JRIIE Journal of Research Innovation and Implications in Education
Center for Research Implications & Practice

Website: www.jriie.com **ISSN 2520-7504 (Online) Vol.4, Iss.4, 2020 (pp. 119 - 129)**

Levels of Rider Training and Its Influence on Road Safety among Motorcycle (*Boda Boda)* Riders in Kisumu East Sub-County in Kisumu County, Kenya

Gladys M. M. Nyachieo

Multi Media University of Kenya

Corresponding author: gmasomo@gmail.com

Received December 24, 2020; Revised December 28, 2020; Accepted December 31, 2020

Abstract: *Road safety is one of the biggest challenges facing countries in Sub-Saharan Africa. Although there could be other factors leading to road crashes, literature indicates that rider training is an important aspect in motorcycle safety. This study sought to establish the levels of formal rider training among boda boda riders in Kisumu, and how it influences motorcycle safety. The study examined rider characteristics, the nature of rider training and possession of valid licenses. The study also sought to test whether there was no significant relationship between rider training and accident involvement rates among riders of boda boda motorcycles. It adopted a descriptive research design and employed cluster sampling and systematic random sampling to recruit the study participants. A sample of 370 riders were selected from a population of 10,000 riders in Kisumu. Quantitative data was analysed using both descriptive and inferential statistics while qualitative data was analysed using content analysis. The study found that formal rider training levels were low and recommended that the government, through NTSA, ensure training for riders through subsidizing the training fee. In addition, NTSA needed to come up with a standardized training manual that is implemented and audited periodically. This contributes to empirical knowledge on motorcycle safety and may contribute to targeted interventions in road safety.*

Keywords*: Motorcycle, Boda boda, Riders, Formal training, Safety knowledge, Kisumu, Kenya*

How to cite this article (APA):

Nyachieo, G. M. M. (2020). Levels of rider training and its influence on road safety among motorcycle (Boda Boda) riders in Kisumu East Sub-County in Kisumu County, Kenya. *Journal of Research Innovation and Implications in Education 4*(4), 119 – 129.

1. Introduction

Motorcycles have become an important way of ensuring that the vast majority of people living in countries where motorcycling is common are actively engaged in social and economic activities. Historically, motorcycles had already to some degree been providing one of the public mobility alternatives: in Nigeria, the first appearance of moto-taxis dates back to the 1970s, while in countries such as Niger, Cameroon, Benin and Rwanda the use of motorcycles for taxi services started in the 1980s; Chad, Kenya, Togo and Uganda followed in the 1990s (Ehebrecht, Heinrichs & Lenz, 2018).

In most towns and cities, Boda bodas are helpful in reducing bad road delays or rush hours. They are available during the day and night and can be driven even on small village paths that are not accessible by other fast means of transport (Kitara, 2011 in Baker, 1975 & Naddumba, 2004). Nevertheless, in addition to the inherent dangerous features of the motorcycle-traffic environment, the vast number of motorcycles pose major threats to motorists

(Jadaan et al., 2018; Vlahogianni et al., 2012; WHO, 2017). World Health Organization statistics indicate that in South-East Asia, motorcyclists account for 43 percent of all deaths (WHO, 2018). In particular, the National Traffic Safety Committee of Vietnam recorded more than 8,500 deaths annually from on-road accidents, while motorcyclists and their passengers accounted for around 90% of the casualties (WHO, 2018).
The African area has the highest fatality rate in road traffic (24.1 per 100,000 population) and motorcyclists have been found to be among the most vulnerable road users, with nearly a quarter (23 percent) of road traffic deaths occurring among motorcyclists worldwide (WHO, 2018).

According to the most comprehensive motorcycle study ever done, motorcycle rider training experience reduces accident involvement (Kardamanidis, Martiniuk, Ivers, Stevenson & Thistlethwaite, 2010) and is related to reducing injuries in the event of accidents (Clarke, Ward, Bartle & Truman, 2004; Gboyega, Ebijuwa, Oyetola & Akinola, 2012; Hurt, 1981). According to Hurt, Ouellet and Thom (1981), majority (92%) of the motorcycle riders did not undergo any formal rider training. They were self - taught or learned from family or friends. Asogwa (1992) in a study in Nigeria found that a large number of drivers who had valid driving licenses had never gone to training colleges or checked as required by the law. Drivers who are not qualified have higher risks of violating traffic laws and regulations and thereby causing accidents (Peck, 2011). Most accidents are caused by less skilled and non-professional drivers (Asogwa, 1978). In another recent study 85% revealed riders did not go through formal training while only 15% had gone through formal training (Sahr Nyuma, & Lawrence Sao. 2020). A nother study revealed that some commercial motorcyclists suggested improving driver training for motorcycles (37.9%, n ¼ 231), an indication that even where there is training, it is not adequate (Nickenig Vissoci, Krebs, Meier, Vieira, de Andrade, Byiringiro, & Staton, 2020).

While information on levels of rider training is important for road safety interventions, this information is not easy to come by although a recent study on crash risk factors for novice motorcycle riders indicated that riders who attended a pre-learner course had 1.41 times (95% CI 1.08–1.84) higher odds of crashing compared to those who did not participate in a pre-learner course (Möller, Senserrick, Rogers, Sakashita, De Rome, Boufous, ... & Ivers, 2020). It is not easy to tell the global motorcycle training levels because the *Global status reports on road safety* do not capture that specific information. However, it is necessary have this information to understand the magnitude of the problem since motorcycle injuries contribute a majorly to road injuries and general public health problem but are neglected especially in developing countries (Sahr Nyuma, & Lawrence Sao, 2020 citing Elliott, Baughan & Sexton, 2007). Among the most vulnerable road users are motorcyclists. Motorcyclists account for almost a quarter (23 percent) of the world's road traffic fatalities. Motorcycle riders have a 34-fold greater chance of death in an accident per vehicle mile traveled than people driving other forms of motor vehicles (Tumwesigye, Atuyambe & Kobusingye, 2016 in Lin & Kraus, 2009)
In African countries, just like other countries, the information on levels of formal rider training is scarce. However, a study showed that in East Africa, motorcycles in Kenya, Tanzania and Uganda are growing as a major public transport company, commonly known as "Boda-Boda" (Hung, Stevenson & Ivers, 2006). A study in Tanzania through the thematic analysis revealed that riders suggested among other interventions to curb motorcycle injury, education and training of riders.

In Kenya nationally, data on the number of *boda boda* riders attending driving schools is non-existent. This is despite the increasing cases of motorcycle accidents. For example, motorcycle (*boda boda*) fatalities increased from 750 in 2018 to 959 in 2019. Deaths by road user category, according the Road Safety Status report, was 24% (WHO 2016) while in 2018, for riders of motorized two and three wheelers was 26% of all the death in road accidents. This therefore makes it necessary for transport researchers to carry out research to establish the association between rider training and motorcycle accident in order to curb this trend (WHO, 2018).

According to the National Transport and Safety Authority *Operation of Motorcycles Regulations*, 2014, it is the responsibility of a motorcycle rider to have a valid driving license issued by NTSA. After they have gone through driving school and acquired the necessary skills to ride and ferry passengers, is not enough without a valid license. It is also the responsibility of the law enforcement agencies to enforce this regulation. Some studies in Kenya suggest that most motorcyclists are not trained or are not properly trained, leading to reckless riding and violation of existing traffic laws (Nyachieo, 2015; Moraa, 2010; Odera, 2009). This is exacerbated by the absence of special motorcycle lanes on the roads in Kenya, thus forcing them to jostle with other vehicles for space (Saidi & Mutisto, 2013). This study therefore set to investigate the socio-economic characteristics of riders and the influence of motorcycle rider training on road safety in Kisumu in Kenya.

1.1 Theoretical framework: Structural Functionalism

Structural Functionalism is a philosophy of sociology that seeks to understand why society operates the way it does. It does this by reflecting on the connections between the different social structures that make up society. The theory maintains that social systems, which are relatively stable patterns of social activity, direct our lives. Each structure performs a social role that contributes to the functioning of the whole of society. The theory describes the preservation of a social system's sections, frameworks,

organizations, norms or cultural practices. It looks at the specific role played or satisfied by each component (Burrell & Morgan, 2017).

Just like a society, the road and transport system has many units or parts that perform different roles for the whole (the whole here means the road transport system in Kenya). The current study conceives of the road transport system as consisting of several institutions and structures such as NTSA, the Traffic Police Department, the Criminal Justice System, Ministry of Transport and Infrastructure, KRA, the Kenya Roads Board. Driving/riding schools, Non-Governmental Organizations (NGOs), Insurance Regulatory Authority (IRA), the Automobile Association of Kenya, motorcycle manufacturer among others. To this end, the study presupposes that the survival of the system, in this case the road transport system is dependent on the working together of the different institutions to meet the road and transport systems need for safety. Each institution is seen as performing a function that meets that need of safety. As indicated above, in Kenya there are many institutions involved in road traffic safety. These institutions may contribute to or hinder accident causation behaviour among riders depending on how they play their roles within the system.

2. Literature Review

Globally and in Sub-Saharan Africa, cities are characterized by informal transport services like boda boda that compensate for the absence of an institutionalized system of transport (Amadi, 2013). The origin of motorcycles can be traced back to the trans-border illegal trade at Busia town in the 1960s. This is where the name *boda boda* came from (it was from border to border-'boda boda') (Anon, 2014). They are essentially a bicycle-based taxi service, a major source of employment and livelihood support for the poor (Howe, 2013). At this time, it was bicycles that were used to ferry the illegal goods. After the illegal trade was closed, still in the 1960s, the bicycles were still used to carry people and goods in the larger Western Kenya. Later in the 1990s, the motorcycles took over performing the same duties. And still retained the name *boda boda (*Howe & Maunder, 2004). According to Urioh (2020) citing Mugie (2018), most parts of sub-Saharan Africa, the growth of motorcycles as a mode of transport has mostly been motivated by the need to easily reach remote areas in an inexpensive way.

Unfortunately, there have been reported increases in motorcycle deaths and accidents nationally which have demonstrated the need to improve motorcycle safety. One of the main road safety challenges is motorcycle safety. Motorcycles account for just 3% of the traffic flow and 0.6% of the miles traveled by cars (National Safety Council, 2016). To be sure, running a motorcycle is a much more complicated method than operating a vehicle, and once they are involved in an accident, many riders do not have a complete understanding of the complexities of motorcycle activity. Motorcycling poses enormous skill challenges for riders of all ages, from the principle of countersteering to the application of front and rear brake force, traction control and power application, and the alertness and focus needed to navigate traffic conditions controlled by vehicles (Elliot, Baughan, Broughton, Chinn, Grayson, Knowles & Simpson, 2003). A recent study by Ganem and Fernandes (2020) showed that men represent the largest proportion of motorcyclists, professional or not which explained dominance in motorcycle accidents among males although they did not dwell much on training versus road safety.

Previous studies showed that formal education and preparation for motorcycle riders was seen as crucial to mastering the challenging abilities required to operate and control a motorcycle. Many have thought that the motorcycle's unusual handling characteristics and the susceptibility of the rider to perceptual, aerodynamic, and roadway disruptions require inherent expertise and the development of a high level of competence, most efficiently learned through formal training. However, considering the importance given to such activities, relatively few assessments have been carried out to evaluate the efficacy of motorcycle rider education and training and how it influences road safety (Singh & Mattoo, 2020; Mayhew, Simpson, Williams & Ferguson, 1998).

Of these, early studies on the efficacy of rider training programs yielded promising results, with formally trained riders having a lower risk of collision than riders not so trained (Ivers, Sakashita, Senserrick, Elkington, Lo, Boufous & De Rome, 2016), although the results of several of the early studies were later challenged by methodological limitations. Among the different problems found in these studies by Collins (1979) and Satten (1980) were limited sample sizes and a lack of control over important variables, such as rider preparation and exposure. In New Zealand Mullin, Jackson, Langley and Norton (2000) assessed various crash risk factors using a population based case control method. They found that riders older than 25 had less than half the risk than those aged between 15 and 19.

The better-designed experiments, on the other hand, usually yielded misleading results, frequently showing that formally qualified riders were not at lower risk of a crash than riders who did not receive the training. In fact, some assessments showed that officially trained riders had higher accident rates (per number of miles driven) than those who were informally trained (Mayhew, Simpson, Williams & Ferguson, 1998). The results are mixed as motorcycle education has been shown elsewhere to be a promising intervention to avoid accidents in conditions where safety measures and compliance are missing

(Kisaalita & Sentongo-Kibalama, 2007 citing Swaddihiwudhipong et al., 1998).

However, there are recent studies that have investigated rider training among other novice road injury risk factors (Möller, Senserrick, Rogers, Sakashita, De Rome, Boufous, , ... & Ivers, 2020) as well as older riders (Chen, Chen & Lin, 2018). Some research has shown that commercial motorcycle riders tend to be younger males who are often inexperienced and display risk-taking habits such as speeding, transporting multiple passengers, disobeying traffic rules, and maneuvering through traffic laws (Wankie, Al-Delaimy, Stockman, Alcaraz, Shaffer & Hill, 2020 citing Johnson, 2012; Oginni et al., 2009). Particularly on rider training, research shows that formal training courses advance the use of protective equipment and deter unpromising riders from becoming motorcyclists, in addition to lowering the crash rates among inexperienced riders (Singh, & Mattoo, 2020).

3. Methodology

3.1 Study site

In Kisumu (City), where many boda boda motorcycle riders conduct their business, the study was conducted. Kisumu has a long history in the field of *boda boda*. The sub-county of Kisumu East was chosen because it was among the other sub-counties in Kisumu County with the highest population. It is also the county's headquarters, so it was supposed to have many boda boda riders because it is the region's economic centre. In addition, the Kisumu East District Development Plan 2008 2012 reported that in Kisumu East there were 10,000 boda boda riders in service.

3.2 Research Design

A descriptive cross-sectional design was adopted by this research within the mixed methods approach collecting both quantitative and qualitative data. The descriptive design helped to generate data on the safety of the boda boda motorcycle. The study answered the questions of who, what, when, where, and how issues associated with boda boda motorcycle safety in Kisumu county. The potency of descriptive design is that it yields rich data that leads to useful study recommendations. Additionally, this approach collected a large amount of data that allowed detailed analysis. Moreover, descriptive research is also used as a pre-cursor to more quantitative research designs, since it points out certain essential variables that could be subjected to further quantitative study. Given that the study was conducted at one point in time, a cross-sectional survey was best suited for this study. The study focused on capturing and drawing inferences from existing differences among the subjects, in this case the boda boda riders. This design examines the relationships between variables at one moment in time. Moreover, the cross sectional survey allowed for the collection of data from a large number of subjects (370). The design obtained generalizable data for the study.

3.3 Sample size determination

The sample size had been earlier calculated by the use of the Online Sample Size Calculator for (Creative Research Systems, 2013).

Sample Size

$$Ss = \frac{Z^2 * (p) * (1-p)}{c^2}$$

Where: Z = Z value (e.g. 1.96 for 95% confidence level)
p = percentage picking a choice, expressed as decimal (0.5 used for sample size needed)
c = confidence interval, expressed as decimal (e.g., .05 = ±5)
To get the sample size, the researcher needed to know the actual or approximate population size. With the population size of 10,000 the researcher then selected the desired confidence level and interval. Thereafter, the computer generated the sample size automatically. For this study, the sample was calculated at a confidence level of 95% and confidence interval of 5 and a population of 10,000. The sample size generated was 370.

3.4 Sampling procedure

The researcher undertook a reconnaissance visit a week prior to field data collection to establish the riders' assembly points. The first assembly point was identified within the Central Business District (CBD). The researcher then used the snowball method to identify and map other assembly points. These assembly points were treated as clusters. A total of twenty-two (22) bases/clusters were identified and listed, out of which 12 clusters were selected. With the help of assembly leaders, 1,272 riders were selected from 12 of the 22 clusters identified. Since the clusters were not of the same size, "probability proportional to size" (PPS) was used to select respondents from each cluster using systematic random sampling was used. A final sample of 370 respondents were recruited for the study.

3.5 Data Collection

Data was collected using an interview schedule which sought to collect information on rider training. Two focus group discussions (FGDs) were conducted. As an inclusion criterion, the two FDGs comprised only those riders who were in the business at the time of the study i.e. those riders found at the assembly point (base) waiting to ferry passengers for a fee.

3.6 Data Analysis

From the mixed methods approach, the study produced both qualitative and quantitative data. Qualitative information in the interview schedule was created from FGDs, key informant interviews and open-ended questions, while quantitative data came from closed-ended questions. In analyzing the qualitative data, content analysis and NVIVO 10 were used. The researcher reads data from FGDs, main informant interviews and information recorded. To define the key themes, the research used NVIVO 10 to come up with themes and trends, and content analysis was used. Data was imported from the source (i.e. reported interviews) in NVIVO10, then the nodes were generated on the basis of the queries. By collecting all the information provided by a respondent, the case nodes were set up. Themes were then coded and included any emerging theme. Queries were then used to compare themes and memos were eventually created to document the new results and ideas.

To produce descriptive statistics from quantitative data, SAS was used. By summarizing trends in the responses of respondents in the survey, descriptive statistics were used to categorize variables. This is because it offers simple summaries and graphs, distribution tables of frequency, central pattern percentages and measurements and also explains the characteristics of the population that are of interest. In this analysis, it was also important because it helped to imagine and summarize vast volumes of information in order to make them more manageable. Inferential statistics included bivariate and multivariate statistical analyses. Bivariate analyses used included Chi-squared test to examine the significance.

4. Results and Discussion

This study set out to investigate the levels of motorcycle training and how that influences road safety. The section presents socio-economic characteristics of riders, their involvement in accidents, rider formal training and possession of license. Lastly the results of hypotheses are presented.

4.1 Socio-economic Characteristics of Riders

The socio-economic characteristics of riders investigated in this study included sex, age, level of education and prior occupation.

Table 1: Basic Descriptive Statistics: Categorical Variables

Variable	Category	Frequency	Percent
Sex	Male	370	100
	Female	0	0
Age	Less than 18	4	1.08
	18-24	100	27.03
	25-31	192	51.89
	32-38	59	15.95
	39-45	14	3.78
	46-52	1	0.27
Level of Education	Primary	161	43.51
	Secondary	200	54.05
	College	8	2.16
	University	1	0.27
Nature of prior occupation	Jobless	167	65.14
	Bicycle *boda boda* rider	94	25.41
	Informal jobs	80	21.62
	Formal employment	29	7.84

Source: Field data (2012)

The study found that all respondents were male. This implies that motorcycle riding is a male dominated trade. It is thus rare to find women as riders mostly because of the nature of the work. *Boda boda* motocycle business is physically challenging and women with their multiple roles in the family and other responsibilities may take on this business. In addition, society perceives commercial *boda boda* riding as a realm for men (Mahlstein, 2009) although Thompson (2012) citing Martin et al. (2006) and Roster (2007) reports that since the 1980s women have increasingly participated in male-dominated leisure activities including motorcle riding which is not necessarily boda boda.

Women were not attracted to this venture because of the long hours of working, the dangerous terrains, working at night with the ever present risk of sexual assault among many other issues. Women were also not able to raise the money that could enable them buy motorbikes or even hire for the business. This concurs with a study by Ganem and

Fernandes (2020) that showed men represent the largest proportion of motorcyclists, professional or not which explained dominance in motorcycle accidents among males.

The average age of the riders was between 18 and 31. Those aged 18-24 accounting for 27% and those aged 25 - 31 accounting for 52%. Those aged 32-38 were 15.95%. This is by all standards a youthful group. This segment of the population may be unemployed and likely to engage in this business. According to the current study, young riders seemed to dominate the business. Past studies have shown that young riders are far more likely to be involved in motorcycle accidents because they are prone to risk taking (Clarke et al., 2004: Rutter &Quine 1996: Keskinen, Ota, & Katila 1998). Recent studies indicate that psychological traits significantly affect risky behavior among young drivers (Shaheed & Gkritza, 2014; Ulleberg and Rundmo, 2003; Dahlen et al., 2005; Kim and Yamashita, 2007) although it is still unclear how these two are causally related. Some research has shown that commercial motorcycle riders tend to be younger males who are often inexperienced and display risk-taking habits such as speeding, transporting multiple passengers, disobeying traffic rules, and maneuvering through traffic laws (Wankie, Al-Delaimy, Stockman, Alcaraz, Shaffer & Hill, 2020 citing Johnson, 2012; Oginni et al., 2009).

Most riders (54%) were literate with secondary level education while those with primary education accounted for 44%. This may explain why they were not in skilled labour and why may have opted to motorcycle operation. Lack of higher education and job skilled often lead to unemployment. The minimal rigour required for training in this industry attract many who are not highly educated and therefore compromising safety since some riders avoid formal training and overlook some serious requirements in the industry at the expense of the safety of their customers and themselves.

Prior to *boda boda* employment, 65% of the riders were jobless, about 25% were previously bicycle *boda boda* riders while 22% indicated that they had been in other informal employments. Prior work as bicycle riders may explain the high transition to *boda boda* motorcycle and the idea that they could ride a bicycle why not a motorcycle? These findings concur with a study by Sadeghi-Bazargani, Ayubi, Azami-Aghdash, Abedi, Zemestani, Amanati, ... & Safiri (2016) who reported motorcyclists prone to more accidents and injuries were from a low social economic status.

4.2 Accident involvement

Accident involvement was to reflect how often rider respondents had been involved in accidents the last twelve months. This was to give an insight into how many riders, given their level of education and training had been involved or not involved in accidents and whether that would be attributed to training or related factors.

Table 2: Accident involvement in the last twelve months

Accident involvement 12month	Frequency	Percent
Yes	149	40.27
No	221	59.73
TOTAL	370	100

Source: Field data (2012)

The study results indicate that those involved in motorcycle accident 12 months prior to the study were about 40%. While majority of the riders were not involved in this accidents, 40% percent is still high considering the increasing numbers of *boda boda* motorcycles and more untrained riders are venturing into this business. Those involved in accidents had low motorcycle knowledge and some were attributable to their rider behaviour.

4.3 Formal Rider Training

The study found that levels of formal rider training were low. Less than half, that is 38 percent of the riders, reported formal training while 62% did not undergo formal training. Table 3 presents percentage distribution of those formally trained to ride and those that are not formally trained to ride.

Table 3: Frequency Distribution of Formal Rider Training

Formal training	Frequency	Percent
Yes	140	37.84
No	230	62.16
TOTAL	370	100

Source: Field data (2012)

These results indicate that majority of the *boda boda* riders were not formally trained to ride. In this study, those riders that were not formally trained acquired their training from fellow riders (i.e., backstreet training) at a smaller fee between 50 and 200 Kshs (equivalent to US $ 0. 5 to 2) compared to commercial driving schools that charged between Kshs. 6,000 to 9,000 (US $61 to 91) for two or three weeks respectively). The study also found that the fee for backstreet training was negotiable. One could bargain depending on how much money they have. These findings concur with a study on the effects of motorcycle transport revolution on the economic growth in Thika, Mbugua (2011) which indicated that majority (60%) of respondents were not formally trained on motorcycle riding whereas 40% of the respondents indicated that they had received any formal training.

In addition, Obara (2009) while looking at motorcycle injuries in low and middle income countries observed that in Kisumu, majority of the riders were untrained. Lack of rider training has been cited as a major problem in *boda boda* motorcycle safety in Kenya and other African countries. In a study on understanding the role of motorcycles in African cities, Kumar (2011 p 14) observes that:

> *"In spite of their growing importance, motorcycles present some clear disadvantages from the perspective of the public interest. The motorcycle growth has developed without adhering to safety prescriptions as contained in the traffic laws of the countries. The distribution of motorcycles has been carried out without ensuring proper operator training and licensing." (Kumar 2011 p 14)*

Findings from other related studies clearly indicate that lack of training is a serious issue in commercial motorcycle business. The 2005 survey by Ngim and Antony (2007) evaluating the attitude of *Alalok* riders to road safety indicated that of 247 interviewed commercial motorcyclists, less than half (41%) had received formal training on motorcycle riding, and only 88 or 36% had a motorcycle riders' license.

The reason cited for lack of training in the two rider FGDs was that it was too expensive. The key informant also confirmed that, training in a driving school was too expensive. The FGD data was thematically analysed. The FGD participants reported that they were required to pay up to Kshs 6,500 (US $66.11) for training which was unaffordable to them.

Most riders were therefore trained informally (i.e., backstreet/informal training). The riders FGD participants confirmed that most motorcycle (*boda boda)* riders were previous bicycle *boda boda* riders who had shifted from bicycle *boda boda* for various reasons. After a brief informal training, the former bicycle riders were ready to carry pillion passengers. Some participants from the two rider FGDs claimed that *boda boda* riders did not need any training because it would not make any difference, as said by one FGD participant;

> *The matatu (small private car) drivers have licenses and they still cause accidents, why should we then attend training*? *(FGD 1 respondent 2, March, 2012)*

In the first FGD, only 11% of participants had attended rider training. While both theory and practice in rider training are important, the trained members claimed that riders who went for rider training only benefited from the theory, which comprised learning about road signs, how to use lanes, etc, as part of the training, but they got very little practical skills in actual sense, they were instructed by riding short distances and thus acquiring little practice and consequently ended up with inadequate skills on the road. Informal training took one or two days and was relatively cheaper as compared to formal training. The FGD participants confirmed that the fee was negotiable and could be as low as Kshs 50 (0.5 US $) per session. Riders lack of money to pay for training maybe a major limitation to motorcycle training according to the FGD participants.

In contrast to what rider FGD participants thought about the inadequacy of the current driving schools, a key informant from one of the driving schools thought that

there was no need to have specialized driving schools for *boda boda* riders as reported below:

> *Driving schools are enough. Furthermore, traffic rules for riders and other drivers are the same so I do not see the need for introducing driving schools for boda boda riders only. The riders should just join the existing driving schools and learn. (Respondent 3, March, 2012)*

The above statement implies that motorcycle riders need to be trained but not necessarily in special schools for riders only. Many accidents involving *boda boda* motorcycle have been reported and they have been attributed to lack of training for *boda boda* motorcycle riders. As Nazif (2011) puts it, 'the formal rider training is a process of secondary socialization through formal institutions such as professional driving schools which should have a positive impact on road users' safety behaviours."

4.4 Possession of Motorcycle License

The study found out that more than half of respondents, (61%) were not in possession of driving licenses. Thirty nine percent reported to possess valid riding licenses. This was triangulated with an Interview guide to confirm consistency.

Table 4: Accident involvement in the last twelve months

Possession of license	Frequency	Percent
Yes	145	39.19
No	225	60.81
TOTAL	370	100

Source: Field data (2012)

The lack of riding licenses for the majority of respondents was attributed to lack of money to pay for training and the availability of a cheaper 'training' option (ie., informal backstreet training). This is consistent with findings from other studies in low and middle income countries of Asia and Africa. Maina (2011) found that less than 10% of the respondents had the mandatory riding license. Kumar (2011) observed that, in Lagos, Nigeria, commercial motorcycles are required be registered under the Road Traffic Rule and Regulations. All operators are expected to possess a driving license and a road worthiness certificate as well as use protective helmets for passengers and riders. However, this was not the case. A large number of operators do not comply with the legislation. He estimated that over 50% of the motorcycles in Lagos operated without a valid license. The situation in Douala Cameroon, however, was worse. Only 18% of commercial motorcycles (*bendskin*) riders acknowledged having a driving/riding license. Maina (2011 also observed that, possession of riding/driving license was therefore consistent with past studies done in other African countries.

In Kenya, the increasing motorcycle accident rates necessitated a review of the Traffic Act to ensure stiffer and deterrent penalties. The Traffic Act was amended to include section 103(b) in the Traffic Act Cap 403 of 2012. This new section was introduced on 1st December 2012 and among other things it states that, "A person shall not ride a motorcycle unless that person has a valid driving license issued in accordance with the provisions of the Act."

4.5 Hypothesis Testing: Accident Involvement and Rider Training

The null hypothesis tested in this study is that "There is no significant relationship between rider training and accident involvement rates among riders of *boda boda* motorcycles". In order to establish whether or not there was a statistically significant difference in accident involvement with regard to formal training, a Chi-Square test was used. Table 5 presents the cross-tabulation of accident involvement by training type.

Table 5: Cross-Tabulation of Accident Involvement by Rider Training

Accident involvement in the last twelve months		Formal Training in *boda boda* Motorcycle Riding		
		Yes	No	**Total**
	Yes	49	100	**149**
		32.9%	67.1%	**100.0%**
	No	91	130	**221**
		41.2%	58.8%	**100.0%**
Total		**140**	**230**	**370**
		37.8%	**62.2%**	**100.0%**

Source: Own computation based on SAS results.
χ^2=2.60; df = 1; *p*=0.107

The respondents who had formal training, but were reportedly involved in *boda boda* accidents within the last twelve months preceding this study accounted for 33% of the total accident involvement. A much higher proportion (67%) of the accident involvements was accounted for by riders without formal training. On one hand, those respondents not involved in *boda boda* accidents but had formal training in motorcycle riding were 41.2%. On the other hand, those respondents who were not involved in *boda boda* accidents and at the same time not trained formally to ride motorcycles were 58.8%.

The Chi-Square results indicate that there is no significant difference between those formally trained riders involved in *boda boda* accidents and those untrained riders involved in *boda boda* accidents (χ^2=2.60; df=1; P=0.107). The odds indicate that the likelihood of formally trained *boda boda* rider being involved in an accident is 0.107 at the degree of confidence of 95%. The null hypothesis that there is no significant relationship between rider training and accident involvement rates among riders of *boda boda* is therefore accepted.

This is an important finding for this study because these results may mean that, the training received in the formal training school is not necessarily different from the one received from the informal trainers therefore inadequate. This is because the results revealed that there was no significant difference between those formally trained riders involved in *boda boda* accidents and those untrained riders involved in *boda boda* accidents. This concurs with a previous study by Kitara (2011) on patients admitted in Gulu hospital who were trained but failed to poss necessary skills and ended up getting involved in an accident. This is because the motorcycle riders are still trained in the regular driving schools and probably by untrained and inexperienced motorcycle trainers. This would produce riders that have gone through rider training but are lacking in knowledge and riding skills. This may have safety implications in that it may give false confidence to the riders while in reality they do not have the necessary skills. This may lead to more accident involvement. The results could also imply that those who were licensed may have acquired their licenses fraudulently– not because they proved their competence while taking the riding test.

5. Conclusion and Recommendations

5.1 Conclusion

The results of this study have shown that levels of formal motorcycle training are low and that majority of the respondents were not in possession of driving licenses. Participants thought about the inadequacy of the current driving schools that to them may have complicated their access to formal training. Lack of money to pay for training and the availability of a cheaper 'training' option (ie., informal backstreet training) was also a contributor to inadequacy in formal training of the motorcyclists. The *boda boda* rider-related accidents are on the rise in Kisumu in particular, and Kenya, in general. It is therefore necessary to come up with creative ways of ensuring that riders are adequately trained. Untrained riders will increase because most of them cannot afford the riders formal training fee. The use of *boda boda* motorcycle is one way of creating employment and therefore needs to be streamlined to improve efficiency and reduce the many accidents involving motorcycles (Nyachieo, 2012). The study has shown that most riders in Kisumu were not trained and consequently have low motorcycle safety knowledge.

5.2 Recommendations

Based on the findings, the study recommends the reduction of accident rate by improving rider skills and

motorcycle safety knowledge. This can be accomplished by doing the following:

1. Rider specific schools; the National Transport Safety Authority (NTSA), should consider safety knowledge are improved by making sure that all riders are trained. These schools will have to charge less in terms of training fee considering that most riders did not go for formal rider training because they could not afford. This may help those who want to be riders but cannot afford formal training fee in the regular driving schools. This can be practical if the government steps in and subsidizes the training fee.
2. Standardized training manual: To ensure the problem of inadequate training it tackled, NTSA must come up with a, which must be implemented and audited periodically.
3. Rider License: The study found that most riders were not licensed as required by the Traffic Act. The study therefore recommends that rider testing and licensing should be strictly enforced. Driving schools must also be compelled to ensure that a rider trains for the stipulated hours, periodic inspections and audits. The idea of only registering riders to take the riding/driving test must be discouraged.

References

Amadi, D. E. C. (2013). Cultural Factors on the Girl-Child Education in Secondary Schools in Ihiala Local Government Area of Anambra State, Nigeria. *Journal of Curriculum Studies*, *4*(7), 22-24.

Anon H. I (2014) motorcycle-related road traffic crashes in Kenya Facts & figures. RS10, Kenya project, Nairobi

Anon H. I (2015). Rural transport service indicators; report of the piton-Djallo road, Nothern Cameroun. International Forum for Rural Transport and Development. Londo.

Burrell, G., & Morgan, G. (2017). *Sociological paradigms and organisational analysis: Elements of the sociology of corporate life*. Routledge.

Chen, S. J., Chen, C. Y., & Lin, M. R. (2018). Risk factors for crash involvement in older motorcycle riders. *Accident Analysis & Prevention*, *111*, 109-114.

Clarke, D. D., Ward, P., Bartle, C., & Truman, W. (2004). In-depth study of motorcycle accidents. *Road Safety Research Report* No 54. London: Department for transport.

Collins, R. L. (1979). *A Longitudinal Study on Effects of Motorcycle Safety Education in Accident Prevention* (No. Dissertation).

Elliot, M., Baughan, C., Broughton, J., Chinn, B., Grayson, G., Knowles, J., ... & Simpson, H. (2003). *Motorcycle safety: a scoping study*.

Gboyega, A., Ebijuwa, A. S., Oyetola, S. O., & Akinola, J. O. (2012). Factors influencing high rate of commercial motorcycle accidents in Nigeria. *American international journal of contemporary research*, 2(11), 130-140.

Howe, J., & Maunder, D. (2004). Boda Boda-Lessons from East Africa's Growing NMT Industry. In *10th World Conference on Transport Research World Conference on Transport Research SocietyIstanbul Technical University*.

Hung, D. V., Stevenson, M. R., & Ivers, R. Q. (2006). Prevalence of helmet use among motorcycle riders in Vietnam. *Injury prevention*, *12*(6), 409-413.

Hurt, H. H., Quellet, J. V., & Thom, D. R. (1981). Motorcycle Accident Cause Factors and Identification of Countermeasures, Vol 1: technical Report. Contact No DOT HS-5-01160. Los Angeles: Traffic Safety Centre, University of Southern California.

Ivers, R. Q., Sakashita, C., Senserrick, T., Elkington, J., Lo, S., Boufous, S., & De Rome, L. (2016). Does an on-road motorcycle coaching program reduce crashes in novice riders? A randomised control trial. *Accident Analysis & Prevention*, *86*, 40-46.

Keskinen, E., Ota, H., & Katila, A. (1998). Older drivers fail at intersections: speed discrepancies between older and younger male drivers. *Accident Analysis and Prevention*, *30* (3), 323–330.

Kisaalita, W., & Sentongo-Kibalama, J. (2007). Delivery of urban transport in developing countries: the case for the motorcycle taxi service (boda-boda) operators of Kampala. *Development Southern Africa*, *24*(2), 345-357.

Kitara, D. L. (2011). Boda Boda Injuries in Gulu Regional Hospital, Northern Uganda. *East and Central African Journal of Surgery*, *16*(2), 97-101.

Kumar, A. (2011). Understanding the role of motorcycles in African cities; a political economy perspective. Sub-Saharan Africa Transport Policy Program. SSATP discussion paper No 13 (urban transport series).

Maina M, E. (2011). An Assessment of Training and Safety Needs of Motorcyclists in Kenya. Nairobi, Ngong, Kiserian, Ongata Rongai, Kitengela and Athi river townships. An Online Published Thesis.

Mayhew, D. R., Simpson, H. M., Williams, A. F., & Ferguson, S. A. (1998). Effectiveness and role of driver education and training in a graduated licensing system. *Journal of public health policy*, *19*(1), 51-67.

Mbugua, C. (2011). *The effects of the motorcycle transport revolution on the economic growth of Kenya:A case of Thika*. An online published thesis.

Möller, H., Senserrick, T., Rogers, K., Sakashita, C., De Rome, L., Boufous, S. & Ivers, R. (2020). Crash risk factors for novice motorcycle riders. *Journal of Safety Research*.

National Transport and Safety Authority Operation of motorcycles Regulations, 2014.

Nazif, J. I. (2011)"Testing and Contrasting Road Safety Education, Deterrence, and Social Capital Theories: A Sociological Approach to the Understanding of Male Drink-Driving in Chile's Metropolitan Region." In *Annals of Advances in Automotive Medicine/Annual Scientific Conference*, vol. 55, p. 313-323. Association for the Advancement of Automotive Medicine.

Ngim, E. U., &Anthony, M. (2007). Commercial motorcyclists: Do they care about Road Safety?. In: *Nigerian Medical Practitioner*, Vol. 51 (6), 2007. 111-113.

Nickenig Vissoci, J. R., Krebs, E., Meier, B., Vieira, I. F., de Andrade, L., Byiringiro, F., ... & Staton, C. A. (2020). Road traffic crash experience among commercial motorcyclists in Kigali, Rwanda. *International journal of injury control and safety promotion*, *27*(2), 181-187.

NTSA REGULATIONS 2014

Nyachieo, G. M. M. (2012). Creating employment through transport; the youth and motorcycle (*boda boda*) in Kitengela, Kajiado county-Kenya. *Research journal in organizational psychology and educational studies (RJOPE) volume 2 number 4*: 154-157.

Obara, R. (2009). Motorcycle injuries in low and middle income countries experiences within Kisumu municipality. RTIRN Regional Workshop on motorcycle injuries, Nairobi, Kenya June 23, 2009.

Peck, R. C. (2011). Do driver training programs reduce crashes and traffic violations?—A critical examination of the literature. *IATSS research*, 34(2), 63-71.

Sadeghi-Bazargani, H., Ayubi, E., Azami-Aghdash, S., Abedi, L., Zemestani, A., Amanati, L. & Safiri, S. (2016). Epidemiological patterns of road traffic crashes during the last two decades in Iran: a review of the literature from 1996 to 2014. *Archives of trauma research*, *5*(3).

Sahr Nyuma, E., & Lawrence Sao B, J. S. (2020). The Factors Associated with the Occurrence of Road Traffic Accidents among Commercial Motorcycle Riders in Kenema City, Eastern Sierra Leone. *J Public Health Dis Prev*, 2, 207.

Saidi, H., & Mutisto, B. K. (2013). Motorcycle injuries at a tertiary referral hospital in Kenya: injury patterns and outcome. *European journal of trauma and emergency surgery*, *39*(5), 481-485.

Satten, R. S. (1980). *Analysis and evaluation of the motorcycle rider course in thirteen northern Illinois counties* (No. HS-029 667).

Singh, K., & Mattoo, R. (2020). Motorcycle Riding Safety. *International Journal of Progressive Research in Science and Engineering*, *1*(3), 64-66.

Thompson, W. E. (2012). Don't Call Me "Biker Chick": Women Motorcyclists Redefining Deviant Identity. *Deviant Behavior*, *33*(1), 58-71.

Urioh, N. (2020). *Contribution of Bodaboda Business on Improving the Standard of Living among Youth in Tanzania: A Case of Ubungo District in Dar Es Salaam* (Doctoral dissertation, Mzumbe University).

World Health Organization. (2018).Global status report on road safety. Geneva: CC BYNC-SA 3.0 IGO.