Analysis of Factors that Effects Road Traffic Accidents in Muscat City

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ABSTRACT

Traffic accidents are such random and complex events in severity and occurrence that are influenced by many factors such as road conditions and environmental, physical, and mental of road users, and vehicles. The Sultanate of Oman endures many accidents that occur usually in our daily lives. Many lives have been lost as a result of accidents, due to many reasons the most common are; neglected people who need more awareness to understand the meaning of danger, the failure to maintain vehicles on time, and maintain roads, etc., thus this study is being conducted to reduce them. Different cases of accidents that occurred in recent years, the most common to evaluate road accidents in Oman, and identify variables impacting road traffic accidents in Muscat city, by assessing road safety measures implemented by local governments, to prevent road accidents, providing a set of recommendations for reducing traffic accidents and improve car driver performance, therefore, the research was conducted to determine whether more can be done to reduce traffic accidents in this industry. In order to achieve the research aims set out, this research project engages in a review of existing literature, before assessing the outcomes and conclusions of primary research using thematic analysis for interviews, and a questionnaire analysis program (IBM SPSS) to meet the research goals stated. The primary research will be conducted through a variety of virtual interviews with professionals from a variety of police station areas, the ministry in the transportation department within the Oman traffic industry, the traffic safety institute, and a survey questionnaire conducted to drivers, to determine the factors influencing road accidents in Muscat in order to achieve lower accidents. Overall, this research aimed to determine whether more can be done in the industry to reduce traffic accidents and potential enhancements for vehicle drivers that are likely to aid in this process. On balance, road accidents have a lot of factors required to meet. Therefore, this project will underline that there is significant room for improvement in accident factors within the Omani traffic industry.

Introduction

Road traffic accidents, commonly referred to as motor vehicle accidents or car accidents, are occurrences involving the usage of a motor vehicle that causes at least one person to sustain injuries or pass away. They pose a serious risk to people's health and safety since they are a major source of accidents and fatalities across the world (WHO,2022). Road accidents are a leading cause of injuries deaths and disabilities traffic accidents can be expressed as events or accidents like a car accident, vehicle collision, vehicle crash, pedestrian, road debris, animal, or other obstruction like a pole, building, etc. It has increased by almost 300% in Oman since 1985. An element of speeding was reported in all crashes since 1992. Road traffic accidents (RTCs) are the main external causes of morbidity and directly affect economic and health resources (AL-Risi,et al., 2013). A significant part of the incidents in the period from 2008 to 2018 was carried out by factors such as recklessness and an outrageous approach to acting. After the outbreak, end, and repercussions of the COVID-19 pandemic, the degree of this has been observed, and become limited and a start-to-finish survey with massive RTA facts is proposed for extra studies and model new improvement. To manage or solve road traffic accidents, it is also necessary to classify them based on traffic variables such as accident type, lighting condition, road type, driver, and road characteristics.

Literature Review

Around 1.5 million people consistently lose their lives in a busy time gridlock-related disaster. RTA has grown to be one of the huge features within side the again of setback specifically a number of the provider demography of society, more than 70% of the RTA setbacks are from the low to popularity pay worldwide places which make RTA a scary scenario of social and economic thriving of a country (MoH, 2019). According to Al-Maniri et al. (2013), from 1995 to 2009, a numerical study on statistics of traffic deaths in Oman found that total mortality grew by about 50% for those aged 26–50 years, men, Omani nationals, and drivers had a considerable rise in the number of fatalities and mortality rates. Referring to Ramana et al. (2018), identified the causes of accidents in Oman to improve traffic safety. The running speeds of cars on designated roadways in heavy traffic and normal traffic were collected to validate the theory. The outcomes where the field studies verify the hypothesized notion that 22high vehicle speed is a major contributory cause of RTA.

Másilková (2017) investigated strength and societal implications of road accidents. Recorded documents analysis was the preferred data processing system found that vehicle accidents result in a high number of fatal disabilities and are unnaturally mirrored in the social sphere. The expenses of traffic accidents are shared by the entire society. Although the Czech Republic gives financial, medical, and social assistance to families of traffic accident victims, other EU nations provide substantially less options through social allowances and measures. Morency et al. (2012) investigated the amount to which overall traffic and road data could represent socioeconomic disparities in pedestrian behavior, bicycle, and passenger car injuries in rich and poor areas. At corners in the poorest and richest parts of a major civic area of Montreal, Canada, there were many more wounded climbers, cyclists, and automobile passengers, traffic volume, junction data, and rambler and cycling levels are considered, the incident rate between corners in the poorest and richest areas were significantly reduced. A pricing of health research in Barcelona was undertaken by Garcia-Altes and Perez (2007) utilizing a frequency approximation, a social and healthcare system viewpoint, and a 1-time perspective. Property damage, insurance administration charges, and sanitarium costs accounted for 329 million (89.8 percent of total expenditures). The expenditures of police, emergency services, and transportation had little impact on overall direct costs. In 2003, results were measured in euros. According to the results of the receptivity analysis, the total lucrative cost of accidents in Barcelona is 782 million. Therefore, the idea of the composition is to estimate the overall profitable costs of road traffic.

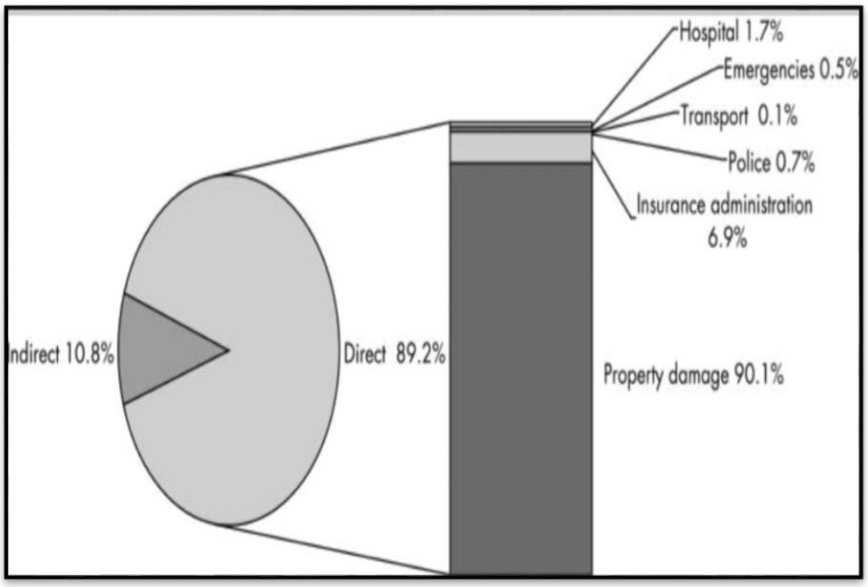

Figure 1. Distribution costs of road traffic in Barcelona (Garcia-Altes & Perez, 2007)

Methodology

This study included a combination of quantitative and qualitative data (mixed method approach) where there were two methodologies investigated: qualitative and quantitative. Qualitative research allows the researcher to examine underlying causes and motives, whereas quantitative research focuses on identifying and categorizing aspects to develop statistical models (Thomas, 2003). Mixed methods studies combine quantitative and qualitative approaches to research to give a greater understanding of challenges and complicated processes. According to Creswell (2008), the general goal and basic premise of mixed methods studies are that combining quantitative and qualitative approaches gives a better understanding of research challenges and complex processes. The qualitative approach in this design dealt with interviews, three interviews were performed with experts to acquire more accurate data, which took place with the Royal Oman Police, Traffic Safety Institute, and the Ministry of Transportation to monitor accidents and analyzed them using the constant comparative method. The quantitative data included Secondary data related to accidents from 2009 to 2021 and surveys issued to 131 vehicle drivers, with the use of the Statistical Package for the Social Sciences (SPSS) application to access the results of the questionnaires. The research results were analyzed and assessed based on qualitative and quantitative approaches, and the results were analyzed using the triangle technique. According to Flandorfer and Wegner (2011), the triangulation technique integrates qualitative and quantitative methodologies and complements the results to give a comprehensive perspective of the topic under analysis.

Results and Discussion

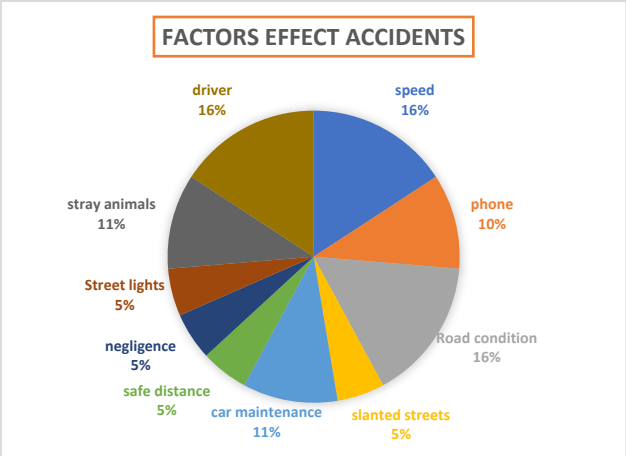

Figure 2. Factors effects accidents by the interview respondents

In the qualitative "interviews", the most influences that obtained high percentages: are speed, the driver, road conditions, use of the telephone, followed car maintenance, and stray animals.

Table 1. Relationship between driving experience and point system

Driving experience * Point system Crosstabulation							
Count							
		Point system					
		Agree	Disagree	Neutral	Strongly Agree	Strongly Disagree	Total
Driving experience	1-5 years	22	0	18	28	3	71
	6 -12 years	8	3	7	23	0	41
	More than 12 years	5	0	3	10	1	19
Total		35	3	28	61	4	131

The association between one of the safety measures, which is the point system, and the number of years of driving experience was shown in the table above. The findings revealed that most participants across the whole driving experience scored highest at “strongly agreed” and lowest at “disagree”. The results indicated that the point system is well implemented because most drivers enthusiastically supported this safety measure.

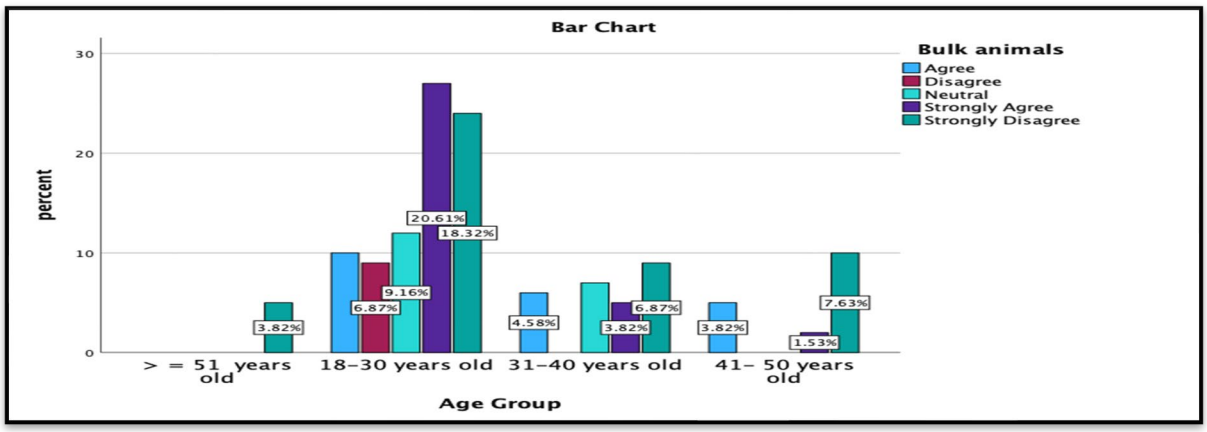

Figure 3. Relationship between age group and Bulk animals

The bar graph displays the scale relationship between the age group and the component that influences accidents, which is bulk or stray animals. The age group (18-30) years was the group that had the highest level of support and response to the problem of stray animals. Most of the factors that contribute to accidents have been located. First, in the qualitative “interviews”, the most influences that obtained high percentages: are speed, the driver, road conditions, use of the telephone, followed car maintenance, and stray animals. In terms of the questionnaires, the results that obtained a higher percentage of acceptance in the response are speed, child seats, education cars, streetlights, age of the driver, and disrespect for pedestrians. The common element among them is speed, which is an influence that the driver controls, where most of the findings of all the quantitative and qualitative indicators suggested that the driver is the source of the influencing variables then comes the other influences.

The measures that had a significant influence and those that needed to be increased were discovered via the findings, in order to perform them more effectively. The following measures were identified as having a significant impact through both the questionnaire and the interviews: measures taken at speed, such as installing speed control devices; road movement; driver violations, such as not wearing seat belts; road repairs; flags; all measures in all Transportation; and the points system. However, certain viewpoints about the questionnaire and the interview were divergent. According to those interviewed, one of the initiatives is defensive driving, which it continues to work on to better deploy it, depending on the driver, and the simulation method which will be used shortly to test drive the vehicle which is mentioned in According to the questionnaire, the low measures were speed signs, while some of the ostensible measures, such as excluding people who wear spectacles for driving at night and the safety measure of annual checkups every six months for those over 56, were unacceptable big. On the other hand, some people's opinions were neutral regarding some safety measures, which in my opinion must be worked on more, such as raising public awareness of traffic accidents, enforcing applicable rules and regulations, and enacting fines and deterrent violations for lawbreakers.

Conclusion

Both the survey questionnaire and the interviews revealed three important themes: elements affecting traffic accidents, safety measures put in place, and suggestions to lessen accidents and encourage better driving habits. Most of the factors contributing to accidents have been located and the recommendations were set accordingly.

All in all, qualitative and quantitative data are important in research; together, they can be used to provide a fuller understanding of a phenomenon.

Recommendation

- Installing solar-powered lighting around Muscat will help prevent accidents since even if one does, the damage will be minimized. Solar lighting will also be useful in case of power outages and bad weather.
- Increasing petrol stations on the highway to reduce accident damage and congestion.
- Develop a program to help people who have been involved in an accident, whether on the street or in the desert
- Increasing a line in public streets, and highways to reduce congestion and accidents.
- Permeable concrete can be used in constructing roads to prevent the spread of water to a greater level.
- In the absence of lighting, the white and yellow lines on the road can be made as reflective lines.
- Implementing a special school for driving without the need to train on the road in order to reduce accidents.
- Increasing exits on public roads and highways and placing signs to reduce the speed at each exit.
- Raising awareness for final-year students in schools to educate them about the dangers of accidents.

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