

**PREVALENCE AND FACTORS ASSOCIATED WITH BODA-BODA
MORBIDITY AND MORTALITY AT FORT PORTAL REGIONAL
REFERRAL HOSPITAL.**

**BY
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DECLARATION

I do hereby declare that this research dissertation is the product of my own efforts and to the best of my knowledge and conviction, has never been presented to any institution for any award or qualification whatsoever. Wherever the works of other people have been included, due acknowledgement to this has been made in accordance with the appropriate referencing and citations. The findings and the analysis that will result from this research project will be my original information.

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Signature

Date

APPROVAL

This is to certify that this research dissertation has been prepared under my supervision and has never been presented anywhere for any other purpose and is now ready for submission to the Faculty of Clinical Medicine and Dentistry of Kampala International University for further consideration.

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Signed.....

Date.....

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LIST OF ABBREVIATIONS AND ACRONYMS

A&E	:	Accidents and Emergencies
FPRRH	:	Fort Portal Regional Referral Hospital
KIU	:	Kampala International University
LMICs	:	Low- and Middle-Income Countries.
NRSCK	:	National Road Safety Commission of Kenya
RTA	:	Road Traffic Accidents
WHO	:	World Health Organization

OPERATIONAL DEFINITIONS

Boda-Boda:(in some countries) a type of motorcycle or bicycle with a space for a passenger or for carrying goods, often used as a taxi. (Oxford Learners' Dictionary).

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ABSTRACT

Introduction: Road traffic accidents are the number nine cause of death worldwide.

Due to their affordability and the opportunity they offer towards self-employment, many young Africans have taken up business as boda-boda riders. A business they have delved into without appropriate training on riding, road traffic rules and safety. In Uganda, many cases of motorcycle related accidents have been reported daily. This can be attributed to many factors, among which boda-bodas, being the chief means of transport within and around Fort-Portal town, are ridden by unqualified, drunk and reckless riders. No similar study has been conducted on the magnitude of the problem especially in Fort-Portal. For this reason, the researcher felt that a study on this is warranted and proposed to conduct such a study.

Objective: To determine the magnitude of boda-boda related morbidity and mortality among victims attending FPRRH, and factors associated with boda-boda related accidents.

Method: A descriptive questionnaire-based cross-sectional study design was used and it involved 696 boda-boda accident victims.

Results: Prevalence of boda-boda accidents was 20% with rider associated factors including lack of training with lack of rider's permit, riding long hours into the night by male young riders. Common injuries were lower limb, head and upper limb injuries followed by full recovery.

Conclusion: The prevalence of boda-boda related injuries at FPRRH surgical wards is the highest of all RTA related injuries. Though lower than other studies conducted previously, this still warrants intervention.

The rider-related factors found significant were male sex, age younger than 35 years, riding at night of a motorcycle that did not belong to the rider, lack of use of PPEs, lack of formal riding training and lack of a rider's permit.

Common injuries included lower limb injuries, head injuries and upper limb injuries. Other injuries reported were spinal cord injuries, bruises, abrasions and contusions which were followed mainly by full recovery with no complications.

Keywords: **Boda boda, accidents, injuries, victims.**

CHAPTER ONE: INTRODUCTION

1.1.BACKGROUND

Motorcycle taxis or Boda-Boda, as they are famously known, have become the mainstay means of transportation in Rural Africa. They have eased movement of both goods and persons to places that were initially unreachable by any other means apart from on foot. With the good that they have brought the poor rural African, with them the bad too.

Majority (90%) of deaths resulting from road traffic accidents occur in low- and middle-income countries (LMICs), and while these countries also account for 82% of the world's population, they nevertheless bear a disproportionate number of deaths relative to their level of motorization, as they account for only 54% of the world's registered vehicles(WHO, 2015)

Injuries resulting from road traffic accidents are the number ninth cause of death in the world.This is down compared to 2012, when it was the number one cause. Among those most affected are the young energetic and productive population aged between 15 and 29 years. Almost 3,400 people die road traffic accidents daily (WHO, 2015).

At the rate at which road traffic accidents are occurring presently, it is projected that by the years 2030 (year in which all millennium development goals are targeted at) road traffic accidents will become the seventh leading cause of death if nothing drastic is done to intervene(WHO, 2015). The costs emanating from injuries sustained from road traffic accidents setback low and middle income countries (LMICs), especially in Africa, billions of dollars annually.

The rate at which persons are injured on the roads in LMICs is double that in high-earning countries. Africa has the highest RTA related fatalities - at a rate of 26.6 per 100, 000.

Motorcycle riders are among the most at risk of getting injured or killed in our roads. Almost a quarter (23%) of deaths from RTAs globally are among motorcycle riders. Motorcycle riders have a 34-fold higher risk of death in a crash than those in other types of motor vehicles(Tumwesigye, Atuyambe, & Kobusingye, 2016).Injuries to the head and lower limb fractures are the most common injuries in motorcycle rider. Others range from abrasions, bruises and contusions to fractures and deformations of the spine (Tumwesigye et al., 2016).

Motorcyclists are exposed to more road hazards compared to those in other vehicles (Berecki-Gisolf et al., 2015).

Among the factors cited for this increased risk are the smaller size of motorcycles, less stability, unfriendly conditions on the roads such as dead animals, slippery wet conditions, potholes and

other unexpected eventualities. Furthermore, the motorcyclist is not enclosed and thus not protected to impact injuries and is likely to be thrown very far and hit very hard the outcomes of such crashes are bound to be deadlier than those involving other vehicles. In the advent of cheap motorcycles from China and other countries, the LMICs e.g. in Africa can now easily become motorized(Lin & Kraus, 2009).

Many more can now afford a motorcycle than before. Injuries sustained from motorcycle accidents, either involving the rider, passenger or pedestrians have exponentially increased over the years. Victims of motorcycle accidents are filling up surgical wards and trauma centers in hospitals with some hospitals even opting to establish separate “boda-boda accidents units”.

Uganda is among the countries that have seen an exponential increase in the numbers of boda-bodas on the roads and with this increase, the number of casualties and fatalities from motorcycle accidents have increased dramatically(Kato, 2018). This calls for an intervention, which will only be possible if studies are carried on the subject matter(Pebalo et al., 2012).

The prevalence, risk factors, and outcomes of motorcycle accidents are key in capturing the state of the matter as it were, and thus will enable influencing the planning and policy making for appropriate intervention.

1.2.PROBLEM STATEMENT.

Road traffic accidents are the number nine cause of death worldwide (WHO, 2015). It is projected that by the year 2030 they will become number seven (WHO, 2015). These RTAs are depriving nations of their youthful (15 – 29 years) and productive age bracket of the population. Motorcycles have become cheap and affordable in LMICs, especially in Africa. They have opened up job opportunities as motorcycle taxis (boda-bodas as they are famously known) in most parts of Africa). Due to their affordability and the opportunity they offer towards self-employment, many young Africans have taken up business as boda-boda riders. A business they have delved into even without appropriate training on riding, road traffic rules and regulations and safety. With the money they get, they often opt to drink while on duty, ride when drunk and thus chances of them causing accidents are high (WHO, 2015). This has seen an exponential increase in RTAs, especially involving motorcycles. Emergency departments, trauma centers and surgical wards receive victims of motorcycle accidents daily. The situation has been so dire that some hospitals have opted to even go ahead and open entire “boda-boda units” set aside specifically for these victims.

In FPRRH, many cases of motorcycle related accidents have, and are being reported daily. The prevalence has been on the rise. Studies have shown that boda-boda-related leg fractures are on the increase in Uganda, and surgical wards, especially at FPRRH, are filled with victims of these accidents (Lule, Ssebuufu, & Okedi, 2017). This can be attributed to many factors, among which boda-bodas, being the chief means of transport within and around Fort-Portal town, are driven by unqualified, drunk and reckless riders. No similar study has been conducted on the magnitude of the problem especially in Fort-Portal. For this reason, the researcher felt that a study on this was warranted and proposed to conduct such a study.

1.3. STUDY OBJECTIVES

1.3.1. BROAD OBJECTIVE

To determine the magnitude of boda-boda related morbidity and mortality among victims attending FPRRH, and factors associated with boda-boda related accidents.

1.3.2. SPECIFIC OBJECTIVES

1. To determine the prevalence of boda-boda related accidents at FPRRH.
2. To identify the various injuries sustained among victims of boda-boda related accidents and their end outcome/prognosis at.
3. To identify the rider-related factors associated with boda-boda related accidents among victims at FPRRH.

1.4. RESEARCH QUESTIONS

1. What is the prevalence of boda-boda related accidents at FPRRH?
2. What are the various injuries sustained among victims of boda-boda related accidents at FPRRH?
3. What are the different outcomes/prognosis of boda-boda related accidents' victims at FPRRH?
4. What are the rider-related factors involved in boda-boda related accidents at FPRRH?

1.5. JUSTIFICATION OF THE STUDY

Road traffic accidents are top contributors to morbidity and mortality in Low- and Middle-Income countries. The projection that by the year 2030, RTAs will be the number five cause of death is worrisome. An escalator of the problem of RTAs is the proportion contributed by motorcycle accidents that has been increasing steadily over the years. An increase that can be attributed to various factors. The increase has been witnessed in our hospitals as the increase in

number of beds occupied by victims of motorcycle accidents or trolleys laden with bodies of the said victims being wheeled to the morgue.

An urgent intervention is needed, if this trend is to be curbed. Intervention needs to be based on scientific information that has been researched and tested. Policies cannot be formulated unless based on reliable and verifiable statistics that can only be obtained from research. The study will aim to contribute, in its own small way, towards these crucial statistics that will aid in policy formulation, planning and intervention. The researcher aimed to achieve this by giving the actual figures on the ground, using boda-boda accident victims that are attended to at FPRRH as a sample of the bigger problem that is facing Uganda at the moment.

1.6. STUDY SCOPE

1.6.1. GEOGRAPHICAL SCOPE

The study was conducted at Fort Portal Regional Referral Hospital (FPRRH) Fort Portal Regional Referral Hospital, commonly known as Fort Portal Hospital, sometimes referred to as Buhinga Hospital, is a hospital in the town of Fort Portal, in Kabarole District, Western Uganda. It is the referral hospital for the districts of Bundibugyo, Kabarole, Kamwenge, Kasese, Ntoroko and Kyenjojo. It is a public hospital, funded by the Uganda Ministry of Health and general care in the hospital is free. It is one of the 13 "Regional Referral Hospitals" in Uganda. The hospital is designated as one of the 15 "Internship Hospitals" where graduates of Ugandan medical schools can serve one year of internship under the supervision of qualified specialists and consultants. The bed capacity of Fort Portal Hospital is quoted as 333.

1.6.2. CONTENT SCOPE

The study was about boda-boda related morbidity and mortality and rider-related factors associated with boda-boda accidents. It covered the prevalence, various injuries, human-factors and outcomes of boda-boda related accidents. Factors outside the influence of the rider such as pot-holed or slippery roads, motor-cycle-related factors such as roadworthiness, length of periodic servicing and tyre change and pedestrian-related factors such as inattentiveness while using the road, were not within the scope of this study.

1.6.3. TIME SCOPE

The study was conducted from May 2018 to February 2019, a period of 10 months. This is the period from identifying a problem, actual study undertaking and collection of data.

1.7.CONCEPTUAL FRAMEWORK

The interplay of individual factors with road and other external factors to affect prevalence and outcomes of boda-boda accidents have been shown below.

The individual factors such as lack of training, recklessness and human errors, riding while drunk are the independent or modifiable factors. The prevalence of occurrence of motorcycle accidents and the eventual out comes such as physical and mental disabilities, reduction of work capacity, permanent dependence or even death are the dependent variables.

There are also intervening variables such as the state of the road, riding at night, substandard motorcycles etc. that also influence the prevalence and outcomes of motorcycle accidents.

Independent variables

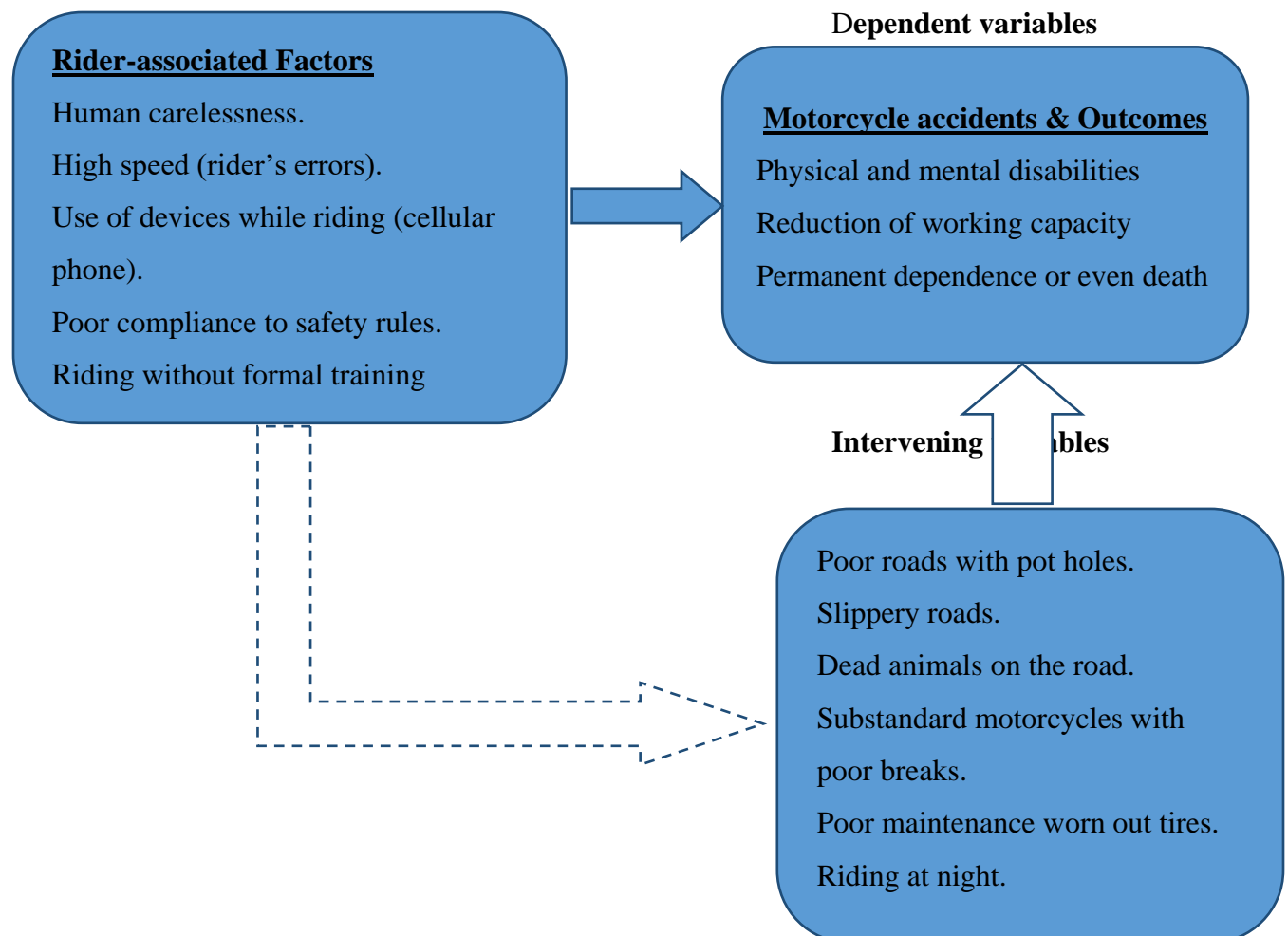


Figure 1: Conceptual Framework on Factors and outcomes of motorcycle accidents

CHAPTER TWO: LITERATURE REVIEW

2.0. INTRODUCTION

This chapter looks into the literature reviewed on the prevalence of boda-boda accidents, injuries sustained by boda-boda victims and outcomes/prognosis of boda-boda related accidents and the human-related factors associated with boda-boda accidents.

2.1. PREVALENCE OF BODA-BODA RELATED ACCIDENTS

Worldwide, almost a quarter of all road traffic deaths are among motorcyclists. However, just like in the case of RTAs in general, the distribution is also disproportionate across the world, with the South-East Asian Region and Western Pacific Region each accounting for 34% of the world's motorcyclist deaths, compared to the African Region which account for 7%. This reflects the situation as it is on the ground whereby the use of motorcycles is much higher in Asian countries than elsewhere. Data has it that the proportion of motorcyclist deaths is largely unchanged since 2010 in all regions, except in the Americas: here the proportion of motorcycle deaths has increased from 15% to 20% of the total road traffic deaths over the 3-year period between 2010 and 2013, reflecting rapid growth in the number of motorcycles in the region.

While no change in the proportion of deaths among motorcyclists has been reported in the African Region, this may be due to the fact that only less than half(15 of the 43) participating African countries provided data on deaths by type of road user. However, at country level, many African nations report a rise in motorcycle use and this shift is beginning to be reflected where data are available. Tanzania, for example, has seen motorcycles rise from 46% to 54% of its registered fleet in the last three years, and motorcycle deaths rise from 13% to 22% of its total number of road traffic deaths(WHO, 2015).

In Thailand, where a large portion of its motorized population is on motorcycles, most crashes involved a motorcycle (74%). Car access increased and motorcycle use decreased between 2005 and 2009. Among those who used a motorcycle at both time points, traffic injury prevalence was 2.8 times greater compared to those who did not use a motorcycle at either time point (Berecki-Gisolf et al., 2015).

A six-year survey conducted in China revealed that during the 6 years, the number of motorcycle accidents were up to 122 300 in 2003, which was the highest, and then gradually decreased. However, the casualty had the tendency of consistent increase, for example, the motorcycle accidents resulted in 26 200 deaths and 157 500 injuries in 2005. The mortality per 10 000

motorcycles and the ratio of deaths to injuries were lower than those of automobiles, but the mortality per 100 motorcycle accidents was significantly higher than that of automobiles ($P < 0.01$) (Li et al., 2008).

In a survey conducted in Kenya on road traffic injuries caused by commercial motorcycles, it was found that, of the 200 respondents, majority 123 (61.5%) sustained an injury while riding a motorcycle followed by bicycle riders 71 (35.5%) (Duncan Mwangangi Matheka &, Faraj Alkizim Omar, Chebiwot Kipsaina, 2015).

According to the National Road Safety Commission of Kenya, the trend in motorcycle accidents in East Africa is worrying. The number of deaths attributed to motorcycle accidents in Kenya has steadily been on the increase, from 427 in 2002 to 1,755 in 2010. The recorded motorcycle fatalities in Kenya have increased four-fold from 44 in 2005 to 164 in 2009, with a particularly high growth in 2008/2009 (Singoro, Wakhungu, Obiri, & Were, 2016).

In a three in one survey conducted in Tanzania, it was revealed that the boda-boda riders' RTA rate was 633.4 per 1,000 person-years, which meant that at least six out of ten (60%) members of the study population can be expected to suffer an RTA in one year. At one of the study locations, the figure was as high as ten out of ten. In comparison, the motorcyclist RTA rate for Great Britain is 17.0 per 1,000 person-years – more than 37 times less than the boda-boda driver RTA rate for rural Tanzania (van der Loeff, Bishop, Jinadasa, & Witte, 2013).

In Mulago hospital, Ward 3C is the Accidents and Emergency (AE) ward. This particular ward is always flooded with victims of accidents majority of which result from boda-bodas. The ward has even acquired a pseudo name of the “boda-boda ward.” According to the Injury Control Centre, Uganda, Mulago Hospital alone receives 5 to 20 boda-boda accident cases every day, resulting to 7,280 cases in year. According to Dr. Titus Beyeza, the head of the Orthopaedic Department at Mulago hospital, in an interview held at Mulago Hospital, he noted that 90% of patients admitted are accident victims, majority of which are boda-boda accidents. “The orthopaedic ward has run out of space to admit other orthopaedic cases as all the beds are filled up with the emergency boda-boda cases,” he lamented (Makerere University Journalism club, 2012).

2.2. RIDER-RELATED FACTORS ASSOCIATED WITH BODA-BODA ACCIDENTS

According to the WHO status report on road safety of 2015, factors cited were untrained rider, carelessness, driving while drunk, uneven road surfaces, slippery surfaces, dead animals on the roads, potholes among others(WHO, 2015).

In Taiwan, higher fatality rates among motorcycle riders correlated with the following factors: male, older, unlicensed, not wearing a helmet, riding after drinking, and driving heavy (i.e., above 550 cc) motorcycles. In addition, motorcyclists involved in nighttime, nonurban single-vehicle accidents had a higher risk of death, and lone riders had a higher risk of death in accidents than did riders carrying passengers. The seriousness of passenger injury also correlated positively with the rider's risk of death(Jou, Yeh, & Chen, 2012).

In Thailand, factors cited were riding during late night and late morning, during weekend and holiday season, collision with truck, driving under influence, age above 40 years old, and pillion passengers(Baral& Kanitpong, 2015).

In regions of Caicó, Rio Grande do Norte, Brazil it was found that the factors included motorcycle taxi drivers having a high level of daily working hours (12 hours on average), and it was found that 63.6% were involved in at least one motorcycling accident. The occurrence of motorcycling accidents was significantly associated to level of education ($p < 0.001$), with no significant association with the other variables, such as age ($p = 0.132$), time of service ($p = 0.744$) and working hours ($p = 0.830$)(Maia de Almeida, Dantas de Medeiros, Oliveira Pinto, Bezerra de Oliveira Moura, & Costa Lima, 2016).

In a study conducted in Kenya, among the factors cited were negligence (33%), and speeding (17.5%). The risk of sustaining a bodily injury was 1.3 times higher in drivers who had not received prevention education compared to those who had received such education(Duncan Mwangangi Matheka &, Faraj Alkizim Omar, Chebiwot Kipsaina, 2015).

In Morogoro Tanzania, driving a motorcycle without formal training (70%), use of substandard motorcycles especially those imported from China (77%) and motorcycle defects such as break failure and tire bursts were reported by (79%) of the respondents (Mnzava, 2013).

2.3. COMMON INJURIES AND OUTCOMES OF BODA_BODA ACCIDENTS

In a research that involved three studies running concurrently in Tanzania, Study three was specifically about motorcycle accidents. Injuries to the legs were most common, and Study 3 identified two leg amputations among boda-boda riders (van der Loeff et al., 2013).

In Kampala Uganda, injuries to the head and lower limb fractures are the most common injuries in motorcycle riders. Others range from abrasions, bruises and contusions to fractures and deformations of the spine(Tumwesigye et al., 2016).

CHAPTER THREE: METHODOLOGY

3.0.INTRODUCTION

This chapter deals with the different tools and methods used in population selection and sampling, study design, data handling, analysis and presentation plus all other determinants of study feasibility.

3.1. STUDY DESIGN

Descriptive cross sectional survey with both qualitative and quantitative components was utilized.

3.2. STUDY POPULATION

The study included all RTA victims attending FPRRH i.e. victims brought to the Accidents & Emergencies (A&E) who were either managed and discharged or stabilized and transferred to surgery department.

3.2.1. INCLUSION CRITERIA

All RTA victims brought to A&E department of FPRRH who were able to consent or whose attendants consented on their behalf if they themselves were not in a position to offer or deny consent.

3.2.2. EXCLUSION CRITERIA

Other emergency cases brought to the A&E department of FPRRH that were not as a result of an RTA or those that were as a result of an RTA but were not willing to consent or were not in a position to offer or deny consent but there was no one who could offer consent on their behalf.

3.3. SAMPLE SIZE DETERMINATION

Using the formula (Fisher et al, 2006)

I.e. $N = Z^2 PQ / D^2$:

Where N is the desired sample size

Z is the standard normal deviation taken as 1.6 at a confidence interval of 90%.

P is the prevalence of motorcycle accidents among all RTAs = 60% (values from nearby Tanzania)

D is the degree of accuracy = 0.05.

Q = (1-P) which is the population without the desired characteristics.

$$N = \frac{1.6^2 \times 0.6 \times (1-0.6)}{(0.05)^2}$$

N = 246 = sample size

3.4. SAMPLING TECHNIQUE

Consecutive sampling technique was employed whereby candidates were approached as they were brought in and after stabilization. Those who got to be referred to the surgery department through theatre for example, were followed up later.

3.5. DATA COLLECTION METHOD

A two-pronged approach of data collection was employed. Patient data was obtained from history-taking notes from the victim's file either upon arrival at the A&E department or the patient's file in the surgical ward. More information was obtained through a self-administered questionnaire.

3.6. DATA COLLECTION TOOLS AND PROCEDURE

A researcher-administered questionnaire which had been specifically formulated so as to meet the objectives of the study was used. The questionnaire had questions directed at the victim themselves, caretakers and bystanders and witnesses to the accident. Data acquisition process started immediately the victim was wheeled into the emergency department after which supplemental data was obtained from victim's progress and surgical notes.

3.7. QUALITY CONTROL

Quality control was ensured through induction and training of the research assistants, who had been selected based on their knowledge of the field and language. The questionnaire, was also pre-tested before the primary study. The data collection instrument format was developed in English by different individuals for its accuracy and desired results.

3.8. DATA ANALYSIS

Each questionnaire was checked for completeness, missed values and unlikely responses and then manually cleaned up on such indications. Data was exported to SPSS version 17. Using double entry, the data was cross-checked for consistency and accuracy. Responses and observations given points and tallied then recorded to obtain means that were then presented in statements, graphs, charts and tables.

3.9. ETHICAL CONSIDERATIONS

Clearance was obtained from Kampala International University-Western Campus faculty of clinical medicine & dentistry through IREC. Consent was obtained, both verbally and in writing from each selected participant and/or caretaker. Confidentiality was ensured throughout the

whole process and all information obtained from the respondents was used solely for the purpose of the study.

CHAPTER FOUR: STUDY FINDINGS

4.0.INTRODUCTION

This chapter presents the result findings of the study and presents them in the form of statements, tables, graphs and charts.

4.1. PREVALENCE OF BODA-BODA RELATED ACCIDENTS

CASES	NUMBER	PERCENTAGE
Total surgical cases	3,482	100
RTA cases	1045	30.27
Boda-boda accident victims	696	20.0

Table 1: Prevalence of RTAs and Boda-boda Accident Victims (N=3,482)

RTA CASES	NUMBER	PERCENTAGE
Total RTA cases	1045	100
Non-Boda boda cases	349	33.40
Boda-boda accident victims	696	66.60

Over the study period, a total of 3,482 surgical cases were reviewed, out of which 1,045 were RTA victims of which 696 were boda-boda accident victims and 349 were victims of other RTAs. Boda-boda accident victims made 20.0% of all surgical cases and 66.6% of all RTA victims. Most of these boda-boda accident victims were male (59.20%) passengers (50.57%) or riders (43.68%) who were aged 35 years and below (89.8%).

4.1.1. BODA-BODA ACCIDENT VICTIMS BY AGE

AGE (YRS)	RIDER		PASSENGER		PEDESTRIAN		TOTALS	
	No	%	No	%	No	%	No	%
16 – 35 (youth)	273	89.8	316	89.8	36	90	625	89.8
36≤	31	10.2	36	10.2	4	10	71	10.2
TOTAL	304	43.7	352	50.6	40	5.7	696	100

Table 2: Age Categorization of boda-boda Accident Victims into Youth and Non-youth (N=696)

The youth made the largest number of boda-boda accident victims. 625 (89.80%) were youth and only 71 (10.20%) were not.

Out of the total 696 boda-boda accident victims, 304 (43.68%) were riders, 352 (50.58%) were passengers and 40 (5.75%) were pedestrians. 273 (89.80%) of the riders, 316 (89.78%) of the passengers and 40 (90%) of the pedestrians were youths (between the ages of 16 and 35 years). Passengers were more likely to be victims of boda-boda accidents than riders and pedestrians. Odds were higher that a victim would have been a passenger (odds:1.0235) than a rider (odds: 0.7756) or a pedestrian (odds: 0.0610). This means that passengers were more likely to be injured in a boda-boda accident compared to the riders (OR:1.32) and pedestrians (OR: 16.78).

The youth were more likely to be victims of a boda-boda accident compared to their older counterparts (OR: 77.5)

4.1.2. BODA-BODA ACCIDENT VICTIMS BY SEX

Majority of the boda-boda accident victims were male. There were 584 (83.9%) males in total and 112 (16.1%) females. Table 3 below shows the sex distribution as victim i.e. rider, passenger or pedestrian.

SEX	RIDER		PASSENGER		PEDESTRIAN		TOTALS	
	No	%	No	%	No	%	No	%
Male	304	100	251	71.3	29	72.5	584	83.9
Female	0	0	101	28.7	11	27.5	112	16.1
TOTAL	304	43.7	352	50.6	40	5.7	696	100

Table 3: Boda-boda Accident Victims by Sex (N=696)

From Table 3 above, males were more likely to be boda-boda victims compared to females (OR: 27.19).

4.2. RIDER-RELATED FACTORS ASSOCIATED WITH BODA-BODA ACCIDENTS

4.2.1. Motorcycle ownership, training, permit possession, diurnal distribution of the boda-boda accidents, Time of closing work (N=304)

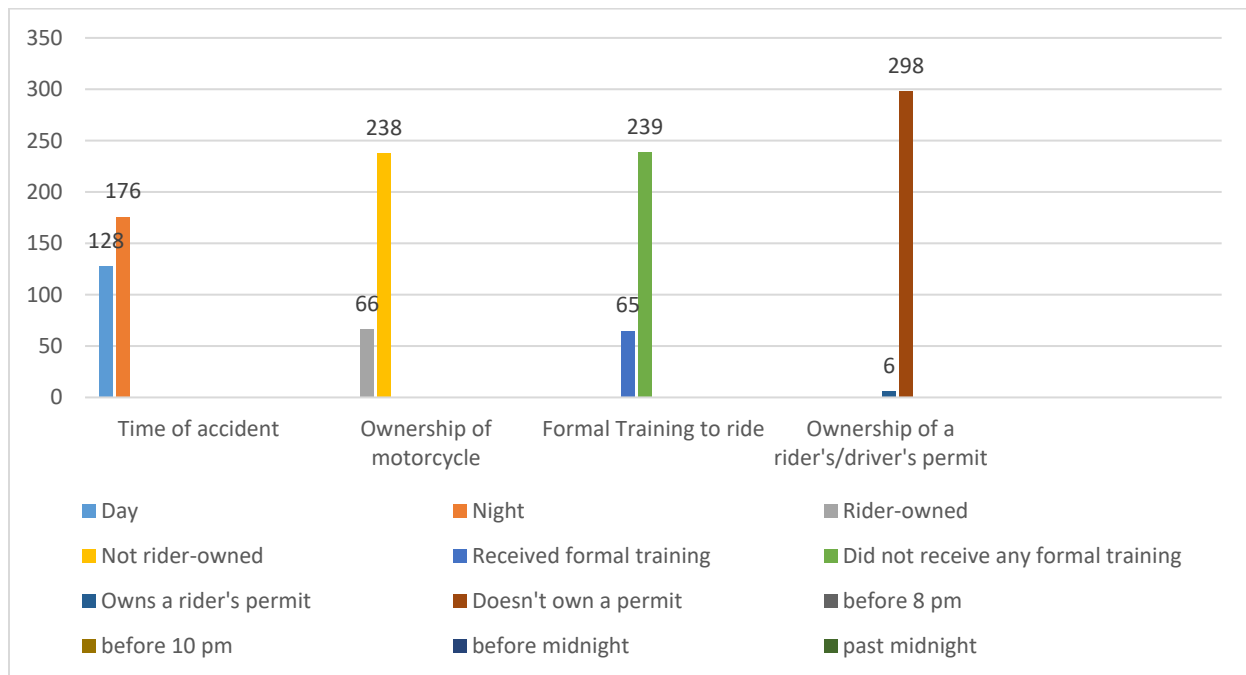


Figure 2: Some Key Rider-Associated Factors as Determinants of boda-boda Accidents (N=304)

176 (58.0%) of the accidents were reported to have occurred at night, by riders who did not own the motorcycles they were riding (78.29%), without any formal training (78.62%), and without a riders' permit (98.03%). This is summarized in figure 2 above. Most of the riders closed shop before 10 pm (238, 78.29%) while 66 (21.71%) worked up to midnight or even beyond.

4.2.2. Safety Practices to minimize accidents and injuries sustained by rider and passenger (N=656)

Among the injured victims, there were 304 riders and 352 passengers. They were asked if they had on any form of PPE such as reflectors and helmets at the time of the accident. Of note was that, though most riders had with them a reflector jacket and a helmet, their use was so minimal. Of alarming significance too was that none of the riders had an extra set of helmet and reflector for the passenger. As shown in figure below, a staggering 552 (84%) rider and passenger victims were not using any PPE at the time of the accident. Only 104 (16%) said that they had some PPE on and all of them were the riders.

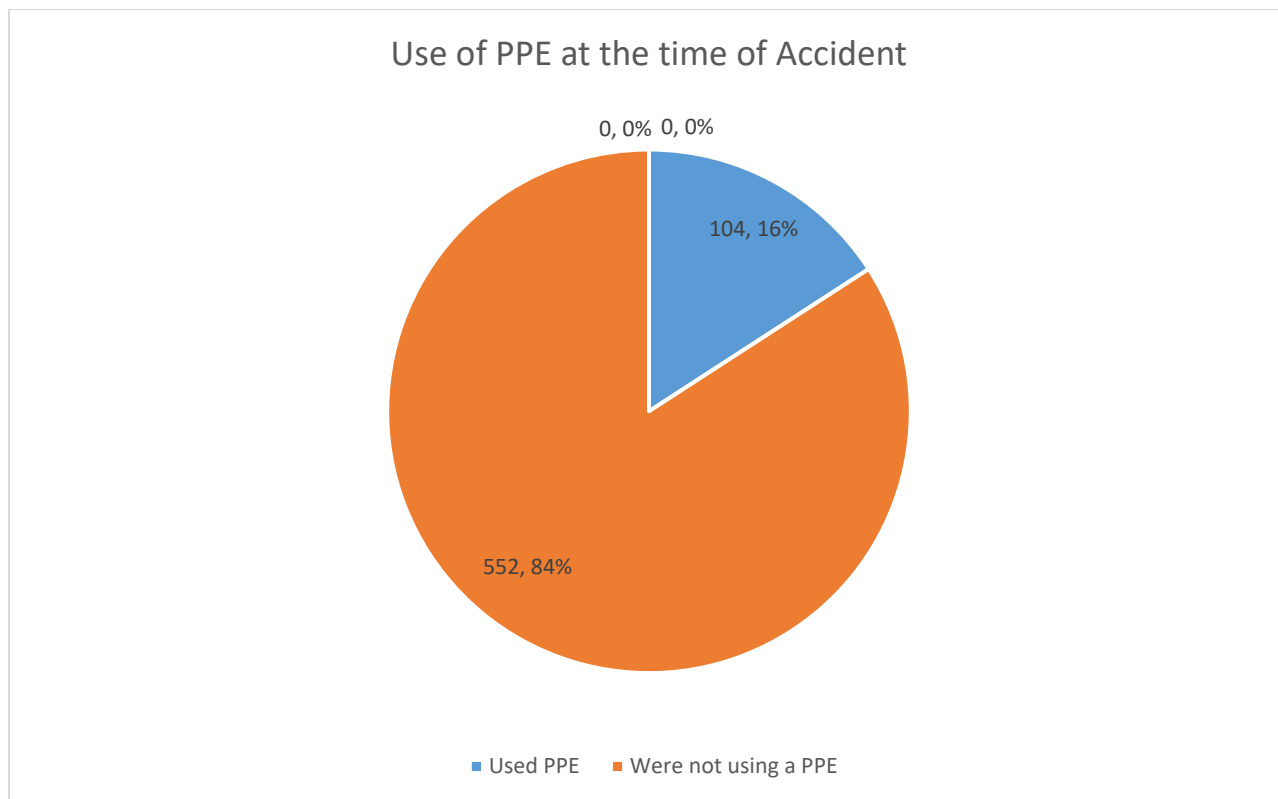


Figure 3: PPE us among Rider and Passenger Boda-Boda Accident Victims (N=656)

4.2.3. Alcohol use and use of mobile phone while riding (N=304)

Despite quite a number of the riders affirming ownership of a mobile phone, all said that they would always stop and pack before using their mobile phones because they were aware of the dangers of mobile phone use while riding or driving. More than 50% also stated that they take alcohol, but categorically stated that they never drunk while at work and specifically on the material day of the accident, they had not taken any alcohol.

4.3. INJURIES SUSTAINED & OUTCOMES OF VICTIMS OF BODA-BODA ACCIDENTS (N=696)

INJURIES SUSTAINED	FREQUENCY (N)	PERCENTAGE (%)
Upper limb injuries	87	12.5
Spinal cord injuries	4	0.58
Head injuries	190	27.29
Lower limb injuries	352	50.58
Abrasions, bruises and contusions	63	9.05

TOTALS	696	100
OUTCOMES	FREQUENCY (N)	PERCENTAGE (%)
Full Recovery	603	86.64
Recovery with complications (Limb loss, disability, other complications)	86	12.36
Death	7	1.01
TOTALS	696	100

Table 4: Injuries incurred and the several outcomes of boda-boda accidents (N=696)

As table 2 above shows, lower limb injuries (50.58%) were the most common injuries incurred followed by head injuries (27.29%) and upper limb injuries (12.5%). Other injuries reported included spinal cord injury, bruises, abrasions and contusions. These injuries were accompanied by either full recovery (86.64%), recovery with complications e.g. limb amputations (12.36%) or even death (1.01%).

CHAPTER FIVE: DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.0.INTRODUCTION

This chapter presents the discussions of the study findings, conclusions arrived at and the recommendations made to various stakeholders to whom these findings might be useful.

5.1. DISCUSSIONS

5.1.1. Prevalence of boda-boda-related injuries

From the study results, the prevalence of boda-boda accident victims in the surgical wards was very high and was also seen to involve young people and males more. The high prevalence may be due to the increase in the number of boda-boda users witnessed within the past years and more involvement of the unemployed youth in the boda-boda industry. These findings agree with those by (Berecki-Gisolf et al., 2015) who also found that motorcycle accidents in Thailand were high and involved mainly young males. Similar findings were reported by (Makerere University Journalism club, 2012) in Mulago and (Singoro et al., 2016), in Kenya.

The youth, being the most affected as boda-boda accident victims may also be because of a number of reasons. First and foremost, the youth are the most active portion of the population that are always up and about going on their activities of daily living. More importantly though, the youth are the largest portion of Uganda's population which, together with Zambia, have been categorized as countries with the youngest populations (Kristensen & Birch-Thomsen, 2013); most energetic and able to contribute to the workforce, and the most affected by unemployment. The boda-boda industry has enabled these unemployed youths employ themselves and be able to provide for themselves and their loved ones (Nyachieo, 2013). We therefore find that unemployment has led to more youth finding alternative sources of livelihood such as self-employment, and the boda-boda business has become well suited for them (Magelah & Ntambirweki-Karugonjo, 2014). At times traffic snarl-ups lead to increased accidents, especially by motorcycle riders. Traffic snarl-ups cause special problems arising during rush hours with an increase of RTAs that result from the need to overcome the traffic snarl-up, especially by the boda-boda riders. Riding involves dangerously weaving in and out of traffic, at reckless and breath-taking speeds at times, and which could culminate into disaster any time as reported by (Tumwesigye et al., 2016).

More males were involved from the mere fact that the boda-boda business is a male dominated industry with more males willing to take up this risky business as boda-boda riders. Working late

into the night, with all the risks and dangers that come with that, among other factors, have made bode-boda riding a male-dominated undertaking. The women's contribution to the statistics is mainly as passengers or pedestrians.

The researcher noted that more passengers were injured compared to riders and pedestrians. This is attributable to the possibility that there are more than one passengers carried on the bode bode and it could also be due to the possibility that passengers get injured in accidents where the riders may not or even the riders may get less severe injuries that may not warrant them to get hospitalized. Passengers are more likely to suffer more injuries since, apart from being unable to avoid the accident, they are also disadvantaged since most riders only have protective gear such as helmets, elbow and knee caps just for themselves and not for the passengers (Ramli, Oxley, Hillard, Mohd Sadullah, & McClure, 2014), and (Tavakoli Kashani, Rabieyan, & Besharati, 2014). Helmet use by passengers has been associated with less severe injuries, especially to the head, and less fatalities. It was also noted that there were significantly less pedestrians compared to the riders and passengers among the accident victims. Reasons attributable to this include that bode-boda accidents commonly involve collisions and falls as opposed to knocking down pedestrians. Pedestrians are less likely to become victims maybe because pedestrians may have time to avoid being knocked (Zulkipli et al., 2012).

5.1.2. Rider-related factors associated with bode-boda accidents

The rider-related factors found significantly associated with bode-boda accidents included not owning the motorcycle thus at times being forced to work long hours into the night so as to meet the daily quota, lack of formal riders'/drivers' training and consequently lack of a riders'/drivers' permit. Others that could be directly associated with occurrence and severity of injuries were the lack of PPE such as reflector jackets and riding helmets for both the rider and his passenger. This could explain the significant number of head injuries reported.

These findings agree with those of several previous studies such as that by (Baral & Kanitpong, 2015) in Thailand who reported that working long hours and lack of use of helmets were associated with increased motorcycle accidents and severity of injuries. (Maia de Almeida et al., 2016) in Brazil reported lack of formal training and licensing of riders were chiefly to blame for the high numbers of motorcycle accidents recorded. (Duncan Mwangangi Matheka & Faraj Alkizim Omar, Chebiwot Kipsaina, 2015) in Kenya, reported recklessness, riding while under

the influence, lack of knowledge and complete disregard for road track rules and regulations, as the key contributors to increased boda-boda-related accidents.

5.1.3. Injuries sustained and outcomes of boda-boda accidents

Lower limb, head and upper limb injuries in that order, topped the list of boda-boda accident injuries reported although the prognosis was good with a majority achieving full recovery with no complications. Low mortality was related in this study: only 7 deaths were reported. These findings agree with those of (van der Loeff et al., 2013) in Tanzania and that by (Tumwesigye et al., 2016) back home in Uganda.

5.2. CONCLUSIONS

The prevalence of boda-boda related injuries at FPRRH surgical wards was significantly high due to first and foremost, increased usage of motorcycles both as a means of transport and as a source of employment, and secondly riding without formal training, late into the night and without personal protective gear such as helmets and reflectors.

The rider-related factors found to be significantly associated with boda-boda accidents were male sex, being in the youthful years, riding at night of a motorcycle that did not belong to the rider, lack of use of PPEs, lack of formal riding training and lack of a rider's permit.

The common injuries associated with boda-boda injuries include lower limb injuries, head injuries and upper limb injuries. Other injuries reported were spinal cord injuries, bruises, abrasions and contusions which were followed mainly by full recovery with no complications.

5.3. RECOMMENDATIONS

5.3.1. To the boda-boda riders and their passengers

Ensure following riding rules and regulations with adherence to road traffic signs and symbols together with ensuring use of PPEs such as reflectors and helmets for both the rider and the passenger at all times.

However much they need to make the day's quota, they should ride late into the night cause fatigue and darkness are great contributors to motorcycle accidents.

5.3.2. To the surgical staff at FPRRH

Together with treating these accident victims, as part of their rehabilitative therapy, and education on road safety and the importance of use of PPEs.

5.3.3. To fellow researchers

Since alcohol use did not come out clearly in this study as a factor associated with boda-boda accidents, further studies into this is warranted, a study that may involve the measurement of blood alcohol levels of on duty boda-boda riders.

5.4.4. To the governing authorities

Improve roadway infrastructure and traffic regulations together with education on safe road use. Ensure the law is enforced in as far as training and acquisition of a rider's permit and use of reflectors and helmets for both rider and passenger at all times. Do spot checks for those riders riding under the influence of alcohol and taking appropriate actions.

5.4.5. Limitations

The key limitation met was confirming the sobriety of the riders at the time of accident since it relied only on the riders' response that could not be investigated further. The truthfulness of their responses could not be assured and the researcher had to take the riders' word for it, which is likely not to be the truth as no rider would want to confess riding under the influence of alcohol in fear of legal repercussions as it is an offence. For this reason, the researcher recommends other studies that would involve assessment of alcohol use or levels of intoxication of boda-boda riders especially at admission post-accident.

REFERENCES

- Baral, S., & Kanitpong, K. (2015). Factors Affecting the Severity of Motorcycles Accidents and Casualties in Thailand by Using Probit and Logit Model. *Journal of the Eastern Asia Society for Transportation Studies*, 11, pp 2175-2188. Retrieved from <http://dx.doi.org/10.11175/easts.11.2175> <https://trid.trb.org/view/1378321>
- Berecki-Gisolf, J., Yiengprugsawan, V., Kelly, M., McClure, R., Seubsman, S. A., & Sleigh, A. (2015). The impact of the thai motorcycle transition on road traffic injury: Thai cohort study results. *PLoS ONE*, 10(3). <https://doi.org/10.1371/journal.pone.0120617>
- Duncan Mwangangi Matheka & Faraj Alkizim Omar, Chebiwot Kipsaina, J. W. (2015). *Road traffic injuries in Kenya: a survey of commercial motorcycle drivers* (Vol. 8688). <https://doi.org/10.11604/pamj.2015.21.17.5646>
- Jou, R. C., Yeh, T. H., & Chen, R. S. (2012). Risk factors in motorcyclist fatalities in Taiwan. *Traffic Injury Prevention*, 13(2), 155–162. <https://doi.org/10.1080/15389588.2011.641166>
- Kato, J. (2018). Boda bodas kill 7,000 in three years - Daily Monitor. Retrieved from monitor.co.ug website: <http://www.monitor.co.ug/News/National/Boda-bodas-kill-7000-three-years/688334-4302092-v1jwb4/index.html>
- Kristensen, S., & Birch-Thomsen, T. (2013). Should I stay or should I go? Rural youth employment in Uganda and Zambia. *International Development Planning Review*, 35(2), 175–201. <https://doi.org/10.3828/idpr.2013.12>
- Li, Y., Qiu, J., Liu, G. D., Zhou, J. H., Zhang, L., Wang, Z. G., ... Jiang, Z. Q. (2008). Motorcycle accidents in China. *Chinese Journal of Traumatology - English Edition*, 11(4), 243–246. [https://doi.org/10.1016/S1008-1275\(08\)60050-4](https://doi.org/10.1016/S1008-1275(08)60050-4)
- Lin, M. R., & Kraus, J. F. (2009). A review of risk factors and patterns of motorcycle injuries. *Accident Analysis and Prevention*, 41(4), 710–722. <https://doi.org/10.1016/j.aap.2009.03.010>
- Lule, H., Ssebuufu, R., & Okedi, X. F. (2017). Prehospital Factors Associated with Injury Severity of Motorcycle Related Femoral Fractures at Mbarara and Kampala International University Teaching Hospitals in Uganda. *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 16(8), 79–92. <https://doi.org/10.9790/0853-1608107992>
- Magelah, P., & Ntambirweki-Karugonjo, B. (2014). YOUTH UNEMPLOYMENT AND JOB CREATION IN UGANDA: Opportunities And Challenges. *Proceedings of the 49th Session*

- of the State of the Nation Platform*, 1–4. Retrieved from https://www.acode-u.org/Files/Publications/infosheet_26.pdf
- Maia de Almeida, G. C., Dantas de Medeiros, F. da C., Oliveira Pinto, L., Bezerra de Oliveira Moura, J. M., & Costa Lima, K. (2016). Prevalence and factors associated with traffic accidents involving motorcycle taxis. *Revista Brasileira de Enfermagem*, 69(2), 359–365. <https://doi.org/10.1590/0034-7167.2016690223i>
- Makerere University Journalism club. (2012, September 12). *Bodaboda transport: a death-trap in the city*. Retrieved from <https://jocom.mak.ac.ug/news/bodaboda-transport-death-trap-city>
- Mnzava, E. G. (2013). *The Impact of Motorcycle Accidents in Tanzania : A Case Study of Morogoro Municipality*. Morogoro.
- Nyachieo, G. M. (2013). *CREATING EMPLOYMENT THROUGH TRANSPORT ; THE YOUTH AND*. 2(4), 154–157.
- Pebalo, F. P., Kwikiriza, N. M., Kiyita, C., Mahaba, T., Muwanga, E., Tinka, A. A., ... Odongo-Aginya, E. I. (2012). Risk factors for road traffic accidents in Gulu municipality, Uganda. *East African Medical Journal*, 89(10), 345–350.
- Ramli, R., Oxley, J., Hillard, P., Mohd Sadullah, A. F., & McClure, R. (2014). The effect of motorcycle helmet type, components and fixation status on facial injury in Klang Valley, Malaysia: A case control study. *BMC Emergency Medicine*. <https://doi.org/10.1186/1471-227X-14-17>
- Singoro, B. W., Wakhungu, J., Obiri, J., & Were, E. (2016). *Causes and trends of public transport motorcycle accidents in bungoma county, kenya*. 4(1), 36–42.
- Tavakoli Kashani, A., Rabieyan, R., & Besharati, M. M. (2014). A data mining approach to investigate the factors influencing the crash severity of motorcycle pillion passengers. *Journal of Safety Research*, 51, 93–98. <https://doi.org/10.1016/J.JSR.2014.09.004>
- Tumwesigye, N. M., Atuyambe, L. M., & Kobusingye, O. K. (2016). *Factors Associated with Injuries among Commercial Motorcyclists : Evidence from a Matched Case Control Study in Kampala City ,.* <https://doi.org/10.7910/DVN/RSOQ5E.Funding>
- van der Loeff, M. S., Bishop, T., Jinadasa, D., & Witte, J. (2013). *Three Studies Into Road Traffic Injury on Rural Roads in Tanzania : 1 . The MagnitudeE and Characteristics of Road Traffic Injury Among Rural Communities 2 . The Impact of Rural Road Traffic Injury*

- Prevention Programme 3 . The Magnitude and Characteristic.* (June).
- WHO. (2015). *Global Status Report on Road Safety, 2015*. Geneva.
- Zulkipli, Z. H., Abdul Rahmat, A. M., Mohd Faudzi, S. A., Paiman, N. F., Wong, S. V., & Hassan, A. (2012). Motorcycle-related spinal injury: Crash characteristics. *Accident Analysis and Prevention*. <https://doi.org/10.1016/j.aap.2011.12.011>

APPENDICES

APPENDIX ONE: CONSENT FORM

CONSENT FORM

STUDY TITLE:PREVALENCE AND FACTORS ASSOCIATED WITH BODA-BODA MORBIDITY AND MORTALITY AT FORT PORTAL REGIONAL REFERRAL HOSPITAL.

I have read and understood the research topic above on the planned study and the explanations given to me. I understand what I have been requested to do in respect to this study.

I have asked questions and clarifications that existed about the study and got satisfied with the answers. I have, after due consideration, willingly consented to take part in this study as explained.

Participant's signature Date

Investigators name Signature

Date

APPENDIX TWO: DATA COLLECTION TOOL

STUDY QUESTIONNAIRE

SERIAL NO:

INTRODUCTION

STUDY TITLE:PREVALENCE AND FACTORS ASSOCIATED WITH BODA-BODA MORBIDITY AND MORTALITY AT FORT PORTAL REGIONAL REFERRAL HOSPITAL.

CONFIDENTIALITY: I am **Tumwebaze Flavia**, a final year medical student at Kampala International University – Western Campus carrying out the above research. I would hereby wish to assure you that the information you will provide will be accorded the confidentiality it deserves and will not be used for purposes other than those meant for this research. You have the right not to answer any questions you feel uncomfortable to and you are free to pull out of the study at any time you wish.

PART ONE: SOCIO-DEMOGRAPHIC CHARACTERISTICS

1. AGE

2. SEX MALE ☐ FEMALE ☐

3. ETHNICITY

Munyankole ☐ganda Much ☐ Mutoro ☐ ☐

Mukoonjo ☐

Other (specify)

4. RELIGION

Orthodox ☐ Muslim ☐ Protestant ☐ Catholic ☐

Other(specify)

PART TWO:MAIN BODY ASSESSING FACTORS ASSOCIATED WITH BODA-BODA

ACCIDENTS

RIDER, PASSENGER OR PEDESTRIAN?

Rider ☐ Passenger ☐ Pedestrian ☐

A. For the rider,

a) Is the motorcycle yours? YES ☐ ☐

b) Did you receive any kind of formal training on how to ride a motorcycle?

YES ☐ NO ☐

c) Do you have a driving/riding permit?

YES ☐ NO ☐

d) For how long have you been riding a motorcycle?

e) For how long have you been riding this particular motorcycle?

f) Is this your first accident?

YES ☐ NO ☐

g) How many accidents have you had since you started riding?

h) When do you start work?

i) When do you close work for the night?

j) How often do you service your motorcycle?

Weekly ☐

Bi-weekly ☐

Monthly ☐

Bi-monthly ☐

Yearly ☐

Never ☐

k) How Often do you have the tyres changed?

After six months ☐

After a year ☐

After 18 months ☐

I have never changed ☐

l) When did the accident occur

During the day ☐

At night ☐

m) Do you own and were you using personal protective equipment (e.g. helmets and reflectors) for both you and the rider during the accident?

YES ☐ NO ☐

n) In your own words, what do you think happened?

.....
.....

o) Do you think it dangerous to ride a motorcycle while under the influence of alcohol?

- YES ☐ NO ☐
- p) Do you take alcohol
- YES ☐ NO ☐
- q) Have you ever ridden your motorcycle while having had taken alcohol?
- YES ☐ NO ☐
- r) Had you taken alcohol this time round when the accident occurred?
- s) Have you ever used your mobile phone while riding your motorcycle?
- YES ☐ NO ☐
- YES ☐ NO ☐
- t) Do you think it is dangerous to use a mobile phone while riding a motorcycle?
- YES ☐ NO ☐

B. For the passenger

- i) When did the accident occur
- At night ☐
- During the day ☐
- ii) In your own words what do you think happened?
-
-
-

C. For the pedestrian

- i. When did the accident occur
- At night ☐
- During the day ☐
- iii) What were you doing when the accident happened?
- Attentively just crossing the road ☐
- Crossing the road inattentively (while using my phone) ☐
- iv) In your own opinion, what do you think happened?
-
-

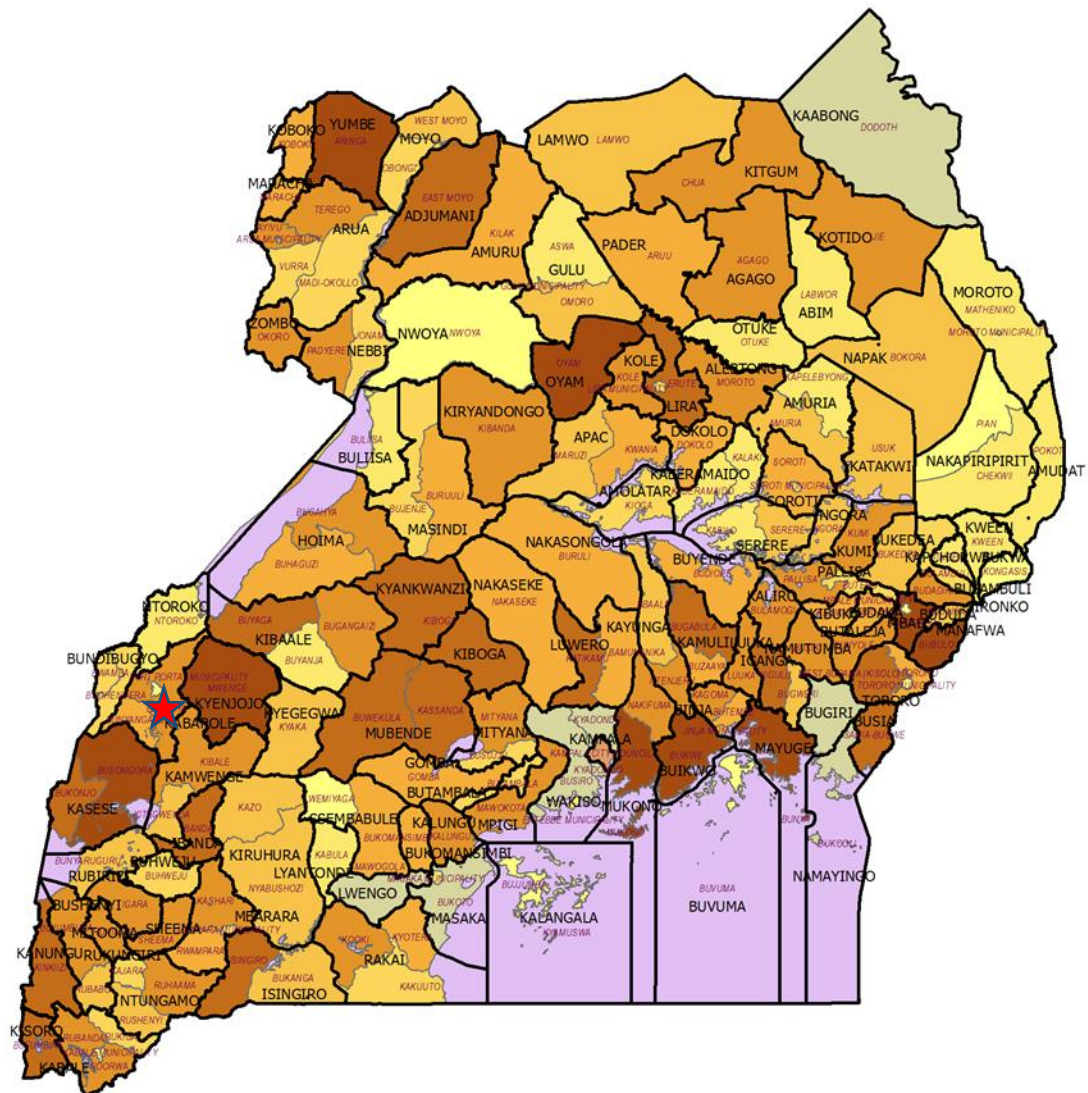
Do you have anything else you want to add, any question, clarification, concern etc.?

Otherwise, *THANK YOU.*

APPENDIX THREE: LIST OF SEVERAL INJURIES SUSTAINED & OUTCOMES OF VICTIMS OF BODA-BODA ACCIDENTS

INJURIES SUSTAINED	FREQUENCY (N)	PERCENTAGE (%)
Head injuries		
Upper limb fractures and dislocations		
Lower limb fractures and dislocations		
Minor bruises and sprains		
Others		
OUTCOMES	FREQUENCY (N)	PERCENTAGE (%)
Full Recovery		
Recovery with complications (Limb loss, disability, other complications)		
Death		
TOTAL		

APPENDIX FOUR: MAP OF UGANDA SHOWING THE LOCATION OF KABAROLE (RED STAR) DISTRICT WHERE FORT-PORTAL IS FOUND



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**OFFICE OF THE DEAN
FACULTY OF CLINICAL MEDICINE & DENTISTRY**

04/02/2019

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: TUMWEBAZE FLAVIA (BMS/0036/132/DU)

The above named person is a fifth year student at Kampala International University pursuing a Bachelor of Medicine, Bachelor of Surgery (MBChB) Programme.

She wishes to conduct his student research in your hospital.

Topic: Boda Boda related Morbidity and Mortality

Supervisor: Dr. Peter Musinguzi

Any assistance given will be appreciated.

Yours Sincerely,

05 FEB 2019

Dr. Akib Surat
Deputy Executive Director/Assoc Dean FCM&D

For the attention of
• A & E Unit
• Surgical Ward
• Medical Records

*Please record her
your assistance*

Handwritten signature
FEB 07 2019
PRINCIPAL ADMINISTRATOR

"Exploring the Heights"
Assoc. Prof. Sawubudu Robinson, Dean (FCM & D) 0773 507240 / 0773 507241 / 0773 507242 / 0773 507243 / 0773 507244 / 0773 507245 / 0773 507246 / 0773 507247 / 0773 507248 / 0773 507249 / 0773 507250 / 0773 507251 / 0773 507252 / 0773 507253 / 0773 507254 / 0773 507255 / 0773 507256 / 0773 507257 / 0773 507258 / 0773 507259 / 0773 507260 / 0773 507261 / 0773 507262 / 0773 507263 / 0773 507264 / 0773 507265 / 0773 507266 / 0773 507267 / 0773 507268 / 0773 507269 / 0773 507270 / 0773 507271 / 0773 507272 / 0773 507273 / 0773 507274 / 0773 507275 / 0773 507276 / 0773 507277 / 0773 507278 / 0773 507279 / 0773 507280 / 0773 507281 / 0773 507282 / 0773 507283 / 0773 507284 / 0773 507285 / 0773 507286 / 0773 507287 / 0773 507288 / 0773 507289 / 0773 507290 / 0773 507291 / 0773 507292 / 0773 507293 / 0773 507294 / 0773 507295 / 0773 507296 / 0773 507297 / 0773 507298 / 0773 507299 / 0773 507300 / 0773 507301 / 0773 507302 / 0773 507303 / 0773 507304 / 0773 507305 / 0773 507306 / 0773 507307 / 0773 507308 / 0773 507309 / 0773 507310 / 0773 507311 / 0773 507312 / 0773 507313 / 0773 507314 / 0773 507315 / 0773 507316 / 0773 507317 / 0773 507318 / 0773 507319 / 0773 507320 / 0773 507321 / 0773 507322 / 0773 507323 / 0773 507324 / 0773 507325 / 0773 507326 / 0773 507327 / 0773 507328 / 0773 507329 / 0773 507330 / 0773 507331 / 0773 507332 / 0773 507333 / 0773 507334 / 0773 507335 / 0773 507336 / 0773 507337 / 0773 507338 / 0773 507339 / 0773 507340 / 0773 507341 / 0773 507342 / 0773 507343 / 0773 507344 / 0773 507345 / 0773 507346 / 0773 507347 / 0773 507348 / 0773 507349 / 0773 507350 / 0773 507351 / 0773 507352 / 0773 507353 / 0773 507354 / 0773 507355 / 0773 507356 / 0773 507357 / 0773 507358 / 0773 507359 / 0773 507360 / 0773 507361 / 0773 507362 / 0773 507363 / 0773 507364 / 0773 507365 / 0773 507366 / 0773 507367 / 0773 507368 / 0773 507369 / 0773 507370 / 0773 507371 / 0773 507372 / 0773 507373 / 0773 507374 / 0773 507375 / 0773 507376 / 0773 507377 / 0773 507378 / 0773 507379 / 0773 507380 / 0773 507381 / 0773 507382 / 0773 507383 / 0773 507384 / 0773 507385 / 0773 507386 / 0773 507387 / 0773 507388 / 0773 507389 / 0773 507390 / 0773 507391 / 0773 507392 / 0773 507393 / 0773 507394 / 0773 507395 / 0773 507396 / 0773 507397 / 0773 507398 / 0773 507399 / 0773 507400 / 0773 507401 / 0773 507402 / 0773 507403 / 0773 507404 / 0773 507405 / 0773 507406 / 0773 507407 / 0773 507408 / 0773 507409 / 0773 507410 / 0773 507411 / 0773 507412 / 0773 507413 / 0773 507414 / 0773 507415 / 0773 507416 / 0773 507417 / 0773 507418 / 0773 507419 / 0773 507420 / 0773 507421 / 0773 507422 / 0773 507423 / 0773 507424 / 0773 507425 / 0773 507426 / 0773 507427 / 0773 507428 / 0773 507429 / 0773 507430 / 0773 507431 / 0773 507432 / 0773 507433 / 0773 507434 / 0773 507435 / 0773 507436 / 0773 507437 / 0773 507438 / 0773 507439 / 0773 507440 / 0773 507441 / 0773 507442 / 0773 507443 / 0773 507444 / 0773 507445 / 0773 507446 / 0773 507447 / 0773 507448 / 0773 507449 / 0773 507450 / 0773 507451 / 0773 507452 / 0773 507453 / 0773 507454 / 0773 507455 / 0773 507456 / 0773 507457 / 0773 507458 / 0773 507459 / 0773 507460 / 0773 507461 / 0773 507462 / 0773 507463 / 0773 507464 / 0773 507465 / 0773 507466 / 0773 507467 / 0773 507468 / 0773 507469 / 0773 507470 / 0773 507471 / 0773 507472 / 0773 507473 / 0773 507474 / 0773 507475 / 0773 507476 / 0773 507477 / 0773 507478 / 0773 507479 / 0773 507480 / 0773 507481 / 0773 507482 / 0773 507483 / 0773 507484 / 0773 507485 / 0773 507486 / 0773 507487 / 0773 507488 / 0773 507489 / 0773 507490 / 0773 507491 / 0773 507492 / 0773 507493 / 0773 507494 / 0773 507495 / 0773 507496 / 0773 507497 / 0773 507498 / 0773 507499 / 0773 507500 / 0773 507501 / 0773 507502 / 0773 507503 / 0773 507504 / 0773 507505 / 0773 507506 / 0773 507507 / 0773 507508 / 0773 507509 / 0773 507510 / 0773 507511 / 0773 507512 / 0773 507513 / 0773 507514 / 0773 507515 / 0773 507516 / 0773 507517 / 0773 507518 / 0773 507519 / 0773 507520 / 0773 507521 / 0