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RESEARCH ARTICLE

FACTORS CONTRIBUTING TO PUBLIC TRANSPORT MOTOR VEHICLE ACCIDENTS WITHIN NAKURU COUNTY IN KENYA

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ABSTRACT

14– Road transportation which includes the use ofmotor vehicles and bicycles provides benefits both to nations and to individuals by facilitating the movement of goods and people and services (WHO, 2009. The use of the motor vehicle as a means of transportation of people is increasingly popular across the world. A WHO report cited Westernized countries as examples that saw a rise in the ownership of motor vehicles from 23% in 1987 to 63% in 2001 (WHO, 2006). In Kenya, A report by the National Road Safety Commission (NRSC) indicated that 59 deaths were recorded from publicmotor vehicle accidents in 2008.This study sought to underpin factors that contribute to road traffic accidents among public transport vehicles. The study was conducted at Nauru town which is 157km South East of Nairobi the capital of Kenya in Africa The study adopted a cross section research design. The researcher used random sampling to select the study. Research instruments included structured self-administered questionnaires and also checklists.Data was cleaned, code, analyzed and managed by use of SPSS. The study showed that 69.3% or the accidents were due to pot holes.Other causes of road accidents included human factor, weather, and the condition of the motor vehicles. The study concluded that many roads in Nakuru are not in standard shape. Not all roads are marked and many also do not have designated crossing points.

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INTRODUCTION

Road transportation which includes the use of vehicles, motor vehicles and bicycles provides benefits both to nations and to individuals by facilitating the movement of goods and people (WHO, 2009). The World Health Organization in 2006 revealed in a world report on Road Traffic Injury Prevention: The use of the motor vehicle as a means of transportation is increasingly popular across the world. The report cited Westernized countries as an example which saw a rise in the ownership of motor vehicles from 23% in 1987 to 63% in 2001 (WHO, 2006). In Africa, a research carried out in Tanzania on the use of motor vehicles revealed that there has been an increase in its usage from 60,700 in 2007 to 850,000 in 2009 (Nkwame, 2010). Haworth (2010) indicated that with the increasing number of motor vehicles as a means of transport, motor vehicle accidents will also become high. He added that the causes of motor vehicle accidents were human, environmental errors and defective motor vehicle s. In the USA, records from the Department of Transport's National Highway Safety Administration (NHTSA) showed that there were 4,553 deaths from motor vehicle accidents in 2005. Of these, 48% were as a result of over speeding and 42% of the riders had blood alcohol concentration (BAC) of 0.08 or high which was illegal. It has been revealed that alcoholic beverages are frequently available and promoted where motor vehicles are ridden and at events targeting motorists (NHTSA, 2007).

A similar picture is given in other countries. Coincidently, there was the same number (4,553) source of motorists fatalities recorded in Malaysia as in the USA in the year 2005. In Malaysia however, 69% of the victims were drunk while riding as compared to 42% in the USA (had BAC level of 0.08 which was an illegal limit for drunk riding) and 97% of the victims were males while only 3% were females (PDRM, 2007). Studies by the WHO have revealed that motor vehicle accidents were mostly costly for countries in which they occur ranging from medical cost, productivity losses and loss of quality of life (WHO, 2010). An earlier report by the WHO on road safety in 2009 however revealed that over 90% of the world's fatalities on the roads occurred in low-income and middle-income countries which had only 48% of the world's vehicles (WHO, 2009). Several factors in various combinations were thought to be responsible for these high rates of accidents. For instance, Eke et al. (2000) using data from the University of Port Harcourt Teaching Hospital from January 1986 to December 1995 found that 70% of the accidents in Port Harcourt occurred during the rainy season

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(from June to August) and that most of these accidents occurred during weekends. Another research by Naddumba (2001) on the use of motor vehicles in Kampala, Uganda revealed that most of the accidents were as a result of over speeding. In Ghana, the Upper West Regional Commander of the Motor Traffic and Transport Unit (MTTU) of the Ghana Police Service in an interview with the Ghana News Agency (GNA) in Wa, revealed that there were 203 reported motor vehicle accidents cases from 2005 to 2011. These accidents were attributed to the bad nature of the roads, the high level of alcohol consumption in the region and over speeding on the part of riders (GNA, 2012). As a result of the statistics given above, and the fact that the usage of motor vehicles had become a popular means of transport in the urban areas of the country, there was the need to research into the causes and effects of these accidents.

Also, the literature reviewed revealed that there were several causes of motor vehicle accidents such as bad roads, alcohol consumption, over speeding and the high number of motor vehicles used as means of transportation and its effects included loss of life and financial losses. This research adopted mainly quantitative methods to investigate and determine if these same factors resulted in motor vehicle accidents in Nakuru town. It also sought to find out if the victims of these accidents suffered these same effects so as to help policy makers in the road and transport sector in drafting their plans and policies. Globally, Hurt et al (1981) revealed that motor vehicle accidents had increasingly become a problem for countries where they are patronized. Confirming Haworth's (2010) assertion that high number of motor vehicle usage has a correspondence with the number of accidents, Afukaar et al (2009) indicated in a research that Northern region accounted for the most (20%) motor vehicle fatalities in The US followed by the Japan with 14.7%. The report added that these two regions had the higher number of motor vehicles in Europe. The incidence of road accidents including motor vehicle accidents affects the economy of industrialized countries. It has been revealed that the country loses 1.6% of her Gross Domestic Product (GDP) to all forms of road accidents (Chronicle, 2012). In Nakuru, between April and July 2012, there were 65 reported cases of motor vehicle accidents as against three car accidents in the town. As a result of this problem, a lot of pressure is exerted on the already constrained County Referral Hospital, the War Memorial hospital. The hospital administrator in an interview with the KNA revealed that the facility had within the first quarter of 2012, treated 126 victims of motor vehicle accidents (KNA, 2012).

In 2013 there has been over 137 total public vehicle accidents, in 2014 there was a total of 156 public vehicle accidents and in 2015/2016 there was a total of 176 public motor vehicle accidents (Nakuru, Traffic Police Records 2015/2016). It was against the backdrop of these problems and others associated with the high rate of motor vehicle accidents that the researcher sought to find out the causes and effects of motor vehicle accidents in Nakuru town so as to inform policy making. Poor road conditions such as missing guardrails, erosion, pot holes and faulty design can be the cause of serious car accidents or even injuries for the unwary driver. But, whether a person can sue for the resulting damage or injuries is a complicated question.A plaintiff who is a victim of a car accident due to poor road conditions must prove that the road conditions actually caused the damage to the car and/or the injuries. The plaintiff must also show that the agency or company responsible for maintaining the road was negligent in its duty to provide a safe roadway -- or that they failed to adequately warn drivers of a potential hazard. Finally, the plaintiff must determine if the agency responsible is allowed to be sued in court and whether too much time has passed since the accident. While driver errors such as speeding, distracted driving and drunk driving are among the leading causes of automobile accidents in Florida, dangerous road conditions are also a significant contributor. Dangerous road conditions may be the result of natural events, such as tropical rains and flooding, that make driving unsafe. Dangerous conditions can also arise from the poor physical condition of a road and its surroundings.

MATERIALS AND METHODS

Study Area

The study was conducted in Nakuru town in NakuruCountyin Kenya. Nakuru town is the 3rd biggest town in Kenya. The town is situated at Central Rift Valley Region within Nakuru County which is 157 Kms from Kenya's capital city of Nairobi. Nakuru town is Located at the South Eastern part of the Rift Valley. The coordinates of thetown are: 0°22'11.0"S, 35°55'58.0"E (Latitude:-0.369734; Longitude: 35.932779) (survey of Kenya). The main economic activities around the University are agricultural-based industries including vegetable and milk processing, large-scale wheat and barley farming. Light manufacturing industries such as timber milling and quarrying are also a mainstay of the local economy. The economic growth of the town has been slowed due to its proximity to the provincial capital, Nakuru. The university has the academic departments and service departments

Study design

The study will adopt cross sectional descriptive study design the study will use both qualitative and quantitative methods. The strength of the study lies in the scope for probing complex hazards in order to identify new and significant ways of classifying and understanding the risks that they pose. In order to avoid confounding, the study will examine the relationship between injuries and other variables of interest as they exist in the defined population as a single over a short period of time (point prevalence).

Target Population

The study targeted a total population of 307,990 inhabitants. The activities within this town differ greatly and hence the sources and nature of hazards are different.

Sample size determination

In order to determine the sample size, the researcher will Cochran's formulae (1987)

$$n = Z^2 P(1-P)/e^2$$

- Thus; $n=Z^2 P(1-P)/e^2$
- n = sample size
- z = standard normal deviate at 95% confidence interval (1.96)
- p = estimated proportion of people with WRMSIs (15%)
- 1-p = the desired confidence level

- e = statistical significance level (desired level of precision = 0.05)

n=1.96X1.96 (1-P)
0.05^2
n=3.84 (0.15x0.85)
0.0025
n=195.84
n= rounded up 196

Sampling Procedure

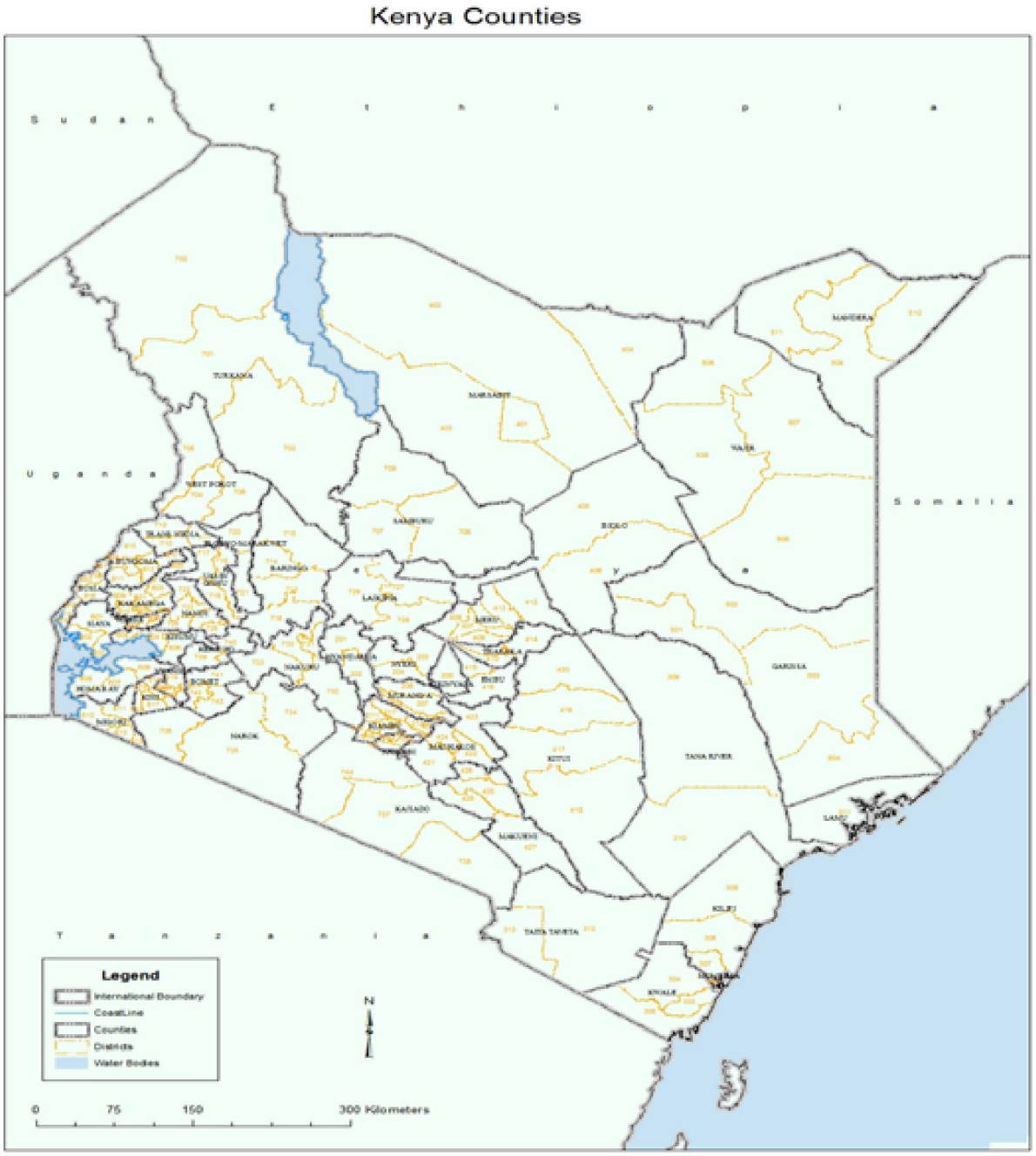
The researcher applied random sampling method to select the study participants. Subjects were explained the nature of the study and given the questionnaire to fill. The researcher also observed the state of the vehicles and recorded in the checklist.

Research Instrument

Data was gathered in various ways, primarily through structured interviews from a range of drivers in public motor vehicles industry. More interviews were conducted among other subjects including traffic police and National Traffic and Safety Authority. The other instruments included structured self-administered questionnaires. Documents from traffic police and National Road Safety Authority were also review or collected for all aspects of road traffic accidents, both as a source of information and to verify the interview data. In most cases, road traffic accidents assisted in the verification process and provide an opportunity to speak employees.

Reliability and Validity

Both content and construct validity of instruments were verified for accuracy. According to Kothari C., 2004, Content validity ensured that the items in the questionnaire are adequately representative of the subject area; the researcher therefore carefully selected the items to be included in the instrument based on researcher objectives. Questionnaires items were validated by the supervisors. Based on pre-test



results, the questionnaire were revised as necessary to rephrase the items, change number and order of items, change the tones (either positive or negative) and change the instructions.

Ethical considerations

Permission to conduct research was sought from the university authorities. The participants included in the study were informed in advance to prepare them for the study. Questionnaires were administered and participants completed them in the presence of the researcher in order to get maximum returns. Researcher then collected the completed questionnaires. Interview schedules were face to face encounter. The responses were recorded immediately and any further explanations were noted.

Data Analysis

Data was cleaned, codedentered in computer software and summarized based on specific objectives. Some data were analyzed qualitatively using content analysis while the rest was analyzed quantitively. The Statistical Package for Social Science (SPSS) version 22.0 computer programme was used to manage the data.

RESULTS

Data on gender distribution revealed that majority (91.3%) were male respondents while 8.7% were female respondents. This can be explained due to socio cultural factors where driving a public service vehicle is considered mainly a male undertaking in most Kenyan community. In some communities a woman is not allowed to drive even a family vehicle.

Table 1. Gender distribution

Gender	Frequency	Percent
Male	137	91.3%
Female	13	8.7%
Total	150	100.0%

Age distribution

The study found out that majority (32%) of the public vehicle drivers were aged between 31 and 40yrs. According to the expectation in many Kenyan communities, a man is widely expected to have a family at the age of about 30years. The economic burden is least to the man to fend for the family. Driving is the easiest skill to acquire for those who drop out of high schools. The least (11.3%) number of public drivers were aged below 20 years. In Kenya the condition of acquiring a driving license is by virtue of having an identification card which is given at the age of 18 years. After the age of 40 years, some drivers develop eye sight problems and hence pull out of the public vehicle driving sector. Figure 1 below shows the age distribution of public vehicle drivers.

Religion

Though there is no restriction of driving public service vehicle by religion, the study found out that majority (80%) of the drivers were Christians. This scenario can also be explained by the fact that majority of the inhabitants in Nakuru town tribes that subscribe to Christian faith.

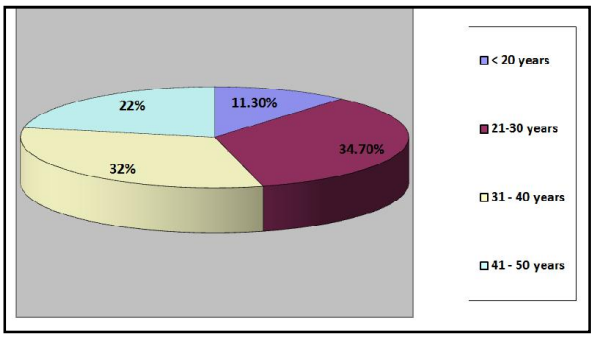


Figure 1. Age distribution

Table 2. Religions

Response	Frequency	Percent
Christian	120	80.0%
Muslim	30	20.0%
Total	150	100.0%

Marital status

On whether those with families were more engaged as public vehicle drivers, drivers than those without, the study found out that there was no significant difference as 29.3% were widowed or widower while single drivers were 28.0%.

Table 3. Marital status

Response	Frequency	Percent
Single	42	28.0%
Married	29	19.3%
Divorced/separated	35	23.3%
Widow/widower	44	29.3%
Total	150	100.0%

Occupation

Majority (52%) of the public vehicle drivers were full time employees of the industry while 48% were working on part time basis. Whenever they got any other job that could pay better they left the driving. This may contribute to lack of seriousness in driving.

Figure 2. Occupations

Perception of drivers on condition of the road

The study revealed that some drivers (30.7%) believed that the road network in Nakuru town was good while majority (69.3%) thought the roads were in poor state of repair.

Road markings

Majority (88.7%) of the respondents reported that the roads were not well marked while 11.3% said their roads were

marked. Poor or lack of road markings can be a major cause of accidents especially at night, during rainy seasons and when there is fog.

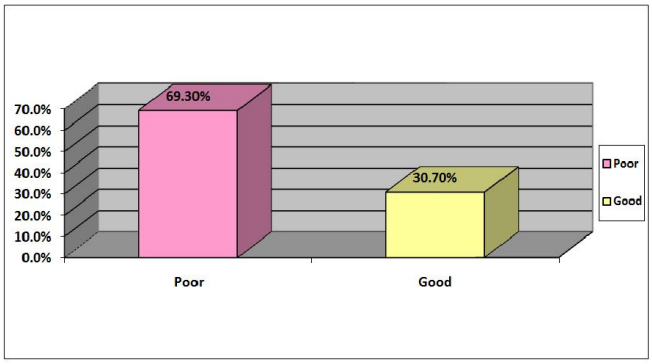


Figure 3. Perceptions on condition of the road

Table 4. Perceptions on road marking

Response	Frequency	Percent
Yes	17	11.3%
No	133	88.7%
Total	150	100.0%

Frequency of road repair

The study revealed that majority 62% of the responded of the respondents said their roads were repaired once in every 5 years while 18% (27) agree that their roads are repaired once a year. the poor state of road repair was cited by majority of the applicants as a major contributor to road traffic accidents in Nakuru town. This happened as vehicles collided head on as they tried to avoid pot holes.

Table 5. How often are the roads repaired

Response	Frequency	Percent
Once a year	27	18.0%
Once every 2 years	30	20.0%
Once in 5 years	93	62.0%
Total	150	100.0%

State of traffic lights and markings

Majority 86.7% of the respondent's stated that traffic lights were not working and Zebra crossing markings at every strategic place had faded with poor visibility while minority (13.3%) of the respondent's indicated that traffic lights and Zebra crossing were in working condition. Lack of working traffic lights and faded or poorly positioned zebra crossing markings and lack of policemen to control the vehicles had cause many accidents.

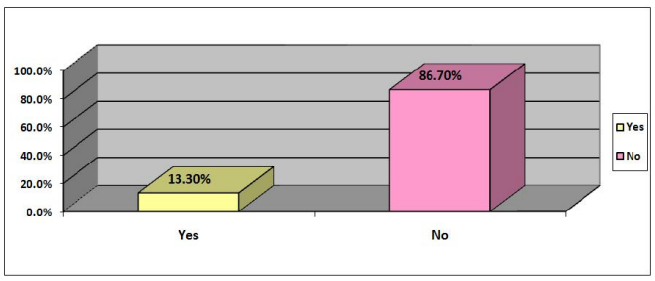


Figure 4. Presence of working traffic lights and zebra crossing at every strategic place

Table 6. Do you have pedestrian paths

Response	Frequency	Percent
Yes	127	84.7%
No	23	15.3%
Total	150	100.0%

84.7% (127) of the respondents agree that they have pedestrian paths while 15.3% (23) disagree that their roads do not have pedestrian paths

DISCUSSION

The study established that 91.3% (137) of drivers and riders were male respondents while 8.7% (13) were female respondents the age distribution revealed that a n=52 (34.7%) were aged between 21to30 years, whilen=17 11.3%) were aged < 20 years. Majority of drivers and riders (80%) were of Christian religion while 20% (30) were of Muslim religion. This group was generally expected to abide with the road traffic regulations. 29.3% (44) were widows/widowers while 19.3% (29) were married. 52% (78) were employed while 19.3% (29) were self-employed. Compared to a neural conducted in Kisii town, Kisii County. The study established that the majority of the respondents 147 (54.6%) lied in the age bracket of 20 – 29 years, followed by 83 (30.9%) who were in the age bracket of 30 – 39 years, 23 (8.6%) were in 40 – 49 years, 12 (4.5%) below 18 years and 4 (1.4%) above 50 years. On road condition contributing to road traffic accidents the study showed that 69.3% (104) said the condition of the roads were poor while 30.7% (46) said the condition of the roads were good and a majority 88.7% (133) of the respondents said the roads were not marked while 11.3% (17) said their roads were marked. 62% (93) of the respondents said their roads are repaired once in every 5 years while 18% (27) agree that their roads are repaired once a year, also that 86.7% (130) of the respondent's streets have traffic lights and Zebra crossing at every strategic place while 13.3% (20) of the respondent's streets do not have traffic lights and Zebra crossing and a majority 84.7% (127) of the respondents agree that they have pedestrian paths while 15.3% (23) disagree that their roads do not have pedestrian paths.

Conclusion

Based on the findings of this study, speeding, alcohol drinking and driving, driver fatigue, and reckless driving account for higher percentage of factors that causes motor vehicle accidents in Nakuru town. The study concluded that the public motor vehicle drivers do not comply with legal Traffic Act requirements.

Recommendations

This study recommends that;

- Adequate funds should be set aside for the creation of road safety road construction, maintenance and repairs
- Law enforcement agents including traffic police and NTSA should be strict for those public motor vehicle drivers who violate traffic rules and regulations.
- Strict penalties against anybody contravening the road traffic rules including over speeding, alcoholic drink and driving, drivers without safety belts and other offences.

- Road infrastructure should reviewed and
- Government should ensure strict adherence of training policy before motorists are issued with road license.

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