European Journal of
Sociology
(EJS)

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AJP

European Journal of Sociology
ISSN 2709-5886 (Online)
Vol.5, Issue 1, pp 45 – 56, 2022

www.ajpojournals.org

Effects of Motorcycle Accidents on Household Livelihood in Vihiga County, Kenya

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Abstract

Purpose: World Health Organization reports that more than 1.2 million people die every year due to road transport related traffic accidents. In Kenya approximately one in every five death is due to road traffic accidents. In Vihiga County, motorcycles are the leading cause of accidents with victims increasing from 140 in 2008 to 338 in 2018. Therefore, the purpose of this paper was to analyze motorcycle accident effects on household livelihood in Vihiga County, Kenya.

Methodology: The study was modeled around the system theory. A descriptive research design was adopted with a target population of 140 respondents who were the victims of the road traffic accident were involved using the census technique. Data collection was done using questionnaires and interviews. Validity test was by construct validity while reliability test involved the use of Cronbach' alpha. Data was analyzed into frequencies, cumulative frequencies and percentages using the Statistical Package for Social Sciences (SPSS version 16).

Findings: The study findings indicated that motorcycle accidents have an effect on livelihoods because families find it difficult accessing basic needs after their bread winner is involved in a road accident. There is an association between motorcycle accidents and access to food with chi-square of 4.487 and p-value of 0.016.

Unique contribution to practice and policy: The study recommends that the government should train all riders to impart them with skills that will help reduce accidents and also revise the driving school curriculum in order to seal loopholes that see unqualified motorcycle riders on the road. National Transport and Safety authority to make known to the public blackspot areas especially in Hamisi sub county and ensure safety measures are taken to stop motorcycle accidents. Traffic police department to reinforce traffic rules especially on the use of helmets as most of the injuries that were fatal were as a result of riding without helmets. Ministry of education through the constituency development fund committee to identify children from families with victims of motorcycle accidents and ensure their fees is paid to avoid the high school dropout cases. The government to incorporate NGOs offering humanitarian services to consider including families of victims of motorcycle accidents in their feeding program to ensure they access food. Finally, public campaign to be carried out to sensitize the motorcycle riders on importance of subscribing to NHIF so as to be able to access treatment in case of an accident.

Keywords : *Road Traffic Accident, National Transport and Safety Authority, National Health Insurance Fund, Nongovernmental Organisations, World Health Organisations.*

INTRODUCTION

Road transport plays a key role in the economic growth of a country by integrating various sectors in the economy Silas *et al*. (2011). Over the recent years the use of motorcycle has increased as a mode of road transport for commercial or public transport in Africa as a relatively recent phenomenon (Ismail & Abdelmageed. 2010). Motorcycles are preferred by people as means of public transport given their ability to travel on poor roads. For example, due to increased commercial demand it is estimated that the number of motorcycles in Kenya increased from 3,759 units in 2005 to 91,151 in 2009 Matheka *et al.(* 2015). The commercial motorcycle service growth has led to an increase in road accidents, difficulty in traffic management, serious noise and increase in local air pollution and greenhouse gas emissions (Kumar, 2011).

Globally, road traffic accidents (RTAs) the ninth leading cause of death with predictions indicating that by the year 2030 it will be the fifth leading cause of death (Ismail & Abdelmageed, 2010). According to the World Health Organization (WHO) report (2009), many people were found to die from road traffic accidents than malaria in the world. The reports further estimate that 1.2 million deaths are due to road related traffic accidents and the injuries obtained from this are estimated to be between 10 and 15 million people per year all over the world. Motorcyclists are reported to account for over 16 times of Killed & Serious Injury (KSI) rate in the UK per million vehicle kilometers, (WHO, 2009). It further informs that although motorcyclists make up less than 1% of vehicle traffic; their riders suffer 14% of total deaths and serious injuries especially on Britain's roads.

In Africa, more than one in five deaths occur on Nigerian roads and six other countries such as Kenya, Ethiopia, South Africa, Tanzania, Uganda and Democratic Republic of Congo which contribute to 64 percent of the regions road deaths (Respicious *et al*., *2016*) .While Kenya, Tanzania and Ethiopia have the lowest road fatality rates in the region, South Africa, Uganda and Nigeria have high fatality rates and high death rates. In 2002, for instance, injuries that incurred from road traffic accidents were the 9th leading cause of disability-adjusted life years lost representing 2.5 percent of the burden of disease worldwide or more than 38 million disability adjusted life years lost (WHO, 2009).

Road Traffic Accidents (RTAs) have become a worrying issue to various stakeholders in Vihiga County in Kenya. A report by National Transport and Safety Authority (NTSA,2018), indicate that deaths due to RTAs in Vihiga had increased from 140 victims in 2008 to 338 victims in 2018. The distribution of RTAs by the type of vehicle captured in Table 1.1 as compiled from the County traffic police and Vihiga County Referral Hospital records indicate that a total of 149 accidents victims had been reported during the study period between May 2014 and April 2020. Out of the 149 victims, motorcycle accidents involved 102 (68.5%) victims, buses 5 (3.3%) victims, saloon cars 15 (10.1%) victims, bicycles 4 (2.7%) victims, matatus 16 (10.7%) victims while trucks involved 7 (4.7%) victims. The findings show that motorcycles are the leading cause of RTAs in Vihiga County, Kenya. Further findings indicate that injuries resulting from motorcycle accidents leave families of the victim(s) in deplorable conditions due to costs associated with such accidents.

Table 1. Distribution of RTA by type of vehicle

Type of vehicle	Frequency	Percent (%)
BUS	5	3.3
SALOON CAR	15	10.1
BICYCLE	4	2.7
MOTORCYCLES	102	68.5
TRUCK	7	4.7
MATATU	16	10.7
Total	149	100.0

Source: NTSA (2015)

Kenya like many other countries is experiencing economic loss as a result of the road traffic accidents. For example, NTSA reported that road traffic accidents cost the Kenyan economy approximately Ksh.14 billion which represents 5% of the nation's Gross Domestic Product (National Transport and Safety Authority,2016). In 2010, NTSA reported that there were 3055 people who died as a result of road related traffic accidents of which 7% of the deaths were motorcyclists. It further reported that 62% of the victims were vulnerable road users who included passengers, pedestrians and children. Furthermore, a comparative study by National Road Safety Authority of Kenya (2018), showed that in the year 2016 to November 2018, 511 motorcyclists were killed representing 17% increase compared to a similar window of the previous year.

Various studies examining the effects of road accidents and necessary intervention have been conducted world over .For example, Bachani *et al*. (2012) in Australia, Bishai *et al.* (2006) in India, Matheka *et al.* (2015), Manyara (2016) and Abdulgafoor *et al.* (2012) in Kenya among others. These studies established injury, death, overall economic costs to the country as the major effects of road traffic accidents while road safety promotion, installation of speed governors in passenger service vehicles in Kenya, use of child safety seats were identified as road safety interventions. However, it should be noted that studies focused on overall economic effect to the country and not livelihoods of victims and their families while interventions were mainly focused on curbing motor vehicle accidents. Therefore, the effect of motorcycle accidents to households and interventions curbing motorcycle accidents remain unknown. This justifies the need to establish the effects on livelihoods and interventions to curb motorcycle accidents in Vihiga County, Kenya, thus the need for the study. The Purpose of the study is to analyze the effects of motorcycle accidents on household livelihoods in Vihiga county, Kenya.

Objectives of the study.

i) To find out the effects of motorcycle accidents on household livelihoods Vihiga County, Kenya.

ii) To generate injury types associated with motorcycle accidents in Vihiga County, Kenya.

iii) To Map out motorcycle accident black spots in Vihiga County, Kenya.

Study Area

The study was carried out in Vihiga County, Kenya. It borders Nandi County to the East, Kakamega County to the North, Siaya County to the West and Kisumu County to the South. Vihiga County covers an area of 530.9 square kilometers with a total population of approximately 6 million people. The area lies between latitude 0^0 066700' and 0^0 15' N and longitude 34^0 30' and 35^0 0'E. The County has five sub-counties namely; Vihiga, Sabatia, Emuhaya, Luanda and Hamisi. Mbale is the administrative headquarters. According to the 2019 census, the population distribution of the sub-counties is as follows; Hamisi with 170,566 people, Emuhaya with102, 522, Vihiga with 105,309, Luanda with 110,369 and Sabatia with 149,079(Republic of Kenya, 2019). The Equator cuts across the county in its southern region.

The county is located in the lake basin region with an average altitude between 1500m and 1800m above sea level. The average annual rainfall for the county is between 1800mm and 2000mm with an average temperature of 24 degrees Celsius. Its terrain is hilly sloping from east to west and it has some forest cover. Agriculture is the main activity of the county with some crop and livestock keeping practice. Most of the household engage in crop farming (Vihiga, 2015). According to the Vihiga county integrated plan of 2018, the total road network in the county is 1058.2km with tarmac surface covering a length of 157km, gravel surface 373.7km and earth surface 483km (Vihiga, 2018). The main mode of transport in the area is motorcycle. The residents find the use of motorcycle to be the fastest and convenient form compared to other modes of transport. Vihiga county was selected purposively because the data was accessed with ease.

European Journal of Sociology
ISSN 2709-5886 (Online)
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www.ajpojournals.org

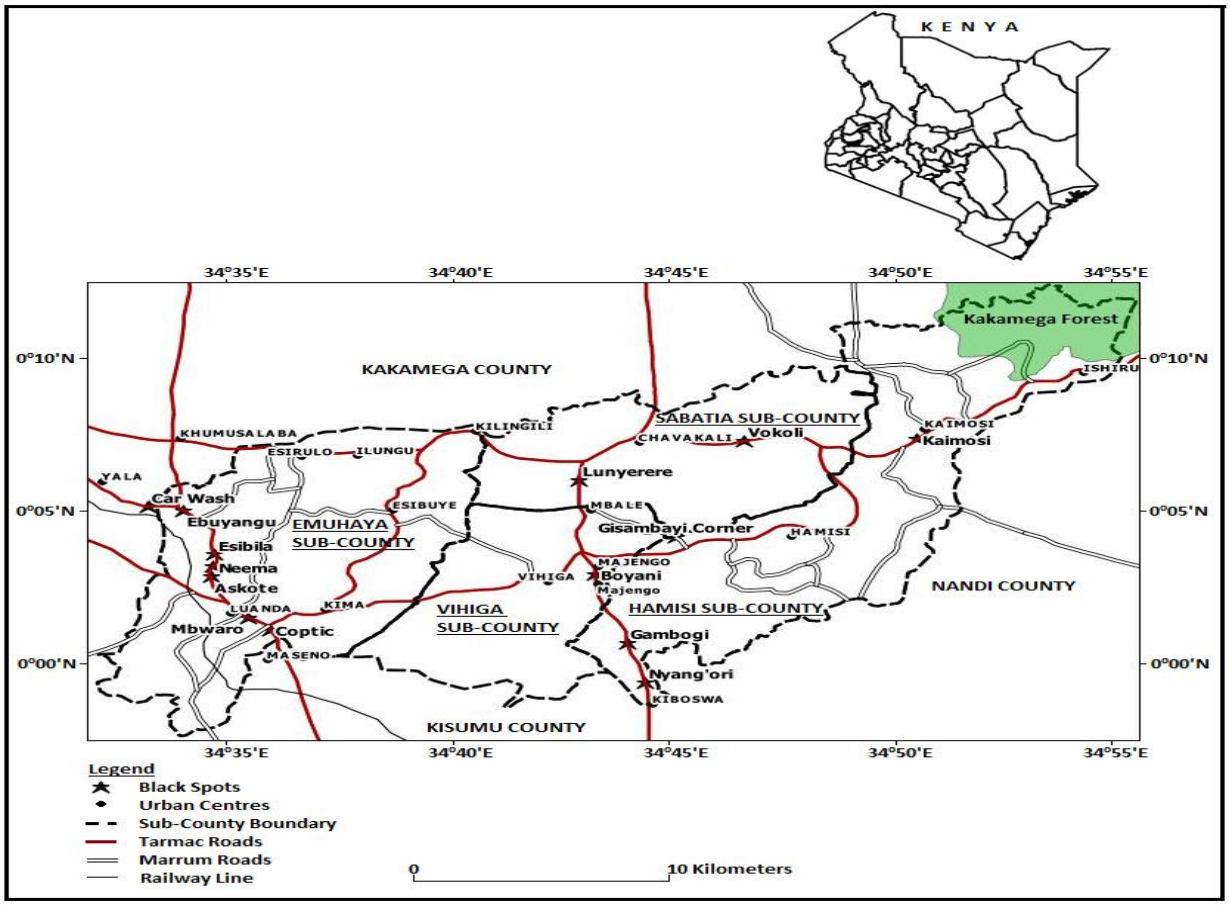

Figure 1: Map of Vihiga County

Source: Research Cartographer Vihiga County, 2019

RESEARCH METHODOLOGY

Sampling technique and sample size determination

The total number of accident victims recorded was 149 .The study adopted a census technique where all the 140 victims that had been registered by the traffic police during the study period were interviewed. The households of the 9 deceased victims were excluded from the study because the study aimed at getting first-hand information from the victims themselves.

Data Collection Methods and Procedures

Both secondary and primary data was used in the study. The primary data was collected using a face to face interview with the victims to establish the effect that the motorcycle accidents have had on their livelihood. Questionnaires were also used to supplement the information collected using interview. Secondary data was obtained from the Vihiga County Traffic Department record for the accidents that occurred between the years 2014-2019. To do this, random spatial distribution model was used for this study. This is because motorcycle accidents can occur anywhere and thus not possible to use an even distribution. Structured questionnaires were used in establishing household income status. Secondary data was used from the police database in the

county to establish status of the accidents and mapping of the areas where the accident occurred. Motorcycle accident victims were the main informant in this study mainly because they were the ones who could give their first-hand experience. In this group there were 140 victims who were interviewed. The victims were all selected upon inquiring about where they lived which was mainly guided by the police records and the process took approximately three weeks. The interview was only done after the victims gave their consent. For victims who were illiterate, the interview questions were interpreted for their understanding. All accident victims were considered.

Data Analysis Procedures

Data collected was analyzed using SPSS software version 16. Descriptive statistics were done such as mean, mode, median standard deviation, frequency, percentages and presented in the form of tables to depict the demographic characteristics of the respondents. The descriptive statistics also helped to understand whether the data was normally distributed. Graphs were also generated to demonstrate clearly the trend of road traffic accidents in Vihiga County. Inferential statistics was done using correlation to determine the relationship between motorcycle accidents and household livelihood.

RESULTS AND DISCUSSIONS

Effects of Motorcycle Accidents on Household Livelihood

The main objective of this study was to analyze the effect of motorcycle accidents on household livelihood in Vihiga County, Kenya. This objective sought to investigate the effect of motorcycle accidents on household livelihood in Vihiga County, Kenya Results in Table 2 show the physical condition of the accident victims, 90 (70%) of them had temporal disability .There were 45 (26.4%) of the victims who had permanent disability while 5 (3.6%) had fully recovered.

Table 2: Physical condition of the victim

Physical Condition	Frequency	Percent (%)
Temporally Disabled	90	70
Permanently Disabled	45	26.4
Fully Recovered	5	3.6
Total	**140**	**100.0**

Source: Researcher's compilation (2019)

An interview with the nurses revealed that most of the casualties that they received as a result of motorcycle accident were because they did not wear protective gear. The interview results were complemented by the findings of Thomson *et al*, (2002) that indicated that the risk of head injury in riders who used helmets was reduced by 85 percent compared to those who did not use a helmet. Therefore, if riders and their passengers use helmets then the injuries that occur in the county due to motorcycle accidents will not be severe. The study concurs with the findings of Bachani, et al. (2012) that relatives of accident victims were left to suffer by seeking alternative means to cater

for family needs because their loved one could not continue providing for them, with some of their children permanently dropping out of school or suffering from malnutrition as a result of inadequate food, or having poor clothing and shelter.

Results in Table 3 show the effect of motorcycle accidents on access to basic needs (food, clothing, shelter and education) after their loved one got involved in motorcycle accident. From the study 23 (16.4%) had difficulties for a short period but managed to go back to their original status to obtain basic needs. On the other hand, 113(80.7%) of the victims had difficulty in accessing food most of the time when their loved one was involved in an accident. Only 4 (2.9%) did not find any difficulty in accessing basic needs. When a household member is involved in an accident, most of the money earned is spend on their treatment and in case of death the money is spend on funeral expenses. Therefore, the money that was meant for basic needs was spent on treatment of the accident victims. The difficulty in accessing basic needs because of the accidents describes clearly how a household is affected economically thus answering the main objective. Aeron-Thomas *et al* (2004) in their study discovered that increasing road traffic accidents also affected the livelihood of a household because road traffic injuries also imply important distributional consequences on household income.

Table 3: Effect of Motorcycle Accident on Access to Basic need

How difficult was it to obtain basic needs	Frequency	Percent (%)
For some time before stability	23	16.4
Very much- they cannot access basic needs fully	113	80.7
Not at all- obtained basic need with no difficulty	4	2.9
Total	**140**	**100.0**

Researcher's compilation (2019)

The results in Table 4. further show the association between accessing basic needs and motorcycle accidents. The Pearson's correlation between motorcycle accident and access to basic needs was 0.039 indicating that there exist a positive relationship between motorcycle accidents and household livelihood which are measured by the ability to access basic needs in a household. This results show that there is a significant relationship between motorcycle accidents and household livelihood. The study finding are similar to those of Aeron *et al*., (2010) who established that increasing road traffic accidents also affect the economy at different levels. For instance, "in agricultural villages" around the world, the poorest people are those who cannot work due to some long-term disability or injury that are sustained from accidents caused by motorcycles and other vehicles.

Table 4: Relationship between Motorcycle Accident and access to household basic needs

Measure	Correlation	p-Value
Interval by Interval	Pearson's R	0.039
Ordinal by Ordinal	Spearman Correlation	0.042
N of Valid Cases		140

Source: Researcher (2019)

Total cost associated with motorcycle accidents in Vihiga County

Table 5 : Total cost in (USD) associated with motorcycle accidents and type of injury

Type of costs	Slight injury n=49	Serious injury n=80	Fatal injuries n=11	Total
Average total direct cost	27,542.15 (58.12%)	69,726.48 (33.72%)	10,617.28 (7.44%)	107,885.91
Direct cost	11,254.63 (23.75%)	41,692.64 (20.16%)	2,134.56 (1.50%)	55,081.83
Non-direct total cost	15,672.5 (33.07%)	32,763.66 (15.84%)	7,981.84 (5.60%)	56,418
Total indirect cost	4354.75 (9.19%)	31,652.63 (15.31%)	0	36,007.38
Indirect cost of the victim	3497.60 (7.38%)	23,310.15 (11.27%)	0	26807.75
Indirect cost of care takers	742.92 (1.57%)	7,632.42 (3.69%)	0	8375.64
Productivity loss as a result of fatality	0	0	102,763.69 (72.03%)	102,763.69
Total cost	47,392.05	206,777.98	142,677.31	396,847.34

The second objective of the study was to examine the cost associated with Motorcycle accidents depending on the types of injuries incurred in the accidents as indicated in Table 5. For the 49 individuals that were slightly injured, the direct cost incurred by the household for treatment is $11254.63 while for those with serious injuries amounted to $41692.64 and those with fatal injuries incurred a cost of$2134.56. From the study to completely treat a patient with slight injuries up to full recovery costs $ 47,392.05, those with serious injury pay $ 206,777.98 and those with fatal injury paid $ 142,677.31. It is clear that the cost incurred by household to cater for the motorcycle accidents victims is high thus affecting the cash flow of the house which in turn affects their household income. A study by Bachani, et al. (2012) at New South Wales indicated that

household who are victims to road traffic accident face financial crisis due to spending funds in search for medical services. Thus the findings of this study concur with their findings.

CONCLUSION

The study concluded that motorcycle accidents have an effect on household livelihoods. For instance, physical conditions of the accident victims determined whether the victim would continue to provide for the family and most of the victims had obtained temporal injury (70%) and permanent disability (26.4%). Therefore, this means that their working condition was affected permanently or temporarily and thus interrupted the household income hence affecting their livelihood. Furthermore, the money used for treatment affected the household income negatively since the treatment for most of the accident victims was expensive making some of the households to end up suffering and finding it difficult to meet their basic needs.

Furthermore, the study concluded that there was an association between motorcycle accidents and access to basic needs of household having victim of motorcycle accident. The study concluded that there exists a significant relationship between motorcycle accidents and household livelihood. 90 of the victims had temporal disability representing 70%. 45 of the victims had permanent disability representing 26.4% while 5 (3.6%) had fully recovered. From this it is clear that many of the victims could not continue with their daily jobs because of the injuries they sustained with only a handful getting full recovery.

The study concluded that the household livelihood of road traffic accident victims was affected after occurrence of Motorcycle accident First of all, it was clear that the productive age (between 25 and 34 years) was the most affected in motorcycle accidents. The youths who were just starting out in life by providing their family's needs with the income they got from their motorcycle business. When the accidents occurred, then these youths were not able to work becoming a burden to the household especially in cases where the victim was the bread winner. Another effect was the high cost of treating the victims. The household had to divert its income to meet the medical bills during the treatment. The cost increased further if the victims needed constant care after the accident, forcing their caregivers to stop working in order to care for the injured. The study concluded that the Motorcycle accidents occurred in steep road surfaces on latitude of 34^0 and longitude of between 35^0 and 45^0.

After an analysis of motorcycle accident effects on household livelihood in Vihiga County in Kenya the following are the study recommendations;

1. National Transport and Safety Authority to make known to the public black spot areas especially in Hamisi sub county and ensure safety measures are taken to stop motorcycle accidents.

2. Traffic police department to reinforce traffic rules especially on the use of helmets as most of the accidents that were fatal were as a result of riding without helmets.

3. Ministry of education through the constituency development fund committee to identify children from families with victims of motorcycle accidents and ensure their fees is paid to avoid the high school dropout cases.

4. The government to incorporate NGO's offering humanitarian services to consider including families of victims of motorcycle accidents in their feeding program to ensure they access food.

5. Finally, public campaign to be carried out to sensitize the motorcycle riders on importance of subscribing to NHIF so as to be able to access free treatment in case of an accident.

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