

Towards Reducing the Number of Traffic Accidents in Khartoum State (Republic of Sudan)

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Abstract: The problem of traffic accidents is one of the important problems, serious and common among all countries of the world, especially developing countries. In this study it was to identify the causes of traffic accidents in Khartoum state and ways to minimize them, and has been the identification of dangerous locations where accidents abound within the state according to the annual report of the traffic accidents and violations, issued by the General Directorate of Traffic, and it has been monitoring the speeds of sites where repeated traffic accidents on them, has also been the performance of some elements of traffic safety of this roads. The researcher designing and distributing a questionnaire to get feedback from different segments of society about what are the causes of traffic accidents and what are the most successful ways to reduce them and see how the application of traffic safety in the state of Khartoum, and the questionnaire were analyzed using statistical analysis software SPSS. The study found suggestions of possible solutions to improve traffic safety level of roads in the state of Khartoum.

Keywords: Traffic accidents, Roads, Traffic safety

I. Introduction

Over 1.2 million people die each year on the world's roads, with millions more sustaining serious injuries and living with long-term adverse health consequences. Globally, road traffic crashes are a leading cause of death among young people, and the main cause of death among those aged 15–29 years (Fig. 1) [1]. Road traffic injuries are currently estimated to be the ninth leading cause of death across all age groups globally, and are predicted to become the seventh leading cause of death by 2030 .This rise is driven by the escalating death toll on roads in low- and middle-income countries – particularly in emerging economies where urbanization and motorization accompany rapid economic growth. In many of these countries, necessary infrastructural developments, policy changes and levels of enforcement have not kept pace with vehicle use. In contrast, many high-income countries have managed to break the link between rising motorization and road traffic deaths, with some managing to dramatically reduce such deaths. These achievements are the result of making infrastructure safer, improving the safety of vehicles, and implementing a number of other interventions known to be effective at reducing road traffic injuries. Having good quality data to monitor the impact of these efforts is also critical to demonstrating their success [1]. In addition to deaths on the roads, up to 50 million people incur nonfatal injuries each year as a result of road traffic crashes, while there are additional indirect health consequences that are associated with this growing epidemic. As vehicle ownership grows, many countries face the twin problems of traffic congestion and rising vehicle tailpipe emissions, resulting in higher rates of respiratory illness. Rising car ownership has also resulted in reduced physical activities such as walking and cycling, with associated health consequences [1].

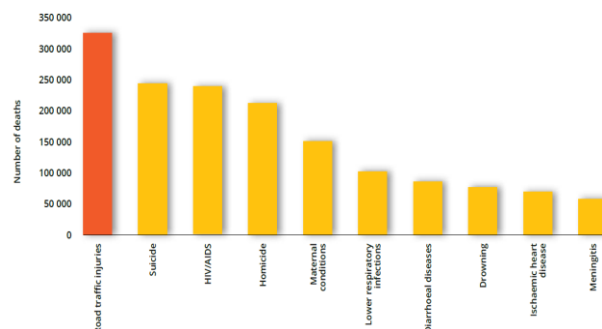


Fig. 1: Top ten causes of death among people aged 15–29 years, 2012

The risk of dying as a result of a road traffic injury is highest in the African Region and lowest in the European Region (Fig. 2). Nonetheless, there are significant disparities in road traffic fatality rates between countries in the same region, with the European Region showing the greatest differences [2].

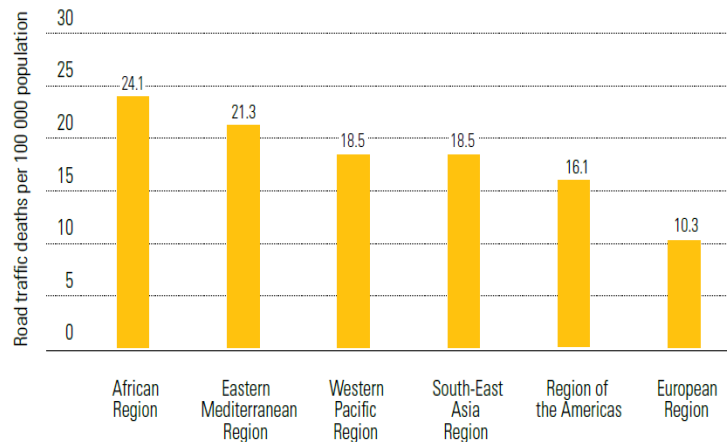


Fig. 2: Road traffic deaths per 100 000 population, by WHO region

Half of the world’s road traffic deaths occur among pedestrians (22%), bicyclists (5%) and motorcyclists (23%) – i.e. “vulnerable road users”. However, there are significant differences regarding who is most at risk by country income status and by region. In the African Region, where walking and bicycling are important forms of mobility, a high proportion of deaths (38%) occur among pedestrians. In contrast, in many Western Pacific countries where motorcycles are used frequently, 36% of road traffic deaths are among motorized two- and three-wheelers [2]. Since the society in Sudan - Khartoum state is suffering like all other societies of the problem of high rates of road accidents and the resulting incidents of human and economic losses. And it became traffic accidents represent a most significant issues and problems faced by the residents of the state of Khartoum. The state of Khartoum occupied the highest level of Sudan for road accidents; the rate of accidents has reached to about 53.9% of which occurs in all states of Sudan [3 - 6]. From Fig. 3 it is clear that the year 2010 has the highest percentage of deaths due to traffic accidents since the year 2010 to 2014 began a number of death accidents continues to drop.

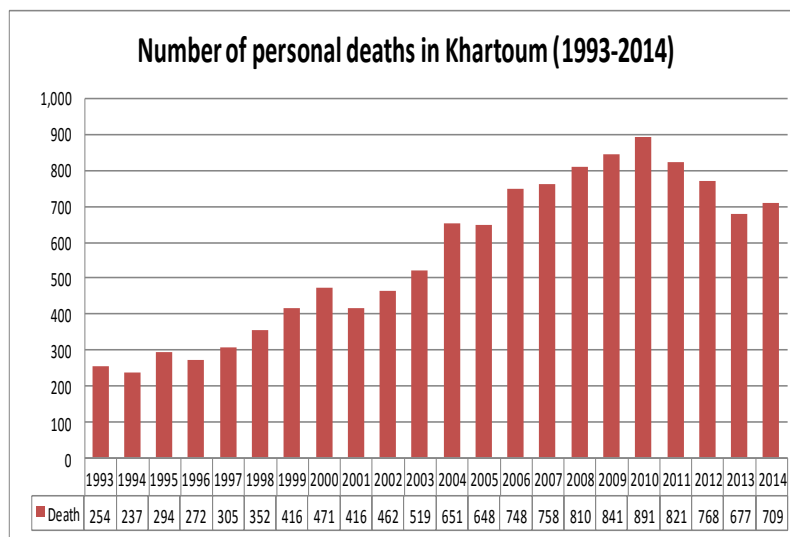


Fig. 3: A number of personal deaths in Khartoum state (1993-2014)

II. Research Objectives

The main objectives of this research are summarized on the followings points:

- Identify the causes of traffic accidents the state of Khartoum - Sudan.
- The extent of the traffic safety application on both the vehicle and the road and road users.
- What are the most successful ways to reduce the number of traffic accidents in Khartoum state

III. methodology of the study

The methodology of this research relied on two aspects, the first theoretical side and the other is the practical side, the theoretical side includes the collection of information and theoretical data from various global reports related to traffic accidents, but the practical side has relied on the distribution and analysis of questionnaires to a selected sample of the various sectors of the Sudanese society in the state of Khartoum.

Axes of questionnaire questions:

- Personal Information
- Cause of traffic accident
- Application of traffic safety – Vehicle
- Application of traffic safety – Road
- The behavior of road user
- Deferent questions

IV. discussion of the results

• Section I: Personal data

The questionnaire results of section I (includes personal information such as Gender, Age, Marital Status, Educational level, own a vehicle, have availed driver's license, have been a traffic accident, were showed in the Fig.4, Fig.5, Fig.6, Fig.7, Fig.8, Fig.9 & Fig.10. A percentage of 91% of the targeted sample were male, while 9% of the sample were female have shown in Fig.4. Fig.5 shows, the percentage of 54 % of the targeted sample were age between (30 to 40), 28% between (20 to 30), 11% between (40 to 50), 07% more than 50 year, Fig.6 shows, a percentage 57 % of the targeted sample is married, 43% of them is not married. Fig.7 shows, a percentage of 73 % of targeted sample is graduate studies level, 15 % post graduate and 12% secondary studies level. Fig.8 shows, a percentage of 66 % of targeted sample is own a vehicle, 34% don't have a vehicle. Fig.9 shows, a percentage of 93 % of targeted sample is have availed driver's license, 07% don't have an availed driver's license. Fig.10 shows, a percentage of 42 % of targeted sample is have been a traffic accident, 58% don't have been ever a traffic accident.

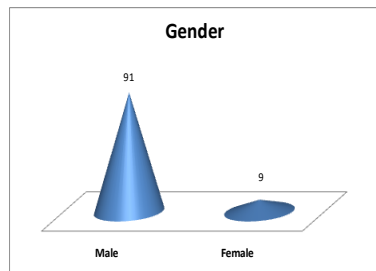


Fig. 4: Personal information (gender)

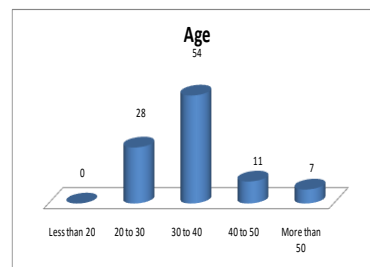


Fig. 5: Personal information (Age)

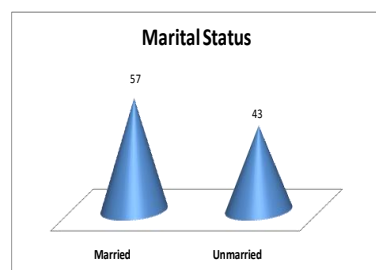


Fig. 6: Personal information (Marital Status)

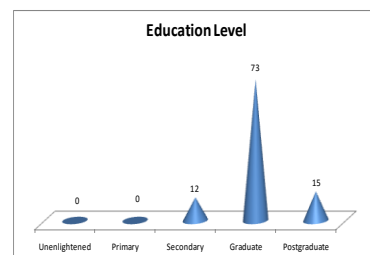


Fig. 7: Personal information (Education Level)

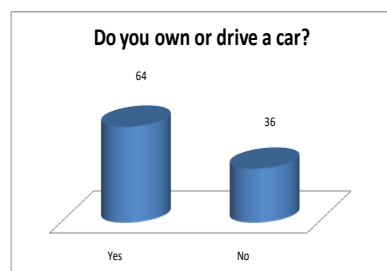


Fig. 8: Personal information (Owning a vehicle)

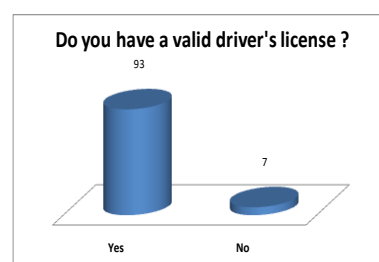


Fig. 9: Personal information (driver's license)



Fig. 10: Personal information (traffic accident)

• **Section II: Causes of traffic accidents**

The questionnaire results of section II (includes the Causes of traffic accidents), were showed in the Fig.11. We find A percentage of 100 % of the targeted sample were unanimous that it is a major cause of traffic accidents is Driving under the influence of alcohol and drugs, Driving with fatigue or drowsiness or disease, Reckless driving. A percentage of 95 % for Lack of respect for traffic signals and traffic rules, 90% for Driving during the rain and strong winds, 89% for Driving too fast, 88% for Wrong overtaking.

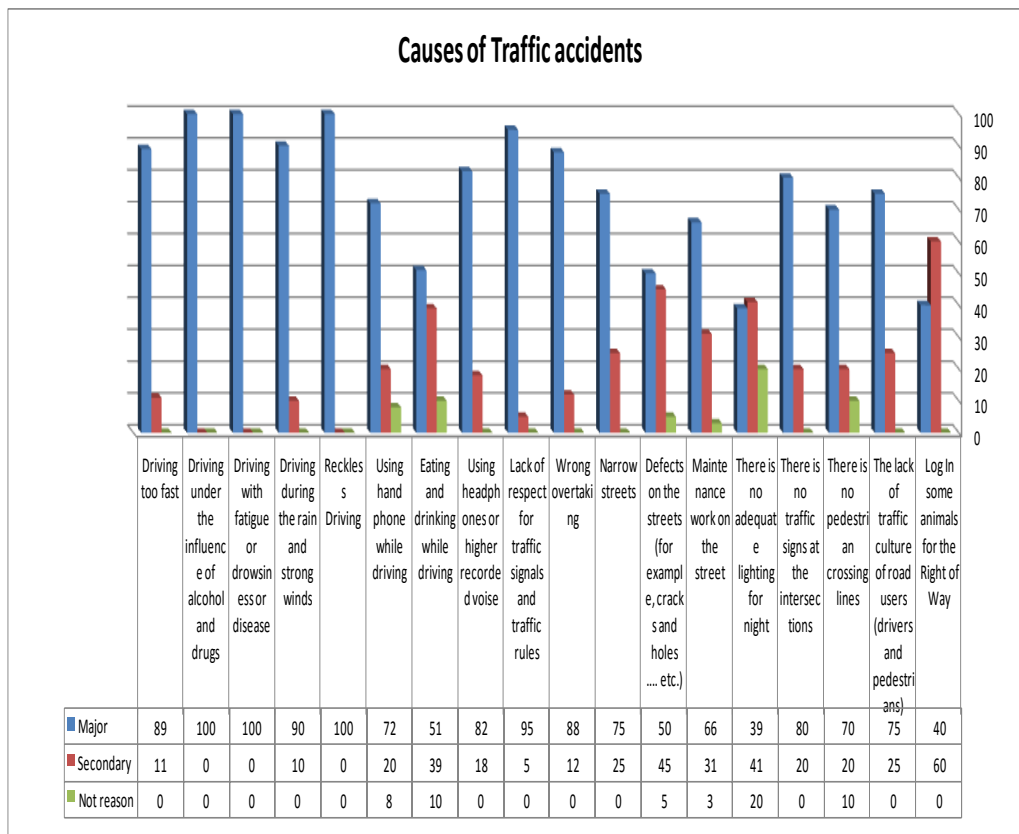


Fig.11: Causes of Traffic Accidents

• **Section III: Application of traffic safety – Vehicle**

The questionnaire results of section III (includes the Application of traffic safety – Vehicle), were showed in the Fig.12. We found a percentage of 100 % of the targeted sample they have a Seat belt, Brakes and the handbrake work well, Mirrors (right, left, and center), Spare wheel and Hag and the key wheel. A percentage of 97 % they have Interior door locks, 95 % they have Signals (right, left, huzer, long, short), 95 % they have Internal indicators (for fuel, heat, oil, speedometer, etc.). we also find that 100% of the targeted sample they don't have Fire-resistant mattresses, Door locking systems in the case of the coup, 98% they don't have Child seats, 97% they don't have hand lamp (Flashlight), 95% they don't have Airbags.

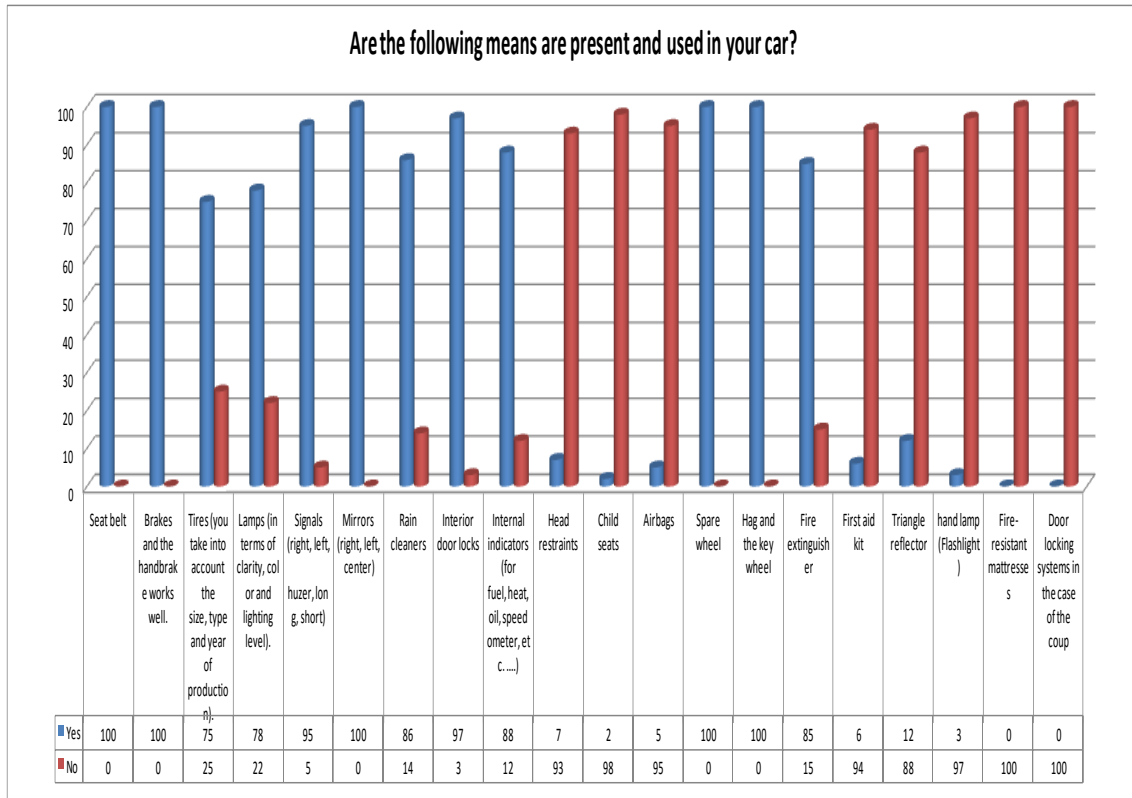


Fig.12: Application of traffic safety – Vehicle

• Section IV: Application of traffic safety – Road

The questionnaire results of section IV (includes the Application of traffic safety – Road), were showed in the Fig.13. We find a percentage of 100 % of the targeted sample they say that these items are not available; Right of Way enough for future expansion, There are lines crossing for pedestrians at intersections. 95% they say there are no side protection bars in sharp curves, there are no roundabout and it's bad designed, bad roads and is defective holes and cracks and other. 90% they say the Number of traffic lanes is not enough to traffic in coming and going.

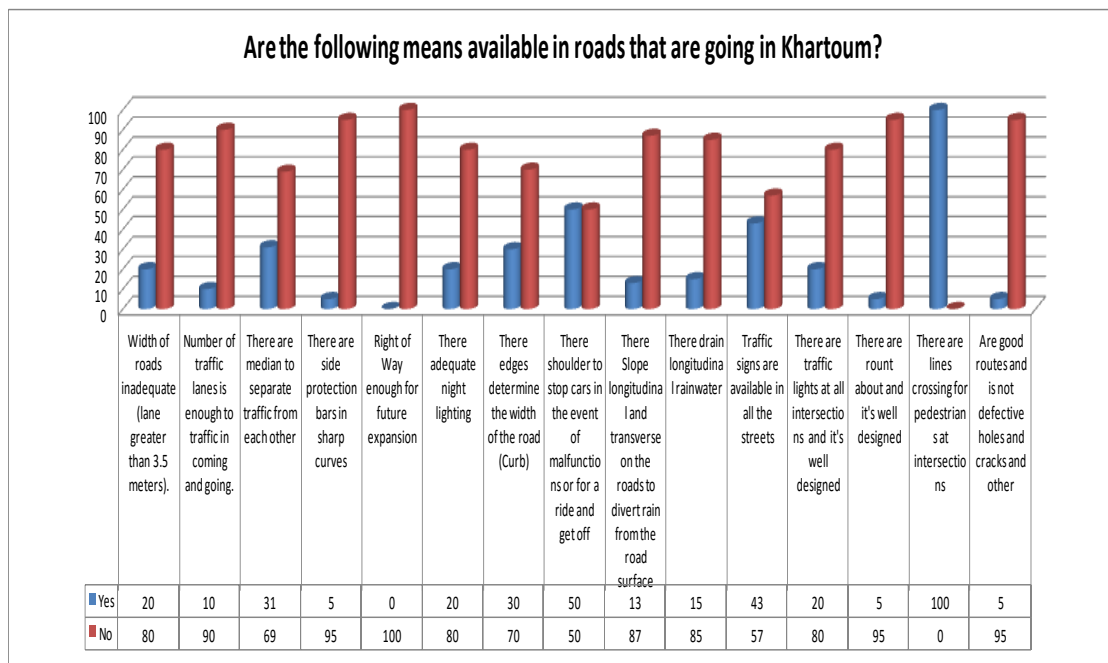


Fig.13: Application of traffic safety – Road

• **Section V: The behavior of road user**

The questionnaire results of section V (includes the behavior of road user), were showed in the Fig.14. We find a percentage of 100 % of the targeted sample they say I never interfere with car safety equipment, I check before reversing, will be attentive at intersections and I gave the incorrect signals when changing direction. We also find that 99% of the targeted sample they say not turn off vehicle engine and mobile when refueling.90% of the targeted sample they talking by mobile while driving.

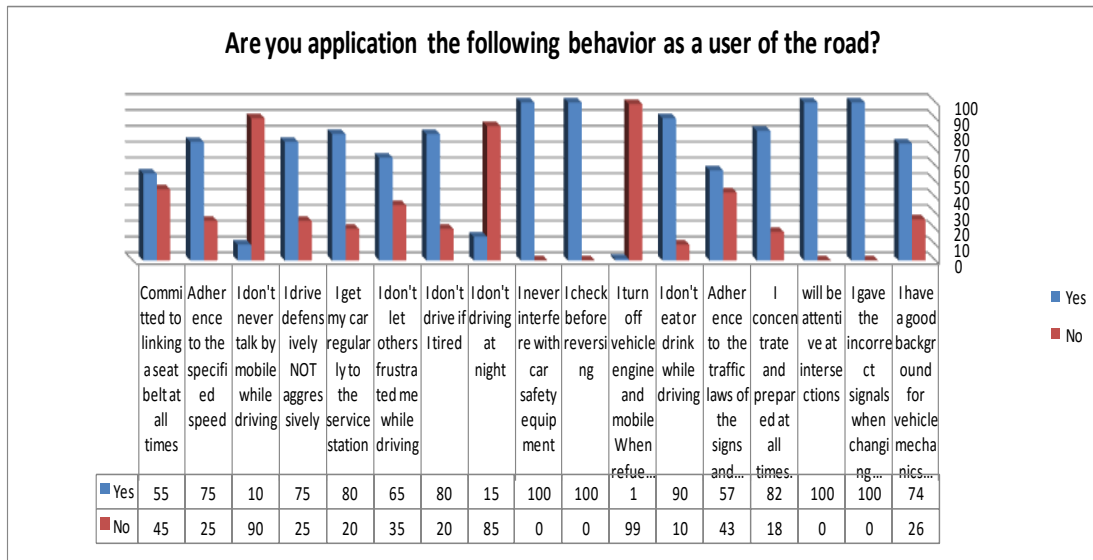


Fig.14: The behavior of road user

• **Section VI: Deferent questions**

The questionnaire results of section VI (includes what is the punishment that supports and believes it helps to apply traffic safety? Who is responsible for the application of traffic safety?, What are the best methods to control traffic?, What is a technique that supports to increase traffic awareness?, Is there an indulgence in the extraction and renewal of driving licenses?, Do you look at the traffic law for 2010?, Do you agree that the retirement age for the age pension is the withdrawal of driving license and Are you interested in traffic safety on the roads), were showed in the Fig.15, Fig.16, Fig.17, Fig.18, Fig.19, Fig.20 Fig.21and Fig.22.

We found a percentage of 72 % of the targeted sample they supports punishment by increase financial fine. 100% of the targeted sample they say the application of traffic safety responsible for Traffic police, Vehicle driver and Road Engineering. 100% they say the best methods to control traffic are Surveillance Cameras, Radar and The spread of policemen. 52% they say the technique that supports to increase traffic awareness is TV and radio programs. 77% they say there is an indulgence in the extraction and renewal of driving licenses. 92% don't look at the traffic law for 2010. 98% they agree that the retirement age for the age pension is the withdrawal of driving license. 100% of the targeted sample they interested in traffic safety on the roads.

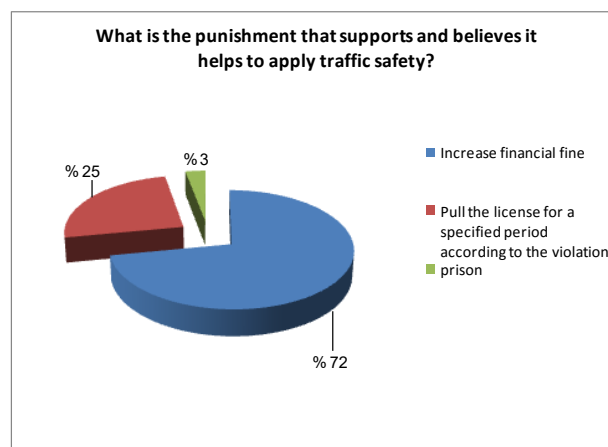


Fig.15: Result of question (What is the punishment that supports and believes it helps to apply traffic safety?)

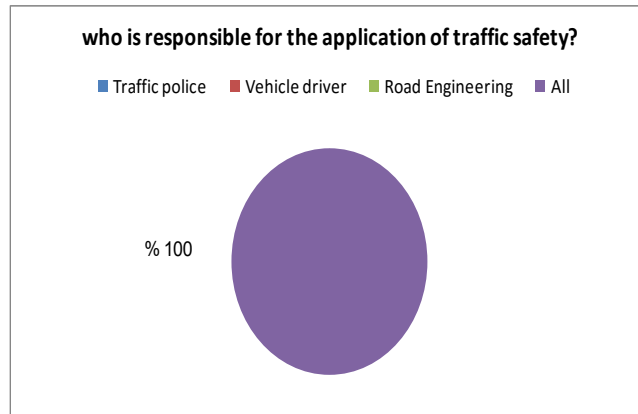


Fig.16: Result of question (Who is responsible for the application of traffic safety?)

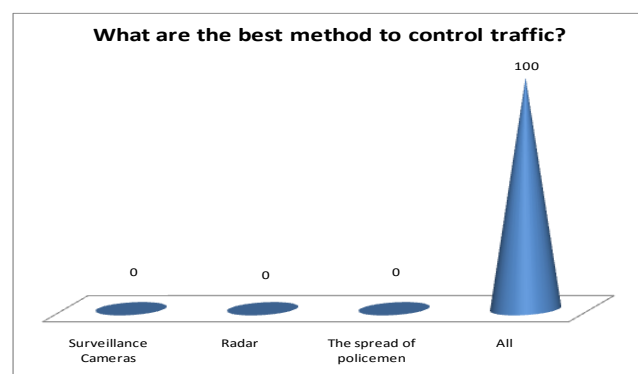


Fig.17: Result of question (What is the best method to control traffic?)

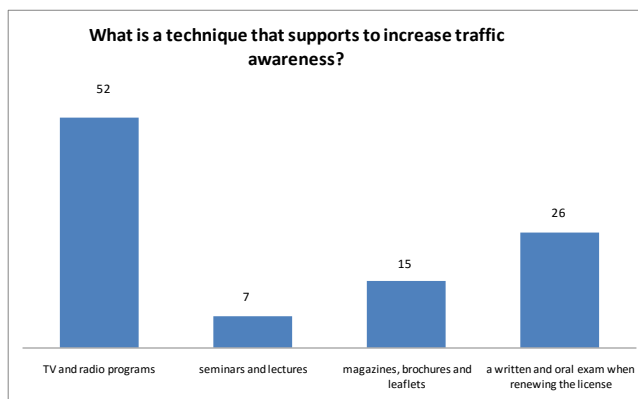


Fig.18: Result of question (What is a technique that supports to increase traffic awareness?)

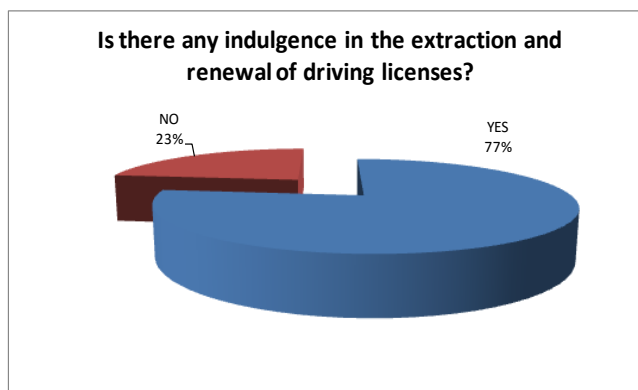


Fig.19: Result of question (Is there an indulgence in the extraction and renewal of driving licenses?)

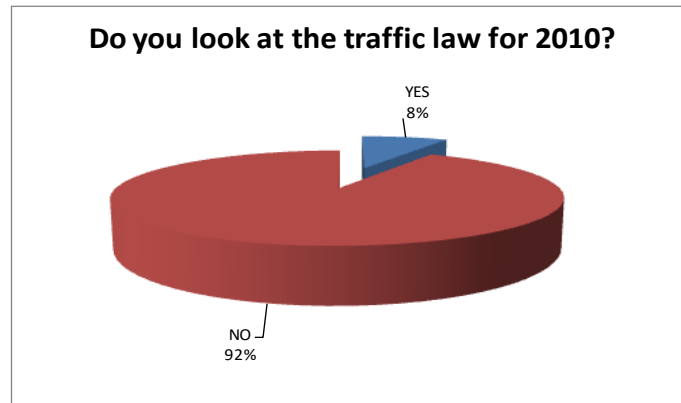


Fig.20: Result of question (Do you look at the traffic law for 2010?)

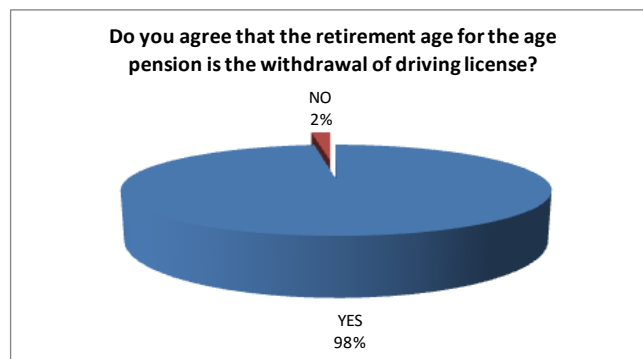


Fig.21: Result of question (Do you agree that the retirement age for the age pension is the withdrawal of driving license?)

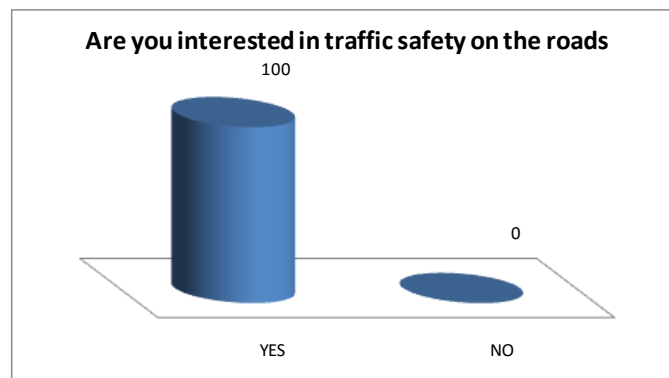


Fig. 22: Result of question (Are you interested in traffic safety on the roads?)

V. Conclusion

By analyzing the results of the questionnaire, the results of the study are summarized as follows: -

- Top ten causes of traffic Accidents in Khartoum – Sudan is (1.Reckless Driving, 2.Driving with fatigue or disease, 3.Driving under the influence of alcohol and drugs, 4.Lack of respect for traffic signals and traffic rules, 5.Driving during the rain and strong winds, 6. Driving too fast, 7. Wrong overtaking, 8. Using headphones or higher recorded voice, 9. no traffic signs at the intersections, 10. Narrow streets and the lack of traffic culture of road users (drivers and pedestrians).
- Application of traffic safety on vehicle is applied with percentage of 100 % just at five elements from 20 elements (25%); 1.Seat belt, 2.Brakes and the handbrake work well, 3.Mirrors (right, left, and center), 4.Spare wheel and 5.Hag and the key wheel. And don't applied with percentage of 100 % just at two element from 20 elements (10%); 1.Fire-resistant mattresses, 2.Door locking systems in the case of the coup. And applied partially for other elements.
- Application of traffic safety on roads is applied with percentage of 0 %. And don't applied with two element from 15 elements (13.3%); percentage of 100 % of the targeted sample they say that these items are

not available; 1.Right of Way enough for future expansion, 2.There are lines crossing for pedestrians at intersections. And applied partially for other elements.

- Behavior of road user is applied just at four elements from 17 elements (23.5%); a percentage of 100 % of the targeted sample they say 1. I never interfere with car safety equipment, 2. I check before reversing, 3. Will be attentive at intersections 4. I gave the incorrect signals when changing direction. And applied partially for other elements.
- We find a percentage of 72 % of the targeted sample they supports punishment by increase financial fine. 100% of the targeted sample they say the application of traffic safety responsible for Traffic police, Vehicle driver and Road Engineering. 100% they say the best methods to control traffic are Surveillance Cameras, Radar and The spread of policemen. 52% they say the technique that supports to increase traffic awareness is TV and radio programs. 77% they say there is an indulgence in the extraction and renewal of driving licenses. 92% don't look at the traffic law for 2010. 98% they agree that the retirement age for the age pension is the withdrawal of driving license. 100% of the targeted sample they interested in traffic safety on the roads.

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