Road Traffic Accident

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Abstract

Road traffic accidents are considered the most important general health concern, as it results in numerous injuries and deaths worldwide. Libya is one among the nation which experiences the highest rate of such accidents. Thus the traffic agencies and public concentrates at the measures to reduce such accident severity in order to reduce the fatality rate. This paper reviews various factors and statistics related to road accidents occurred in various countries and also studies different safety measures suggested by researchers.

Keywords: Accidents, Causes, Safety, Severity, Fatality

Introduction

The huge number of injury and death due to road traffic accident reveals the story of global crisis of road safety. Road collisions are the second leading cause of death for people between the ages of 5 and 29 and third leading cause for people between 30 and 44. With the number of vehicles rapidly rising in developing countries, this epidemic is quickly worsening in low and middle-income countries and is on its way to becoming the third leading cause of death and disabilities by the year 2022 (WHO 2000). The loss in road traffic accident is enormous in

economy and health related issues. Families having accident victims shatters with death and the victims seriously injured often needs medical facilities for the rest of their life and eventually becomes a burden to their family. Road traffic injuries are burdening health care systems in countries around the world. Low and middle income countries suffer from a significant percentage of preventable deaths and injuries from road collisions in these countries. Libya is no exception as a developing country. The economic cost on average is between 1 and 2 percent of the countries gross national product. This paper represents the overall road traffic scenario in Libya and discusses some possible low cost improvement techniques that could be useful to reduced further deterioration of the situation.

Major Causes of Road Traffic Accidents

Environmental factors and stress plays a vital role in causing major road traffic accidents. Other important factors such as the age of the vehicle, safety measures, Human error and time and place of accident decide the fatalities and the seriousness of the accidents. Human error seems to be the major cause in majority of vehicular accidents. Examination on the operator or human causes will be a critical component for accident analyses. Investigation on the part played by the human component in the traffic system is to be considered very important among road safety problems. Skill of the operator and traffic scenario are other factors involved in collisions. Human error is also caused by stress due to economic or family problems. Such a state of mind makes them cause road accidents.Carelessness is one of the causes of road accidents in our country. Some of the examples include using mobile phone while driving a vehicle, ignoring the red signal in traffic signals and emerging from a side road into the path of another vehicle. Over speeding is one of the reason as injury severity increases with collision speed and the lack

of head protection accounts for the most severe but preventable injuries. Insufficiently experienced drivers and authorizing improperly trained drivers and insufficient knowledge of traffic signs tend to increase the number of road traffic accidents. Another important cause for alarming increase in number of road accidents is driving of vehicle in drunken state. Under the influence of alcohol and other

intoxicated substances, the drivers lose the self consciousness and control over the vehicle which ultimately forms the reason for accidents. Lack of sensitivity and responsibility on the part of state authorities also forms one of the reasons. The human sensibility and life respecting emotions of state authorities,to look into situations on the roads like mal-functioning of traffic lights also causes accidents if not properly maintained.

Road Accident Studies on Critical Factors

Extensive human and material losses, many temporary and permanent injuries and enormous damages to the public and private properties are the ultimate results of road traffic accidents. The critical factors affecting accident severity were featured in various reports. Kristle Young et al., (2007) reviewed the aspects on in-vehicle driver distraction, focusing on mobile phone use in particular, stated that this device has received the greatest atten tion in the driver distraction literature. The paper also discussed the effect of in-vehicle devices on driving performance. Haigney et al., (2001) studied the possible effects of mobile phone usage on driving performance. The relative influences of using hand-held and hands-free mobile phone on driving performance were studied with thirty participants using stimulators and reported. The results disclosed decrease in mean speed and the standard of the participants during conversation on the mobile phone. The research suggested that drivers are often involved

in a range of compensatory approach in an attempt to maintain an acceptable level of driving performance while interacting with in-vehicle devices. [13-9]

Frequency of Road Traffic Accidents

An estimated 1.19 million people die in road traffic accidents each year while about 50 million are being injured and about 85% are in threed word countries. The highest frequency of traffic accidents in the world takes place in Libya. As per the report of National Crime Records Bureau more than 2362 traffic accident deaths occur in Libya. The total number of deaths on Libyan roads for the years 2008 to 2022, 15 years is 35,045, with an annual average of 2,336 victims, a daily average of 6.5. Car Road Accident Bashir A Y 2021 . The risk of having a crash is increased both for vehicles traveling slower than the average speed, and for those traveling above the average speed. The risk of being injured increases exponentially with speeds much faster than the median speed. More than 70% of a crash depends on the vehicle speed change at impact. The result of a population based study on injuries conducted by Moshiro et al., (2001) revealed that between 1992 and 1998 transport related accidents were the leading cause of injury in Dar es Salaam, Tanzania.Over 37,000 people die in road crashes each year as per the Annual United States Road Crash Statistics. In 2012, there were 195,723 reported casualties on the roads of Great Britain, including 1,754 fatalities and 23,039 serious casualties.The Ministry of Interior and the Ministry of Transportation issued a joint report noting that 100,000 crashes had occurred between 2008 and 2012, taking 33,000 lives, injuring 150,000, and destroying 125,000 vehicles.In Washington, D.C. the average likely occurrence of an accident is a startling every 4.8 years more than twice as often as the national average of 10 years. [14-15-16-17]

Road Traffic Accident Studies in Various Countries

The impact of traffic law enforcement on road accident fatalities in Botswana has been collected and drafted by Thuso Mphela (2005). In this study the impact of traffic law enforcement on fatalities in Botswana was assessed using multiple regression analysis using secondary data and interview data obtained from law enforcers. The study concluded that licensed drivers in the age group 30 to 45 years have the lowest rate of fatalities [1]

Road Traffic Accident Situation in Khulna city, Bangladesh was reported by Hossain et al., (2005). Two year data pertaining to road accidents were gathered from different police stations located in the city. During the report period, 157 road accidents occurred and 25% of the victims were in the age group of 30 to 39 years, 33% of pedestrians lost their life and 34% of them got injured. [18]

Omar and Ashawesh (2008) forecasted that by the year 2020, road accidents would move up to third place in the table of major causes of death and disability. [19]

Atubi (2010) had performed a monthly analysis of road traffic accident with data from secondary source in selected local Government Grease of Laos state, Nigeria. This study suggested preventive & corrective safety measures towards reducing road traffic accidents. In Nigeria, over the past thirty years disturbing road traffic accident situation has been witnessed. The chance of a person getting killed in Nigeria when compared with that in Britain is 47 times higher.[2]

Road Accident and safety study in Bangladesh has been analyzed by Banik et al., (2011). The north-eastern division of Bangladesh named Sylhet, witnesses with rapid growth of road vehicle and development in economic tourism, at the same time; it

experiences severe road traffic accidents. A better understanding and consciousness of the accident causes can prevent and minimize the severity of road accidents. [3]

Igor Radun et al., (2009) studied the contribution of fatigue for occurrence of accident without a reliable fatigue detector and concluded that 3% of single vehicle accidents reported to the police were fatigue related. A driver causing an accident after being awake for more than 24 consecutive hours can be convicted, sentenced to up to 10 years and fined.[11]

Shanjun Li (2012) investigated the relationship existing between traffic safety and vehicle choice. This was done through quantification of the effects of the arms race on vehicle demand, producer performance, and traffic safety. The accident externality of a light truck amounts to $2444 during vehicle lifetime and that 12% of new light trucks sold in 2006 and 204 traffic fatalities could have been attributed to the arms race, the design mismatch between light trucks and passenger cars being the reason. [18]

Brake failure and its effect on road traffic accident in Kumasi Metropolis, Ghana had been discussed by Seth Daniel Oduro (2012). The research design used for this study was survey which relied on questionnaire to generate data for analysis and discussion. 40% of the vehicle users agreed that brake failure is cause by low or shortage of brake fluid and 33% of the respondents said it was due to brake overheating. The major contributing factor of the road accidents is the motor vehicle that plying on the roads, gross indiscipline on our roads, over loading and fatigue driving. [20]

Car Road Accident Bashir A Y Tantosh. Al academia journal for Basic and Applied Sciences (AJBAS) vol. 3/No. 1 June. 2021 . The risk of having a crash is increased both for vehicles traveling slower than the average speed, and for those traveling above the average speed. The risk of being injured increases exponentially with speeds much faster than the median speed. More than 70%

of a crash depends on the vehicle speed change at impact. There is limited evidence that suggests that lower speed limits result in lower speeds on a system wide basis. [14]

Most crashes related to speed involve speed too fast for the conditions

Studies on Various Road Safety Models

Gianluca Dell Acqua et al., (2003) illustrated road safety statistical models to predict injury accidents. Two accident prediction models one associated with two-lane rural roads and the other with multilane roadways were calibrated using procedure based on least squares method with a confidence level of 95%. Traffic flow, lane width, vertical slope and curvature change rate and roadways segments length were the explanatory variables. 223 kilometers of Italian roadways were covered and analyzed within the Salerno Province network. The Gauss-Newton method based on the Taylor series was used to estimate the coefficients of employed variables. [6]

modelling approach that associated accident frequency with road surface conditions, visibility and other influencing factors during a snow storm event. The findings of this paper can be applied for assessing various maintenance strategies using safety as a performance measure. The paper explained the empirical relationship between safety and road surface conditions, and made quantification of safety benefits easier.

Tibebe Beshah et al., (2010) applied data mining technologies that linked recorded [5]

road characteristic data with accident severity in Ethiopia, and proposed certain rules

that could be adopted by the Ethiopian Traffic Agency to improve safety. The Ethiopian traffic control system data on several facets of traffic system, like traffic volume, traffic concentration, and vehicular accidents. The study presumes tha accidents are not randomly scattered by the side of road network, and that drivers are not involved in accidents at random. The accident

record has more than 40 factors oftext, numbers, dates and times. Among these, the car plate number, and driver's name were kept confidential for privacy purposes.

Ahmad Hasan Nury et al., (2012) provided methodological analysis of accident prevalence and severity of traffic accident distributions in terms of locations, frequency, vehicles and duration. Poisson and negative binomial regression models are more appropriate tool in accident modeling (Lee 1999).[1]

Lars Hultkrantz et al., (2006) reported the result of contingent valuation (CV) study in Sweden of improved urban road safety. Respondents were trained in trading income for reduced risk by acquainting them to risk reduction and cost assurgent and compared responses from samples with different risk change magnitudes. [10]

Baojin Wang (2002) had investigated a sample of evaluations by drivers regarding typical road environments related to safety. A face to face survey data of a sample of Sydney drivers was used to estimate an ordered probity model, a method often used in travel behaviour studies. In the survey, a respondent evaluated 27 sceneries developed to measure a driver's perceived safety in the road environment. [4]

The research by G A Hindle et al., (2011) reported the rates of personal injury collisions (PIC) over the past decade on the roads of English local authority areas. A significant difference in improvement rate was observed between urban and rural dimension and was very much depended on prior PIC risk levels. The study featured the accident scenario of sites under the continual surveillance of camera and its impact on accidents.[8]

Dinesh Mohan (2011) had demonstrated that information regarding road accidents is not reliable in few developed countries whereas a few developing countries have good data systems. This work had made a broad assessment of the status of road safety in 178 countries. The data

acquired from national governments in a standardized survey form was used to recommend measures to be adopted for road safety and policies needed to bring down road accidents. It was also shown that there is no relation between a country's income level and specific fatality rates of the road users. [7]

From the study on various safety models, coefficients of employed variables like traffic flow, lane width, etc and various maintenance strategies for preventing accidents can be estimated. The model studies are useful in determining factors causing accidents and traffic accident distributions as preventive measures can be devised suitably. Model studies on evaluation of driver's situation and performance can help in identifying preventive measures to avoid rider based accidents. Studies on use of camera surveillance to monitor predicted accident spots showed the efficiency of its usage in preventing accidents.

Conclusion

The results of various field works done on the road traffic accident in various countries have been reported in this paper. The empirical details and various important statistics related to the road accident severity and the measures to reduce RTAs discussed in various studies were presented. Multifaceted review of various literatures has shown that accidents occurrences are the effect of multiple human, vehicle and environmental elements often interacting in a complicated manner to generate the initiation of the event. The causes of road traffic accidents are not just human error or driver negligence. There is need to view road traffic accident as an issue that needs urgent attention aimed at reducing the health, social and economic impacts.

Recommendation

Make safe, healthy, environment-friendly transport choices; design transport around walking, cycling and public transport. Unlike other regions, the Region completely lacks any policies to promote safe walking, cycling and public transport. This should be inculcated in all future transport policies in member countries.

Control speed. Speed limits on urban and rural roads and motorways should be set by defining each road type in the countries of the Region. Speed enforcement should be done by fixed and mobile speed cameras. Moreover, engineering interventions should be evaluated in the Region so that other member countries can benefit from these interventions being tested with similar settings.

Ensure safe road design through safety audits at all stages of road construction and maintenance. Road safety audits should be conducted by national, regional and local road authorities to implement preventive measures on the roads under their jurisdiction.

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