ATTITUDE TOWARDS AND PRACTICE OF HELMET USE AMONG COMMERCIAL MOTORCYCLISTS IN DAR ES SALAAM REGION, TANZANIA

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By

Emmanuel Geofrey Mwakapasa

A Dissertation Submitted in partial Fulfillment of the Requirements for the Degree of M Sc. Nursing (Critical Care &Trauma) of the Muhimbili University of Health and Allied Sciences

November, 2011

CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance a dissertation entitled ***Attitude towards and Practice of Helmet use among Commercial Motorcyclists in Dar es Salaam region*** submitted in Partial Fulfillment of the requirement for the degree of Master of Science in Nursing (Critical Care and Trauma) of the Muhimbili University of Health and Allied Sciences.

_____

A Outwater (*RN, PhD*)

(Supervisor)

Date: _____

DECLARATION AND COPYRIGHT

I, **Emmanuel G. Mwakapasa**, declare that this dissertation is my own original work and that it has not been presented and will not be presented to any other university for a similar or any degree award.

Signature _____

Date _____

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Lastly, but not least, I would like to thank all participants for voluntarily providing useful information in this research activity. The accomplishment of this study required the involvement of many individuals and may not have mentioned them here, but I am really grateful to you all.

DEDICATION

This dissertation is dedicated to my dear wife and son, Elizabeth and Joel, who sacrificed so much to give me time and support for the successful completion of my studies. My dear parents, Mr. and Mrs. Geofrey Mwasakatili, I thank you so much for laying a good foundation in my life and my education. It is for this foundation that I have grown into a person who I am today, doors opening up for higher academic circles.

ABSTRACT

Background: Motorcycle accidents form a fatal category of motor traffic accidents. Motorcycle riders have a 34 times risk of death than the drivers of other types of vehicles and 8 times more likely to be injured. The non-use of helmet is a specific factor leading to head injuries and fatalities resulting from motorcycle crashes.

Objectives: The purpose of this study was to explore the commercial motorcyclists' attitude and their practices of helmet wearing. The specific objectives were to determine the following among commercial motorcyclists in Dar es Salaam region: attitude of helmet use, proportion of commercial motorcyclists who wear helmet and the practice of helmet use.

Material and methods: A cross-sectional survey was conducted in urban and peri-urban areas of Dar es Salaam region in May, 2011 at randomly selected commercial motorcycle parking points. A total of 273 conveniently selected eligible commercial motorcyclists participated. Face-to-face interviews were performed using a standard questionnaire while observation was conducted using an observation checklist. Data was analyzed using SPSS version 16.0**.**

Results: All commercial motorcyclists were males, with the majority (64.8%) with primary education. The proportion of commercial motorcyclists who reported to wear helmet was 81.3%. However about two thirds of them (67.6%) reported to not wear helmet consistently. Helmet wearing was strongly predicted by having a positive attitude towards helmet for passengers (p=0.005), protective ability of helmet against head injury (p=0.003), wearing helmet during night (p=0.001) and wearing helmet even for the experienced rider (p=0.000). However in a multiple regression model, it was found that those who agreed regarding the protective ability of helmet against head injury were more likely to wear helmet than those who disagreed (AOR: 0.279; 95% CI: 0.086-0.905); those who strongly agreed on wearing helmet during hot weather were more likely to wear helmet than those who disagreed (AOR: 0.039; 95% CI: 0.002-0.698). Those who strongly agreed on necessity for passengers to wear helmet and wearing helmet during night were more likely to wear helmet than those who were undecided (AOR: 0.091; 95% CI: 0.013-

0.617 and AOR: 0.114; 95% CI: 0.014-0.931 respectively). Those who had primary education were more likely to wear helmet than those who had no formal education (AOR: 6.146; 95% CI; 1.345-28.097). There was no significant difference in helmet wearing between urban and peri-urban areas (p=0.109). A small majority (52.7%) were observed wearing helmet, although 91.8% of them had no passenger's helmet.

Conclusion: These findings indicate that despite the inconsistent helmet wearing, commercial motorcyclists had positive attitude towards helmet wearing. Helmet wearing is associated with the level of education and having a positive attitude towards helmet wearing. There is a high disparity on the observed helmet wearing between riders and passengers. Very few among the later were found to be wearing helmet.

Recommendations: There is a need to strengthen legal enforcement of helmet wearing and ensuring the availability and accessibility of quality helmet to the majority of commercial motorcyclists. There is also a need for regular education campaigns to foster positive attitude towards helmet use. Further explorative studies on the quality of helmet and the factors associated with the use and non-use of helmet among motorcycle passengers are recommended.

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OPERATIONAL DEFINITIONS

1. **Attitude**: is someone's opinion or feelings about motorcycle helmet, especially as shown by his/her practice towards helmet use.

2. **Helmet**: is a type of protective headgear used by motorcycle riders. The primary goal of a motorcycle helmet is to protect the rider's head during impact, thus preventing or reducing head injury or saving the rider's life.

3. **Practice**: the action and/or process of wearing helmet.

4. **Urban area**: An area along the four main roads (Bagamoyo, Kilwa, Morogoro and Nyerere) which most frequently suffer traffic jams.

5. **Peri –urban area**: An area along the four main roads (Bagamoyo, Kilwa, Morogoro and Nyerere) which hardly suffer traffic jams and it is located about 20, 15, 20 and 14 kilometres along Bagamoyo, Kilwa, Morogoro and Nyerere roads respectively from the city centre.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Motorcycle accidents, among other types of road accidents, form a fatal category of motor traffic accidents (NHTSA, 2007). Several studies have been done on issues around motorcycle injury protection (Chang & Yeh, 2006; Hung, Stevenson & Ivers, 2008; Julian et al., 2002; Brown et al., 2009; Lin et al., 2003). This is because motorcyclists are more at risk of sustaining injury than motor vehicle drivers; per mile travelled, motorcycle riders have a 34 times risk of death than the drivers of other types of vehicles. They are also 8 times more likely to be injured (NHTSA, 2007).

In middle and low-income countries, motorcycles form a common means of transport (WHO, 2006). Motorcyclists form a significant proportion of people who are affected by road traffic accidents, for example in Tanzania 181 lives were claimed due to motorcycle accidents during the first quarter of 2010 (Nkwame, 2010). This is partly due to the rapidly increasing number of motorcycles from 6,700 in 2007 to 85,000 in 2009, a 13 fold increase in the period of 2 years (Nkwame, 2010). The reason behind the reported increase in number of commercial motorcycles is the fact that motorcycles are sold at relatively cheaper prices than other vehicles and good earnings from the motorcycle taxi business which encourages more people especially youths to join this business (Solagberu et al., 2006).

According to the then Acting Chairman for Road Safety Committee, Mr. Jerome Ringo, Dar es Salaam alone, in the period from January to June 2010, has witnessed 64 deaths and 615 casualties due to motorcycle related accidents, involving both drivers and passengers (Mustapha, 2010).

Motorcycle accidents have drawn great attention from the Tanzanian government authorities. For example, 2010 Road Safety Week had a theme of "Discourage High Speed; Cyclists Wear Helmets; Accidents Kill, Injure'' (Mustapha, 2010).

Regarding risk factors for motorcycle injuries, the non-use of helmet has been identified as a specific factor leading to head injuries and fatalities resulting from motorcycle crashes. Helmets as a protective measure have been identified to be effective towards head injury prevention (WHO, 2006); and reduces the fatality of motorcycle riders (Keng, 2004). The fatality risk is reduced by 34% (Dee, 2009).

To protect themselves from head injury, motorcyclists need to consistently and properly wear helmets according to the prescribed standards. However, non-consistent use of helmet has been evident in several studies. It has been shown that motorcyclists are likely to put on helmets when they are driving on the highways (Kulanthayan, 2000; Skalkidou, 1999; Hung, 2006), travelling on a long trip (Hung, Stevenson & Ivers, 2008) and if they anticipate meeting a traffic police (Kulanthayan, 2000; Corad, 1996); during the day rather than night hours and during weekdays rather than weekends (Dandona, 2005).

Despite their effectiveness, helmets are not as widely used as they should be and when used, they are not used properly (Li et al., 2008). Negative attitudes towards helmet use (Hung, Stevenson & Ivers, 2008) among other factors, explains the reason behind the reported low rate of use (Odelowo, 1994; Oluwadiya et al., 2004). Some reasons for non-adherence and non-use of helmet include feelings of discomfort due to heat during the hot weather, and lateral vision and hearing ability impairment (Dandona, 2005). However it has been shown that helmets do not impair hearing ability and the lateral vision can be complemented by lateral head rotation (NHTSA, 1997).

According to studies done in Vietnam, Nigeria and USA, low rates of helmet use have been evident despite the enactment of helmet laws (Hung et al., 2008; Solagberu et al., 2006; Ranney et al., 2008; Houston, 2007; NHTSA, 2001). This highlights the importance of looking at, and addressing other factors, attitudinal factors in particular, as complementary measures to

the helmet laws and road safety regulation enforcement in the endeavour to achieve a permanent and sustainable solution for injury protection particularly head injury among motorcyclists.

It has been shown that people do not draw personal implications from risk information because they have a tendency to perceive negative events as less likely and positive events as more likely to occur to oneself than others (Weinstein, 1987). They tend to protect themselves against diseases and injuries depending on their perceived susceptibility of experiencing adverse outcomes (Harris and Middleton, 2004; van der Pligt, 1996) with their behavioural intentions influenced by their attitudes (Quite, 2001).

The Health Belief Model (Rosenstock et al., 1974) will be applied in assessing the attitudes of motorcyclists towards, and practice of, helmet use.

As a way of increasing motorcyclists' personal commitment towards helmet use, education campaigns that will address their attitudes towards helmet use and increase awareness of their susceptibility to motorcycle accidents, head injury in particular, are necessary. Most effective educational campaigns are evidence based (Morrison et al., 2003; Nja and Nersvag, 2007). This study, in the endeavour of reducing motorcycle related accidents, head injury in particular, intended to give useful information that could be used for raising awareness of helmet use among motorcyclists.

1.2 Significance of the Study

Helmet wearing has a protective effect towards head injury. However in Tanzania there are no published studies concerning motorcyclists, as far as helmets are concerned. Little was known on the reasons behind the use and non-use of helmets among motorcyclists. As a strategy of finding ways of alleviating motorcycle accidents and minimizing their consequences in terms of mortality and disability, this study was set out to help in understanding various attitudes that commercial motorcyclists have about the use of helmets and their practice of helmet use as

possible behaviour change modifiers in the endeavour to curb the increasing number of fatalities due to motorcycle accidents.

1.3 Broad objective

It was the interest of this study to find ways of minimizing the consequences of motorcycle accidents in terms of mortality and disability. The study addressed Dar es Salaam commercial motorcyclists' attitude towards, and their practice of helmet use.

1.3.1 The specific objectives

1. To determine the attitude of helmet use, among commercial motorcyclists in Dar es Salaam region.
2. To determine the proportion of commercial motorcyclists who wear helmets in Dar es Salaam region.
3. To determine the practice of helmet use among the commercial motorcyclists in Dar es Salaam region.

1.4 Hypotheses

1. There is an association between attitude towards helmet use and helmet use among commercial motorcyclists in Dar es Salaam region.
2. Commercial motorcyclists in Dar es Salaam city (urban) areas are more likely to wear helmet than those at outside the city areas (peri-urban).

1.5 Theoretical Framework

Health Belief Model (HBM)

The Model was developed in 1950s by researchers at the U.S. Public Health Service (Hochbaum, Rosenstock and Kegels) after being inspired by a study of why people sought X-ray examinations for tuberculosis. It attempted to explain and predict a given health-related behavior from certain patterns of belief about the recommended health behavior and the health problems that the behavior was intended to prevent or control (Breslow, 2002).

A person's motivation to undertake health behaviour can be divided into three main categories: individual perceptions, modifying behaviours, and likelihood of action. Individual perceptions are factors that affect the perception of illness or disease; they deal with the importance of health to the individual, perceived susceptibility, and perceived severity. Modifying factors include demographic variables, perceived threat, and cues to action. The likelihood of action discusses factors in probability of appropriate health behaviour; it is the likelihood of taking the recommended preventive health action. The combination of these factors causes a response that often manifests into action, provided it is accompanied by a rational alternative course of action (Breslow, 2002).

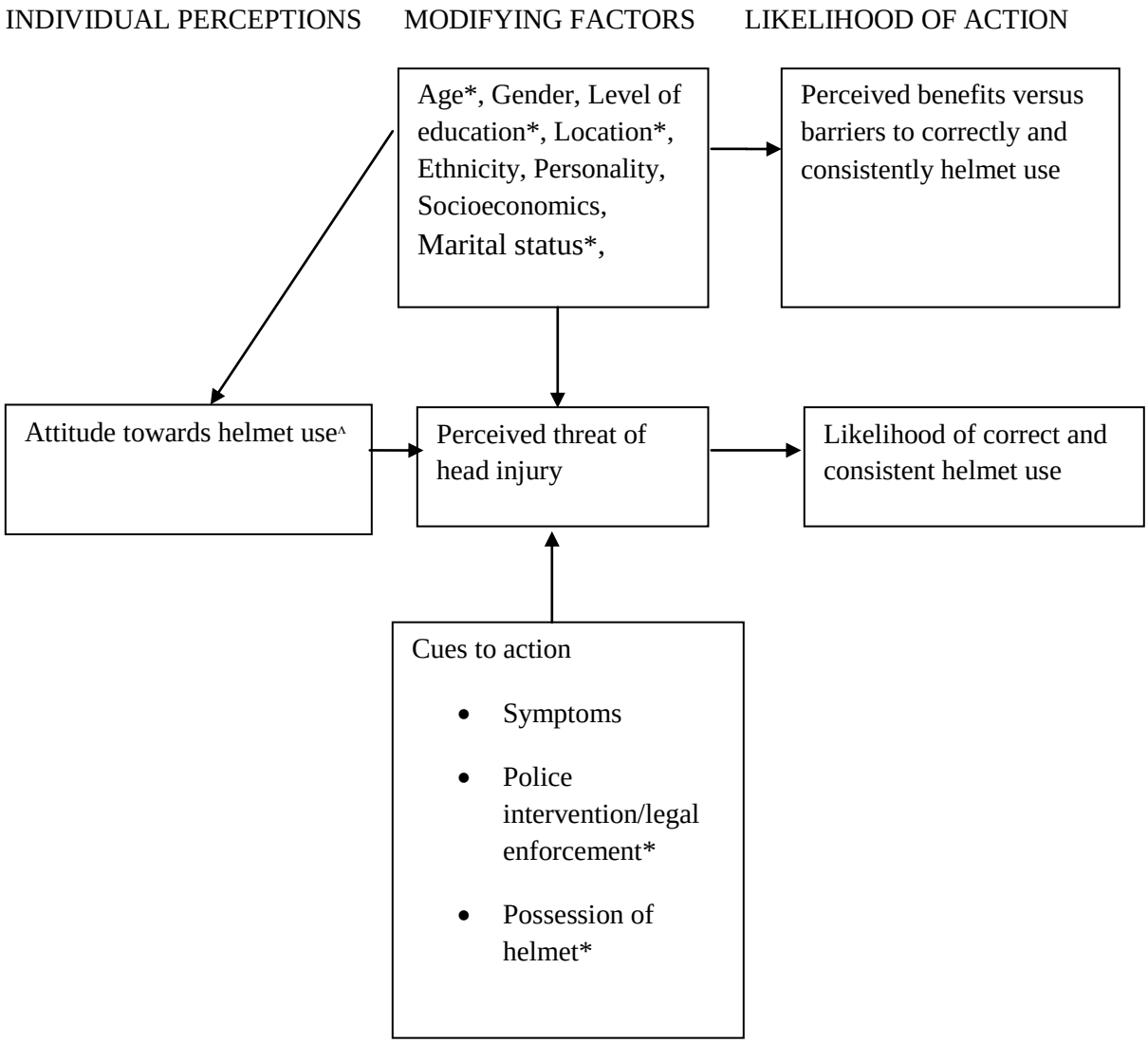


Figure 1: Health Belief Model (HBM).

Source: Glanz et al, 2002, p. 52

*Addressed in this study

^ As a product of perceived susceptibility to head injury

The application of the HBM to the study topic

The health belief model was modified to suit the study objectives. The perceived susceptibility to motorcycle related injury among other things influences one's attitude towards helmet use. However, the use or non-use of helmet was influenced by the modifying factors such as age, gender, location (urban vs. peri-urban) and the nature of the trip; and level of education. The helmet usage (possible behaviour to manifest/likelihood of action) was reflected by the practice of helmet use as it was ascertained through interview and observation. Therefore the likelihood of helmet usage depended on one's feelings about the protective nature of helmet against head injury secondary to one's perception of being susceptible to head injury; modifying factors, attitude towards the protective nature of helmet and ability to overcoming the costs of buying helmet.

1.6 Statement of the problem

Globally, road traffic injuries (RTIs) are responsible for a significant proportion of overall injury morbidity and mortality; 90% of mortalities are seen in low and middle income countries (Peden, 2002). Motorcycle users are vulnerable on the road and represent an important group to target for reducing road traffic injuries. Riding motorized two-wheeled vehicles carries a higher risk of being involved in a fatal traffic accident than from using any other common mode of transport. It has been estimated that, per100 million person travelling hours, 440 motorized two-wheeled vehicle rider fatalities occur, compared to 75 and 25 fatalities for bicyclists and car drivers, respectively (Koornstra et al., 2003).

In Tanzania, because of the poor transportation and inadequate road infrastructure with respect to the rapid increase in motorization, many people import motorcycles for commercial purposes. These motorcycles are used by many as taxis and they have an advantage of evading traffic jams, passing along narrow paths and relatively affordable costs as compared to motor vehicle taxis.

According to the Tanzania Traffic Police Chief, as it has been reported by the '*Daily News'* Paper, Tanzania has recently observed a surge increase in the number of motorcycles. About 85,000 new motorcycles were shipped into the country in the year 2009, which is a drastic increase from just 6,700 motorcycles imported in 2007. Likewise the number of those who die or injured due to motorcycle related accidents keeps on escalating. For example, in 2009, about 385 people lost their lives and 3,000 were injured due to motorcycle accidents. In year 2010 the problem is expected to be even bigger, whereby in a period of first 3 months a total of 181 people are reported to have lost their lives leaving 1200 victims badly injured (Nkwame, 2010).

However, the observed mortality could be reduced by improving the emergency and critical care services parallel with advocating and enforcing on the use of helmets. Several studies have reported on the effectiveness of helmets on reducing the mortality from head injury (Keng et al., 2005; Brandt et al., 2002). However in the low and middle income countries, the non-use of helmets is a commonly observed phenomenon (Odelowo, 1994; Oluwadiya et al., 2004). Studies have shown that the non-helmeted riders are at higher risk of incurring fatal head injury as compared with helmeted riders (Crompton et al., 2009). Commercial motorcyclists are at more risk of accidents than drivers of other vehicles. This is due to the fact that in a bid to maximize their daily earnings, they often drive against traffic and beat traffic lights, a situation that exposes them to accidents (´´Use of Crash Helmets``, 2008). Motorcycles, although a swift means of transportation in the face of incessant transport snarls, are more vulnerable and more dangerous forms of travel than cars because motorcycles are unenclosed, leaving riders vulnerable to crashes. This is why wearing a helmet is so important (´´Use of Crash Helmets``, 2008).

It was the interest of this study to find the ways of alleviating motorcycle accidents and minimizing their consequences in terms of mortality and disability. The study has addressed the motorcyclists' attitude towards, and their practice of helmet use. The study setting was Dar es Salaam region.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 General overview

Road traffic injuries form a significant amount of injury related mortality and morbidity around the world with an estimated 1.2 million people killed and about 20–50 million injured on the roads annually (Peden et al., 2004). Low- and middle-income countries account for the majority of these injuries. Nearly 85% of the global burden of road traffic injuries is accounted for by these countries (Peden et al., 2004). The road traffic injury mortality rate is highest in Africa (28.3 per 100,000 population when corrected for underreporting, compared with 11.0 in Europe) (Peden et al., 2004). The rate of road traffic deaths in Sub-Saharan Africa is 40% higher than that in all other low- and middle-income countries (28.3 compared to 20.2 per 100,000) and 50% higher than the world level (28.3 compared to 19.0 deaths per 100,000 population) (Peden et al., 2004; WHO, 2010), making traffic injuries the 10th leading cause of death in the region (WHO, 2010). In East Africa, Tanzania and Kenya accounts for more road traffic deaths with 34.3 and 34.4 deaths per 100,000 population respectively. Burundi, Uganda and Rwanda accounts for 23.4, 24.7 and 31.6 deaths per 100,000 population respectively (Peltzer, 2011).

A ten year epidemiological appraisal survey done in Tanzania (Museru et al., 2002), between 1990 and 2000 road accidents rose by 44% for a cumulative total of 10,107. However due to the rapid importation of motorcycles, the contribution of motorcycles to road accidents cannot be ignored; in the first 3 months of the year 2010, 181 people died in motorcycle accidents leaving 1200 injured (Nkwame, 2000).

Motorcycles have increasingly become a popular means of transport in low and middle-income countries (WHO, 2006).This is partly because motorcycles are relatively cheaper than other motor vehicles in terms of initial purchase and maintenance costs (Solagberu et al., 2006). The motorcycles can easily evade traffic jams, making them an attractive means of transport in these countries. In Dar es Salaam, the business of commercial motorcycle taxis is increasing. At different locations in Dar es Salaam seeing the commercial motorcyclists parking waiting for the passengers forms a common phenomenon. A study by Solagberu et al., (2006), in Nigeria showed that the business of motorcycle taxis was becoming an increasingly popular means of employment and one can earn enough amount of money for daily living out of this business. Tanzania has witnessed a mushrooming of imported motorcycles between year 2007 and 2009 from 6700 to 85000 respectively (Nkwame, 2000).

Despite the advantages that motorcycles have, motorcyclists form a large proportion of those injured or killed on the roads. This is because they often share the traffic space with fast-moving, heavier and bigger cars, buses and trucks, and also because they are less visible. In addition, their lack of physical protection makes their passengers vulnerable to being injured if they are involved in a collision (WHO, 2006). This is compounded by the fact that motorcycles have much higher risks of being involved in crashes involving fatalities than other vehicles (Deutermann, 2004). Lack of safe driving concepts is another factor that increases the vulnerability of the motorcyclists in road traffic accidents. In a study done in Taiwan (Chang & Yeh, 2006) it has been observed that almost all motorcycle riders (engine capacity lower than 250cc) were self-taught with a lack of appropriate driving education or training and many accumulated their experiences via trial-and-error process. This is a typical situation that happens in Tanzania.

2.2 Head injuries are a leading cause of death and disability

Injuries to the head and neck are the main cause of death, severe injury and disability among users of motorcycles (Ankarath et al., 2002; Umar, 2002). In European countries, head injuries contribute to around 75% of deaths among motorized two-wheeler users; in some low-income and middle-income countries head injuries are estimated to account for up to 88% of such fatalities (Umar, 2002). In a recent study done in Dar es Salaam, Tanzania it has been revealed that head injury accounted for 14.3% of all road traffic related injuries (Zimmerman et al., 2011).

The social costs of head injuries for survivors, their families and communities are high, in part because they frequently require specialized or long term care (Peden et al., 2004). Head injuries also result in much higher medical costs than any other type of injury (Blincoe et al., 2000), such that these injuries exert a high toll on a country's health care costs and its economy. In the study regarding costs of traumatic brain injury due to motorcycle accidents done in Hanoi Vietnam , it was found that only 12% of the households could afford to pay the costs associated with the treatment of traumatic brain injury (TBI) from household savings (Hoang et al., 2008).

2.3 Protective benefits of helmet against head injury

Several studies have reported on the effectiveness of helmet in protecting against head injury (Chang & Yeh, 2006; Hung, Stevenson & Ivers, 2008; Julian et al., 2002; Brown et al., 2009; Lin et al., 2003). Motorcycle helmets reduce the risk of mortality and head injury in motorcycle riders who crash (WHO, 2006). In a study done in USA, it was found that helmet use reduces fatality risk by 34% (Dee, 2009). The effect on death may be modified by other factors surrounding the crash, such as the speed the motorcyclist was travelling when the crash

occurred. Crashes at higher speeds may result in multiple injuries likely to cause death, regardless of how well the head is protected (WHO, 2006).

Motorcycle riders who do not wear a helmet run a much higher risk of sustaining head and traumatic brain injuries, or a combination of them. Helmets create an additional layer for the head and thus protect the wearer from some of the more severe forms of traumatic brain injury. In spite of the protective nature of helmets, and the impact of traumatic brain injury for motorcycle users (WHO, 2006), low rate of helmet use in middle and low-income countries is the commonly observed phenomena (Odelowo, 1994; Oluwadiya et al., 2004). To make matters worse, in spite of the low rate of helmet use, helmets are not worn properly by having the chin strap fastened (Li et al., 2008).

2.4 Attitude towards helmet use

The non-use of helmet has been associated with the notion that use of helmet increases rather than decreases the risk of an injury by reducing field of vision, creating discomfort, etc. (Dandona, 2005). Although these prepositions are moot, research has been found that although helmets can reduce a motorcyclist's lateral vision, motorcyclists adjust for this by increasing head rotation (NHTSA, 1997). Other reasons for not wearing helmet include the idea that helmets are necessary for the drivers of powerful engine motorcycles that travel in a high speed and not necessary for moped and scooter drivers; inconvenience of carrying the helmet as it could be stolen if left on the vehicle, and the inconvenience of removing it now and then for taking calls on the hand-held mobile phones while driving (Dandona, 2005), lack of comfort, negative social perception and inconvenience of helmets particularly in relation to storage of helmets when not riding (Grima et al., 1995; WHO, 2006) and being a good driver as an excuse of not wearing helmet (Dandona, 2005). The nature of weather has been reported as another factor associated with helmet usage. In studies done in Nigeria (Solagberu et al., 2006) and Sweden (Kraus et al., 1995; Lund et al., 1991) it has been evident that helmet use is less likely during hot weather and more likely during winter respectively. Helmet use has also

been reported to be more frequent during day rather than night hours and during weekdays rather than weekends (Dandona, 2005; Corad et al., 1996; Skalkidou et al., 1999).

2.5 Modifying factors affecting Helmet Usage

Helmet usage is affected by various factors. These include age, location (urban vs. peri-urban) and nature of trip; education, individual possession of helmet and legal enforcement, just to mention a few. However there are currently no studies concerning factors affecting helmet use in East African countries including Tanzania.

Age

Helmet users are more likely to be drivers of older age (Hung et al., 2006; Kulanthayan et al., 2000; Skalkidou et al., 1999). A study done by (Ackaah & Afukaar, 2010) in Ghana, found the difference on helmet use among different age groups. Helmet use was highest among elderly (>50 years), followed by adults (26-50 years) and young people (<26 years).

Location and nature of the trip

Regarding the location, it has been found that helmet users are more likely to be riding a long distance, travelling on highways and freeways, and/or in an urban area (Kulanthayan et al., 2000). This study conquers with another study done in Ghana by (Ackaah & Afukaar, 2010) whereby it was evident that many commercial motorcyclists who work in town areas were wearing helmet more than their rural counterparts.

Education

Regarding the effect of education on helmet use, a study done in Thailand by Swaddiwudhipong et al., (1998) showed that motorcyclist education increased helmet use from below 20% to 46%. However this study contradicts with the study done in Iran whereby it revealed a non-significant association between level of education and helmet use (Medhati et al., 2010).

Cues to helmet use

Possession of helmet may be one of the determinants of helmet use. However, very few motorcyclists wear helmets for preventive purposes and many just do because they don't want to be caught by law (Li et al., 2008). Inconsistent helmet wearing is secondary to ineffective legal enforcement towards helmet use (Kulanthayan et al., 2000). Generally, this suggests that low level of helmet use may be partly attributed by the lack of knowledge of the protective benefits of helmets and low legal enforcement regarding helmet use.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Design

The cross-sectional study design was employed to suit studying the phenomena under study (commercial motorcyclists' attitude and practice of helmet use). This 'snap shot' has involved interviewing and observing the commercial motorcyclists right at their randomly selected parking points. Data were collected for duration of one month (from 1st May to 1st June, 2011).

3.2 Setting

The study was conducted in Dar es Salaam region at the selected commercial motorcycle parking points. Dar es Salaam is located at 6°48' south, 39°17' east. It is located at the eastern side of Tanzania and it is bordered by the Indian Ocean at its eastern side and encapsulated by the Coast region. It has the biggest, fast growing city of Tanzania, and a population of about 4 million people of different cultural backgrounds from all over Tanzania. Administratively, it is has three districts, namely Kinondoni, Ilala and Temeke. It is connected with the neighbouring regions through four main roads, namely Morogoro, Nyerere, Kilwa and Bagamoyo.

Dar es Salaam is the largest city in the country, and is comprised of different types of people with different values, beliefs, and cultural background. The study of commercial motorcyclists in Dar es Salaam could be generalized to all commercial motorcyclists within Tanzania.

3.3 Target population

Regarding to the spreading use of the motorcycle taxis throughout Tanzania, the target population was all commercial motorcyclists in Dar es Salaam. However the accessible population was commercial motorcyclists along Kilwa, Pugu, Morogoro and Bagamoyo roads in Dar es Salaam region.

3.4 Study population

The study involved commercial motorcyclists in Dar es Salaam region whose representative sample was obtained from randomly selected commercial motorcycle parking points.

3.5 Inclusion criteria

The participants for the interviews were commercial motorcyclists with motorcycle present and candidates for observation were commercial motorcyclists with customer(s) to ride.

3.6 Exclusion criteria

Commercial motorcyclists without motorcycle present and commercial motorcyclists without customer(s) to ride were not eligible for both interview and observation.

3.7 Sampling

The sample population was obtained through both simple random and convenient sampling (Figure 2). All main roads (Morogoro, Kilwa, Nyerere and Bagamoyo) from the city centre that directly connect Dar es Salaam to the nearby region (Coast Region) were included. These roads represent Dar es Salaam by the fact that each district of Dar es Salaam region has at least one of these roads.

All commercial motorcycle parking points along those roads to the geographical boundary with Coast Region were mapped and assigned a specific identity. The mapping process was done by the principal investigator and one commercial motorcyclist familiar with the concerned road.

For each road, two categories of commercial motorcycle parking points, those within the city (urban), and those outside the city (peri-urban) were made. For each category, the commercial motorcycle parking points to be included in the study were obtained by using the table of random numbers. Commercial motorcyclists from the selected parking points were conveniently included in the study.

In observation, commercial motorcyclists from the selected parking points who fulfilled the inclusion criteria were observed right at their parking points. To avoid the influence of interview on change of practice, the observation was conducted prior to interview. The observation and interview timings were during weekdays and weekends from 7.00 AM to 9.00 PM when many commercial motorcyclists operate.

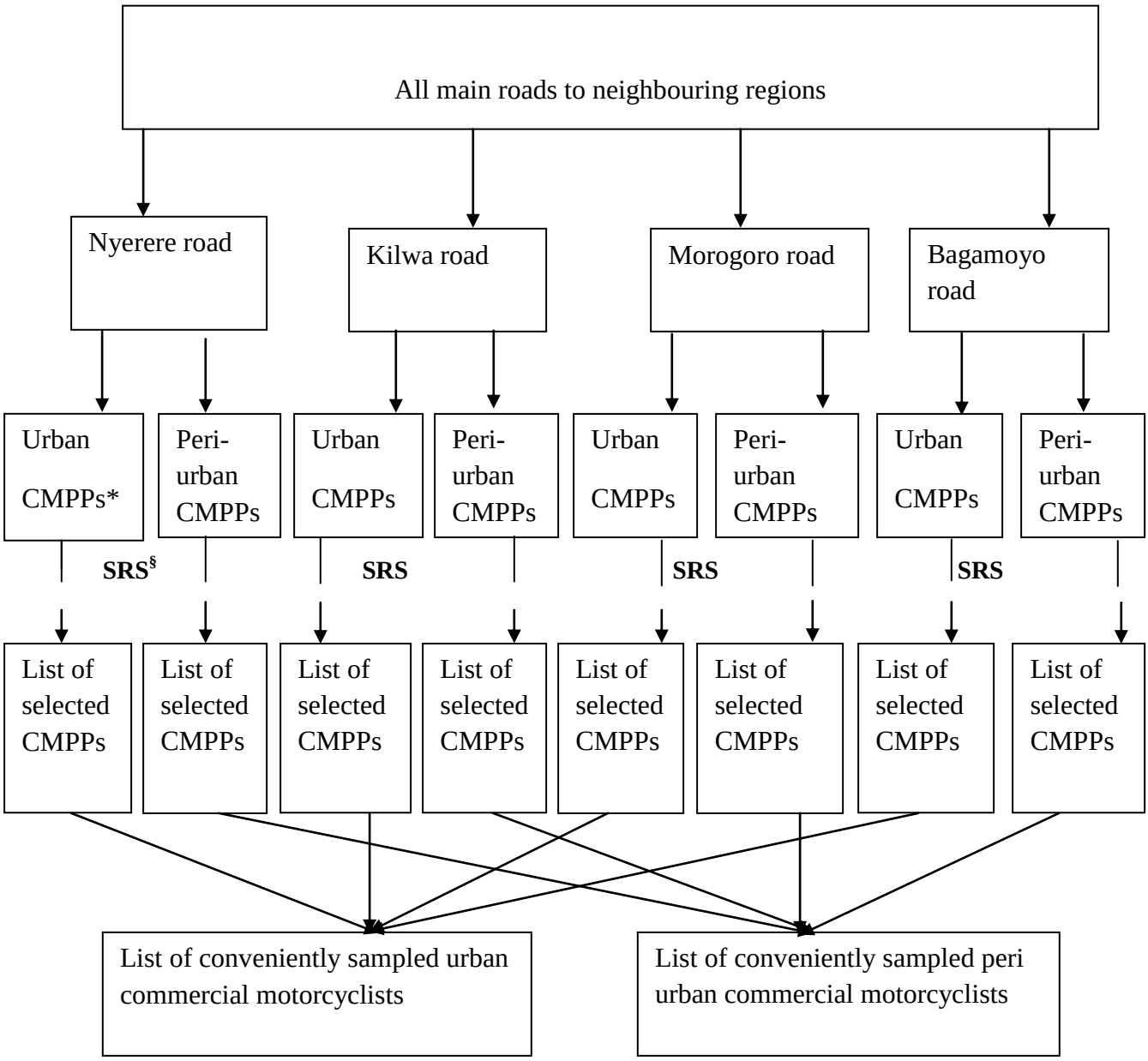


Figure 2: Sampling flow chart

*Commercial Motorcycle Parking Points

§ Simple Random Sampling

3.8 Sample size

Sample size was calculated based on somewhat similar study done in Hanoi, Vietnam (Hung, Stevenson & Ivers, 2008) titled "Barriers to, and factors associated, with observed motorcycle helmet use in Vietnam", whereby among other things, it looked at the proportion of commercial motorcyclists who wear helmets and their attitudes towards helmet wearing. It was found that 23.1% of motorcyclists were reported wearing helmets. The formula for sample size calculation was as follows (Kirkwood, 2003):

$$n = \frac{Z^2 P(1-P)}{d^2}$$

Where n=sample size

Z=Z statistics for a level of confidence e.g. 1.96 (95%)

P=expected proportion or prevalence = 23.1%

d=precision (in proportion of one e.g. if 5%, d = 0.05)

Using proportion of 23.1%, precision of 5% and confidence level of 95%,

Substituting, this gave:

$$n = \frac{(1.96)^2(0.231)(1-0.231)}{(0.05)(0.05)}$$

=273 commercial motorcyclists in Dar es Salaam region

Adding 10% of this value to take care for possible non-response gave:

$= 273 + 0.1 \times 273 = 300.3 \infty 300$

Therefore the calculated sample size was 300 commercial motorcyclists in Dar es Salaam region. In the absence of a non-response bias, 273 commercial motorcyclists were involved in the study.

3.9 Data collection

3.9.1 Instrument

Two instruments were used; an observation checklist adapted from World Health Organization (WHO) and a survey questionnaire was used for data collection.

Survey Questionnaire

The survey questionnaire was used to gather attitudes and practices. It had 26 questions which were read verbatim by the interviewer. Taking into account the education background of most commercial motorcyclists, Swahili version of the questionnaire was used for easy comprehensibility and therefore ensured the validity of responses. Time estimated for interview was 15 minutes. The survey questionnaire had questions regarding demographics, attitude towards and practice of helmet use. Positive and negative worded statements were developed for measuring attitude of commercial motorcyclists towards helmet use. A 5- item Likert scale was used, ranging from 1 (strongly disagree) to 5 (strongly agree). The negatively worded statements were reverse scored. Higher scores indicated positive attitude towards helmet use.

Observation checklist

Actual practice was observed through the checklist. The observation sheet was modified to suit the study topic and used to estimate the proportion of commercial motorcyclists who wore helmet, those who had helmet for passenger(s), type of helmet worn; and those who had their helmets buckled well. A list of all commercial motorcyclists with their motorcycle plate

numbers from the selected parking points was obtained. All commercial motorcyclists who fulfilled the inclusion criterion [commercial motorcyclist with customer(s) to ride] were observed right at their parking points. To ensure consistency in observation and therefore internal validity of the study, each observation took about 3 minutes, using similar observation checklists. In order to avoid the Hawthorne effect, the observation was direct and unobtrusive. Repeated observations were avoided by recording the motorcycle plate numbers. The observation timings were during weekdays and weekends from 7.00 a.m. to 9.00 p.m. when many commercial motorcyclists operate. To avoid the influence of interview on change of practice, observation was conducted prior to interview.

3.9.2 Pre-testing

A pilot study was conducted to pre-test the questionnaire and the accessibility of the target population. Fifteen commercial motorcyclists at randomly selected commercial motorcycle parking points apart from the ones selected for the study were involved in pilot-testing the questionnaire and observation form.

3.9.3 Validity

The validity of the content of the questionnaire was examined in collaboration with two research scientists interested in the area of injury prevention; the questionnaire was translated into the national language which is Swahili and back to English to ensure the same meaning is conveyed.

3.9.4 Reliability

The internal reliability of 17 Likert-scaled items, which measured attitude towards helmet use, was checked by Cronbach's alpha reliability test. The initial alpha coefficient was 0.720, but after deleting four statements (helmet use is important for driver's safety, everyone should wear helmet, wearing a helmet reduces peripheral vision, and storage of helmets when the motorcycle is parked is a problem), the alpha coefficient increased up to 0.824 whereby deleting further statements had no effect in increasing the coefficient.

3.10 Data analysis

Descriptive variables were presented as means and nominal as percentages. To minimize risk of type II error, the probability value of $p \leq 0.05$ was considered significant. Chi square test was employed in measuring the relationship between binary variables. A logistic regression analysis was done in ascertaining the effect of demographic variables in helmet wearing and the relationship between attitude towards helmet use and helmet use. The negative attitude statements were reversed and reverse scored before being analysed. All statistical analyses were done using SPSS version 16.0. Results were presented in tables.

3.11 Ethical considerations

Ethical clearance for the study was obtained from the MUHAS Research and Publication Committee.

Participants were thoroughly informed about the study and their written consent was sought. The consent form was signed upon agreement of participation in the study (see Appendices III and IV). Confidentiality was guaranteed through participants' state of anonymity, only

numbers were used to identify participants, not names. Participants' rights such as freedom to withdraw from the study, freedom from not answering some questions and other rights were addressed and observed. The study posed no other practical issues.

CHAPTER FOUR

4.0 RESULTS

Data were collected from May to June, 2011 at motorcycle parking points on Morogoro, Bagamoyo, Kilwa and Nyerere roads as planned. Both urban and peri-urban located commercial motorcycle parking points were included in the study. The results were categorized into two sections, those from the interview and those from observation. However, the results were made up by the individual components that were within the scope of this study and discussed in the conceptual model. These components were later disaggregated in discussion section according to the major components of the conceptual model.

4.1 Results from the interview questionnaire

Respondents

The socio-demographic profile of commercial motorcyclists is shown in Table 1. All were male. Most were young, with primary education. About half were married.

Table1. Distribution of the socio-demographic Characteristics of the Commercial Motorcyclists in Dar es Salaam region

Characteristic	Frequency (n)	Percent (%)
Age		
<18	4	1.5
18-24	105	39.9
25-29	70	26.6
30-34	60	22.8
35-39	19	7.2
40-49	4	1.5
≥50	1	.4
Gender		
Male	273	100
Female	0	0
Marital Status		
Single	140	51.3
Married	133	48.7
Level of Education		
Never gone to school	9	3.3
Primary education	177	64.8
Secondary and/or vocation	87	31.9
Location of Parking site		
Urban	118	43.2
Peri-urban	155	56.8

Practices

Table2. Commercial motorcyclists reported ever wearing helmet

	Frequency (n= 273)	**Percent (%)**
Yes	222	81.3
No	51	18.7
Total	273	100

Table3. Distribution of participants' responses by when they don't wear helmet

Category	**Frequency (n)**	**Percent (%)**
I don't wear helmet when not anticipating meeting a policeman	86	57.0
I don't wear helmet when riding for a short trip	166	76.8
I don't wear helmet during the hot weather	13	8.6
I don't wear helmet during the day	3	2.0
I don't wear helmet during the night	5	3.3
I don't wear helmet during weekdays	2	1.3
I don't wear helmet during weekends	1	0.7
Others[≈]	10	6.6

[≈] I don't wear helmet when: mine has been borrowed by someone, I forgot to take it, and I am in hurry.

Among commercial motorcyclists who reported to wear helmets, 81.3% (n=222) as shown in Table 2 above, most reported wearing helmets at least sometimes. Most commercial

motorcyclists don't wear helmets when riding for a short trip and when they don't anticipate meeting a policeman (Table 3).

Table4. Commercial motorcyclists' frequency of wearing helmet

	Frequency (n=)	**Per cent (%)**
Neither every day nor at every trip	122	55.0
Every day but not at every trip	28	12.6
Every day at every trip	72	32.4

Table 4 above shows that about two thirds (67.6%) of participants reported an inconsistent helmet wearing whereby majority reported to poorly comply with helmet wearing. The consistent helmet use was reported by only one third of commercial motorcyclists.

Table5. Socio-demographic factors associated with reported helmet wearing among commercial motorcyclists in Dar es Salaam

Background Characteristic	Category	N	Wearing helmet		p-value†
			Yes n (%)	No n (%)	
Age	<18	4	3(75.0)	1(25.0)	
	18-24	105	86(81.9)	19(18.1)	
	25-29	70	55(78.6)	15(21.4)	
	30-34	60	47(78.3)	13(21.7)	
	35-39	19	17(89.5)	2(10.5)	
	40-49	4	4(100)	0	.839
	≥50	1	1(100)	0	
Marital status	Not married	140	114(81.4)	26(18.6)	
	Married	133	108(81.2)	25(18.8)	.962
Location	Urban	118	101(85.6)	17(14.4)	
	Peri-urban	155	121(78.1)	34(21.9)	.114
Level of Education	Never gone to school	9	5(55.6)	4(44.4)	
	Primary	177	141(79.7)	36(20.3)	
	Secondary and /or vocational	87	76(87.4)	11(12.6)	.042*

†P-value from χ^2 test for differences in proportions, * Indicates statistical significance at 5% level.

Helmet wearing increases with the level of education. The level of education is a significant predictor of helmet wearing ($p < 0.05$) (Table 5).

Table6. Socio-demographic factors associated with reported helmet use using regression models

Category	Frequency	Crude OR	AOR	95% CI	P-value
Age		.992	.997	.936-1.061	.920
Unmarried	173	.985	.870	.415-1.823	.712
Urban	118	.599	.539	.279-1.045	.067
Primary	173	5.527	6.146	1.345-28.097	.019
Secondary and or vocational	81	1.764	1.567	.742-3.311	.239

OR=Odd Ratio, AOR= Adjusted Odd Ratio

Covariates which were significant in univariate logistic regression model were further fitted in multiple logistic regression models. After holding other factors constant, it was found that those who had primary education were 6.15 times more likely to wear helmet than those with no formal education (AOR: 6.146; p=0.019; 95% CI: 1.345-28.097) (Table 6).

Table7. Respondents' possession and wearing of helmet

		Wearing helmet			
		Yes	No	Total	P value
Having helmet	**Yes**	199(99.0)	2(1.0)	201(100)	
	No	23(31.9)	49(68.1)	72(100)	
	Total	222(81.3)	51(18.7)	273(100)	.000

Owning/having a helmet is a significant predictor of helmet use. However more than one third of the commercial motorcyclists who had no helmet reported to be wearing helmet at least sometimes as shown in (Table 7). These may be motorcyclists who do not have a helmet but want one.

Attitudes

Table8. Respondents' distribution by attitude

	Sd (%)	**D (%)**	**Un (%)**	**A (%)**	**Sa (%)**
Wearing helmet is necessary regardless of whether there is traffic police around or not.	1.1	4.4	3.7	66.7	24.2
Helmet is necessary for passengers	2.6	5.1	6.2	60.4	25.6
Helmet wearing is necessary even during hot weather	2.6	5.9	15.4	60.4	15.8
Helmet wearing minimizes injuries to the head during crash	1.5	7.7	5.5	51.6	33.7
Helmet wearing is equally important during the day as night	1.5	2.9	3.7	68.5	23.4
Helmet wearing is equally important during weekdays as weekends	.7	1.1	4.0	64.8	29.3
Helmets are comfortable	1.8	16.5	8.1	46.5	27.1
Helmet wearing is equally important when riding in urban as peri-urban areas	3.7	12.8	9.9	58.6	15.0
Children should wear helmet	1.8	7.7	7.7	65.2	17.6
Helmet wearing is important even when riding for a short trip	2.6	11.7	10.6	60.8	14.3

	Sd (%)	D (%)	Un (%)	A (%)	Sa (%)
Helmet wearing is for one's safety and not just for avoiding fines	.7	5.5	6.6	64.5	22.7
Helmet wearing is necessary even for the experienced rider	.7	4.0	1.5	62.3	31.5
Helmet wearing is equally important when riding in small roads as highways	1.5	14.3	5.9	61.9	16.5

Sd-Strongly disagree, D-Disagree, Un-Undecided, A-Agree, Sa-Strongly agree

Regarding the attitude statements, with all previous 17 statements as were in the interview questionnaire, the Cronbach's alpha coefficient was 0.720. The alpha coefficient kept on increasing by deleting statements till when it reached 0.824 whereby deleting further statement had no effect in increasing the coefficient. Thirteen attitude statements were then included in analysis. All negative statements were reversed and reverse scored.

Table 8 above shows that for every attitude statement, more than half of the respondents (ranging from 73.6% to 94.1%) either agreed or strongly agreed with the statement. Very few respondents strongly disagreed with each statement.

Table 9: Distribution of respondents by wearing helmet with attitude

	Sd	D	Un	A	Sa	Total	P value
Wearing helmet							
	Wearing helmet is necessary regardless of whether there is traffic police around or not.						
Yes	2(66.7)	7(58.3)	7(70.0)	146(80.2)	60(90.9)	222	
No	1(33.3)	5(41.7)	3(30.0)	36(19.8)	6(8.1)	51	
Total	3	12	10	182	66	273	.048
	Helmet wearing is necessary even during hot weather						
Yes	5(71.4)	11(68.8)	29(69.0)	135(81.8)	42(97.7)	222(81.3)	
No	2(28.6)	5(31.3)	13(31.0)	30(18.2)	1(2.3)	51(18.7)	
Total	7	16	42	165	43	273	.008
	Helmet is necessary for passengers						
Yes	6(85.7)	10(71.4)	10(58.8)	130(78.8)	66(94.3)	222(81.3)	
No	1(14.3)	4(28.6)	7(41.2)	35(21.2)	4(5.7)	51(18.7)	
Total	7	5	17	48	10	273	.005
	Helmet wearing minimizes injuries to the head during crash						
Yes	4(100)	11(52.4)	11(73.3)	115(81.6)	81(88.0)	222(81.3)	
No	0(0.0)	10(47.6)	4(26.7)	26(18.4)	11(12.0)	51(18.7)	
Total	4	21	15	141	92	273	.003
	Helmet wearing is equally important during the day as night						
Yes	4(100)	6(75.0)	4(40.0)	149(79.7)	59(92.2)	222(81.3)	
No	0(0.0)	2(25.0)	6(60.0)	38(20.3)	5(7.8)	51(18.7)	
Total	4	8	10	187	64	273	.001

	Helmets are comfortable						
Yes	4(80.0)	33(73.3)	15(68.2)	106(83.5)	64(86.5)	222(81.3)	
No	1(20.0)	12(26.7)	7(31.8)	21(16.5)	10(13.5)	51(18.7)	
Total	5(100)	45(100)	22(100)	127(100)	74(100)	273(100)	.325
	Helmet wearing is equally important when riding in urban as peri-urban areas						
Yes	8(80.0)	28(80.0)	20(74.1)	128(80.0)	38(92.7)	222(81.3)	
No	2(20.0)	7(20.0)	7(25.9)	32(20.0)	3(7.3)	51(18.7)	
Total	10(100)	35(100)	27(100)	160(100)	41(100)	273	.325
	Children should wear helmet						
Yes	5(100)	18(85.7)	13(61.9)	143(80.3)	43(89.6)	222(81.3)	
No	0(0.0)	3(14.3)	8(38.1)	35(19.7)	5(10.4)	51(18.7)	
Total	5(100)	21(100)	21(100)	178(100)	48(100)	273	.640
	Helmet wearing is important even when riding for a short trip						
Yes	7(100)	28(87.5)	19(65.5)	133(80.1)	35(89.7)	222(81.3)	
No	0(0.0)	4(12.5)	10(34.5)	33(19.9)	4(10.3)	51(18.7)	
Total	7(100)	32(100)	29(100)	166(100)	39(100)	273	.057
	Helmet wearing is for one’s safety and not just for avoiding fines						
Yes	1(50.0)	12(80.0)	14(77.8)	138(78.4)	57(91.9)	222(81.3)	
No	1(50.0)	3(20.0)	4(22.2)	38(21.6)	5(8.1)	51(18.7)	
Total	2(100)	15(100)	18(100)	176(100)	62(100)	273	.134
	Helmet wearing is necessary even for the experienced rider						
Yes	0(0.0)	11(100)	4(100)	129(75.9)	78(90.7)	222(81.3)	
No	2(100)	0(0.0)	0(0.0)	41(24.1)	8(9.3)	51(18.7)	
Total	2	11	4	170	86	273	.000

	Helmet wearing is equally important when riding in small roads as highways						
Yes	4(100)	34(87.2)	12(75.0)	135(79.9)	37(82.2)	222(81.3)	
No	0(0.0)	5(12.8)	4(20.0)	34(20.1)	8(17.8)	51(18.7)	
Total	4(100)	39(100)	16(100)	169(100)	45(100)	273	.649

Sd-Strongly disagree, D-Disagree, Un-Undecided, A-Agree, Sa-Strongly agree

The Table 9 above shows that most of the commercial motorcyclists either strongly agreed or agreed with the attitudinal statements listed in the Table. Commercial motorcyclists who have shown positive attitude towards listed statements (those who either agreed or strongly agreed with the statements) reported to wear helmet. The positive attitude towards helmet wearing is a significant predictor of helmet wearing (p values<0.05). However helmet wearing was strongly predicted by having positive attitude towards helmet for passengers (p=.005), protective ability of helmet against head injuries (p=.003) , helmet wearing during night (p=.001) and helmet wearing for the experienced rider (p=.000).

Table10. Factors associated with helmet wearing in a multiple logistic regression models

Statement/Category	**Frequency**	**P-value**	**AOR**	**95% CI**
Wearing helmet is necessary regardless of whether there is traffic police around or not.				
Strongly disagree	7	.759	.475	.004-55.191
Disagree[n]	16	.957		
Undecided	42	.824	.723	.042-12.588
Agree	165	.534	.493	.053-4.595
Strongly agree	43	.494	.425	.037-4.921
Helmet wearing is necessary even during hot weather				
Strongly disagree	3	.719	.435	.005-40.537
Disagree[n]	12	.221		
Undecided	10	.123	.212	.030-1.523
Agree	182	.065	.182	.030-1.112
Strongly agree	66	.028*****	.039	.002- .698
Helmet is necessary for passengers				
Strongly disagree	7	.295	.033	.000-19.504
Disagree	14	.396	.370	.037-3.665
Undecided[n]	17	.125		
Agree	165	.296	.481	.122-1.896
Strongly agree	70	.014*	.091	.013-.617

Statement/Category	Frequency	P-value	AOR	95% CI
Helmet wearing minimizes injuries to the head during crash				
Strongly disagree	4	.999	.000	.000
Disagree[n]	15	.337		
Undecided	21	.378	.447	.075-2.677
Agree	141	.034*	.279	.086-.905
Strongly agree	92	.125	.346	.089-1.342
Helmet wearing is equally important during the day as night				
Strongly disagree	4	.999	.000	.000
Disagree	8	.824	1.429	.062-33.106
Undecided[n]	10	.199		
Agree	187	.090	.239	.046-1.248
Strongly agree	64	.043*	.114	.014-.931
Helmets are comfortable				
Strongly disagree	5	.700	2.572	.021-311.798
Disagree	45	.577	1.574	.319-7.757
Undecided[n]	22	.594		
Agree	127	.520	.637	.161-2.520
Strongly agree	74	.523	.618	.141-2.704

Statement/Category	Frequency	P-value	AOR	95% CI
Helmet wearing is equally important when riding in urban as peri-urban areas				
Strongly disagree	10	.061	25.604	.862-760.197
Disagree	35	.142	5.133	.580-45.442
Undecided[n]	27	.219		
Agree	160	.530	1.524	.409-5.684
Strongly agree	41	.932	1.090	.149-7.981
Children should wear helmet				
Strongly disagree	5	.999	.000	.000
Disagree	21	.077	.164	.022-1.213
Undecided[n]	21	.406		
Agree	178	.098	.315	.080-1.239
Strongly agree	48	.382	.439	.069-2.783
Helmet wearing is important even when riding for a short trip				
Strongly disagree	7	.999	.000	.000
Disagree	32	.053*	.113	.012-1.032
Undecided[n]	29	.418		
Agree	166	.754	.833	.266-2.608
Strongly agree	39	.781	.769	.120-4.924
Helmet wearing is equally important when riding in small roads as highways				
Strongly disagree	4	.999	.000	.000
Disagree	39	.575	.493	.041-5.870
Undecided [n]	16	.243		
Agree	169	.238	2.816	.505-15.688
Strongly agree	45	.103	4.995	.723-34.497

[n] Constant variable in the model, *Statistically significant at 5%

The covariates were subjected in the multiple logistic regression models whereby three statements were rejected which included: Helmet wearing is necessary even for the experienced rider, helmet wearing is for one's safety and not just for avoiding fines, and helmet wearing is equally important during the weekdays as weekends. After holding other factors constant as shown in the Table 10 above, those who strongly agreed with statements that suggest wearing helmet during hot weather were more likely to wear helmet than those who disagree; and those who strongly agreed with the statements that suggests helmet wearing for passengers and wearing helmet during night were more likely to wear helmet than those who were undecided. Furthermore, those who agreed with the statement that suggests a protective ability of helmet against head injuries were more likely to wear helmet than those who disagreed; and those who were undecided with the statement suggesting wearing helmet when riding for a short trip were less likely to wear helmet than those who disagreed.

Table11. Distribution of respondents by attitude towards helmet wearing

	Strongly disagree (%)	**Disagree (%)**	**Undecided (%)**	**Agree (%)**	**Strongly agree (%)**
Wearing helmet is necessary regardless of whether there is traffic police around or not.	1.1	4.4	3.7	66.7	24.2
Helmet is necessary for passengers	2.6	5.1	6.2	60.4	25.6
Helmet wearing is necessary even during hot weather	2.6	5.9	15.4	60.4	15.8
Helmet wearing minimizes injuries to the head during crash	1.5	7.7	5.5	51.6	33.7

	Strongly Disagree (%)	Disagree (%)	Undecided (%)	Agree (%)	Strongly Agree (%)
Helmet wearing is equally important during weekdays as weekends	.7	1.1	4.0	64.8	29.3
Helmets are comfortable	1.8	16.5	8.1	46.5	27.1
Helmet wearing is equally important when riding in urban as peri-urban areas	3.7	12.8	9.9	58.6	15.0
Children should wear helmet	1.8	7.7	7.7	65.2	17.6
Helmet wearing is important even when riding for a short trip	2.6	11.7	10.6	60.8	14.3
Helmet wearing is for one's safety and not just for avoiding fines	.7	5.5	6.6	64.5	22.7
Helmet wearing is necessary even for the experienced rider	.7	4.0	1.5	62.3	31.5
Helmet wearing is equally important when riding in small roads as highways	1.5	14.3	5.9	61.9	16.5

Table 11 shows that for every attitude statement more than half of the respondents (ranging from 73.6% to 94.1%) either agreed or strongly agreed with the statement. Very few respondents strongly disagreed with each statement.

Table12. Distribution of commercial motorcyclists by the reason of not wearing helmet (n=45*)

Reason	Yes (%)	No (%)	Total
Many helmets are of low quality	17(37.8)	28(62.2)	45(100)
Helmet storage is a problem	4(8.9)	41(91.1)	45(100)
Helmets are uncomfortable	17(37.8)	28(62.2)	45(100)
Not decided	11(24.4)	34(75.6)	45(100)

*Different from the original sample size (n=51) due to missing data.

Helmets, being of low quality and not comfortable were the most frequently reasons behind not wearing helmet as mentioned by commercial motorcyclists who reported to not wear helmet (Table 12).

4.2 Results from the observation checklist

Practices

Table13. Distribution of observed commercial motorcyclists wearing helmet by location

	Wearing helmet			
	Yes	**No**	**Total**	**P value**
Urban	63(58.9)	44(41.1)	107(100)	
Peri-urban	81(48.8)	85(51.2)	166(100)	
Total	144(52.7)	129(47.3)	273(100)	.109

Table14. Distribution of commercial motorcyclists who had helmet for passengers

	Frequency (n= 273)	**Per cent (%)**
Yes	24	8.8
No	249	91.2
Total	273	100

A small majority (52.7%) of the commercial motorcyclists were observed wearing helmet; more in urban than peri-urban areas. However, the observed difference is not significant ($p>0.05$) as shown in Table 13 above. Despite the observed majority of commercial

motorcyclists who wore helmet, a substantial number of them (91.2%) had no helmet for passengers (Table 14).

Table15. Distribution of commercial motorcyclists by the observed buckling of helmet

	Frequency (n= 146)	**Per cent (%)**
Yes	70	47.9
No	76	52.1
Total	146	100

A small majority (52.1%) of participants were observed to not having buckled the chinstrap (Table 15).

CHAPTER FIVE

5.0 DISCUSSION

5.1 Socio-demographic characteristics of commercial motorcyclists

All commercial motorcyclists in both urban and peri-urban areas were males. This male preponderance found in this study is consistent with findings in other countries including Ghana and Nigeria (Amoran et al., 2005; Adogu & Ilika, 2006; Alti-Muazu & Aliyu, 2008; Iribhogbe & Odai, 2009). This may be due to the fact that it is a common observed phenomenon and customary to see more male than female gender in commercial motorcycling in African cultural context. Furthermore, since motorcycling is a high risk venture, males tend to engage more in risky ventures than their females counterparts do.

Majority of the commercial motorcyclists were between the ages 18 to 34 years with a cluster in the 18 to 24 year group. This shows that many commercial motorcyclists are young, in productive age groups. However a big number of them are lowly educated with primary education or less. A similar observation was done by Iribhogbe & Odai (2009) in Nigeria whereby it was found that most of commercial motorcyclists (52.8%) had primary education or no formal education. This good number of commercial motorcyclists with low level of education could be partly attributed by the fact that those who are less educated found themselves with few chances of getting other jobs and thus engage into commercial motorcycling business as a last resort following unemployment regardless of being a risky job (Iribhogbe & Odai, 2009). The low level of education has further been identified as a risk factor in motor accidents in other countries (Valent et al., 2002; Zargar et al., 2004; Adogu, Ilika & Asuzu, 2009).

5.2 Attitude towards helmet wearing

It has been shown that participants who had positive attitude towards helmet wearing (those who either agreed or strongly agreed with the stipulated attitude statements) are more likely to wear helmet than those who had negative attitude towards helmet wearing. Helmet wearing was strongly predicted by having a positive attitude towards helmet for passengers (p=0.005), protective ability of helmet against head injury (p=0.003), wearing helmet during night (p=0.001) and wearing helmet even for the experienced rider (p=0.000). Helmet wearing was, however, not predicted by having a positive attitude towards helmet wearing for a short trip (p=0.057). This contradicts with the finding of Hung, Stevenson & Ivers (2008) whereby having a positive attitude towards wearing helmet when travelling for a short trip were associated with increased helmet use. This partially explains the reason why among the majority who reported to wear helmet (81.3%), the high proportion (76.8%) reported to not wearing helmet when riding for a short trip.

However after subjecting the statements in the multiple regression models, it was found that those who agreed regarding the protective ability against head injury were more likely to wear helmet than those who disagreed (AOR: 0.279; 95% CI: 0.086-0.905). Furthermore, those who strongly agreed on wearing helmet during hot weather were more likely to wear helmet than those who disagreed (AOR: 0.039; 95% CI: 0.002-0.698). Those who strongly agreed on necessity for passengers to wear helmet and wearing helmet during night were more likely to wear helmet than those who were undecided (AOR: 0.091; 95% CI: 0.013-0.617 and AOR: 0.114; 95% CI: 0.014-0.931 respectively). These results are however, related to the finding of another somewhat similar study done in Vietnam (Hung, Stevenson & Ivers 2008).

Most participants (60.4%) reported to agree that helmet is necessary for passengers. However only very few of them (8.8%) were observed having helmets for passengers. This may be due to non-availability of helmet for passengers or passengers dislike wearing helmets for various reasons (Ohajinwa et al., 2010).

5.3 The influence of modifying factors on practice of helmet wearing

Most commercial motorcyclists reported wearing helmet sometimes. This inconsistent helmet wearing was found to be influenced by various factors as discussed below:

Location

The location to where the motorcyclists work had no significant influence on helmet wearing, in both interview and observation (p = 0.114 and p= 0.103 respectively). However more commercial motorcyclists, 85.6% (n=101) in the urban areas reported to wear helmet than their peri-urban counterparts, 78.1%, (n=121). This finding concurs with observation results whereby 58.9%, (n=63) in the urban areas put on helmet than their peri-urban counterparts 48.8%, (n=81). This is in line with the findings of other author where by it has been shown that more people in the urban areas tend to put on helmet than those in per-urban areas (Xuequn et al., 2010). However, according to the current study, the location of motorcyclist (urban vs. peri-urban) during both interview and observations had no significant influence on helmet wearing (p= 0.114 and p= 0.103 respectively).

Level of education

However, it has been found that level of education is a significant predictor of helmet wearing (p=0.048). With reference to those who never gone to school, and by controlling for other factors in the multiple regression models, those who had primary education were more likely to wear helmet than those who never gone to school (AOR=6.146; p=0.019; 95% CI=1.345-28.097). However these results refute the findings of Medhati et al., (2010) where non-significant association between education and helmet wearing was evident.

Age

Those who are aged (40 years and above) seemed to wear helmet than those less than 40 years whereby all (100%) who were 40 years and above reported to wear helmet. This finding is similar to the finding of other authors (Ackaah & Afukaar, 2010). The reason behind not wearing helmet among those in the young age may be due to the fact that young people generally tend to adopt risky behaviour and attitudes as compared to their elder counterparts (Seleye-Fubara & Ekere, 2003). However this study has found that age is not a significant predictor of helmet wearing (p=0.839).

Cues to helmet wearing

It has been shown that having helmet is a significant predictor of helmet wearing (p=0.000). Surprisingly about one third of study participants who did not have helmets at the time of interview reported to use helmets. The possible reason for this could be that they borrow from their colleagues especially at times when they anticipate meeting a policeman (Hung, Stevenson & Ivers, 2008) or when riding for a long trip (Kulanthayan, 2000; Corad, 1996).

5.4 Helmet wearing practice

Barriers versus benefits of helmet use

Among participants who reported to not wear helmet, the most frequently mentioned reason behind the practice were helmets are not of good quality and are not comfortable. The low quality of helmets has been mentioned by other author (Peek-Asa et al., 1999) and may be partly expounded by the lack of focus on the matter by the quality regulatory bodies. The mentioned reason that helmet is not comfortable corresponds to the finding of another study done in Iran whereby one of the reasons given for poor compliance to helmet wearing was

that helmets were designed to be used in temperate countries and were uncomfortable to use in hot weathers (Zargar et al., 2006).

Most participants agreed that wearing helmet is necessary and helmet reduces head injury in case of accident. This finding is somewhat similar to the study done in Nigeria whereby it was found that majority of participants acknowledged the benefits of helmet (Oluwadiya, 2008). This shows that many commercial motorcyclists are aware of the benefits of helmet wearing.

Despite the awareness of the benefits of helmet wearing among commercial motorcyclists, the most frequent mentioned reasons for wearing helmet were when anticipating meeting a policeman and when riding for a short trip. This finding concurs with a somewhat similar finding of a study done in China where by it was found that despite the majority of motorcyclists acknowledged the benefits of helmet, but only 20% of them said they would wear it for preventive purposes (Li et al., 2008). This finding explains the low risk perception among commercial motorcyclists (Khan et al., 2009). This low risk perception leads to unsafe driving practices which further results into fatal injuries (Julian, 2002). Furthermore, it seems that commercial motorcyclists are under intense pressures to make profit and may take unnecessary risks to do so. Also it has been shown that people sometimes behave differently when they see themselves as members of a group, thus drivers may make risky decisions because the perceived “social norms” legitimizes care free behaviour (Broughton, 2005).

Likelihood of helmet wearing

Most commercial motorcyclists reported wearing helmet sometimes. Of those who wear helmets (n=222), most reported that they do not wear consistently with majority, (76.8% and 57%) reported to not wearing helmet when riding for a short trip and when not anticipating meeting a policeman respectively. Similar findings have been reported elsewhere (Hung, Stevenson & Ivers, 2008; Kulanthayan, 2000; Corad, 1996).

More than half of the participants (52.7%) were observed wearing helmet, the rate higher than what observed in Nigeria, whereby 23.8% were observed wearing helmet (Oginni et al., 2007). Despite this, the majority of them had no helmet for passengers (91.2%). This could be due to non-availability of helmet for passengers or passengers dislike wearing helmets for various reasons (Ohajinwa et al., 2010).

Improper helmet use has been observed to the majority of participants whereby 52.1% were observed having not buckled the chinstrap. This observation is congruent with finding of other authors (Ouellet & Kansantikul, 2006; Peek-Asa et al., 1999; Li, et al., 2008). This observed highly improper helmet wearing together with low helmet wearing rates could partially explain why the 90% of motorcycle fatalities are seen in low income countries (Peden et al., 2002).

5.5 Limitation of the study

Data collection was conducted during rainy and somewhat cool season in Dar es Salaam (May, 2011). This may in one way or another have adjusted the motorcyclists' behaviour of helmet wearing as many tend to wear helmet during the cool season contrary to the previously observed phenomenon during the hot season. Therefore the prevalence of the observed helmet wearing, as it has been found by this study should be interpreted in light of this circumstance. However, to get meaningful findings in the face of this limitation the observations were conducted during the day and evening times. The former was relatively warmer than the later.

About three months prior to data collection, there was a road safety week, whereby among other things it emphasized on helmet wearing to motorcyclists; and the traffic police started to be very keen in enforcing the use of helmet. This may have in one way or another; quickly increased the proportion of commercial motorcyclists who wear helmet contrary to the previously observed phenomenon, whereby the rate of helmet wearing among the commercial motorcyclists seemed to be very low. However much this change, there was a need to explore

further to see at what extent their attitude towards, and the extent to which it is related to the practice of helmet use.

CHAPTER SIX

6.0 CONCLUSION

All commercial motorcyclists were males with the majority at the age group of 18-24 years. Most of them were having primary education or less.

Commercial motorcyclists in Dar es Salaam region, generally have positive attitude towards helmet use. A positive attitude towards protective ability of helmet against head injuries, wearing helmet during hot weather, wearing helmet during the night and passenger's helmet use were associated with increased chances of helmet wearing. There were a high proportion of reported as well as observed commercial motorcyclists who wear helmet. In spite of this noteworthy information, the inconsistent use of helmet was clearly evident whereby majority of commercial motorcyclists wear helmet when riding for a short trip or when anticipating meeting a policeman. This may be partially explained by either somewhat weak legal enforcement on helmet use which may be due to more often unavailability of traffic police in the small roads and rural areas. Further explanation to this is motorcyclists may perceive low risk when riding in small roads as compared to highways and there is less discomfort associated with removing helmet more often when riding for a long distance as compared to when riding for a short distance. Majority of passengers did not wear helmet. However this

finding warrants further attention to explore various factors explaining the observed phenomenon.

There was no association between helmet wearing and the location of motorcycle parking point. Level of education and possession of helmet were the most significant predictors of helmet wearing.

6.1 RECOMMENDATIONS

Despite the majority of commercial motorcyclists reported to wear helmet, and the positive attitude towards helmet wearing, helmet is not worn consistently. Legal enforcement towards helmet wearing among both riders and passengers should be strengthened, which should be parallel with ensuring that helmets of high quality are available to the majority at the affordable price. Businessmen who import helmets need to be made aware of the complications associated with wearing a bogus helmet and should be incorporated in a plan to ensure that high quality helmets are available and accessible to the majority.

There should be regular educational campaigns to all motorcycle users as the way of increasing awareness of the consequences of not wearing a helmet and to nurture the reported positive attitude towards helmet wearing among motorcyclists.

There is a need for further explorative studies on the quality of helmets and factors associated with the use and non-use of helmet among passengers. However to ascertain for the validity and generalizability of this study, a similar study may be done elsewhere in Tanzania and other settings with similar characteristics to the original one.

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APPENDICES

APPENDIX 1: Informed consent (English version)

MUHIMBILIUNIVERSITY OF HEALTH AND ALLIED SCIENCES

SCHOOL OF NURSING

INFORMED CONSENT FORM

ID-NO

Consent to participate in a research study

Greetings! My name is **Emmanuel Geofrey Mwakapasa** and I am a student at Muhimbili University undertaking Masters of Science Critical Care and Trauma. Currently I am working on this research project with the objective of finding the ways of alleviating motorcycle accidents and minimizing their consequences in terms of mortality and disability. The study is going to address the motorcyclists' attitude towards and their practice of helmet use.If you agree to join the study, you will participate by responding to the asked questions.

All information recorded will be entered into computers with only the study identification number. However no participant's name will be published. We do not expect that any harm will happen to you because of joining this study except giving your time for the discussion.
Taking part in this study is completely your choice. You are free to choose either to participate in this study or not. You can decide to stop participating in this study any time you wish even if you have already given your consent. Refusal to participate or withdrawal from the study will not involve penalty or loss of any benefits to which you are otherwise entitled.

If you agree to take part in this study there are no direct benefits that you will get from this study but we believe the information you will provide will help in decreasing mortality and morbidity of motorcyclists. A small group of scientific experts who are involved in implementing this study will monitor the results of this study and how we conduct this research.

We do not expect that you will get any physical injury resulting from participating in this study. However if any injury resulting from participating in this study occurs, we will provide you with medical treatment according to current standard of care in Tanzania. There will be no additional compensations to you.
If you ever have questions about this study, your rights as a participant, you should contact the principal investigator Emmanuel Geofrey Mwakapasa at School of Nursing, Muhimbili University of Health and Allied Sciences, P.O. Box 65004, Dar es Salaam, through Mobile

0754 638 098 or contact Prof. M. Aboud Director of the University Research and Publications Committee, P.O. Box 65001, Dar es Salaam. Tel: 21503026.

Signature

Do you agree?

Participant agrees……Participant does NOT agree…….

I, _____ have read the content in this form. My questions have been answered. I agree to participate in this study

Signature of participant_____

Signature of witness (if participant cannot read) _____

Signature of researcher_____

Date of signed consent_____

APPEDIX 2: Informed consent (Swahili version)

CHUO KIKUU CHA AFYA NA SAYANSI SHIRIKISHI MUHIMBILI

SHULE YA UUGUZI

Namba ya utambulisho

Ukubali wa kushiriki katika utafiti

Salaam!

Jina langu ni **Emmanuel G. Mwakapasa** ni Mwanachuo katika chuo kikuu cha Muhimbili ninayesomea shahada ya pili ya Kuhudumia Wagonjwa Mahututi na Majeruhi. Katika utafiti huu nina lengo la kutafiti Mtazamo na Uvaaji wa Kofia ngumu kwa waendesha pikipiki za biashara wa Dar es Salaam.

Kama utakubali kujiunga katika utafiti huu utatakiwa kujibu maswali yaliyoandikwa katika dodoso kama utakayoulizwa na mtafiti. Majibu yote yatakusanywa kutoka katika eneo la utafiti na yataingizwa kwenye compyuta kwa kutumia namba ya utambulisho tu. Hakuna jina

la mshiriki litakalochapishwa. Hatutegemei kwamba kutakuwa na madhara yoyote kwa wewe kujiunga na utafiti huu isipokuwa kutumia muda wako tu katika majadiliano.

Kushiriki katika utafiti huu ni uchaguzi wako. Una uhuru wa kukubali au kukataa kushiriki katika utafiti huu. Pia unaweza kuacha kushiriki katika utafiti huu muda wowote utakapojisikia hivyo hata kama umeshakubali kushiriki. Kukataa kushiriki au kuacha kushiriki katika utafiti huu hakutakufanya upate adhabu au ukose kufaidika na yale unayostahili kupata.

Ukikubali kushiriki katika utafiti huu hakuna faida ya moja kwa moja utakayopata lakini tunaamini maelezo utakayoyatoa yatasaidia kupendekeza njia zinazofaa kutatua matatizo ya ajali kwa waendesha pikipiki. Kundi dogo la wataalam wa utafiti ambao hawahusiki katika kutekeleza utafiti huu watasimamia matokeo ya utafiti huu na jinsi utafiti huu utakavyofanyika.

Hatutegemei kwamba utapata madhara yoyote ya kimwili kwa kushiriki katika utafiti huu. Hata hivyo ikiwa kutakuwwa na madhara yoyote yatakayotokana na kushiriki katika utafiti huu, tutakupa huduma ya matibabu kulingana na viwango vya huduma za afya vya Tanzania. Hakutakuwa na fidia ya nyongeza kwako.

Kama utakuwa na swali lolote kuhusu utafiti huu unaweza kuwasiliana na mkuu wa utafiti huu ndugu Emmanuel G. Mwakapasa kwenye Shule ya Uuguzi, Chuo Kikuu cha Afya ya Tiba ya Sayansi Muhimbili, S.L.P. 65004, Dar es Salaam. Na ukiwa na swali lolote kuhusu haki zako kama mshiriki, wasiliana nami kwa namba 0754638098 au Profesa M. Aboud ambaye ni Mwenyekiti wa Kamati ya Utafiti ya Chuo, S.L.P. BOX 65001, Dar es Salaam. Simu: 2150302-6

Sahihi

Je umekubali?

Mshiriki amekubali……..…Mshiriki Hajakubali…….

Mimi, ...nimesoma maelezo ya fomu hii. Maswali yangu yamejibiwa. Nimekubali kushiriki katika utafiti huu.

Sahihi ya mshiriki_____

Sahihi ya shahidi (kama mshiriki hawezi kusoma) _____

Sahihi ya mtafiti _____

Tarehe ya ukubali wa kushiriki_____

ASANTE KWA KUSHIRIKI KATIKA UTAFITI HUU

APPENDIX 3: Questionnaire (English version)

QUESTIONNAIRE FOR DETERMINING ATTITUDE OF COMMERCIAL MOTORCYCLISTS TOWARDS AND THEIR PRACTICE OF HELMET USE

Instructions:

The aim of this questionnaire is to ascertain the attitude of commercial motorcyclists towards helmet use and their practice of helmet use. Questions will be read verbatim by the researcher during a face to face interview. The questionnaire is confidential.

Thank you for your cooperation.

Participant's ID ☐☐☐

Location: City area (urban area) ☐ Outside-the city area (Peri-urban area) ☐

Commercial Motorcycle parking point ID_____

No.	Question	Coding category	Code	Go to
A.	**DEMOGRAPHIC CHARACTERISTICS**			
1.	Sex	Male	01	
		Female	02	

2. Age	Years……	
3. Marital Status	Single	01
	Married	02
4. Level of education	Never gone to school	01
	Primary School	02
	Secondary School and/or Vocational Education	03
	Above secondary school	04
	Others (specify)……..	99

B. ATTITUDE TOWARDS HELMET USE

The following statements test your attitude towards helmet use. For each statement you will give a single response using either of the five options in a scale of 1 to 5.

1=strongly disagree

2=disagree

3=neither agree nor disagree

4=agree

5=strongly agree

Statement	Strongly disagree				Strongly agree
5. Wearing a helmet is not necessary when there are no traffic police around.	1	2	3	4	5

6. Helmet use is not necessary for passengers	1	2	3	4	5
7. Helmet use is important for driver's safety	1	2	3	4	5
8. Wearing a helmet is not necessary during hot weather	1	2	3	4	5
9. Wearing a helmet reduces your peripheral vision.	1	2	3	4	5
10. Everyone should wear helmet.	1	2	3	4	5
11. Wearing a helmet does not reduce the severity of head injury in a crash.	1	2	3	4	5
12. Helmet use is more necessary during the day time than night.	1	2	3	4	5
13. Helmet use is more necessary during the weekdays than weekends.	1	2	3	4	5
14. Helmets are uncomfortable	1	2	3	4	5
15. Helmet use is more necessary when riding in the city than outside-the city areas.	1	2	3	4	5
16. Helmet use is not necessary for small children.	1	2	3	4	5

17. Wearing a helmet is not necessary when riding a short trip (less than 2km).	1	2	3	4	5
18. Wearing helmet is important just to avoid police fines.	1	2	3	4	5
19. Storage of helmets when the motorcycle is parked is a problem.	1	2	3	4	5
20. There is no need for the experienced driver to wear helmet.	1	2	3	4	5
21. Wearing helmet is more necessary when riding on the highways than small roads.	1	2	3	4	5

C. PRACTICE OF HELMET USE

Question	Coding category	Code	Go to
22. Do you have helmet?	Yes	01	
	No	02	
23. Do you wear helmet?	Yes	01	
	No	02	Question 26

24.	How often do you wear helmet?	Neither every day nor at every trip	01
		Every day but not at every trip	02
		Every day at every trip	03 → End of interview
25.	When do you not wear helmet?	When riding for a short trip	01
		When I don't anticipate meeting a policeman	02
		During the hot weather	03
		During the day	04
		During the night	05
		During weekdays	06
		During weekend	07
		Others (specify)……	99
26.	What are the reasons that make you don't wear helmet?	_____	**End of interview**
		_____	
		_____	

_____

_____

THANK YOU FOR YOUR TIME

APPENDIX 4: Questionnaire (Swahili version)

DODOSO LA KUTAMBUA MTIZAMO NA TABIA YA UTUMIAJI WA KOFIA NGUMU KWA WAENDESHA PIKIPIKI ZA BIASHARA

Maelekezo:

Madhumuni ya dodoso hili ni kutambua mtizamo na tabia ya utumiaji wa kofia ngumu miongoni mwa waendesha pikipiki za biashara. Maswali yatasomwa na kuulizwa na mtafiti. Majibu utakayotoa yatachukuliwa kwa usiri.

Utambulisho wa mshiriki ☐☐☐

Mahali: Jijini ☐ Nje ya jiji ☐

Utambulisho wa kituo cha pikipiki_____

Na.	**Swali**	**Coding category**	**Code**	**Nenda**
A.	**TAARIFA BINAFSI**			
1.	Jinsia	Mwanamme	01	
		Mwanamke	02	
2.	Umri	Miaka……		

3. Hali ya ndoa	Sijaoa/Sijaolewa	01
	Nimeoa/Nimeolewa	02
4. Kiwango cha elimu	Sijawahi kwenda shule	01
	Shule ya msingi	02
	Shule ya sekondari na/au elimu ya ufundi	03
	Zaidi ya elimu ya sekondari	04
	Mengineyo (Taja)……..	99

B. MTAZAMO WA UTUMIAJI WA KOFIA NGUMU

Vifungu vya maneno vifuatavyo vinapima mtazamo wako juu ya utumiaji wa kofia ngumu. Utatoa jibu moja tu kwa kila swali

1=Sikubaliani kabisa

2=Sikubaliani

3=Sikubali wala sikatai

4=Nakubaliana

5=Nakubali kabisa

	Kifungu cha maneno	Sikubaliani kabisa				Nakubaliana kabisa
5.	Hakuna haja ya kuvaa kofia ngumu kama hakuna askari polisi wa usalama barabarani.	1	2	3	4	5
6.	Hakuna haja kwa abiria kuvaa kofia ngumu.	1	2	3	4	5
7.	Uvaaji wa kofia ngumu ni muhimu kwa usalama wa dereva.	1	2	3	4	5
8.	Hakuna haja ya kuvaa kofia ngumu wakati wa kipindi cha joto.	1	2	3	4	5
9.	Uvaaji wa kofia ngumu unapunguza uwezo wa kuona pembeni.	1	2	3	4	5
10.	Kila mtu anatakiwa kuvaa kofia ngumu.	1	2	3	4	5
11.	Uvaaji wa kofia ngumu hakupunguzi kiwango cha majeraha ya kichwani wakati wa ajali.	1	2	3	4	5

12.	Kuna haja zaidi ya kutumia kofia ngumu wakati wa mchana kuliko usiku.	1	2	3	4	5
13.	Kuna haja zaidi ya kutumia kofia ngumu siku za katikati ya wiki kuliko mwishoni mwa wiki.	1	2	3	4	5
14.	Kofia ngumu zinakera	1	2	3	4	5
15.	Kuna haja zaidi ya kuvaa kofia ngumu wakati unaendesha maeneo ya mjini kuliko nje ya mji.	1	2	3	4	5
16.	Hakuna haja kwa watoto wadogo kuvaa kofia ngumu.	1	2	3	4	5
17.	Hakuna haja ya kuvaa kofia ngumu wakati unaendesha safari fupi (pungufu ya km 2).	1	2	3	4	5
18.	Uvaaji wa kofia ngumu ni muhimu kwa ajili tu ya kuepuka faini ya polisi.	1	2	3	4	5
19.	Uhifadhi wa kofia ngumu ni tatizo wakati pikipiki likiwa limeegeshwa.	1	2	3	4	5
20.	Hakuna haja kwa dereva mzoefu kuvaa kofia ngumu.	1	2	3	4	5
21.	Kuna haja zaidi ya kuvaa kofia ngumu wakati unaendesha katika barabara kuu kuliko barabara ndogo.	1	2	3	4	5

C. UTUMIAJI WA KOFIA NGUMU

	Swali	Coding category	Code	Go to
22.	Je, unayo kofia ngumu?	Ndio	01	
		Hapana	02	
23.	Je, unavaa kofia ngumu?	Ndio	01	
		Hapana	02	Question 26
24.	Je, unavaa kofia ngumu mara ngapi?	Si kila siku na si kila safari	01	
		Kila siku lakini si kila safari	02	
		Kila siku na kila safari	03 →	Mwisho wa mahojiano

25.	Ni wakati gani huvai kofia ngumu?	Ninapoendesha safari fupi	01
		Wakati sitegemei kukutana na polisi wa usalama barabarani	02
		Wakati wa kipindi cha joto	03
		Wakati wa mchana	04
		Wakati wa usiku	05
		Wakati wa katikati ya wiki	06
		Wakati wa mwisho wa wiki	07
		Mengineyo (Taja)……	99
26.	Je, ni sababu zipi zinazokufanya usivae kofia ngumu?	_____ _____ _____ _____ _____ _____	Mwisho wa mahojiano

ASANTE KWA KUSHIRIKI

APPENDIX 5: Observation Tool

ATTITUDE AND PRACTICE OF HELMET USE AMONG COMMERCIAL MOTORCYCLITS IN DAR ES SALAAM REGION, TANZANIA

TOOL 2: OBSERVATION SHEET

Date: Day: _____Month:_____Year:_____

Time: ____:_____ A.M. _____:_____ P.M.

Place **City area (urban)** ☐ **Outside-the city area (peri-urban)** ☐

Commercial Motorcycle parking point ID_____

Motorcycle plate number_____

Observer _____ Number of

people on motorcycle 1 ☐ 2 ☐ 3 ☐ others (specify) _____

	DRIVER	
Sex	Male ☐	Female ☐
Wearing a helmet	Yes ☐…01	No ☐…02
Type of helmet*	1 ☐ 2 ☐ 3 ☐ 4 ☐ other (specify) _____NA ☐….99	
Helmet buckled correctly	Yes ☐…01	No ☐…02 NA ☐….99
Did s/he have helmet for the passenger (s)?	Yes ☐…01	No ☐…02 NA ☐….99
Did s/he ensure that his/her passenger(s) wore helmet correctly?	Yes ☐…01	No ☐…02 NA ☐….99

*1-Full face (with chin guard), 2- Open-face (covers ears and neck), 3- Half-face (above ears)

4- Other (e.g. bicycle helmet, construction hat, horse-riding hat, etc.).