire was administered to collect the data. These questionnaires were distributed to the 100 drivers in the Kathmandu valley, out of which only 72 drivers constituted the sample size. The survey questionnaire asked respondents to respond in five ways: a short response, a preference of one or three choices, a ranking of options, a multiple-choice, and a Likert scale alternative. Respondents were asked to fill out their names as a brief answer to the question, which was optional for the respondents. Respondents had to select Yes, No or Rarely in some other issues. In the ranking question, respondents to the survey were expected to rate the options from 1 to 4. Respondents can select multiple options in the multiple-choice query. The 5-point Likert scale was used to gather the respondents' views for the study analysis, where point 1 strongly disagreed and 5 is strongly agreed. The study had used some statistical models like mean, medium, standard deviation, to analyze the data. Quantitative data as nature and primary data as sources of information for the study. Primary data were collected and analyzed in a systematic way to derive the findings. In this study, data were analyzed using mean, median, mode, standard deviation, variance and trend analysis.

3. RESULT & DISCUSSION

This section includes the empirical investigation conducted as a field survey in which structured questionnaire was developed and distributed to the sample selected through convenient sampling. The questionnaire was distributed to altogether 100 sample respondents with self-administered to obtain their views regarding the various factors influencing the road traffic accidents in Nepal. All the sample respondents, to whom the questionnaire was distributed, actively participated in the survey with the response rate of 72 per cent. The responses collected are arranged, coded, tabulated, and analyzed to facilitate the study's descriptive analysis.

Table 1 *Gender and Age group of the respondents*

Gender	Frequency	Percentage	Cum %
Male	50	69.4	69.4
Female	22	30.6	100
Total	72	100	

International Research Journal of MMC (IRJMMC)
Open Access
Volume 3(3) ISSN 2717-4999 (Online) 2717-4980 (Print)

Age Group			
Below 20	13	18.1	18.1
20-25	44	61.1	61.1
Above 25	15	20.8	100
Total	72	100	

The table 1 shows respondent 'profile on the basis of strata of gender and age group category. There were 72 respondents for the study. Out of 72 respondents, 50 were male and remaining 22 were female. The result showed that there was less number of female than male in the sample. Among the entire respondent, the majority 69.40% of respondents were female while the rest 30.60% of the respondents were male.

Out of the total respondents, the majority of respondent were of age group 20-25 covering 61.10% of the total respondents, followed by the participants having age above 25 carrying 20.80% and the least percent of the respondent were from age group below 20 representing only 18.10% of the total respondents.

Table 2 *Preference of type of vehicle*

Vehicle Type	Frequency	Percentage	Cumulative Percent
Two-wheeler	54	75%	75%
Four-wheeler	18	25%	100%
Total	72	100%	

The information regarding the kind of vehicle used by the respondents has been shown in Table 2. The type of vehicle uses is categorized into two categories; four-wheelerusers and two wheeler users. Large portion of the respondent were the user of two-wheeler possessing 75% of the entire respondents followed by user of two wheeler covering 25% of the participants. Through this data it can be concluded that people in the Kathmandu valley uses two-wheeled vehicle more in comparison to four- wheeled vehicles.

Table 3 *Respondent's involvement in road accident*

Response	Frequency	Percentage	Cumulative Percent
Yes	28	38.90%	38.90%
No	32	44.40%	83.30%
Rarely	12	16.70%	100%
Total	72	100%	

The table 3 shows that majority of the respondents were not involved in any kind of road accident holding 44.40% of the total respondents, similarly 38.90% were involved in road traffic accident where as 16.70% of the respondents rarely were involved in the road accidents. Through this information, it is clear that vehicle drives inside in the Kathmandu valley are less involved in road accident**.**

Table 4 *Opinion of respondent on diving under speed limit*

Response	Frequency	Percentage	Cumulative Percent
Yes	41	56.90%	56.90%
No	24	33.30%	90.30%
Rarely	7	9.70%	100%
Total	72	100%	

As exhibited in Table 4, majority of the respondents i.e. 56.90 % believed that they drove under considering the speed limit. And lastly, 9.70% of respondents rarely drove under speed the limit of speed applied by law for road vehicles whereas 33.30% of the respondents did not limit.

Table 5 *Opinion of respondent on difficulty caused by poor road condition to drive*

Response	Frequency	Percentage	Cumulative Percent
Yes	69	95.80%	95.80%
No	1	1.40%	97.20%
Rarely	2	2.80%	100%
Total	72	100%	

Table 5reveals that difficulty caused by poor road condition to drive, themajorityof the respondents i.e. 95.80% agreed that bad road condition created difficulty in driving which led to increase in road accident. Similarly, 1.40% believed that driving was not affected by poor road accident. Likewise, 2.80% of respondents faced difficulty rarely due to the poor road condition.

Table 6 *Opinion on drunken drive among respondent*

Response	Frequency	Percent	Cumulative Percent
Yes	17	23.60%	23.60%
No	37	51.40%	75%
Rarely	18	25%	100%
Total	72	100%	

Table 6 shows that output of 72 respondents, 17 respondents claimed that they used to drive when they were drunk with 23.60%, similarly 37 respondents did not use to drive when they were drunk with 51.40% whereas 18 (25%) respondents rarely used to drive when they were drunk.

International Research Journal of MMC (IRJMMC)
Open Access
Volume 3(3) ISSN 2717-4999 (Online) 2717-4980 (Print)

Table 7 *Opinion on most influencing factor for speeding*

Features	Rank 1		Rank 2		Rank 3		Rank 4		Total responses	Median	Rank
	No	%	No	%	No	%	No	%			
Running late	41	58.3	20	26.4	9	12.5	2	2.8	72	1	1
Overtaking	15	20.8	12	16.7	26	36.1	19	26.4	72	3	3
Nature call	2	2.8	19	26.4	14	19.4	37	51.4	72	4	4
Road surface Quality	14	19.4	21	29.2	23	31.9	14	19.4	72	2	2
Total	72		72		72		72				

As evident to the Table 7, majority of the respondent i.e. 58.30% ranked running late. As the first influencing factor for speeding and ranked one showing the median of 1. With the median of 3 and percentage of 29.20% the road surface quality was the second most important factor for influencing the drivers to speed. Similarly, 36.10% of the total respondent with the median of 3 overtaking is ranked third among four alternatives by the respondents of the study. Nature call was ranked fourth with median of 4 and considered as least influencing factor for speeding with 51.40% of respondents.

Table 8 *Opinion regarding severe causes of road accident*

Statements	Responses		Percent of Cases
	N	Percent	
Driving over the directed speed limit	43	13.60%	59.70%
Potholes, blind curve and narrow roads	49	15.50%	68.10%
Driving under the influence of alcohol	56	17.70%	77.80%
Overtaking the vehicle in the same direction	42	13.20%	58.30%
Bad weather condition	29	9.10%	40.30%
Old vehicle condition and carrying overloads	48	15.10%	66.70%
Improper driving skills	50	15.80%	69.40%
Total	317	100.00%	440.30%

As evident from the Table 8, the great majority of the total respondents with 17.70% believed that driving under the influence of alcohol was the major reason for causing severe road accidents. The respondents were aware about the severe causes of driving under the influence of alcohol. Similarly, 15.80 % of the respondents agreed the improper driving skills because severe road accidents and they believed driving skills of drivers could reduce sever road accident. Likewise, 15.50% of respondents believed that road accidents also depended

International Research Journal of MMC (IRJMMC)
Open Access
Volume 3(3) ISSN 2717-4999 (Online) 2717-4980 (Print)

on road condition such as potholes, blind curve and narrow roads which was the third major cause of road traffic accidents. Similarly, 15.10% of respondents admitted that old vehicle condition and carrying overloads caused the road traffic accidents. Similarly, 13.60 % of the respondents agreed that driving over the directed speed limit caused severe road accidents and they believed driving under the directed speed limit could reduce sever road accident. Likewise, 13.20% of respondents agreed the attempt to overtake the vehicle in the same direction leads to severe road accidents. And lastly, 9.10% of the respondents claimed that bad weather condition led to several road traffic accidents in the Kathmandu valley.

Table 9 *Survey on road accidents*

Statements	Ratings					Total responses	weighted Value	weighted Mean
	SA	A	N	DA	SDA			
I am more likely to be involved in crash if I speed.	22	20	17	5	8	72	173	2.40
It is difficult to always drive under speed limit.	7	26	13	20	6	72	208	2.89
It is okay to speed if I drive safely.	11	22	14	13	12	72	209	2.90
The potholes, and narrow road increases risk of injury.	18	30	11	7	6	72	169	2.35
A good road condition improves road safety.	23	32	8	3	6	72	153	2.13
I always preferdriving safely regardless of road condition.	15	32	8	11	6	72	177	2.46
Drinking and driving causes more sever road accident.	32	19	7	7	7	72	154	2.14

Table 9 shows that majority of the respondents agreed that the probability of being involved in road accident increased if they sped with the weightedmean of 2.40.The respondent also agreed on the fact that they found it was difficult to always drive under speed limit with the weightedmean of 2.89.Likewise, the weightedmeanof 2.90 on the other statement shows that the respondents were confident in their driving skill and believed they could drive safely even if they sped.Similarly, the potholes and narrow road increased risk of injury hadweighted mean 2.35.Similarly,majority of the respondent strongly agreed with the fact that they found good road condition to improve road safety with the weighted mean of 2.13.The weighted mean 2.46 shows that the safe driving was always promoted regardless of the road condition. Likewise, the weightedmean of 2.14 on the other statement shows that the respondents strongly agreed with the fact that drunken driving caused more sever road accidents.

Table 10 *Descriptive statistics for all samples*

Statements	N	Mean	Median	Mode	Std. Dev	Varience
I am more likely to be involved in crash if I speed	72	2.40	2	1	1.30	1.68
It is difficult to always drive under speed limit	72	2.89	3	2	1.17	1.37
It is okay to speed if I drive safely	72	2.90	3	2	1.33	1.78

The potholes, and narrow road increases risk of injury	72	2.35	2	2	1.20	1.44
A good road condition improves road safety	72	2.13	2	2	1.16	1.35
I always prefer driving safely regardless of road condition	72	2.46	2	2	1.22	1.49
I drive even if I cross the drinking limit	72	3.65	4	5	1.29	1.67
Random breath testing can reduce the number of road accident	72	2.65	2	2	1.13	1.27
I can be slightly over influence of alcohol and still be a safe driver	72	3.32	4	4	1.16	1.35
I would refuse a lift from a driver who breaks the speed limit	72	2.47	2	2	1.33	1.77
I don‘t blame the condition of road for accident	72	2.89	4	5	1.22	1.48
Drinking and driving causes more sever road accident	72	2.14	2	1	1.35	1.81

The descriptive statistics for the whole sample is depicted by Table 10. The mean regarding a good road condition improved road safety was least 2.13, followed by drinking and driving causes more sever road accident (2.14), I can be slightly over influence of alcohol and still be a safe driver (2.32), the potholes, and narrow road increased risk of injury (2.35), I am more likely to be involved in crash if I speed (2.40), I always prefer driving safely regardless of road condition (2.46), I would refuse a lift from a driver who breaks the speed limit (2.47), Random breath testing can reduce the number of road accident (2.65), It is difficult to always drive under speed limit (2.89), It is okay to speed if I drive safely (2.90), I drive even if I cross the drinking limit (3.65), I don‘t blame the condition of road for accident (3.89).

From the ranking questions, the researchers found that the major reasons for the speed driving of the respondent was running late to their destination with rank two the quality of road surface followed by overtaking and at last nature call.

It was found that the improper driving skill was the major causes of road traffic accident among other. Similarly, bad weather condition was observed to be the least cause for the accidents in the Kathmandu valley.

From the analysis of Likert scale statements, majority of the respondent strongly agreed with the fact that they found good road condition to have improved road safety. Similarly, respondents strongly disagreed they did not blame the condition of road for road accident.

4. CONCLUSION AND RECOMMENDATION

Based on data analysis through several statistical tools and through examining the determinants of road accident on a comprehensive set of characteristics the findings, it has been concluded that there was positive relation of speeding and drunk driving on road accident whereas poor road condition and improper driving skills were major causes of road accident. As per the result of ranking question, running late was ranked as the first important factor influencing to speed, road surface quality was ranked the second important factor, overtaking was ranked as the third most important factor and nature call was ranked as the least important factor i.e. rank four among all the four alternatives of factors influencing speeding. Likewise, the findings of the Likert scale provided the result that, poor road condition was perceived as the most important influential factor of road accident in the Kathmandu valley. The vehicle users were conscious about the causes of road accident and driving safely to prevent themselves from road accidents. The drivers must drive under the directed speed limit and follow the rules and regulations of government related to road safety. The ability to control the driving on the road and this quality is a must in all the vehicle drivers. They should evaluate all the factors that are affecting road accident. The behavioral factors like drunk driving should be discouraged by the drivers. It can reduce the severity of road accident. Similarly, the government should also be aware about the accidents caused through poor condition of road and should take steps for improving the road quality.

5. REFERENCES

Dhakal, K. P. (2018). Road traffic accidents in the Kathmandu Valley. *Journal of HealthPromotion, 6*, 37-44.

Elvik, R., Christensen, P., & Amundsen, A. (2004). Speed and road accidents: An evaluation of the power model. *The Institute of Transport Economics TOI)*.

Fieldwick, R., & Brown, R. J. (1987). The effect of speed limits on road casualties. *TrafficEngineering and Control, 28*, 635-640.

Gulzar, S., Yahya, F., & Zafar, R. (2012). Provincial analysis of traffic accidents in Pakistan.*Social Science and Humanities, 3*.

Harith, S. H., & Mahmud, N. (2018). Technical determinant of road accident: A systematic review. *International Journal of Engineering and Technology, 7*(3.36), 34-39.

Heinrich, W. (1980). Application of domino theory to justify and prevent accident occurance in construction sites. *IOSR Journal of mechanical and Civil Engineering(IOSR-JMCE), 6*.

Islam, M., Alam, M., &Alharthi, M. (2019). The Impact of climate change on road traffic accidents in Saudi Arabia. *climate, 7*(103), 90-103.

Jha, N., Srinivasa, D. K., Roy, G., &Jagdish, S. (2004). Epidemiological study of road traffic accident cases: A study from south India. *Indian journal of Communicity Medicine,29*(1), 20-24.

Kohli, G., Aathi, M. K., &Sethi, M. (2014). Road accidents among adolescents. research&reviews. *A Journal of Health Professions, 4*(1), 15-21.

Kouabenan, D. R., &Guyot, J. M. (2004). Study of the causes of pedestrian accidents by severity. *Journal of Psychology in Africa, 14*(1), 119-126.

Miahra, B., Sinha, N. D., Sukhla, S. K., & Sinha, A. K. (2010). Epidemiological study of road traffic accident cases from western Nepal. *Indian Journal of Community Medicine,35*(1), 115-121.

Shantajit, T., Kumar, C. R., &Zahiruddin, Q. S. (2018). Road traffic accident in India: An overview. *International Journal of Clinical and Biomedical Research, 4*(4), 36-38.

Sharma, S. M. (2016). Road traffic accidents in India. *International Journal of Advanced and Integrated Medical Sciences, 5*(12), 57-64.

Sherstha, B. K. (2013). Road traffic accidents in Kathmandu valley. *TheThird Pole: Journal ofGeography Education, 13*, 54-56.

Shrestha, V. L., Bhatta, D. N., Shrestha, K. M., GC, K. B., &Poudel, S. (2017). Factors and pattern of injuries associated with road traffic accident in hilly district of Nepal. *Journal of Biosciences and Medicines, 5*(12), 88-100.

Srinivasa Kumar, P. V., & Srinivasan, K. (2013). A study on environmental factors influrncing road traffic accident victims in district hospital, Karimnagar. *International Journal ofResearch in Health Sciences, 1*(2), 80-83.

Wangdi, C., Gurung, M. S., Duba, T., Wikinson, E., Tun, Z. M., & Tripathy, J. P. (2018). Burden, pattern and causes of road traffic accidents in Bhutan,2013-2014: Apolic record review. *International Journal of Injury and Safety Promotion, 25*(1), 65-69.

Wilde, G. J. (1980). The theory of risk homostasis: Implication for safety and health. *RiskAnalysis, 2*(4), 209-225.

World Health Organization. (2004). *Road safety - Speed.*

Yero, A. S., Ahmed, T. Y., &Hainin, M. R. (2015). Evaluation of major causes of road accidents along North-East Highway. *Journal Teknologi, 73*(4), 39-43.