DETERMINANTS OF PERFOMANCE OF ROAD SAFETY PROGRAMS IMPLEMENTED BY THE NATIONAL TRANSPORT AND SAFETY AUTHORITY (NTSA), NAIROBI COUNTY, KENYA.

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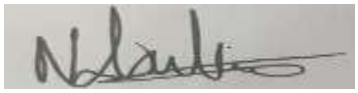
RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT FOR THE REQUIREMENT FOR THE AWARD OF MASTERS DEGREE IN PROJECT PLANNING AND MANAGEMENT OF THE UNIVERSITY OF NAIROBI

2023

DECLARATION

I confirm this proposal is my original work and has not been submitted or presented in any other form at any other institution.

SIGNATURE:  DATE: Date: 24th July 2023

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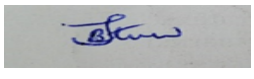
Signature  Date: 27th July 2023

DEDICATION

I dedicate this research to my husband who has supported me financially in my academic pursuits and encouraged me to strive for excellence. This research is dedicated to my mum, who has always provided me with unconditional love and support in my life. I would also appreciate my siblings and friends constantly motivating and inspiring me.

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This research is dedicated to the author's husband, whose financial support has facilitated the author's academic endeavors. His role in encouraging the author to strive for excellence is also acknowledged. I am thankful for the opportunity to be a part of this esteemed institution and to gain the knowledge and experience necessary for success in my research. I am humbled and thankful to all those who have contributed to successfully completing this research project. I am truly grateful for the invaluable help I have received from everyone.

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LIST OF ABBREVIATIONS

ESC-Electronic Stability Control

ABS-Anti-lock Braking Systems

ADAS- Advances driver assistance system

NTSA-National Transport and safety authority

NHTSA- National Highway Traffic and Safety Administration

PMVI- Periodic Motor Vehicle Inspection

PSVs-public service vehicles

ABSTRACT

Road traffic accidents represent a significant worldwide public health issue, resulting in countless injuries and fatalities each year. The purpose of this study was to analyze the impact of safety protocols on road safety outcomes within Nairobi County. The objectives of the study were to find out the influence of road safety training by NTSA, to determine the influence of road safety campaigns by NTSA, to examine the extent to which motor vehicle inspection by NTSA influence road safety outcome and lastly to establish how traffic rules and regulations imposed by NTSA influence the road safety outcome in Nairobi County. The researcher used a descriptive research design. This research investigated a target population consisting of 20 drivers, 20 motor vehicle passengers, 10 officials from the National Transport and Safety Authority (NTSA), 20 motorcyclists, and 10 traffic police officers. A total of 67 participants were selected from the targeted population for the purposes of this study. The researcher used questionnaires and interviews as method of data collection and finally the data was analyzed using SPSS and summarized inform of frequencies. Tables were utilized to illustrate the data and descriptive statistics, such as percentages and frequencies, mean and standard deviation were used to summaries the data. Additionally, inferential statistics such as correlation and regression analysis were used to assess the relationship between independent and dependent variables. On statement that Training programs offered by NTSA play a significant role in reduction of road accidents in Nairobi County, 19(31.7%) strongly agreed with the statement, 28(46.7%) agreed, 6(10.0%) were neutral while 7(11.7%) disagreed with the statement. Safety campaigns carried out by NTSA creates awareness on road safety among the road users which leads to reduction of road accidents, 26(43.3%) strongly agreed with the statement, 28(46.7%) agreed, 1(1.7%) were neutral, 3(5.0%) disagreed, while 2(3.3%) strongly disagree with the statement.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

1.1.1 The concept of road safety

To understand road safety, it is crucial to first comprehend the notion of safety. Risk is defined as the following by Collins English Dictionary (2012): the condition of being safe, freedom from danger or risk of injury, a device or contraption meant to avoid injury. Because of this, it is possible to think of road safety as the state of being shielded from traffic accidents. Another definition of safety is the prevention or reduction of known risks to a level that is deemed acceptable. This might mean being shielded from the incident or from being exposed to something that could harm one's health or result in financial losses. Protection of persons or property may be a part of it.

Road traffic accidents constitute a significant worldwide issue in the realm of public health, leading to countless instances of injury and death each year (World Health Organization, 2018). In order to tackle this issue, government bodies, institutions, and scholars have implemented a range of safety measures aimed at mitigating the frequency and gravity of road accidents.

The matter of road safety has long been recognized as a salient concern on a global scale (Rassool, 2007). Jacobs (2000) cites literature demonstrating that even prior to the advent of the automobile, Great Britain experienced more than 1,000 fatalities per annum. As of 1970, the aforementioned quantity had undergone significant growth, reaching a staggering figure of 7,500, accompanied by a disconcerting statistic of over 300,000 individuals having sustained injuries. In 1974, European countries notified the United Nations of road accidents resulting in 90,000 deaths and 1,800,000 injuries for which motor vehicles were deemed responsible.

One crucial aspect of road safety measures is the improvement of infrastructure. Well-designed roads, appropriate signage, and efficient traffic management systems play a

significant role in preventing accidents (Elvik, 2019). For instance, it has been found that the installation of traffic signals at intersections and the implementation of roundabouts reduce the risk of collisions (Retting et al., 2001).

In addition to infrastructure, traffic regulations and enforcement contribute significantly to road safety. According to the Global Status Report on Road Safety (2018), regulations pertaining to speed limits, seatbelt usage, impaired driving, and distracted driving serve to foster more prudent conduct among individuals utilizing roadways. The enforcement of these regulations through measures such as increased police presence and the use of automated enforcement systems have shown to deter risky behaviors and reduce accidents (Erke et al., 2009).

Vehicle safety features have also played a crucial role in improving road safety outcomes. Recent advancements in technology have facilitated the creation of an array of safety systems, which comprise anti-lock braking systems (ESC), and advanced driver assistance systems (ADAS) (Insurance Institute for Highway Safety, 2021).These features help prevent collisions and mitigate the severity of accidents by alerting drivers, providing automatic braking, and assisting with lane keeping.

Moreover, educational campaigns and public awareness programs contribute to shaping road users' attitudes and behaviors towards safety. These initiatives aim to increase knowledge about safe driving practices, raise awareness of risks, and promote responsible behavior among drivers, pedestrians, and cyclists (Guttman & Hels, 2020). Effective educational campaigns can lead to improved compliance with traffic regulations and safer road user behavior.

Road safety is a major issue everywhere in the globe, but it is particularly severe in underdeveloped nations like Africa. Tanzania, an African nation, is not an exception in this sense. According to the Tanzania Road Safety Policy's (2009) report, car registration is rising as road accidents are on the rise_the research conducted by Chiduo et al. Nonetheless, notwithstanding the government's unwavering pledge, over the past decade, the incidence of mishaps has experienced a surge in frequency. According to Odero et al. (1997),

With an average of 8 fatalities from the 35 collisions that happen every day, Kenya has one of the highest rates of automobile ownership-related deaths and injuries worldwide. (Assum, 2013). Every year, around 3,000 individuals are killed in vehicle accidents in Kenya. According to Odero et al. (1997), this equates to 30–40 times more fatalities per 10,000 registered automobiles than highly motorized nations. In the 2004 World Report on Road Traffic Injury Prevention by the World Health Organization, the concern regarding the aforementioned issue was underscored by the country's president Mwai Kibaki.

While numerous safety measures have been implemented like safety training, safety campaigns, motor vehicle inspection and traffic rules and regulation imposition it is essential to assess their effectiveness and identify areas for improvement. Research studies have investigated the impact of safety measures on road safety outcomes, examining factors such as accident rates, injury severity, and compliance with regulations. These studies utilize a combination of quantitative analysis, statistical modeling, and qualitative research methods to evaluate the effectiveness of different interventions and understand the underlying mechanisms influencing road safety outcomes.

1.2 Statement of the problem

Over the years, the Kenyan government has undertaken a raft of policy strategies aimed at enhancing road safety and reducing road fatalities (GoK, 2003; NTSA, 2016; GoK, 2010). The road safety measures are in line with international standards recommended by the World Health Organization and proven to be effective in reduction of road fatalities (PWC, 2017; WHO, 2016). However more than a decade later, no significant improvements have been realized towards the attainment of realization of SDG 3 and the Road Safety Action Plan which sought to reduce road accident injuries and deaths by 50% by 2020. Road fatalities in the country are still high with Kenya ranking among the top countries with high death rates per 100,000 people at 29.1% above the world’s rate of 24.1% (WHO, 2016).

Statistics on the status of road safety in the country have shown a rising trend of road fatality rates over the years (NTSA, 2020). As at of December 2019 the country has

recorded a total of 3572 deaths tolls, 6938 severe injuries and 5186 minor injuries compared to 1,521 fatalities, 2,123 serious injuries and 2,108 slight injuries in 2018 (NTSA, 2020; Muguro *et al,* 2020). The rising number of road fatalities can be attributed to the inability to effectively enforce road safety regulations by responsible agencies, corruption and disregard of such laws by road users (Ndungu *et al,* 2015). Additionally NTSA's road accident reduction strategies lack sound road safety implementation mechanisms (Mogire, 2017).

Based on data from the National Road Safety Council of Kenya (NRSCK) regarding road fatalities in Kenya categorized by road users and regions in 1990, pedestrians accounted for the highest number of casualties at 41.1%, followed by passengers at 36.7%. Similarly, a road safety assessment conducted in five African countries in 1998 revealed that in Kenya, fatalities among passengers were 34%, while pedestrians accounted for 44% of the casualties. This pattern of high numbers of pedestrian and passenger incidents is observed in many other African countries.

Given this situation, the study's objective was to investigate the impact of various road safety measures in Nairobi County. These measures include road safety training, road safety campaigns, motor vehicle inspections, and the enforcement of traffic rules and regulations by the National Transport and Safety Authority (NTSA) on the overall road safety outcomes.

1.3 Purpose of the study

The study sought to investigate the determinants of the performance of road safety programs implemented by the national transport and safety authority (NTSA), Nairobi County, Kenya.

1.4 Objectives of the study

i. To find out the influence of road safety training by NTSA on road safety outcomes in Nairobi County
ii. To determine the influence of safety campaigns by NTSA on road safety outcomes in Nairobi County
iii. To examine the extent to which motor vehicle inspection by NTSA influence road safety outcomes in Nairobi County

iv. To establish how imposition of traffic rules and regulations by NTSA influence road safety outcomes in Nairobi County

1.6 Research Hypothesis

The study used the Null hypothesis at 0.05 level of significance

$H_0$1: There is no significant relationship between road safety training by NTSA and road safety outcomes

$H_0$2: There is no significant relationship between road safety campaigns by NTSA and road safety outcomes

$H_0$3: There is no significant relationship between motor vehicle inspection by NTSA and road safety outcomes

$H_0$4: There is no significant relationship between imposition of traffic rules and regulations by NTSA and road safety outcomes

1.7 Value of the study

The research will add to the corpus of knowledge already available on traffic accidents and road safety measures. In terms of policy, findings from this study may help to shed light on the effectiveness of the strategies instituted by the NTSA and the traffic police in enforcement of traffic regulations aimed at reducing road accidents. This may also make government agencies concerned with road safety to review policy issues on road safety.

In terms of practice, the study has pointed out possible loopholes and made suggestions on how the strategies can be enhanced for maximum benefit to road users.

In project planning and management discipline, the study will add to knowledge in the discipline especially projects that directly touch on human life and how to implement them effectively for safety purposes. The findings may also form the basis of evaluating the realization of NTSA and traffic police mandate in enhancing road safety in the country.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This component entailed the systematic, identification, and analysis of documents that contain data relevant to the research. This section contained theories underpinning the study, review of related literature and the gaps that have been identified, and conceptual framework of the variables and a summary of a table of reviewed literature.

2.2 Theoretical framework

2.2.1 Systems Theory

Systems theory suggests that elements within their natural environments interact with each other, resulting in a specific mode of operation (Griffith, 2013). Typically, these system elements are interconnected and depend on a feedback loop among themselves. When considering road use and safety, various factors, ranging from human performance to other elements, contribute to either the smooth functioning or the lack thereof on the roads.

The interaction of human and non-human factors whose 24 interaction forms a system has an impact on the road performance. The components of the road utilization framework consist of the conduct of fellow drivers, the operational state of motor vehicles, regulations governing traffic, and the conditions of the road (Muvuringi, 2012).

The theory centers around the various ways in which actors and entities within the system interact to ensure the secure transportation of people and goods between two locations, A and B. Its comprehensive approach in identifying factors that can both positively and negatively impact road safety makes it particularly relevant to this study (Friday et al., 2012). Furthermore, the research investigates the challenges that affect the different components of road systems, consequently influencing road safety. This exploration is carried out by incorporating the systems theory.

2.2.2 The Deterrence Theory

The origins of the deterrence theory can be traced back to classical philosophers like Thomas Hobbes, Jeremy Bentham, and Cesare Beccaria. At its core, the theory asserts that punishing criminals acts as a deterrent for the general population, dissuading them from engaging in criminal activities and thereby reducing the likelihood of such behaviors happening again. Ultimately, this approach aims to lower overall crime rates in society.

The deterrence theory aims to reduce crime in society through two main approaches. Firstly, by imposing fines on offenders, it discourages them from repeating the same crime and engaging in further criminal activities. Secondly, it utilizes normative deterrence, where the awareness of legal consequences for certain crimes prevents individuals from breaking the law due to fear of punishment.

Effectiveness of punishment as deterrence from committing crimes is dependent on two factors: Deterrence hinges on two key factors: the certainty and severity of punishment. The effectiveness of deterrence in discouraging criminal behavior depends on the high probability of the offender being caught and penalized. It is when the offender is certain that their actions will result in apprehension and subsequent punishment. Additionally, the severity of the penalty plays a crucial role in deterring criminal behavior, as a harsh and significant punishment can prevent the offender from repeating the crime.

This theory provides an explanation into one of the major variables under this study: the influence of penalties enforcement on the reduction of road accidents. The theory provides an explanation of how the imposition of penalties on traffic law offenders helps to deter the violation of road safety rules. The imposition of fines and penalties for traffic offences is grounded in the deterrence theory. By fining an offender it works to prevent them from repeating the crime and acts as a deterrence of the general population from committing similar traffic offences for fear of being fined.

The theory offers valuable insights into improving the strategy of imposing penalties to reduce traffic law violations. It emphasizes that the effectiveness of punishment depends on the severity of the penalty. Research conducted by Elvik (2016), Moolenaar (2014), and Nicols et al. (2010) has demonstrated through empirical studies that increasing fines for traffic offenses lowers the likelihood of these offenses being committed or repeated.

Regarding the research, this theory would offer further insight on determinants of road safety.

2.3. Determinants of Road Safety

2.3.1 Safety training and Performance of Road safety Programs

Road safety training programs play a crucial role in improving road safety outcomes. This literature review examines various research studies, reports, and publications to assess the effectiveness of these programs in reducing road accidents, enhancing driver behavior, and overall road safety. By exploring different approaches and methodologies used in road safety training, this review aims to understand their impact on road safety outcomes. Additionally, it identifies gaps in the existing literature and proposes directions for future research. Road safety training programs are designed to enhance driver skills, knowledge, and attitudes, with the ultimate goal of promoting safer road behavior and reducing accident rates.

Numerous studies have evaluated the effectiveness of road safety training programs in improving road safety outcomes. For example, Hatakka et al. (2017) found that driver training programs incorporating hazard perception training and feedback led to significant improvements in hazard perception skills and reduced crash involvement. Similarly, Horswill et al. (2019) conducted a review demonstrating the effectiveness of simulator-based training interventions in enhancing various aspects of driver performance, including hazard awareness and response to potential dangers. Impact on Driver Behavior and Attitudes: Road safety training programs have shown promising results in influencing driver behavior and attitudes.

A study by Jonsson et al. (2018) reported that driver education programs focused on risk perception and risk management contributed to a significant reduction in self-reported risky driving behaviors. Furthermore, a meta-analysis conducted by Elvik et al. (2019) revealed that comprehensive driver training interventions were associated with positive changes in attitude and self-reported driving behaviors, such as compliance with speed limits and seat belt usage. Long-term Effects and Sustainability: The long-term effects of road safety training programs have garnered interest among researchers. Machin et al.

(2020) examined the sustainability of road safety training by evaluating the long-term impacts on driving behavior. The study revealed that participants who underwent road safety training exhibited safer driving behaviors even after a considerable period, suggesting potential long-term positive effects.

2.4.2 Safety Campaigns and Performance of Road safety Programs

The effectiveness of these campaigns has been a subject of extensive research in recent years. This literature review aims to examine the existing body of knowledge on road safety campaigns, focusing on their impact, strategies, and key factors influencing their success.

Road safety campaigns have proven to be effective in increasing awareness and improving road user behavior. Several studies have demonstrated positive outcomes: According to a study by Sze & Wong (2018), a road safety campaign in Hong Kong resulted in a 32% decrease in the number of traffic accidents and a 43% decrease in fatalities. A meta-analysis conducted by Wundersitz (2019) revealed that road safety campaigns had a positive effect on seatbelt use, with an average increase of 9% in compliance. In their study, Beck & Dellinger (2020) found that a comprehensive road safety campaign targeting impaired driving led to a 17% reduction in alcohol-related crashes.

2.4.2.1 Strategies for Effective Road Safety Campaigns

Targeted Messaging: Customizing messages based on the specific target audience has been shown to enhance the effectiveness of campaigns. Paine-Andrews et al. (2021) found that tailoring messages to different demographic groups led to better outcomes.

Emotional Appeals: Emotional appeals, such as fear or empathy, can serve as powerful motivators for behavior change. A study by Elliott et al. (2019) demonstrated that incorporating emotional appeals into road safety campaigns resulted in higher levels of perceived risk and intention to comply with safety measures.

Social Norms and Social Influence: Leveraging social norms and the influence of peers can effectively promote positive road user behavior. Gerber et al. (2020) highlighted the impact of social norms-based campaigns in reducing speeding behaviors.

2.4.3 Motor vehicle inspection and Performance of Road safety Programs

Vehicle inspection and certification is carried out to determine if the vehicles are roadworthy. After the inspection the vehicles are given a roadworthiness certificate, as an indication that the vehicle is safe to drive at the time of inspection. Regular motor vehicles inspection provides assurance that motor vehicle components are in good condition for use and in good working condition. This helps to reduce the chances of an accident occurring and also minimize the impact of the accidents on the passengers whenever they occur. Adequate and good condition of motor vehicles feature such as seat belts, brakes, steering wheel, lights, tires and direction indicators are instrumental in the reduction of Motor Vehicle related accidents (Gitagama, 2014).

Previous studies have shown that regular motor vehicle inspection and certification plays a significant role in the reduction of motor vehicle accidents. A study by Stephanie et al., (2013) in New Zealand revealed that motor vehicles that did not undergo inspection to acquire a certificate of inspection were at a higher risk of being involved in a car crash compared to motor vehicles that had undergone inspection. The study further revealed that vehicles whose tire pressure had not been checked for the past period of 3 months were at a significantly high risk of being in road accidents in comparison to vehicle whose tires pressure had been checked.

Technical defects of motor vehicles which had not undergone inspection accounted for between 6-8% of traffic accidents. Studies by Zovak et al., (2016) revealed that about 22% of the vehicles that did undergo regular technical inspection in Croatia were the cause of the larger number of road accidents. The study found out that older vehicles had a higher rate of failure hence higher risk of accidents (Zovak et al., 2016). A study in rural Pakistan has revealed that the high numbers of accidents in the country are due to lack of a motor vehicle inspection in the country. Findings of a study by Khan (2011) established that lack of a motor vehicle inspection in the country had led to faulty vehicles in the country with defective system of indicator lighting, faulty breaking

system, old and damaged tires, loose and overloaded wheel axles. The study notes that these faulty and dangerous mechanical conditions were responsible for the poor conditions and performance of motor vehicles increasing the risk of them being involved in road accidents.

The findings of this study are backed up by findings of Raynor & Mirzoev (2014) study. The study revealed that motor vehicle inspection and certification does not have much impact on the reduction of road accidents on the Kenyan roads. The study which involved structured interviews with 20 matatu drivers revealed that 18 out of the 20 matatu drivers had bribed police on road block checks which is a norm on the Kenyan roads. The matatu drivers revealed that it is normal to pay bribes even when the PSVs have been inspected and complied with the required safety standard. According to the drivers even when the PSVs are maintained as required by law, traffic police conjecture non-existent problems to receive bribes. Therefore, it is easier to bribe police rather than incur expenses to properly maintain the vehicles (Raynor & Mirzoev, 2014).

Further studies have shown that motor vehicle inspection is instrumental in the elimination of un-roadworthy vehicles and motor vehicles with dangerous mechanical conditions thereby enhancing road safety conditions. An examination of the determinants of accidents on the Nairobi-Kisumu highway by Lewis (2013), revealed that over 15% o of accidents in the country are caused by un-roadworthy motor vehicles. The study attributed the un-roadworthiness of motor vehicles to the importation of second-hand motor vehicles in the country.

Most of these vehicles have dangerous mechanical conditions which increases the risk of motor vehicle accidents. The study also noted that motor vehicle inspection in the country was not reliable and lacked the comprehensive checks required to ensure that the vehicles were in good condition for road use. Most of the inspection undertaken were mainly visual and could not guarantee the safety of motor vehicles (Lewis (2013). This study shows that even though motor vehicle inspection were undertaken in the country, they were ineffective in the reduction of road accidents as they were not carried out effectively and in a comprehensive manner as required.

2.4.4 Traffic rules and regulations and Performance of Road safety Programs

Road safety measures refer to the strategies aimed at reducing the number of road fatalities through the introduction of rules and regulations that enhance proper usage of the roads in a safe manner. There exists a multitude of studies that have demonstrated the importance of adherence to regulations governing road safety. The implementation of specific measures exhibits a favorable influence on the mitigation of vehicular collisions. This study presents an analysis of adherence to regulatory requirements.

The examination of road safety regulations within the jurisdiction of the United States of America evidenced their efficacy. The execution of guidelines outlined by the World Health Organization in relation to legislations. The implementation of road safety regulations within the Nation led to a death rate of 10.4% per 100 000 people which is way below the world's rate of 17.4% per 100 000 people (WHO, 2016).

Similar findings were established by case-control studies in the United States. The study which sought to evaluate helmets effectiveness in preventing head injuries revealed that the wearing of helmets reduces probability of cyclists getting head/ brain injury by between 63% -88% (Thompson et al., 2016).

Previous studies have established that disregard of road safety measures by road user is among the leading causes of road accidents. A study by Sprattler (2012) in the US revealed that despite speed governors being mandatory and speed limits having been established for all vehicles, there were still more road accidents due to disregard of the speed limits by drivers. An assessment of road safety culture in Europe by Kim & Wagner (2014) also established that disregard of the use of mobile phones among pedestrians and drivers put pedestrian are safety at risk. The study observed that use of mobile phones by pedestrians reduced their awareness and alert levels leading to increased dangerous road usage. The study established that talking on the phone increased the risk of accident by 65% compared to texting by 9.1% among pedestrians. The study further revealed that listening to music puts pedestrians at a higher risk of being involved in accidents.

Kim and Wagner (2014) assessed European traffic safety culture, finding that adherence to road safety regulations reduces accidents. Accidents cause damage, injury, and loss of

life. They happen suddenly and are hard to avoid. Accidents are a concern caused by human error, equipment malfunction or environmental factors in various contexts, from workplaces to roads. The consequences can be severe for individuals, organizations and society. It's crucial to create effective accident prevention strategies. The investigation examined alcohol and road safety regulations. Speed limits are key to improving road safety.

The study which used case studies from France and Sweden established that alcohol consumption has a positive and significant influence on road safety levels. Alcohol consumption regulations helped to enhance road safety by ensuring that drivers had full control of the vehicles hence reducing the risk of accidents due to drunk driving. The study also observed that speed limit regulations played a significant role in the reduction of road accidents.

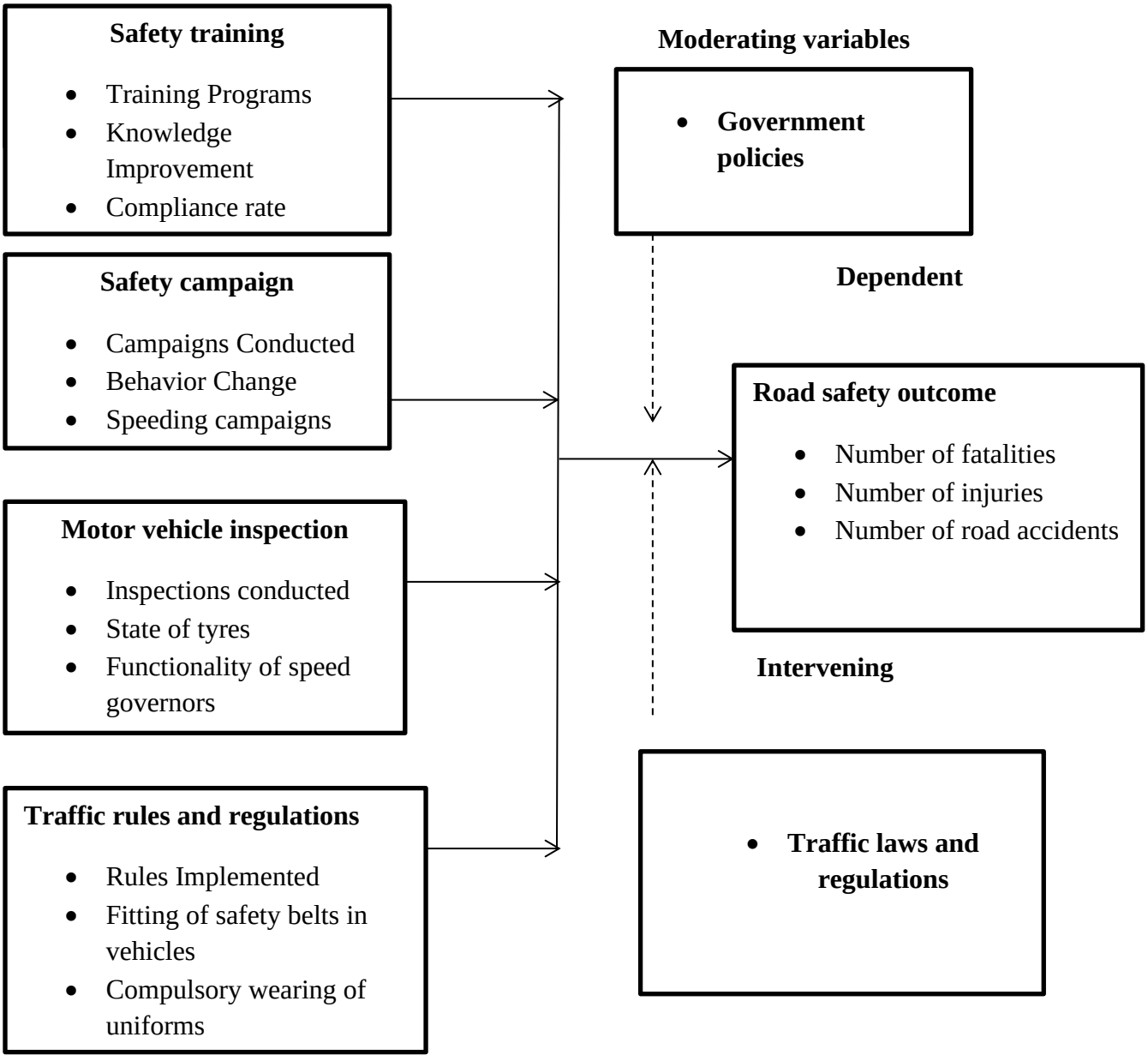
2.5 Conceptual framework

It composed of four independent variables which will included; road safety training, road safety campaigns, motor vehicle inspection and traffic rules and regulations. They count as limiting factor which influenced the dependent variable. The dependent variable was the road safety outcome.

Figure 2.1: Conceptual framework

This study was guided by the conceptual framework shown in figure below

Independent variables



2.6 Research gap

Table 2.1 knowledge gap

Kim and Wagner (2014)	Culture of traffic Safety in Europe	Alcohol consumption regulations and observance of speed limit regulations played a significant role in the reduction of road accidents	Different study context Other road safety metrics including use of safety belts, wearing of uniforms and display of budges by drivers and conductors
Sprattler (2012)	Risk factors for road accidents in the United States	Over speeding was responsible for big percentage of all fatal crashes	Different study context Other road safety metrics including use of safety belts, wearing of uniforms and display of budges by drivers and conductors.
Mogire (2017)	Kenyans Perception of NTSA Accident Reduction Strategies	Compliance with speed limits and continuous monitoring by police officers of PSV speed limits helps to minimize accidents along highways.	Other metrics such as alcohol limits, use of safety belts, prohibition of mobile use and wearing of uniforms and display of budges by drivers
(Zovak et al., 2016).	Influence of vehicle inspection on road accidents	Old vehicles were at higher risk of being involved in road accidents	Different study context Specific motor vehicle inspection metrics such as PSV insurance, state of the tires and motor vehicle road worthiness
Kabue (2017)	Influence of NTSA strategies on road safety in Nakuru County	Motor vehicle inspection had not led to enhanced road safety due to lack of proper inspection and corruption	Specific motor vehicle inspection metrics such as PSV insurance, state of the tires and motor vehicle road worthiness.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter covered research design, target population, sample, research instruments, data collection, validity, reliability, data analysis procedures.

3.2 Research design

According to Saunders et al. (2003), study design is a process that offers solutions to problems including how to collect data, what instruments and sample strategies to employ, and how to handle time and financial constraints. This study used descriptive research which referred to the investigation in which data is collected and analyzed in order to describe the specific phenomena in its current trends, current events and linkages between different factors at the current time (Kothari, 2009).

3.3 Study target population

According to Sauder, Lews, and Thornhill (2009), a target population is a collection of people who exhibit a set of desired qualities and serve as the sample population from which the finding of an analysis was extrapolated. The target population of the study were 80 respondents who included drivers, passengers, NTSA representatives, motorcyclists and traffic police officers. Since NTSA staff number was already known to be 10 and police 10. The remaining target population was determined by mark and capture population estimate. Mark and capture is used in research where it is impractical to count every individual.

3.4 Sample and sampling techniques

The study employed snowball-sampling technique for drivers, riders and passengers. This was deemed appropriate because the study involved a sensitive topic on behavior on the road and competence of those involved. Simple random was used for NTSA staff and traffic police officers. Stratified random sampling was also used to categorize respondents.

The study stipulated a confidence level of 95% along with a margin of error of 5%. To ascertain the appropriate sample size from the population, the researcher employed the Yamane (1967) formula, which can be stated as follows:

$$n = \frac{N}{1+N(e)^2}$$

Where; n= the sample size

e= the error of 5%

N=Size of the population

The sample size is calculated as follows

$n = 80/1+80(0.05)^2$ n=67

Table 3. 1 sample size

Category	**Target population**	**Sample size**	**Percentage**
Drivers	20	17	25
Passengers	20	17	25
NTSA staff	10	8	12
Motorcyclists	20	17	25
Traffic police officer	10	8	12
Total	**80**	**67**	**100**

3.5 Data collection instruments

The act of gathering data is referred to as data collection methods once the researcher has determined the kinds of information required based on the research questions driving the study Fielding (2010). Primary data was used by the researcher for the study, and structured questionnaire and interview were instruments used to gather primary data. Singh (2008) points out that organized survey take less time and money to administer, analyze, and respond to. The researcher interviewed the drivers, passengers and motorcyclists on training and road safety campaign and personally ticked the questionnaire.

3.6.1 Validity of the instruments

Validity is defined as the precision and significance of conclusions drawn from study findings (Mugenda and Mugenda 2003). The validity of this study was assessed by how well the test instruments capture the intended outcomes. This was done by University of Nairobi supervisors and a group of panelist experts.

3.6.2 Reliability of the instruments

The test-retest method was employed to evaluate the dependability of the measuring tool. Reliability can be defined as the degree to which a research instrument yields consistent and dependable results or data across multiple trials, as Mugenda and Mugenda (2003) noted.

Table 2.2: Results of Pilot Coefficients Reliability Analysis

Variable	Reliability Cronbach's Alpha	Comment
Road Safety Training	0.816	Accepted
Road Safety Campaigns	0.821	Accepted
Motor Vehicle Inspection	0.711	Accepted
Traffic Rules and Regulations	0.820	Accepted
Road Safety Outcome	0.828	Accepted
Composite Cronbach's Alpha	0.799	Accepted

All constructs and the composite Cronbach**'s** Alpha showed that the value of Cronbach 's Alpha were above the suggested value of 0.7. A Composite Cronbach**'s** Alpha of 0.799 was obtained. According to Mugenda (2008) Coefficient of 0.7 is a commonly accepted rule of thumb that indicates acceptable reliability hence the research instrument was reliable.

3.7 Data analysis techniques

Data analysis is the act of questioning data using tried-and-true techniques in order to obtain understanding of the study's aims and objectives. To correct any mistakes that occurred during the data gathering process, the gathered data was first be updated. Data was coded and entered into the SPSS programme for data analysis. Tables were utilized to illustrate the data and descriptive statistics, such as percentages and frequencies, mean and standard deviation was used to summaries the data. Additionally, inferential statistics such as regression analysis was used to test hypothesis.

3.8 Operationalization of Variables

Table 3.3: Operationalization of variables

Objectives	Variables	Indicators	Measurement scale	Tools of data collection	Type of data analysis	Tools of Data analysis
To find out the influence of road safety training by NTSA on road safety outcomes in Nairobi County .	Independent variable - Road safety training	Training Programs Knowledge Improvement Compliance rate	Ordinal Scale	Questionnaires Interviews	Descriptive Inferential	Frequencies, percentages, Mean and, Standard deviation. Pearson product Moment correlation Coefficient and multiple linear regression analysis
To determine the influence of safety campaigns by NTSA on road safety outcomes in Nairobi County	Independent variable - safety campaigns	Campaigns Conducted Behavior Change Speeding campaigns	Ordinal Scale	Questionnaires Interviews	Descriptive Inferential	Frequencies, percentages, Mean and, Standard deviation. Pearson product Moment correlation Coefficient and multiple linear regression analysis

To examine the extent to which motor vehicle inspection by NTSA influence road safety outcomes in Nairobi County	Independent variable - motor vehicle inspection	Inspections conducted State of tyres Functionality of speed governors	Ordinal Scale	Questionnaires Interviews	Descriptive Inferential	Frequencies, percentages, Mean and, Standard deviation. Pearson product Moment correlation Coefficient and multiple linear regression analysis
To establish how imposition of traffic rules and regulations by NTSA influence road safety outcomes in Nairobi county	Independent variable traffic rules and regulations	Rules Implemented Fitting of safety belts in vehicles Compulsory wearing of uniforms	Ordinal Scale	Questionnaires Interviews	Descriptive Inferential	Frequencies, percentages, Mean and, Standard deviation. Pearson product Moment correlation Coefficient and multiple linear regression analysis

CHAPTER FOUR

DATA ANALYSIS, FINDINGS, PRESENTATION AND IINTERPRETATION

4.1 Introduction

This chapter focused on data analysis, findings, presentation and interpretation of the study. The objectives of this study were to investigate the influence of road safety measures on road safety outcome in Nairobi County.

4.2 Questionnaire Return Rate

Table 4.1: Response Rate

Table 4.1 shows the results on the response rate of the respondents

Category	Frequency	Percentage%
Responded	60	89.6
Not responded	7	10.4
Total	**67**	**100**

Table 4.1 The questionnaire response rate was 89.6% which is above 50% and according to Babbie (2012) it's reliable for data analysis.

4.3 Background information

This section discussed gender, education level, age, and profession or category of the respondents.

4.3.1 Distribution of respondents by their gender

The respondents were required to state their gender and response were analyzed and presented in table 4.2.

Table 4.2: Distribution of respondents by their gender

Gender	Frequency	Percentage
Male	43	71.7
Female	17	28.3
Total	**60**	**100.0**

Table 4.2 shows that male were 43(71.7%) while female were 17(28.3%). This shows that all the genders were fully represented in this study and the findings are similar to Okobiah and Okorodudu (2004) study.

4.3.2 Distribution of respondents by their education level

The respondents were required to state their education and response were analyzed and presented in table 4.3.

Table 4.3: Distribution of respondents by their education level

Education Level	Frequency	Percentage
Certificate	15	25.0
Diploma	17	28.3
Bachelor's Degree	13	21.7
Post-graduate degree	0	0.0
Others	15	25.0
Total	**60**	**100.0**

Table 4.3 shows that majority of the respondents were those who had Diploma 17(28.3%), followed by those who had certificate and other qualifications with 23(25.0) while those who had Bachelor's Degree were 13(21.7%).

4.3.3 Distribution of respondents by their age

The researcher sought to establish the distribution of the respondents by their age. The respondents were required to state their age and response were analyzed and presented in table 4.4.

Table 4.4 Distribution of respondents by their age

Age	Frequency	Percentage
30 Years and below	18	30.0
31-40 years	25	41.7
41-50 years	14	23.3
Over 51 years	3	5.0
Total	**60**	**100.0**

Table 4.4 shows that majority of the respondents were 31-40 years 25(41.7%), 30 Years and below were 18(30.0%), 41-50 years were 14(23.3%) while those with Over 51 years were 3(5.0%) this implies that the study majorly consisted of youths.

4.3.4 Distribution of respondents by their profession or category

The researcher sought to establish the distribution of the respondents by their profession or category. The respondents were required to state their profession or category and response were analyzed and presented in table 4.5.

Table 4.5 Distribution of respondents by their profession or category

Position	Frequency	Percentage
Drivers	7	11.7
Passengers	15	25.0
NTSA Staff	11	18.3
Motorcyclists	15	25.0
Traffic police officer	12	20.0
Total	**60**	**100.0**

Table 4.5 shows that majority of the respondents were Passengers and Motorcyclists with 15(25.0%), 12(20.0%) were Traffic police officer, 11(18.3%) were NTSA Staff while 7(11.7%) were Drivers.

4.4 Road Safety Training

The study revealed the influence of road safety training by NTSA on road safety outcomes in Nairobi County-;

Table 4.6 Road Safety Training

Table 4.6 shows the results of the respondents on the level of agreement on road safety training by NTSA on road safety outcomes.

Statement	5 SA	4 A	3 N	2 D	1 SD	Mean	SD
Training programs offered by NTSA play a significant role in reduction of road accidents in Nairobi county	19(31.7)	28(46.7)	6(10.0)	7(11.7)		3.983	.9476
Attending a driving	9(15.0)	35(58.3)	13(21.7)	2(3.3)	1(1.7)	3.816	.7917

school leads to knowledge improvement on road safety which leads to reduced road accidents							
Training programs offered by NTSA leads to increased compliance rate by the road users	15(25.0)	24(40.0)	10(16.7)	9(15.0)	2(3.3)	3.683	1.1122
Compliance of road safety regulations contribute to reduction of road accidents	23(38.3)	16(26.7)	15(25.0)	2(3.3)	4(6.7)	3.866	1.1712
Trainers from NTSA are experienced	8(13.3)	30(50.0)	5(8.3)	7(11.7)	10(16.7)	3.316	1.3211
Training modules have quality content	8(13.3)	30(50.0)	5(8.3)	7(11.7)	10(16.7)	3.316	1.3211
Composite mean & SD						**3.6639**	**1.1108**

On statement that Training programs offered by NTSA play a significant role in reduction of road accidents in Nairobi County, 19(31.7%) strongly agreed, 28(46.7%) agreed, 6(10.0%) were neutral while 7(11.7%) disagreed.

Mean and SD of this indicator was (3.983, 0.9476) which was slightly higher than CM and SD (3.6639, 1.1108). This was with line with Hatakka et al. (2017) who found that driver training programs incorporating hazard perception training and feedback led to significant improvements in hazard perception skills and reduced crash involvement. This shows that road safety training by NTSA influence road safety outcomes in Nairobi County positively.

On statement that attending a driving school lead to knowledge improvement on road safety which leads to reduced road accidents, 9(15.0%) strongly, 35(58.3%) agreed, 13(21.7%) were neutral, 2(3.3%) disagreed, while 1(1.7%) strongly disagree. Mean and SD of this indicator was (3.816, 0.7917) which was slightly higher than CM and SD (3.6639, 1.1108). This shows that road safety training by NTSA influence road safety outcomes in Nairobi County positively. According to Horswill et al. (2019) conducted a

review demonstrating the effectiveness of simulator-based training interventions in enhancing various aspects of driver performance, including hazard awareness and response to potential dangers. Impact on Driver Behavior and Attitudes

On statement that Training programs offered by NTSA leads to increased compliance rate by the road users, 15(25.0%) strongly agreed, 24(40.0%) agreed, 10(16.7%) were neutral, 9(15.0%) disagreed, while 2(3.3%) strongly disagree. Mean and SD of this indicator was (3.6639, 1.1108) which was slightly higher than CM and SD (3.6639, 1.1108). This shows that road safety training by NTSA influence road safety outcomes in Nairobi County positively. According to Machin et al. (2020) examined the sustainability of road safety training by evaluating the long-term impacts on driving behavior.

On statement that Compliance of road safety regulations contribute to reduction of road accidents, 23(38.3%) strongly agreed, 16(26.7%) agreed, 15(25.0%) were neutral, 2(3.3%) disagreed, while 4(6.7%) strongly disagree. Mean and SD of this indicator was (3.866, 1.1712) which was slightly higher than CM and SD (3.6639, 1.1108). This shows that road safety training by NTSA influence road safety outcomes in Nairobi County positively. According to Jonsson et al. (2018) reported that driver education programs focused on risk perception and risk management contributed to a significant reduction in self-reported risky driving behaviors

On statement that Trainers from NTSA are experienced, 8(13.3%) strongly agreed, 30(50.0%) agreed, 5(8.3%) were neutral, 7(11.7%) disagreed, while 10(16.7%) strongly disagree. Mean and SD of this indicator was (3.316, 1.3211) which was slightly higher than CM and SD (3.6639, 1.1108). This shows that road safety training by NTSA influence road safety outcomes in Nairobi County negatively. According to Machin et al. (2020) examined the sustainability of road safety training by evaluating the long-term impacts on driving behavior. The study revealed that participants who underwent road safety training exhibited safer driving behaviors even after a considerable period, suggesting potential long-term positive effects

On statement that Training modules have quality content, 8(13.3%) strongly, 30(50.0%) agreed, 5(8.3%) were neutral, 7(11.7%) disagreed, while 10(16.7%) strongly disagree.

Mean and SD of this indicator was (3.6639, 1.3211) which was slightly higher than CM and SD (3.6639, 1.1108). This shows that road safety training by NTSA influence road safety outcomes in Nairobi County negatively. According to Horswill et al. (2019), Road safety training programs have shown promising results in influencing driver behavior and attitudes

4.5 Road Safety Campaigns

The study sought to determine the influence of safety campaigns by NTSA on road safety outcomes in Nairobi County and various statements of safety campaigns were examined and the following are the results: -

Table 4.7 Road Safety Campaigns

Table 4.7 shows the results of the respondents on the level of agreement on safety campaigns by NTSA on road safety outcomes.

Statement	5 SA	4 A	3 N	2D	1 SD	Mean	SD
Safety campaigns carried out by NTSA creates awareness on road safety among the road users which leads to reduction of road accidents	26(43.3)	28(46.7)	1(1.7)	3(5.0)	2(3.3)	4.216	.9583
Safety campaigns by NTSA improves road user behavior which play a significant role in reduction of road accidents	27(45.0)	25(41.7)	3(5.0)	3(5.0)	2(3.3)	4.200	.9880
The major causes of road accidents in Nairobi County is because of negligence	19(31.7)	27(45.0)	6(10.0)	6(10.0)	2(3.3)	3.916	1.0623
Enforcement of penalties help to deter violation of road safety rules and regulations	16(26.7)	18(30.0)	8(13.3)	15(25.0)	3(5.0)	3.483	1.2688
Road safety campaigns are frequently conducted through social media	7(11.7)	10(16.7)	4(6.7)	29(48.3)	10(16.7)	2.583	1.2794
Through safety campaigns traffic rules are well followed	8(13.3)	1 (1.7)		37(61.7)	14(23.3)	2.200	1.2185

Composite mean and standard Deviation	**3.433**	**1.1292**

On statement that Safety campaigns carried out by NTSA creates awareness on road safety among the road users which leads to reduction of road accidents, 26(43.3%) strongly agreed, 28(46.7%) agreed, 1(1.7%) were neutral, 3(5.0%) disagreed, while 2(3.3%) strongly disagree. Mean and SD of this indicator was (4.216, 0.9583) which was slightly higher than CM and SD (3.433, 1.1292). This shows that safety campaigns by NTSA influence road safety outcomes in Nairobi County positively. According to a study by Sze & Wong (2018), a road safety campaign in Hong Kong resulted in a 32% decrease in the number of traffic accidents and a 43% decrease in fatalities.

On statement that Safety campaigns by NTSA improves road user behavior which play a significant role in reduction of road accidents, 27(45.0%) strongly agreed, 25(41.7%) agreed, 3(5.0%) were neutral, 3(5.0%) disagreed, while 2(3.3%) strongly disagree. Mean and SD of this indicator was (4.200, 0.9880) which was slightly higher than CM and SD (3.433, 1.1292). This shows that safety campaigns by NTSA influence road safety outcomes in Nairobi County positively. According to a meta-analysis conducted by Wundersitz (2019) revealed that road safety campaigns had a positive effect on seatbelt use, with an average increase of 9% in compliance.

On statement that the major causes of road accidents in Nairobi County is because of negligence, 19(31.7%) strongly agreed, 27(45.0%) agreed, 6(10.0%) were neutral, 6(10.0%) disagreed, while 2(3.3%) strongly disagree. Mean and SD of this indicator was 3.916, 1.0623) which was slightly higher than CM and SD (3.433, 1.1292). This shows that safety campaigns by NTSA influence road safety outcomes in Nairobi County positively. According to Beck & Dellinger (2020) found that a comprehensive road safety campaign targeting impaired driving led to a 17% reduction in alcohol-related crashes.

On statement that the Enforcement of penalties help to deter violation of road safety rules and regulations, 16(26.7%) strongly agreed, 18(30.0%) agreed, 8(13.3%) were neutral, 15(25.0%) disagreed, while 3(5.0%) strongly disagree. Mean and SD of this indicator was 3.483, 1.2688) which was slightly higher than CM and SD (3.433, 1.1292). This shows that safety campaigns by NTSA influence road safety outcomes in Nairobi County positively. According to Elliott et al. (2019) demonstrated that incorporating emotional appeals into road safety campaigns resulted in higher levels of perceived risk and intention to comply with safety measures.

On statement that the Road safety campaigns are frequently conducted through social media, 7(11.7%) strongly agreed, 10(16.7%) agreed, 4(6.7%) were neutral, 29(48.3%) disagreed, while 10(16.7%) strongly disagree. Mean and SD of this indicator was 2.583, 1.2794) which was slightly higher than CM and SD (3.433, 1.1292). This shows that safety campaigns by NTSA influence road safety outcomes in Nairobi County negatively. According to Khan (2011) lack of a motor vehicle inspection in the country had led to faulty vehicles in the country with defective system of indicator lighting, faulty breaking system, old and damaged tires, loose and overloaded wheel axles.

On statement that through safety campaigns traffic rules are well followed, 8(13.3%) strongly agreed, 1 (1.7%) agreed, 37(61.7%) disagreed, while 14(23.3%) strongly disagree. Mean and SD of this indicator was 2.200, 1.2185) which was slightly higher than CM and SD (3.433, 1.1292). This shows that safety campaigns by NTSA influence road safety outcomes in Nairobi County negatively. According to Elvik et al. (2019) revealed that comprehensive driver training interventions were associated with positive changes in attitude and self-reported driving behaviors, such as compliance with speed limits and seat belt usage.

4.6 Motor Vehicle Inspection

The study sought to establish the extent to which motor vehicle inspection by NTSA influence road safety outcomes in Nairobi County and various statements on motor vehicle inspection were examined and the following are the results: -

Table 4.8 Motor Vehicle Inspection

Table 4.8 shows the results of the respondents on the level of agreement on motor vehicle inspection and road safety outcomes.

Statement	5 SA	4 A	3 N	2 D	1 SD	Mean	SD
Conducting the compliance checks on the state of vehicles, identify and remove non-compliant vehicles	20(33.3)	22(36.7)	8(13.3)	7 (11.7)	3(5.0)	3.816	1.1715
Effective breaking system, clutch and acceleration	11(18.3)	33(55.0)	9(15.0)	6(10.0)	1(1.7)	3.783	.9222
Functionality of speed governors	22(36.7)	25(41.7)	2(3.3)		11(18.3)	3.966	1.0730
Condition of electric and lighting system	8(13.3)	25(41.7)	14(23.3)	12(20.0)	1(1.7)	3.450	1.0155
Frequent motor vehicle inspection prevents fines and penalties from state leading to improved safety	21(35.0)	17(28.3)	10(16.7)	12(20.0)		3.783	1.1363
Motor vehicle inspection minimizes drivers liability in case of road accident	19(31.7)	35(55.0)	3(8.3)	2(3.3)	1(1.7)	4.116	.8252
Composite mean and standard Deviation						**3.819**	**1.024**

On statement that Conducting the compliance checks on the state of vehicles, identify and remove non-compliant vehicles, 20(33.3%) strongly, 22(36.7%) agreed, 8(13.3%) disagreed, while 7 (11.7%) strongly disagree. Mean and SD of this indicator was (3.816, 1.1715) which was slightly higher than CM and SD (3.819, 1.024). This shows that motor vehicle inspection by NTSA influence road safety outcomes in Nairobi County negatively. According Stephanie et al., (2013) in New Zealand revealed that motor vehicles that did not undergo inspection to acquire a certificate of inspection were at a higher risk of being involved in a car crash compared to motor vehicles that had undergone inspection.

On statement that effective braking system, clutch and acceleration, 11(18.3%) strongly agreed, 33(55.0%) agreed, 9(15.0%) disagreed, while 1(1.7%) strongly disagree. Mean and SD of this indicator was (3.783, 0.9222) which was slightly higher than CM and SD (3.819, 1.024). This shows that motor vehicle inspection by NTSA influence road safety outcomes in Nairobi County negatively. According to Gitagama, (2014) adequate and good

condition of motor vehicles feature such as seat belts, brakes, steering wheel, lights, tires and direction indicators are instrumental in the reduction of Motor Vehicle related accidents.

On statement that Functionality of speed governors, 22(36.7%) strongly agreed, 25(41.7%) agreed, 2(3.3%) were Neutral while 11(18.3%) strongly disagree. Mean and SD of this indicator was (3.966, 1.0730) which was slightly higher than CM and SD (3.819, 1.024). This shows that motor vehicle inspection by NTSA influence road safety outcomes in Nairobi County positively. According Gerber et al. (2020) highlighted the impact of social norms-based campaigns in reducing speeding behaviors.

On statement that Condition of electric and lighting system, 8(13.3%) strongly agreed, 25(41.7%) agreed, 14(23.3%) were Neutral, 12(20.0%) disagreed while 1(1.7%) strongly disagree. Mean and SD of this indicator was (3.450, 1.0155) which was slightly higher than CM and SD (3.819, 1.024). This shows that motor vehicle inspection by NTSA influence road safety outcomes in Nairobi County negatively. According to Zovak et al., (2016). The study found out that older vehicles had a higher rate of failure hence higher risk of accidents

On statement that frequent motor vehicle inspection prevents fines and penalties from state leading to improved safety, 21(35.0%) strongly agreed, 17(28.3%) agreed, 10(16.7%) were Neutral while 12(20.0%) disagreed. Mean and SD of this indicator was (3.783, 1.1363) which was slightly higher than CM and SD (3.819, 1.024). This shows that motor vehicle inspection by NTSA influence road safety outcomes in Nairobi County negatively. According to Lewis (2013), most of the inspection undertaken were mainly visual and could not guarantee the safety of motor vehicles

On statement Motor vehicle inspection minimizes drivers' liability in case of road accident, 19(31.7%) strongly agreed, 35(55.0%) agreed, 3(8.3%) were Neutral, 2(3.3%) disagreed while 1(1.7%) strongly disagreed. Mean and SD of this indicator was (4.116, 0.8252) which was slightly higher than CM and SD (3.819, 1.024). This shows that motor vehicle inspection by NTSA influence road safety outcomes in Nairobi County positively. According to Machin et al. (2020) examined the sustainability of road safety training by evaluating the long-term impacts on driving behavior.

4.7 Traffic Rules and Regulations

The study sought to establish how imposition of traffic rules and regulations by NTSA influence road safety outcomes in Nairobi County and various statements on traffic rules and regulations were examined and the following are the results: -

Table 4.9 Traffic Rules and Regulations

Table 4.9 shows the results of the respondents on the level of agreement on traffic rules and regulations.

Statement	5 A	4 OF	3 NS	2 R	1 N	Mean	SD
Enforcing traffic laws such as random breath testing check on alcohol levels and enforcing speed levels	25(41.7)	26(43.3)	2(3.3)	5(8.3)	2(3.3)	4.116	1.0430
Detecting, arresting and prosecution of traffic offenders	17(28.3)	32(53.3)	5(8.3)	5(8.3)	1(1.7)	3.983	.9295
Road block checks by NTSA enforcement officers and traffic police officers contribute to the reduction of road accidents	25(41.7)	24(40.0)		9(15.0)	2(3.3)	4.016	1.1570
More measures need to be reviewed to enhance road safety and reduce road accidents especially in Nairobi County	14(23.3)	24(40.0)	7(11.7)	13(21.7)	2(3.3)	3.583	1.1686
Traffic rules and regulations are being compromised by the enforcement officers	17 (28.3)	23(38.3)	11(18.3)	9(15.0)		3.800	1.0218
Enforcement of fitting of safety belts in vehicles has been neglected	14(23.3)	24(40.0)	7(11.7)	13(21.7)	2(3.3)	3.583	1.1686
Composite mean & SD						**3.8468**	**1.0814**

On statement that enforcing traffic laws such as random breath testing check on alcohol levels and enforcing speed levels, 25(41.7%) picked always, 26(43.3%) often, 2(3.3%) were not sure, 5(8.3%) picked rare, while 2(3.3%) picked never. Mean and SD of this indicator was (4.116, 1.0430) which was slightly higher than CM and SD (3.8468, 1.0814). This implies that the line-item traffic rules and regulations by NTSA influence road safety outcomes in Nairobi County positively.

According to Thompson et al., (2016) determined the study which sought to evaluate helmets effectiveness in preventing head injuries revealed that the wearing of helmets reduces probability of cyclists getting head/ brain injury by between 63% -88%.

On statement that detecting, arresting and prosecution of traffic offenders, 17(28.3%) picked always, 32(53.3%) often, 5(8.3%) were not sure, 5(8.3%) picked rare, while 1(1.7%) picked never. Mean and SD of this indicator was (3.983, 0.9295) which was slightly higher than CM and SD (3.8468, 1.0814). This shows that traffic rules and regulations by NTSA influence road safety outcomes in Nairobi County positively. According to Raynor & Mirzoev, (2014) it is easier to bribe police rather than incur expenses to properly maintain the vehicles.

On statement that road block checks by NTSA enforcement officers and traffic police officers contribute to the reduction of road accidents, 25(41.7%) picked always, 24(40.0%) often, 9(15.0%) picked rare while 2(3.3%) picked never. Mean and SD of this indicator was (4.016, 1.1570) which was slightly higher than CM and SD (3.8468, 1.0814). This shows that traffic rules and regulations by NTSA influence road safety outcomes in Nairobi County positively. According to Raynor & Mirzoev, (2014) it is easier to bribe police rather than incur expenses to properly maintain the vehicles.

On statement that more measures need to be reviewed to enhance road safety and reduce road accidents especially in Nairobi County, 14(23.3%) picked always, 24(40.0%) often, 7(11.7%) were not sure, 13(21.7%) picked rare while 2(3.3%) picked never. Mean and SD of this indicator was (3.583, 1.1686) which was slightly higher than CM and SD (3.8468, 1.0814). This shows that traffic rules and regulations by NTSA influence road safety outcomes in Nairobi County negatively. According to Sprattler (2012) in the US revealed that despite speed governors being mandatory and speed limits having been established for all vehicles, there were still more road accidents due to disregard of the speed limits by drivers.

On statement that traffic rules and regulations are being compromised by the enforcement officers, 17 (28.3%) picked always, 23(38.3%) often, 11(18.3%) were not sure while 9(15.0%) picked rare. Mean and SD of this indicator was (3.8400, 1.0218) which was

slightly higher than CM and SD (3.8468, 1.0814). This shows that traffic rules and regulations by NTSA influence road safety outcomes in Nairobi County negatively. According to Jonsson et al. (2018), driver education programs focused on risk perception and risk management contributed to a significant reduction in self-reported risky driving behaviors.

On statement that enforcement of fitting of safety belts in vehicles has been neglected, 14(23.3%) picked always, 24(40.0%) often, 7(11.7%) were not sure, 13(21.7%) picked rare while 2(3.3%) picked never. Mean and SD of this indicator was (3.583, 1.1686) which was slightly lower than CM and SD (3.8468, 1.0814). This shows that traffic rules and regulations by NTSA influence road safety outcomes in Nairobi County negatively. According to Elvik et al. (2019) revealed that comprehensive driver training interventions were associated with positive changes in attitude and self-reported driving behaviors, such as compliance with speed limits and seat belt usage.

4.8 Road Safety Outcome

The study sought to investigate the influence of road safety measures on road safety outcome in Nairobi County and various statements on safety outcome were examined and the following are the results: -

Table 4.10 Road Safety Outcome

Table 4.10 shows the results of the respondents on the level of agreement on safety outcome.

Statement	5 SA	4 A	3 N	2 D	1 SD	Mean	SD
Number of fatalities have increased	20(33.3)	23(38.3)	8 (13.3)	7(11.7)	2(0.7)	3.866	1.1118
Number of injuries has been reduced	20(33.3)	24(40.0)	7(11.7)	8(13.3)	1(1.7)	3.900	1.0688
Number of road accidents reported has been reduced	19(31.7)	23(38.3)	10(16.7)	7(11.7)	1(1.7)	3.866	1.0490
Road safety is more efficient	23(38.3)	23(38.3)	7(11.7)	6(10.0)	1(1.7)	4.016	1.0332
Composite mean & SD						**3.912**	**1.0657**

On statement number of fatalities have increased, 20(33.3%) strongly agreed, 23(38.3%) agreed, 8 (13.3%) were Neutral, 7(11.7%) disagreed while 2(0.7%) strongly disagreed.

Mean and SD of this indicator was (3.866, 1.1118) which was slightly lower than CM and SD (3.912, 1.0657). This shows that road safety measures influence road safety outcome in Nairobi County negatively. According to Elliott et al. (2019), incorporating emotional appeals into road safety campaigns resulted in higher levels of perceived risk and intention to comply with safety measures.

On statement number of injuries has been reduced, 20(33.3%) strongly agreed, 24(40.0%) agreed, 7(11.7%) were Neutral, 8(13.3%) disagreed while 1(1.7%) strongly disagreed. Mean and SD of this indicator was (3.900, 1.0688) which was slightly lower than CM and SD (3.912, 1.0657). This shows that road safety measures influence road safety outcome in Nairobi County negatively. According to Kim and Wagner (2014), European traffic safety culture, finding that adherence to road safety regulations reduces accidents.

On statement number of road accidents reported has been reduced, 19(31.7%) strongly agreed, 23(38.3%) agreed, 10(16.7) were Neutral, 7(11.7%) disagreed while 1(1.7%) strongly disagreed. Mean and SD of this indicator was (3.866, 1.0490) which was slightly lower than CM and SD (3.912, 1.0657). This shows that road safety measures influence road safety outcome in Nairobi County negatively. According to Gerber et al. (2020), Leveraging social norms and the influence of peers can effectively promote positive road user behavior.

On statement road safety is more efficient, 23(38.3%) strongly agreed, 23(38.3%) agreed, 7(11.7%) were Neutral, 6(10.0%) disagreed while 1(1.7%) strongly disagreed. Mean and SD of this indicator was (4.016, 1.0332) which was slightly lower than CM and SD (3.912, 1.0657). This shows that road safety measures influence road safety outcome in Nairobi County positively. According to Paine-Andrews et al. (2021) found that tailoring messages to different demographic groups led to better outcomes.

4.9 Inferential Analysis

The study section represents the relationship between Road Safety Training, Road Safety Campaigns, Motor Vehicle Inspection and Traffic Rules and Regulations.

4.9.1 Correlations Analysis

This study used Pearson product-moment correlation to measure the relationships between the dependent and independent variables where by Pearson coefficient <0.3 indicates weak correlation, Pearson coefficient >0.3<0.5 indicates moderate correlation and Pearson coefficient>0.5 indicates strong correlation. The findings are shown as in table 4.12 below.

Table 4.11 Inter-Correlations Matrix

Correlations

		Road Safety Training	Road Safety Campaigns	Motor Vehicle Inspection	Traffic Rules and Regulations	Road Safety Outcome
Road Safety Training	Pearson Correlation	1				
	Sig. (2-tailed)		.			
	N	60				
Road Safety Campaigns	Pearson Correlation	.149	1			
	Sig. (2-tailed)	.257				
	N	60	60			
Motor Vehicle Inspection	Pearson Correlation	.221	.503**	1		
	Sig. (2-tailed)	.090	.000			
	N	60	60	60		
Traffic Rules and Regulations	Pearson Correlation	.027	.400**	.534**	1	
	Sig. (2-tailed)	.835	.002	.000		
	N	60	60	60	60	
Road Safety Outcome	Pearson Correlation	-.028	.460**	.446**	.668**	1
	Sig. (2-tailed)	.830	.000	.000	.000	
	N	60	60	60	60	60

**. Correlation is significant at the 0.01 level (2-tailed).

The tables 4.11 show that all the predictor variables on Road Safety Training had a weak correlation while Road Safety Campaigns and Motor Vehicle Inspection had a moderate correlation and Traffic Rules and Regulations had shown to have a strong correlation.

Linear equation of multiple regression equation was developed to establish the relationships between the dependent and independent variables which are Road Safety Training, Road Safety Campaigns, Motor Vehicle Inspection and road safety outcome in Nairobi County. The relationship equation was represented by the linear equation below:

$$\text{Road saftey\_outcome}_{i} = \beta_0 + \beta_1 \text{Rd\_trn}_i + \beta_2 \text{Rd\_Cmpns}_i + \beta_3 \text{Motor\_VI}_i + \beta_4 \text{Traffic\_Reg}_i + \beta_j \sum_{j=1}^{n} \text{Controls}_i + \varepsilon_i$$

Y = Road safety outcome

X1= Road Safety Training, X2= Road Safety Campaigns, X3= Motor Vehicle Inspection, X4= Traffic Rules and Regulations

4.9.2 Model Summary

Table 4.12 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change
1	.706a	.499	.463	2.72875	.499	13.702	4	55	.000

a. Predictors: (Constant), Traffic Rules and Regulations, Road Safety Training, Road Safety Campaigns, Motor Vehicle Inspection

From the Table 4.12 above, R is the square root of R-Squared and is the correlation between the observed and predicted values of dependent variable implying that the association of 0.706 between Influence of road safety outcome which are level of Traffic Rules and Regulations, Road Safety Training, Road Safety Campaigns, Motor Vehicle Inspection was strong.

R-Squared is the proportion of the variance in the dependent variable road safety outcome was explained by variations in the independent variable Traffic Rules and Regulations, Road Safety Training, Road Safety Campaigns, Motor Vehicle Inspection. This implied that 49.9% of variance or correlation between variables in general but does not reflect the extent to which any particular independent variable Traffic Rules and Regulations, Road Safety Training, Road Safety Campaigns, Motor Vehicle Inspection was associated with road safety outcome.

Adjusted R^2 is called the coefficient of determination which indicates road safety outcome varies with Traffic Rules and Regulations, Road Safety Training, Road Safety Campaigns, Motor Vehicle Inspection. From the table above, the value of adjusted R2 is 0.463. This implied that, there was a variation of 46.3% of road safety outcome with

variation i56n influence of Traffic Rules and Regulations, Road Safety Training, Road Safety Campaigns, Motor Vehicle Inspection and was statistically significance with P= 0.00 < 0.05. Other factors not studied contribute to 53.7% of effective road safety outcome and further research should be conducted to establish the same.

4.9.3 ANOVA (b)

Table 4.13 ANOVA (b)

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	408.115	4	102.029	13.702	.000[b]
	Residual	409.535	55	7.446		
	Total	817.650	59			

a Dependent Variable: Road Safety Outcome

Predictors: (Constant), Traffic Rules and Regulations, Road Safety Training, Road Safety Campaigns, Motor Vehicle Inspection

Table 4.13 gives an F-test to determine whether the model had a good fit for the data. The F-Test (F=13.702, P=0.00< 0.05) indicated that the model formed between Road Safety Outcome and influence of road safety measures had data with significant goodness of fit.

4.9.4 Coefficients (a)

Table 4.14 Coefficients (a)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.772	3.153		.879	.000
	Road Safety Training	-.098	.107	-.090	-.911	.045
	Road Safety Campaigns	.199	.100	.223	1.981	.000
	Motor Vehicle Inspection	.069	.142	.061	.488	.000
	Traffic Rules and Regulations	.405	.085	.549	4.754	.000

a. Dependent Variable: Road Safety Outcome

From the table 4.14 the values, the unstandardized coefficients of road safety training, road safety campaigns, motor vehicle campaigns and traffic rules and regulations were -0.098, 0.199, 0.069 and 0.405.

The predictor variables Traffic Rules and Regulations, Road Safety Training, Road Safety Campaigns, Motor Vehicle Inspection are constant. From the Table 4.14, 2.772 represents represented Road Safety Outcome at constant when all other variables of influence of road safety measures were constant at zero (0). The value 2.772 holds level of Traffic Rules and Regulations, Road Safety Training, Road Safety Campaigns, Motor Vehicle Inspection constant at Zero.

In road safety training where trainers from NTSA are experienced and training modules have quality content lead to ineffectiveness of Road Safety Outcome. The study revealed that road safety training influence Road Safety Outcome by (B=-0.098, P=0.00).

In road safety campaign, road safety campaigns are not frequently conducted through social media and safety campaigns traffic rules not well followed lead to infectiveness of Road Safety Outcome. The findings depict that road safety training led to Road Safety Outcome by (B=-0.199, P=0.045).

In Motor Vehicle Inspection, ineffective braking system, clutch and acceleration, lack of frequent motor vehicle inspection to prevents fines and penalties from state leading to improved safety and poor Condition of electric and lighting system lead to infectiveness of Road Safety Outcome The findings depict that road safety training led to Road Safety Outcome by (B=-0.069, P=0.00).

In Traffic Rules and Regulations, lack of enforcement of fitting of safety belts in vehicles which has been neglected, traffic rules and regulations are being compromised by the enforcement officers and lack enough measures need to be reviewed to enhance road safety and reduce road accidents especially in Nairobi County led to infectiveness of Road Safety Outcome. The findings depict that road safety training led to Road Safety Outcome by (B=-0.405, P=0.00).

This clearly indicated that there existed a negative relationship between Road Safety Outcome and deficiency in any of the four independent variables; Traffic Rules and Regulations, Road Safety Training, Road Safety Campaigns, Motor Vehicle Inspection and were statistically significant. The linear model for this study resulted;

$$Y = 2.772 - .098X1 + 0.199X2 + 0.069X3 + 0.405X4$$

Where X1= Road Safety Training,

X2= - Road Safety Campaigns,

X3= Motor Vehicle Inspection,

X4= Traffic Rules and Regulations

CHAPTER FIVE

SUMMARY AND DISCUSSION OF FINDINGS, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter gave a summary of the major findings on the determinants of the performance of road safety programs implemented by the National Transport and Safety Authority (NTSA), Nairobi County, Kenya. The chapter draws the study conclusions and discuses major recommendations and gives suggestion for further studies.

5.2 Summarized Findings

The findings this study was drawn from the study objectives. The study examined the determinants of the performance of road safety programs implemented by the National Transport and Safety Authority (NTSA), Nairobi County, Kenya. In Table 4.1 the questionnaire response rate was 89.6% which is above 50% and according to Babbie (2012) it's reliable for data analysis. In Table 4.2 shows that male was 43(71.7%) while female was 17(28.3%). This shows that all the genders were fully represented in this study and the findings are similar to Okobiah and Okorodudu (2004) study. In education level, Table 4.3 shows Diploma level revealed had Diploma 17(28.3%), followed by those who had certificate and other qualifications with 23(25.0) while those who had Bachelor's Degree were 13(21.7%). This study revealed that most of the respondents were elite and are able provide meaningful information. In the distribution of respondents by age, in Table 4.4 shows that most of the respondents were 31-40 years 25(41.7%), 30 Years and below were 18(30.0%), 41-50 years were 14(23.3%) while those with Over 51 years were 3(5.0%) this implies that the study majorly consisted of youths. Distribution of the respondents by their profession or category, Table 4.5 shows that majority of the respondents were Passengers and Motorcyclists with 15(25.0%), 12(20.0%) were Traffic police officer, 11(18.3%) were NTSA Staff while 7(11.7%) were Drivers.

5.2.1 Road Safety Training and Performance of Road safety Programs

The study sought to find out the influence of Road Safety Training on the performance of road safety programs implemented by the National Transport and Safety Authority (NTSA), Nairobi County, Kenya and various statements of road safety training were examined and the following are the results. According to the results obtained in table 4.6 it is noted; On statement that Training programs offered by NTSA play a significant role in reduction of road accidents in Nairobi County, 19(31.7%) strongly agreed, 28(46.7%) agreed, 6(10.0%) were neutral while 7(11.7%) disagreed.

Attending a driving school lead to knowledge improvement on road safety which leads to reduced road accidents, 9(15.0%) strongly agreed, 35(58.3%) agreed, 13(21.7%) were neutral, 2(3.3%) disagreed, while 1(1.7%) strongly disagree. On statement that Training programs offered by NTSA leads to increased compliance rate by the road users, 15(25.0%) strongly agreed, 24(40.0%) agreed, 10(16.7%) were neutral, 9(15.0%) disagreed, while 2(3.3%) strongly disagree. On statement that Compliance of road safety regulations contribute to reduction of road accidents, 23(38.3%) strongly agreed, 16(26.7%) agreed, 15(25.0%) were neutral, 2(3.3%) disagreed, while 4(6.7%) strongly disagree.

On statement that Trainers from NTSA are experienced, 8(13.3%) strongly agreed, 30(50.0%) agreed, 5(8.3%) were neutral, 7(11.7%) disagreed, while 10(16.7%) strongly disagree with the statement. On statement that Training modules have quality content, 8(13.3%) strongly agreed, 30(50.0%) agreed, 5(8.3%) were neutral, 7(11.7%) disagreed, while 10(16.7%) strongly disagree. Based on the Means and Standard deviation shows that Training programs offered by NTSA leads to increased compliance rate by the road users influence on road safety outcome and had a highest average mean of 3.983 and Std dev. Of 0 .9476 while Trainers from NTSA are experienced and Training modules have quality content influence on road safety outcome had the lowest average mean of 3.316 and Std dev. of 1.3211. This infers the influence on road safety outcome.

5.2.2 Road Safety Campaigns and Performance of Road safety Programs

The second objective determined the influence of safety campaigns on the performance of road safety programs implemented by the national transport and safety authority

(Ntsa), Nairobi County, Kenya. Table 4.7 shows the results of the respondents on the level of agreement on safety campaigns by NTSA on road safety outcomes. On statement that Safety campaigns carried out by NTSA creates awareness on road safety among the road users which leads to reduction of road accidents, 26(43.3%) strongly agreed, 28(46.7%) agreed, 1(1.7%) were neutral, 3(5.0%) disagreed, while 2(3.3%) strongly disagree with the statement. On statement that Safety campaigns by NTSA improves road user behavior which play a significant role in reduction of road accidents, 27(45.0%) strongly agreed, 25(41.7%) agreed, 3(5.0%) were neutral, 3(5.0%) disagreed, while 2(3.3%) strongly disagree.

On statement that the major causes of road accidents in Nairobi County is because of negligence, 19(31.7%) strongly agreed, 27(45.0%) agreed, 6(10.0%) were neutral, 6(10.0%) disagreed, while 2(3.3%) strongly disagree. On statement that the Enforcement of penalties help to deter violation of road safety rules and regulations, 16(26.7%) strongly agreed, 18(30.0%) agreed, 8(13.3%) were neutral, 15(25.0%) disagreed, while 3(5.0%) strongly disagree.

On statement that the Road safety campaigns are frequently conducted through social media, 7(11.7%) strongly agreed with the statement, 10(16.7%) agreed, 4(6.7%) were neutral, 29(48.3%) disagreed, while 10(16.7%) strongly disagree. On statement that through safety campaigns traffic rules are well followed, 8(13.3%) strongly agreed with the statement, 1 (1.7%) agreed, 37(61.7%) disagreed, while 14(23.3%) strongly disagree. Based on the Means and Standard deviation shows that Safety campaigns carried out by NTSA creates awareness on road safety among the road users which leads to reduction of road accidents influence on road safety outcome and had a highest average mean of 4.216 and Std dev. Of 0 .9583 while through safety campaigns traffic rules are well followed had the lowest average mean of 2.200 and Std dev. of 1.2185.

5.2.3 Motor Vehicle Inspection and Performance of Road safety Programs

The third objective sought to establish the extent to which motor vehicle inspection influence on the performance of road safety programs implemented by the National Transport and Safety Authority (NTSA), Nairobi County, Kenya. According to the results shown from Table.4.8, On statement that Conducting the compliance checks on the state

of vehicles, identify and remove non-compliant vehicles, 20(33.3%) strongly agreed, 22(36.7%) agreed, 8(13.3%) disagreed, while 7 (11.7%) strongly disagree.

On statement that effective braking system, clutch and acceleration, 11(18.3%) strongly agreed, 33(55.0%) agreed, 9(15.0%) disagreed, while 1(1.7%) strongly disagree. On statement that Functionality of speed governors, 22(36.7%) strongly agreed, 25(41.7%) agreed, 2(3.3%) were Neutral while 11(18.3%) strongly disagree. On statement that Condition of electric and lighting system, 8(13.3%) strongly agreed, 25(41.7%) agreed, 14(23.3%) were Neutral, 12(20.0%) disagreed while 1(1.7%) strongly disagree. On statement that frequent motor vehicle inspection prevents fines and penalties from state leading to improved safety, 21(35.0%) strongly agreed, 17(28.3%) agreed, 10(16.7%) were Neutral while 12(20.0%) disagreed.

On statement Motor vehicle inspection minimizes drivers' liability in case of road accident, 19(31.7%) strongly agreed, 35(55.0%) agreed, 3(8.3%) were Neutral, 2(3.3%) disagreed while 1(1.7%) strongly disagreed. Based on the Means and Standard deviation shows that Motor vehicle inspection minimizes driver's liability in case of road accident influence on road safety outcome and had a highest average mean of 4.116 and Std dev. of 0 .8252 while the lowest mean recorded was Condition of electric and lighting system with average mean of 3.450 and Std dev. of 1.0155.

5.2.4 Traffic Rules and Regulations and Performance of Road safety Programs

The fourth objective sought to establish how imposition of traffic rules and regulations by NTSA influence the Performance of Road safety Programs. On statement that enforcing traffic laws such as random breath testing check on alcohol levels and enforcing speed levels, 25(41.7%) picked always, 26(43.3%) often, 2(3.3%) were not sure, 5(8.3%) picked rare, while 2(3.3%) picked never. On statement that detecting, arresting and prosecution of traffic offenders, 17(28.3%) picked always, 32(53.3%) often, 5(8.3%) were not sure, 5(8.3%) picked rare, while 1(1.7%) picked never. On statement that road block checks by NTSA enforcement officers and traffic police officers contribute to the reduction of road accidents, 25(41.7%) picked always, 24(40.0%) often, 9(15.0%) picked rare while 2(3.3%) picked never.

On statement that more measures need to be reviewed to enhance road safety and reduce road accidents especially in Nairobi County, 14(23.3%) picked always, 24(40.0%) often, 7(11.7%) were not sure, 13(21.7%) picked rare while 2(3.3%) picked never. On statement that traffic rules and regulations are being compromised by the enforcement officers, 17 (28.3%) picked always, 23(38.3%) often, 11(18.3%) were not sure while 9(15.0%) picked rare. On statement that enforcement of fitting of safety belts in vehicles has been neglected, 14(23.3%) picked always, 24(40.0%) often, 7(11.7%) were not sure, 13(21.7%) picked rare while 2(3.3%) picked never.

Based on the Means and Standard deviation shows that Enforcing traffic laws such as random breath testing check on alcohol levels and enforcing speed levels influence on road safety outcome and had a highest average mean of 4.116 and Std dev. of 1.0430 while the lowest mean recorded was Enforcement of fitting of safety belts in vehicles has been neglected with average mean of 3.583 and Std dev. of 1.1686.

5.3 Discussion of the Findings

5.3.1 Road Safety Training and Performance of Road safety Programs

In road safety campaign, road safety campaigns are not frequently conducted through social media and safety campaigns traffic rules not well followed lead to infectiveness of Road Safety programs. The study revealed that ($P=0.045<0.05$) road safety campaign influence Performance of Road safety Programs as the P-Value is lower than 0.05 as the P-Value is lower than 0.05. Numerous studies have evaluated the effectiveness of road safety training programs in improving road safety outcomes. According to Hatakka et al. (2017) found that driver training programs incorporating hazard perception training and feedback led to significant improvements in hazard perception skills and reduced crash involvement.

5.3.2 Road Safety Campaigns and Performance of Road safety Programs

In road safety campaign, road safety campaigns are not frequently conducted through social media and safety campaigns traffic rules not well followed lead to infectiveness of Road Safety Outcome. The study revealed that ($P=0.045<0.05$) road safety campaign influence Road Safety Outcome as the P-Value is lower than 0.05 as the P-Value is lower

than 0.05. Road safety campaigns have proven to be effective in increasing awareness and improving road user behavior. Several studies have demonstrated positive outcomes: According to a study by Sze & Wong (2018), a road safety campaign in Hong Kong resulted in a 32% decrease in the number of traffic accidents and a 43% decrease in fatalities.

5.3.3 Motor Vehicle Inspection and Performance of Road safety Programs

Ineffective braking system, clutch and acceleration, lack of frequent motor vehicle inspection to prevent fines and penalties from state leading to improved safety and poor Condition of electric and lighting system lead to infectiveness of Road Safety Outcome. The study revealed that (P=0.000<0.05) Motor Vehicle Inspection influence Road Safety Outcome as the P-Value is lower than 0.05 as the P-Value is lower than 0.05. According to Khan (2011) established that lack of a motor vehicle inspection in the country had led to faulty vehicles in the country with defective system of indicator lighting, faulty braking system, old and damaged tires, loose and overloaded wheel axles.

5.3.4 Traffic Rules and Regulations and Performance of Road safety Programs

In Traffic Rules and Regulations, lack of enforcement of fitting of safety belts in vehicles which has been neglected, traffic rules and regulations are being compromised by the enforcement officers and lack enough measures need to be reviewed to enhance road safety and reduce road accidents especially in Nairobi County led to infectiveness of Road Safety Outcome. The study revealed that (P=0.000<0.05) Traffic Rules and Regulations influence Road Safety Outcome as the P-Value is lower than 0.05. According to Kim and Wagner (2014) assessed European traffic safety culture, finding that adherence to road safety regulations reduces accidents. Accidents cause damage, injury, and loss of life. They happen suddenly and are hard to avoid.

5.4 Conclusion

5.4.1 Road Safety Training

The study concluded that road safety training has contribution to influence on road safety outcomes. The study showed that majority agreed that training programs offered by NTSA play a significant role in reduction of road accidents in Nairobi County with a mean of 3.983. Since P calculated is less than 0.05 level of significance (P=0.045<0.05),

the study rejects the null hypothesis and concludes that there is significant influence of Road Safety Training on road safety outcomes.

5.4.2 Road Safety Campaigns

The study concluded that road safety campaigns have contribution to influence on road safety outcomes. The study showed that majority agreed that Safety campaigns carried out by NTSA creates awareness on road safety among the road users which leads to reduction of road accidents with a mean of 4.216. Since P calculated is less than 0.05 level of significance (P=0.000<0.05), the study rejects the null hypothesis and concludes that there is significant influence of road safety campaigns on road safety outcomes.

5.4.3 Motor Vehicle Inspection

The study concluded that motor vehicle inspection has contribution to influence on road safety outcomes. The study showed that majority agreed that motor vehicle inspection minimizes driver's liability in case of road accident with a mean of 4.116. Since P calculated is less than 0.05 level of significance (P=0.000<0.05), the study rejects the null hypothesis and concludes that there is significant influence of motor vehicle inspection on road safety outcomes.

5.4.4 Traffic Rules and Regulations

The study concluded that traffic rules and regulations have contribution to influence on road safety outcomes. The study showed that majority agreed that enforcing traffic laws such as random breath testing check on alcohol levels and enforcing speed levels with a mean of 4.116. Since P calculated is less than 0.05 level of significance (P=0.000<0.05), the study rejects the null hypothesis and concludes that there is significant influence of traffic rules and regulations on road safety outcomes.

5.5 Recommendation

In view of the findings and conclusion generated it was recommended that;

i. Road safety training has great influence on road safety outcomes hence there is need for NTSA to engage experienced trainers and quality content training modules and with this will have great influence on road safety outcomes
ii. Road safety campaigns has great influence on road safety outcomes hence there is need for NTSA to bring on board all parties and come up with policies, traffic

rules to be followed and on how to conduct the campaigns and with this will have great influence on road safety outcomes.

iii. Motor vehicle inspection has great influence on road safety outcomes hence there is need to improve the Condition of electric and lighting system and with this will have great influence on road safety outcomes

iv. Traffic rules and regulations has great influence on road safety outcomes hence there is need for more measures to be reviewed to enhance road safety and reduce road accidents especially in Nairobi County and enforcement of fitting of safety belts in vehicles has been neglected and with this will have great influence on road safety outcomes

5.6 Suggestion for Further study

The study seeks to investigate the influence of road safety measures on road safety outcome in Nairobi County. Further, there is need to undertake similar research in other devolved county governments in order to establish whether the explored road safety measures can be generalized to influence the road safety measures.

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APPENDECIES

APPENDIX I: Research Authorization

Dear Sir/Madam,

RE: REQUEST TO CARRY OUT DATA COLLECTION.

I am a student at the University of Nairobi. I am currently Carrying out a research study to fulfill the requirements of the Award of the degree of masters of arts in Project planning and management on the **determinants of the performance of road safety programs implemented by the national transport and safety authority (ntsa), Nairobi county, Kenya.** You have been selected to participate in this study and I would highly appreciate if you assist me by responding to all questions in the attached questionnaire as completely, correctly and honestly as possible. The information you will give will be treated with utmost confidentiality and will be used for research purposes of this study only.

Thank you in advance for your co-operation.

Yours faithfully,

LUCY MULAA

APPEDIX II: QUESTIONNAIRE

Being one of the respondents you are requested to fill this questionnaire by either ticking or explaining where appropriate. The information gathered will be used strictly for academic purpose only and will be treated with utmost confidentiality.

PART A: DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

1. Gender:

   Male ☐ Female ☐

2. Highest level of education attained.

   Certificate ☐

   Diploma ☐

   Bachelor's degree ☐

   Post-graduate degree ☐

   Other (specify)……

3. What is your age category (Tick appropriate range).

   30 years and below ☐

   31 – 40 years ☐

   41– 50 years ☐

   Over 50 years ☐

4. What is your profession or category?

   Drivers ☐

   Passengers ☐

   NTSA staff ☐

   Motorcyclists ☐

   Traffic police officer ☐

PART B: INFORMATION RELATED TO RESEARCH OBJECTIVES

5. Road Safety Training

Below are statements on the influence of road safety training by NTSA on road safety outcome. As a passenger, driver or motorcyclist indicate your extent of agreement on the following statements by ticking against the correct choice. Using Likert scale 5-1 where;

Strongly agree k	5
Agree	4
Neutral	3
Disagree and	2
Strongly disagree	1

Statement on the influence of road safety training by NTSA	**5**	**4**	**3**	**2**	**1**
Training programs offered by NTSA play a significant role in reduction of road accidents in Nairobi county					
Attending a driving school leads to knowledge improvement on road safety which leads to reduced road accidents					
Training programs offered by NTSA leads to increased compliance rate by the road users					
Compliance of road safety regulations contribute to reduction of road accidents					
Trainers from NTSA are experienced					
Training modules have quality content					

6. Road Safety Campaigns

Below are statements on the extent to which road safety campaigns influence road safety outcome. As a passenger, driver or motorcyclist indicate your extent of agreement on the following statements by ticking against the correct choice. Using Likert scale 5-1 where;

Strongly agree	5
Agree	4
Neutral	3
Disagree and	2
Strongly disagree	1

The following aspects of safety campaign play a significant role in reduction of road accidents	**5**	**4**	**3**	**2**	**1**
Safety campaigns carried out by NTSA creates awareness on road safety among the road users which leads to reduction of road accidents					
Safety campaigns by NTSA improves road user behavior which play a significant role in reduction of road accidents					
The major causes of road accidents in Nairobi County is because of negligence					
Enforcement of penalties help to deter violation of road safety rules and regulations					
Road safety campaigns are frequently conducted through social media					
Through safety campaigns traffic rules are well followed					

7. Motor Vehicle Inspection

Below are statements on the extent to which motor vehicle inspection influence road safety outcome. As NTSA staff indicate your extent of agreement on the following statements by ticking against the correct choice. Using Likert scale 5-1 where;

Strongly agree	5
Agree	4
Neutral	3
Disagree and	2

Strongly disagree [1]

The following aspects of motor vehicle inspection play a significant role in reduction of road accidents	**5**	**4**	**3**	**2**	**1**
Conducting the compliance checks on the state of vehicles, identify and remove non-compliant vehicles					
Effective breaking system, clutch and acceleration					
Functionality of speed governors					
Condition of electric and lighting system					
Frequent motor vehicle inspection prevents fines and penalties from state leading to improved safety					
Motor vehicle inspection minimizes drivers liability in case of road accident					

8. Traffic Rules and Regulations

Below are statements on how traffic rules and regulations imposed by NTSA influence road safety outcome. As a police officer indicate your extent of agreement on the following statements by ticking against the correct choice. Using Likert scale 5-1 where;

Always [5]

Often [4]

Not Sure [3]

Rarely [2]

Never [1]

Statements on how traffic rules and regulations imposed by NTSA influence road safety outcome	**5**	**4**	**3**	**2**	**1**
Enforcing traffic laws such as random breath testing check on alcohol levels and enforcing speed levels					
Detecting, arresting and prosecution of traffic offenders					
Road block checks by NTSA enforcement officers and traffic police officers contribute to the reduction of road accidents					
More measures need to be reviewed to enhance road safety and reduce road accidents especially in Nairobi County					

Traffic rules and regulations are being compromised by the enforcement officers					
Enforcement of fitting of safety belts in vehicles has been neglected					

9. Performance of Road safety Programs

Below are statements on road safety outcome imposed by NTSA .As NTSA staff and police officer indicate your extent of agreement on the following statements by ticking against the correct choice. Using Likert scale 5-1 where;

Strongly agree	5
Agree	4
Neutral	3
Disagree and	2
Strongly disagree	1

Statements on road safety outcome imposed by NTSA	**5**	**4**	**3**	**2**	**1**
Number of fatalities have increased					
Number of injuries has been reduced					
Number of road accidents reported has been reduced					
Road safety is more efficient					

Thank you for your cooperation