ENSIGN COLLEGE OF PUBLIC HEALTH

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FACULTY OF PUBLIC HEALTTH
DEPARTMENT OF COMMUNITY HEALTH

FACTORS CONTRIBUTING TO HIGH INCIDENCE OF MOTORCYCLE ACCIDENTS PRESENTING TO THE KORLE BU TEACHING HOSPITAL IN THE ACCRA METROPOLIS OF GREATER ACCRA REGION, GHANA
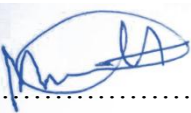
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DECLARATION

This thesis is submitted to Ensign College of Public Health. I hereby declare that this thesis is my independent work and has not been accepted in any previous application for a degree here or elsewhere except for references to other people's work which have been duly acknowledged.

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DEDICATION

I dedicate this work to the Almighty God for His Love and Mercies throughout the program. To my lovely Father Mr Francis Marnah Akrofi and my Siblings for their love and support. I also dedicate this study to Dr Mercy Apea Obrempong-Owusu for her encouragement during my program. And to all my friends and colleagues for their assistance during my studies.

ACKNOWLEDGEMENT

DEFINITION OF TERMS

Traffic Management   Planning, coordinating, controlling and organizing traffic to achieve efficiency and effectiveness of the existing road capacity.

Road Accident   Refers to any accident involving at least one road vehicle, occurring on a road open to public circulation, and in which at least one person is injured or killed.

Headway   The distance between two vehicles travelling one in front of the other.

ABBREVIATIONS AND ACRONYMS

CDC   Centre for disease control and prevention

DANIDA   The Danish International Development Assistance

GHS   Ghana Health Service

GPRTU   Ghana Private Road Transport Union

KBTH   Korle -Bu Teaching Hospital

MTTU   Motor Traffic and Transport Unit

MVA   Motor Vehicle Act

NHTSA   National Highway Traffic Safety Administration

NRSC   National Road Safety Commission

RAC   Royal Automobile Club

RTA   Road Traffic Accidents

RTI   Road Traffic Injury

TBI   Traumatic Brain Injury

UGMS   University of Ghana Medical School

USA   United States of America

WHO   World Health Organization

ABSTRACT

Introduction: Road traffic injuries are the eighth leading causes of death globally, and most affected are young people aged 15-29. By 2030, road traffic deaths will become the fifth leading cause of death unless urgent action is taken. Lack of employment has forced many youths of this country into "Okada" (local name for motorcycle riders in Nigeria which is also commonly used in Ghana) business which has, in turn, caused many accidents. Motorcyclists are among the most vulnerable road users in Ghana; they contribute 34% of all road traffic injuries. The purpose of this study is to determine the factors that contribute to the high incidence of motorcycle accident reporting at the Accident and Emergency Unit at the Korle-Bu Teaching Hospital.

Methods: A descriptive cross-sectional research design using a quantitative approach was used to collect relevant data from participants.

Results: Data gathered from this study revealed that demographic characteristics such as age ($p=<0.001$), marital status ($p=<0.001$), education ($p=0.035$) and occupation ($p=0.002$) have shown a strong association with helmet use. Further analysis was conducted on demographic attributes and road regulations. From the report, education ($p=<0.001$), religion ($p=(0.001)$) and occupation ($p=0.006$) have also shown association between the two variables. The respondents' knowledge of road regulations and road signs were very low. Less than 40% insured their motors and have valid national health insurance. The accident victims attributed the cause of their accidents to non-adherence to road signs and over speeding.

Conclusion: Motorcycle accidents could be reduced through law enforcement agencies, continuous mass education using all media available. Also, there should be a collaboration between Road and Transport sector and Motor Traffic and Transport Directorate (MTTD) of the Ghana Police service to find a solution to the current trend of a motorcycle accident on our roads.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the study

Approximately 1,35 million lives are shortened annually, according to the World Health Organization (WHO), due to a traffic crash. An estimated 20 to 50 million people suffered non - fatal accidents, many of whom suffered injuries. Most are vulnerable road users, motorcyclists, pedestrians and cyclists. Moreover, close to a third of deaths include passengers, many of whom have been killed by unsafe public transportation (WHO, 2013). This is because there are no laws on the use of alcohol - free barrels and where there are laws on road safety they are not adequately implemented. The 2030 Sustainable Development Goals Agenda sets an ambitious target to halve the global number of road accident deaths and injuries by 2020. The risk of crashes and accidents among the most vulnerable road users is higher (Chang & Yeh, 2006; Geedipally et al., 2011). It is attributed to Vlahogianni et al. (2012) and Schneider IV et al.(2012) that motorcyclists often share roads with fast-moving cars, busses and lorries. The number of motorized two-wheelers (motorcycles and motorcycles and mopeds) registered increased by 13 per cent, reaching 115,42 million by 2012 in India and 72 per cent (MoRT & H, 2013) of the two-wheeler total of registered motor vehicles in India. The motorcycle is a common and popular way to travel in Africa and other Asian countries and is primarily compulsory on the road. But a small percentage of motorbike tours cover business, recreation, social and other goals. In comparison with four-wheeler vehicles (Vlashogianni et al., 2012), Also one of the cost-efficient transport means is the motorcycle (vehicle, operation and maintenance). Most motorcycles in Africa have an engine capacity of approximately 90-125 centimetres (4-cylinder). Motorcycles can also run easily on congested roads that need marginal parking (Vlahogianni et al, 2012; Lin & Kraus, 2009; Mannering & Grodsky, 2019). Motorcycle accidents on our roads are on the rise in Ghana, despite

being illegal. National Road Safety Commission NRSC statistics suggest that Ghana reported 589 deaths from motorcycle accidents between January and October 2019. According to NHTSA, since the 1966 Highway and national Transport and Motor Vehicle Safety Act, nearly 148 000 motorcyclists have been killed in traffic crashes. The engine speed is 72.34 per 100,000 registered motorcycles (NCSA, 2007). In 2008, almost 3% of all U.S. vehicles registered were motorcycles, representing just 0.4% of all miles of vehicles journeyed in the United States. In 2008, however, motorcycle deaths represented 14% of all traffic losses in the United States, compared with 5.92% in 1997 (De Rome, 2011).In the United States, the number of motorcycle fatalities rose from 2,161 in 1997 to 5,290 in 2008 by 150 per cent. Over the same period, fatality rates for passenger cars and light trucks fell respectively by 26.74% and 13.54%. Based on the miles travelled by vehicle in 2008, 37% more passengers have been killed and Nine times more likely to be hospitalized in a motor vehicle crash than the passenger car occupant.37% more passengers have been killed and Nine times more likely to be hospitalized in a motor vehicle crash than the passenger car occupant. Such high rates of injuries are partly due to alcohol intake. Consumption of alcohol reduces perceived harmful effects from taking risks, thereby increasing risk-taking readiness after drinking (Traffic Safety Facts: 2008, NHTSA).

1.2 Problem Statement

 Motorisation transformed the lives of many people and communities, but the changes came at a cost. Although the number of lives lost in high - income countries in road accidents has been following a downward trend over recent decades, the risk of road traffic injury –both socially and economically –is increasing substantially for the majority of the population worldwide. (Ameratunga, Hijar, & Norton 2006).Injury and deaths due to road traffic accidents (RTA) are a major public health problem in

developing countries where more than 85% of all deaths and 90% of disability-adjusted life years were lost from road traffic injuries (Nantulya & Reich, 2002).

Overall, road accidents, disease and casualties are of the major cause; 90 per cent of deaths occur in low- and middle - income countries (Peden, 2002). (Peden, 2002). Motorcyclists are prone to road transport and represent the main target group for the reduction of road damage. In Kudebong, Wurapa and Nonvignon (2011), studies have found that a traffic accident in the north part of Bolgatanga to calculate the economic burden of motorcycle accidents was one of the leading preventable causes of motorcycle injuries and premature deaths. Daily, at the Accident and Emergency department at the Korle Bu Teaching Hospital, there is an increasing number of motorcycle accidents compared to other vehicular accidents. From 2017 to 2019, a total of 3,192 accidents cases were reported with 59 deaths. However, both vehicular and motorcycle cases were 4199 with 2,041 being motor victims. Also, 1,091 cases were recorded in 2019 alone compared to 950 cases in the previous year (2018) (OPD, 2019). Based on this data, this study will help assess the factors leading to motorcycle accident cases at the Korle-Bu Teaching Hospital (KBTH) Accident and Emergency Department in the Greater Accra region of Ghana.

1.3 The significance of the Study

This work would bring the motorcycle accident phenomena into the public sphere in the Greater Accra region. It would advise key stakeholders (MTTU, Road Safety Commission and Ghana Highway Authority) that they are aware of the factors that led to the motorcycle accident in the region.

Conceptual Framework

The purpose of this study is to establish the relation of independent and dependent variables within the conceptual framework derived from the research variables. The dependent variable is motorcycle incidents, while independent variables are sociodemographic, helmet use, road regulation and human characteristics
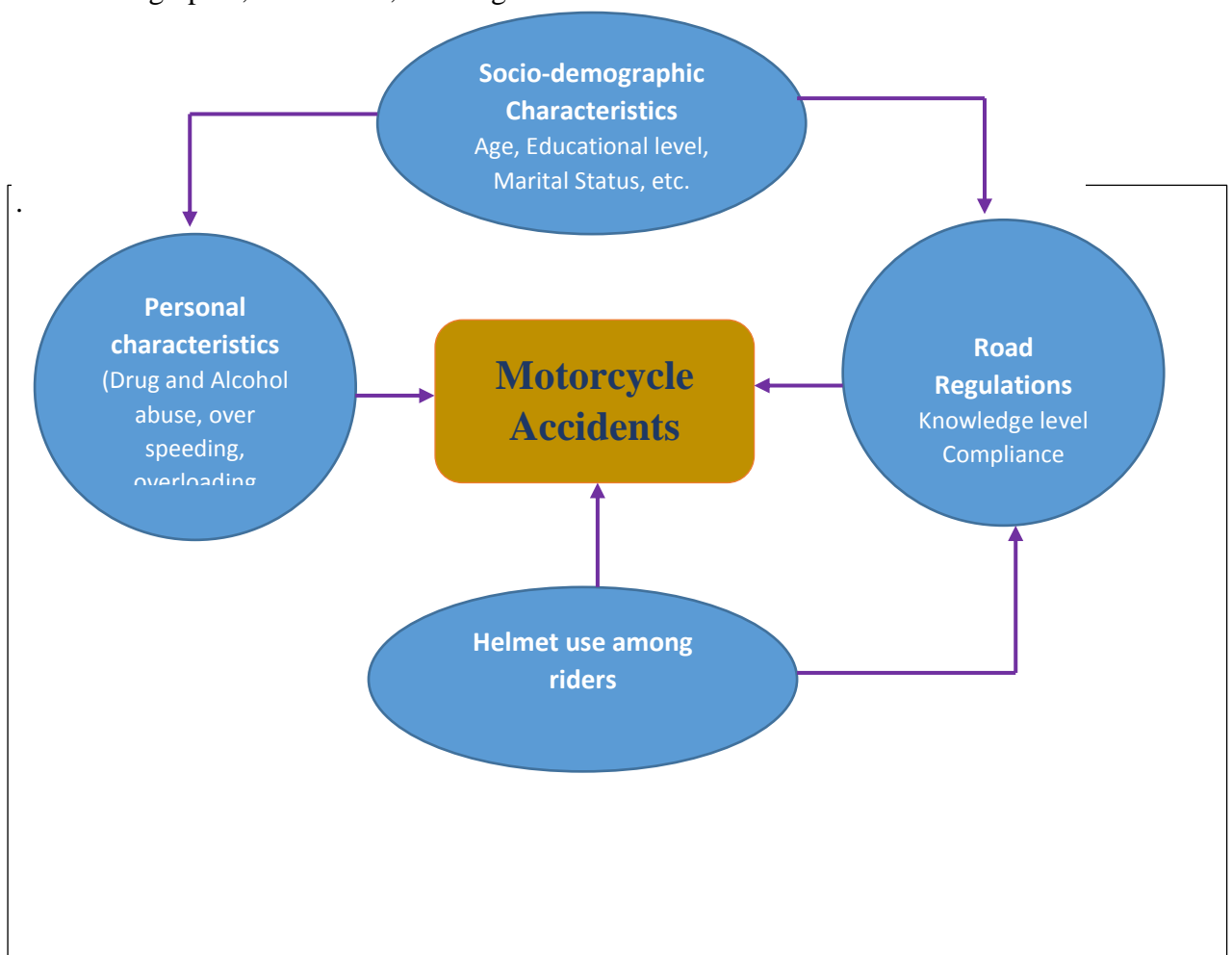
Figure 1 Conceptual Framework

Source: *Author's Construct*

1.4 Research Questions

1. What knowledge do motorcyclists have on-road regulations?

2. What are the contributing factors to a motorcycle accident?

3. How does socio-demographic characteristics influence road traffic accident among motorcyclists?

1.5 General Objectives

This study aimed mainly at analyzing the factors that led to an increase in the number of motorcycle accident cases reported to Korle-Bu Teaching. Hospital accident and emergency department in Accra, Ghana.

1.6 Specific Objectives

1. To assess the knowledge on-road regulations among motorcyclists.

2. To identify the factors contributing to motorcycle accidents.

3. To determine the association between socio-demographic characteristics and motorcycle accidents.

4. To assess helmet use among motorcyclist.

1.7 Profile of Study Area

In the Greater Accra region, Korle-Bu Teaching Hospital (KBTH) is the leading health facility in Ghana. It was the only public tertiary hospital in the south until Ho and Cape Coast Teaching Hospitals were founded. The Korle Bu, meaning Korle Lagoon valley, was founded on 9 October 1923, to address the health needs of indigenous people under the administration of the then Gold Coast governor during the colonial regime, Sir Gordon Guggisberg. In Korle-Bu, growth in population and proven effectiveness in hospital-based therapy led to an increase in patient enrollment. By 1953 the demand for services in the facility had so grown that the government was

forced to create a task force to examine the situation and make proposals to improve the hospital. The Government accepted and implemented the task force's recommendations, culminating in the building of new facilities such as the Blocks for Motherhood, Dental, Surgical, and Child Health. In 1962, when the University of Ghana Medical School (UGMS) was established to train medical doctors, Korle-Bu received the doctrinal rank of a pupil. There are currently two thousand beds and 17 diagnostic and clinical services in the hospital. There are 1,500 patients with about 250 admissions per day on average. The clinical and diagnostic hospital departments comprise pharmacy, child health, obstetrics and gynaecology, anatomy, radiology laboratory care, anaesthesia, surgery, polyclinics, accident and emergency medications and pharmacies. EOLBREAK Besides, Pharmacy, Finance, Engineering, General Administration, are branches. The Accident Centre in the Trauma Emergency Unit sees an average of 30 new trauma cases per day, including children with a yearly visitation of about 10,800. The unit sees all forms of trauma with motor or vehicle-related cases forming the majority of cases.

1.8 Scope of the Study

The leading cause of disability mortality and the 10th highest worldwide cause of death is road accidents. A major category of road traffic accidents were collisions involving motorbikes. The use of motorcycles for commercial purposes in the country has increased particularly in the Greater Accra region. This study is to help assess the factors that contribute to increased motorcycle accidents on our roads. Knowing these factors and managing them will help reduce the number of motorcycle accident cases in our hospitals.

1.9 Organization of Report

The analysis consists of six main chapters. Chapter One covers the introduction, context of the study, problem statement, study reasoning, conceptual framework, questions on analysis, general objectives and specific objectives, study area description and study scope. Chapter Two is a literature review that illustrates some of the work done on a similar topic by other academics. Chapter Three discusses methods and designs for study, data collection and data collection techniques, the population of studies, variables of studies, screening, pre-testing, handling of data, analyses of data, ethical considerations, and limits. The results of data analysis and background information are presented in Chapter Four. The results and consequences are discussed in Chapter Five, while the summary, findings and recommendations are provided by Chapter Six.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter covers the work of other scholars on motorcycle accidents worldwide. The literature review focuses on the following items: an overview of road traffic accidents, demographics of motorcycle users, knowledge of road traffic regulations for motorcyclists and the use of alcohol and drug abuse among motorcycle users.

2.2 Overview of Road Traffic Accidents

The traffic safety community became involved in the extent of the collision because of its direct impact on the passengers. Road injuries in 2016 culminated over 1,4 million deaths according to the World Health Organization (WHO), approximately three - quarters (74 per cent) of which were men and boys. Road accident is the world's eighth leading cause of death. In 2019, a road accident took 2 2 84 lives, up from 2 1020 reported deaths in 2018 and the highest recorded in the last decade (NRSC, 2019). The highest road deaths occurred in Greater Accra, 449 deaths in 2019, led by Ashanti, 448 fatalities and South, 349 deaths. 4,643 motorcycle accidents took truck, wagon, tricycle and motorcycle into account. The accidents resulted in 723 fatalities and 4474 casualties. In many countries motorcycle use is becoming a major transport; it is a highly risky means of transport (Nunn 2011). This is because motorcycles do not have protections to secure the whole driver and passenger body (Albalate & Villadangos, 2010). Motorcycles are the second largest number of vehicles in Brazil, but they are responsible for many deaths. Motorcycles account for approximately 19 per cent of all Singapore vehicles, but 36 per cent of all road traffic accidents are blamed for Singapore (Haquea et al. 2008). Motorcycles make up less than 1% of Great Britain's vehicles, but drivers suffer severe accidents and 14% of all

road deaths (Clarke et al. 2007). The major cause of death and illness-related deaths–was automobile crashes (MacLeod et al. 2010). Various studies have tried to identify individual factors (sex, age, permission), actions (over velocity, overtaking, and consumption of alcohol), geophysical (road structure) and situational (impact object) can be linked to the motorcyclist's greater engagement in road crashes (Nunn 2011; Savolainen et al. , 2007; Haque et al. , 2008; Oluwadiyaa et al., 2009). 2009. A recent study by the Kenya National Transport Safety Authority (NTSA, 2017) reported that there were 274,865 motorcycles registered in the country between 2015 and February 2017. The same study shows that, in the past two years alone, there have been 1399 deaths, 1956 severe injuries and 634 moderate injuries caused by the motorcycle taxi (Bodaboda). In Brazil, bikes are also used by buses, motorcyclists and delivery men as a working tool. Such a trip is less disruptive than other tourists and accessible to income-locomotive consumers (Cavalcanti et al., 2011). The main public problem for road safety has now become that mainstream TV news and newspapers provide daily first-page coverage in the country. The National Road Safety Commission (NRSC), fortunately, both the government and the donor community were responding quickly and increased funding to enable NRSC to develop and implement new road safety measures. Relative to 2005, the last year for which figures remain, the number of road accidents has increased by 16 per cent. Ashanti, Central, Greater Regions. (National Road Safety Commission, 2011). The areas of Accra, Central and Brong Ahafo account for over 70 % of the total number of crash deaths. The most prone roadway users between the ages of 16 and 45 are responsible for 58 per cent of the total road accident fatalities. Denida is a leading contributor to Ghana's public road safety activities. Danish international development assistance (Danida). Danish international development assistance. Although the injury fatality has increased, the rate of accidents has remained stable over the last six years. Statistics should be considered carefully since underreporting (including the failure of both, because not all traffic crashes are reported as a result of insufficient police file crashes), affects the quality of the national data collection. EOLBREAK This study looked at factors contributing to an

increasing number of motorcycle crashes on our roads. The literature reviewed reports on road safety and road accident causes.

2.3 Association between socio-demographic characteristics and motorcycle accidents

Socio-demographic factors in the general population are known to contribute to traffic injuries. More than 90% of road deaths in low and middle-income countries are, according to the World Health Organization (2020). The largest death rates occur in the African region. Many studies have demonstrated that the low socio-economic status of the victim, regional and national traffic injuries. People from lower socio-economic backgrounds, like high - income countries, are more likely to become involved in road accidents. The main causes of death for children and young adults aged 5-29 years of age are road traffically accidents. Males are more likely than females to die in road crashes. The rate of pedestrian-engine collisions is correlated with urban factors and residential density in King County, Washington, United States (Stein, 2015). A report from the Netherlands has shown that increased income, reduced traffic density and greater availability of medical facilities are associated significantly with lower overall traffic mortality (Van, 2019). Different aspects of health and social insecurity of older road users can substantially raise their risk of transport accidents as compared to other age groups. A study by (Patil, et al., 2019) observed that out of 300 road traffic accidents cases studied; there were 253 (84.33%) males and 47 (15.67%) females. A male to female ratio of 5.38:1 was observed with maximum accident cases, i.e. 81 (31.02%) male and 8 (17.02%) females in the age group of 21-30 years. Many people from the poor socio-economic background like taking risks because they do not have much to lose and have the desire to get out of their poverty. In Kenya, unemployment is a serious crisis not only in some parts of the

country but the whole of Kenya (Ombonya, et al., 2013). Most of the youth have been rendered jobless after completing college because white-collar jobs are scarce; some are jobless because they could not gather money for further education due to poverty. They focus on motorcycle operation to gather money for their basics needs. In general populations, alcohol users are an important risk factor in road traffic deaths. Research has shown that this weakness is also significant to elderly road users. An observational study from Italy found that in the general population the percentage of drivers with alcohol impairments is associated with higher traffic mortality rates. In the general population and for the older people who use the highways alcohol is a risk factor for traffic injuries (McMillen 2013). No studies have examined the connection between socio - demographical factors and traffic injuries among elderly people in Japan, although the population ages at the highest rate in the world— more than 20% in 2010. Ironically, the road death in Japan is a small mortality rate, but within highly industrialized countries one of the highest morbidity rates. In 2008, the death rate on traffic was 4.7 per 100,000 people (in the most industrialized countries: 4.3-14.4 per 100,000), but it was 744 per 100,000 (Ross, 2017) in the highest industrialized countries. In contrast, in comparison to other countries, the percentage of pedestrian fatalities is small. The annual number of fatalities for pedestrians in Japan exceeds 2500, or 30 % of the total number of fatalities in traffic; fetal mortality accounts for around 13 per cent of all traffic mortality in other high - income countries including the United States. The number of traffic injuries among the 65- and older population has increased by half (Ross 2017). The number of injuries caused by the age group is increasing. EOLBREAK This trend stresses the need for a better understanding of the factors related to traffic injury, particularly if those relationships differ from the general population for elderly road users. Public health research identifies three factors of risk control: the climate, worker, and host. Each has received substantial analyses of these causes for efforts to reduce impaired driving in the United States, which has contributed to a

dramatic reduction in fatal accidents between 1982 and 1995 (NHTSA, 2009), although these measures have taken the positive trend down to the level of.

2.4 Knowledge of motorcyclists on-road regulations

The impact of RTAs on the lives of people can quickly be reduced by simple actions such as awareness and practice of public protection measures. Road safety tackles road accidents exclusively –how their amount which results become high. Road safety seeks to reduce the harm caused by road crashes and transmit information to road users so that they are more aware of the safety concerns of road transport and have an impact on their behaviour and brace them for future safety measures. road safety Public safety-trained students will develop into community leaders who form opinions. If these young people, who will be grown-ups for tomorrow, are aware of road safety measures, chances of road accidents can be greatest averted. Adolescence is a phase between childhood and adulthood, where a teenager becomes more experienced. Of 372 participants 196 (52.8%) were sufficiently well know and 176 (47.2%) were poor knowledge of road safety rules and regulations. Research by Ranjan, et al. (2010) Under the Motor Vehicle Act (MVA), (Canada, 1996), 18 years were the limit for a proper driving licence. 99.1 per cent of the participants recognized this. The average driving violation without a valid driver's license was only 57.8% identified. 97.8 per cent and 99.4 per cent of participants knew it was necessary to wear a seat belt on a moving car and use a helmet on two-wheeled journeys respectively. Around 55,4% of participants knew that 40 km / h is the normal city driving speed limit, and only 25,3% realized the permissible Indian driving blood limit was < 40 mg/dl. These eight(8) road signs were identified to only 8 participants. A hundred and sixty-two participants (43.6 per cent) could not interpret any of the 8 road signs. About 33.8% of participants had proper traffic lighting awareness (Fombad, 2019).

2.5 Analyze the use of helmet among riders.

The lack of use of the helmet was linked to the notion that use increases the risk of injury, not decreases, by reducing the field of view and causing discomfort among other problems. (Germany, 2005). Certain explanations not to wear helmets include the belief that the helmet is essential for the drivers of high - speed vehicles that are not necessary for motorcycles and scooters, the inconvenience of holding the cask as it could be stolen if left on the car and the inconvenience of removing it from the vehicle to make calls on handheld mobiles when driving another factor related to helmet use was the nature of the weather. It has also been reported that the use of helms is more frequent during the day rather than at night and weekends (Dandona, 2005). A Turkson report (2013) shows that most motorcyclists carry passengers. Do not carry a crash helmet. Do not wear a crash helmet. The young people aged 16-35 are the majority of the riders who knew that the helmet protects from the head injury, but usually, wear it to get the police on-site and in certain cases to avoid being fined. The study showed that motorcyclists in Ghana were using very low crash casks and needed the training to eliminate certain perceptions that prevent them from using them. Several studies have reported that the helmet is successful for head injury safety (Chang & Yeh, 2006; Hung, Stevenson & Ivers, 2008; Julian et al., 2002; Brown et al., 2009; Lin et al., 2003). A study conducted by 90 motorcyclists studying in the Municipality of Wa found that shielding the head from danger and the eyes against foreign materials are the only motivating factor in the use of a helmet. The study showed that of the 68 men surveyed at three tertiary institutions, 41 (60.3%) were helmet users, while 27 (39.3%) were helmet consumers. The study indicated that 8(36,4%) are female respondents and 14(63,6%) are non-helmet users (Musah, Marfo and Akpade, (2018). The use of accident casks reduces the risk of motorcycle mortality and head injury (WHO, 2006). In a study done in the USA, the use of cask

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has been found to reduce the risk of mortality by 34% (Dee, 2009). One of the five high - risk factors for road safety has been listed by the WHO as the wrong or unusable motorcycle crash helmet. The influence on death can be due to other causes that accompany the crash, such as the pace at which the motorcyclist rode in the crash. Higher - speed accidents can lead to multiple fatalities, regardless of how well the head is covered (WHO, 2006). The risk of head and traumatic brain injuries, or both, is much greater among motorcyclists who are not wearing a helmet. Helmets provide additional head protection and protect the person against some of the more severe forms of traumatic brain injury. While helmets are secure and have a traumatic brain injury (WHO, 2006), small casks in the middle and low - income countries are commonly observed (Oluwadiya et al., 2004). And make matters worse, despite the low cask usage, casks are not properly borne by attaching the chin strap (Li et al., 2008). The more likely the helmet user is to be older drivers (Hung et al., 2006; Kulanthayan, et al. , 2010. The difference in the use of cascades among different age groups is found in a study by Ackaah and Afukaar (2010) in Ghana. Elderly people (> 50 years of age) were the strongest in the helmet, led by teenagers (26-50 years of age) and young people(< 26). To find innovative ways to ensure crash helmet use is a much healthier tool for shielding the head to minimize the mortality incidence and severity of motorcyclist non - deadly head injuries.

2.6 Factors that contribute to motorcycle accidents

Traffic accidents are well known to be of major importance for the global public health system. Also, the mortality rates of road accidents are quite high in low in-coming countries like Ghana in comparison with other countries in this region. Media reports reveal that in comparison with other developing countries the road accidents are very high in Ghana. In 2001, Ghana was ranked second highest in six Western

African states with 73 deaths per 1000 accidents (Sarpong 2011). The highest number of accidents was Ghana. Road accidents are having a big impact, particularly in a developing world like Ghana on the economy of any nation. Statistics from the National Road Safety Commission indicate that, apart from the loss of life in road accidents, Ghana loses around 1.7% of its Gross Domestic Product, more than $230 million annually (Ghana News Agency, 2010). Many are still reckless and disregard the risk of driving and there is little scope for commuters to take precautions. Today, cell phones are the most widely-talked and serious cause of accidents in Ghana. Speeding is another explanation for road accidents. Engines that go above or below speed limits on the road could hit other cars and they could also be damaged. Statistics indicate that approximately 30% of road accidents are caused by speed (Akongbota, 2011). Therefore, driving in toxic conditions can cause fatal road accidents. Drugs and alcohol may affect the ability to conduct yourself. The brain and control of the nervous systems are usually affected. Tired or exhausted drivers are usually sleepy, agitated and aggressive on the road. Tiredness will impair your clear thinking if you have a wreck on the bridge, and it could lead to an accident. Some drivers disregard the rules for road travel because they worry more than how they arrive, in particular during the holidays. After all, there are always many passengers and they want to travel as many times as possible to benefit from the growing number of passengers. Such vehicles will break the rules and laws of the road just to get there. This would certainly lead to serious accidents on the road. As accidents are caused by different factors, it is always possible to take preventive action or action to prevent them. This chapter summarizes the worldwide overview of road accidents. Socio-demographic features and motorcyclist's knowledge of road legislation. Even studied

was the use of helmet by the motorbiker in Greater Accra. Furthermore, risk factors contributing to motorcycle deaths and injuries have been examined.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Introduction

According to Bhattacharyya (2004) and Kothari (2009), the research method is a systematic and scientific way to solve research problems. This chapter focuses on the procedure or methods to undertake the study. It involves the research methods and design, study population, study variables, sampling technique, data collection technique and tools, data handling and data analysis.

3.2 Research Methods and Design

The study adopted a cross-sectional descriptive study approach to the collection of quantitative data to study the factors that affect high-motion accidents. The most suitable descriptive research design is when the study aims to provide a detailed description of the problem.

3.3 Data Collection Technique and Tools

This study used primary data collection approach, involving the use of a structured questionnaire. This instrument was developed based on the research literature review and the research objectives. Participants were given a well-structured survey consisting of closed questions to obtain information that they knew in English or a local language. A questionnaire was used to collect data from the respondents because it is an appropriate tool that allowed the respondent to give a self-report at free will. The questionnaire was divided into four (4) sub-sections:

    I.   **Section A**: Socio-demographic aspects such as age, marital status, history, profession, and religious affiliation.Socio-demographic aspects such as age, marital status, history, profession, and religious affiliation.Socio-

demographic aspects such as age, marital status, history, profession, and religious affiliation.

II. **Section B**: Road regulations such as knowledge level and compliance

III. **Section C**: Personal characteristics such as drug and alcohol abuse, over speeding and overloading.

IV. **Section D**: Riding skills on motorcycle accidents such as driving license, helmet use, experience and refresher courses.

3.4 Study Population

A population is a group of people or objects with similar observable characteristics. The study population involved all patients aged 18 years and above who were engaged in motorcycle-related accidents and presented to the accident and emergency unit of the KBTH. All patients who were conscious from the time of accident until the time of discharge were sampled. All minors were excluded from the study.

3.5 Study Variables

Two categories of variables were used in this study, the independent and dependent variables.

3.4.1 Dependent Variable

Motorcycle accident

3.4.2 Independent Variables

1. Socio-demographic characteristics

2. Personal characteristics

3. Riding skills of motorcyclist

4. Road regulation

Table 3.1: Variables operational definition

Variable	Operational definition	Type of variable	Scale of measurement
Motorcycle accidents	Accidents cases at the emergency unit involving a motorcyclist	dependent	Nominal
Socio-demographic characteristics	-age -gender -educational level -religion occupation	Independent	Nominal
Road regulation	-knowledge level -compliance	Independent	Ordinal
Personal characteristics	-drug and alcohol abuse -over speeding -overloading	independent	Ordinal
Riding skills of motorcyclist	-Driving license -experience -refresher courses -helmet use	independent	Nominal

3.5 Sampling Technique

Convenience sampling technique was used in this study. Respondents who were available at the time of data collection and showed a willingness to participate in this study were recruited. Data were gathered through the administration of the questionnaire to 200 respondents.

3.6 Sample size

Sampling procedures are based on a method that selects a certain number of respondents from a defined population-representative (Orodho, 2004). Various approaches are used to assess sample size like a small survey, to mimic the sample size of similar studies, to use published tables and to measure sample size formulas (Israel, 2009). (Israel, 2009). Besides, the time and resources required for determining the sample size to be used for analysis should be taken into consideration. The principal function of the sample is to enable the researcher to carry out the study on individuals from within the country to apply the results of the study to the whole population. The sample size has been calculated using the following Cochran formula;

$$n = \frac{Z^2 \times pq}{e^2}$$

Where,

n = sample size (Cochran, 1977)

Z = the z-score that corresponds with a 95% confidence interval which is 1.96

p = reported proportion of motorcycle accident cases which is 37% (Luther, 2019)

q = Proportion of accident cases which are not due to motorcycle = 0.63

e = Margin of error set at 7% (0.07)

Therefore,

$$n = \frac{(1.96)^2 \times (0.37) \times (0.63)}{(0.07)^2} \cong 182.75$$

A non-response rate of 10 %, resulting in about 18 respondents was added to the minimum sample size to get 200 participants.

3.7 Pre-testing

Pre-testing is where a questionnaire is tried on a small sample of respondents before a full-scale study**.** The questionnaires were pre-examined to determine whether questions and instructions were obvious to respondents and if they knew what was expected. Depending on the sample scale, a pre-test sample must be between 1 per cent and 10% (Mugenda and Mugenda 2003). The researcher pre-tested the questionnaire on ten respondents who met the study criteria set by the Regional Hospital of Greater Accra. All problems during the pre-testing had been corrected before the final collection of data

3.8 Data Handling

A self-administered data collection was used to gather the required data needed. All data collected were protected against inappropriate use or accidental loss or destruction. Data was strictly locked on a secure laptop.

3.9 Data Analysis

The questionnaire was self-administered to respondents to fill out their responses to the questions. Among other methods of data collection, the technique was chosen because it requires less time and effort for management. The data collected were entered using Microsoft Excel and analyzed using the STATA statistical software package (*StataCorp.2007 Stata Statistical software. Release 14. StataCorp LP, College Station, TX, USA*). All analyses were done using STATA.

3.10 Ethical Considerations

It refers to the standard of behaviour and procedures while their study should be practised. Research calls for knowledge and persistence, integrity and completeness. This is to respect and safeguard the rights of respondents. To order to make the study legal, privacy rights must be respected, anonymity, self-determination and informed consent. The researcher explained the purpose of the study to the respondents and assured that all details they provided remained confidential. A unique study number to lieu of their names was given to questionnaires and informed consent documents to protect the privacy of respondents and only conveyed to the research team in this report. Ethical approval has been received from the Ethics Review Board of the Ensign School of Public Health. Participants were advised of their right to freely consent or refuse to participate and to withdraw their participation at any time without penalty. After explaining the purpose and function of the study, all respondents received equal treatment.

3.11 Limitations of Study

This research may not reflect all the factors influencing motorcycle accident cases because it was conducted in only one hospital. One of the significant challenges in collecting data from some respondents had to do with a refusal to take part in the study and the reason being that the study can be used to stop the use of motorbikes in the country.

3.12 Assumptions

The primary assumption made in the study was that the respondents were honest and truthful in answering the questionnaire. Also, that all respondents understood the questions posed.

CHAPTER FOUR

4:0 RESULTS

4:1 Introduction

The results chapter summaries the data collected from 200 motorbike victims who had various degrees of injuries and were attended to at Korle-Bu Teaching Hospital (KBTH). The analysis of the section focused on the respondents' demographic information, the law governing motor ridding, sources of information and perceived risk factors associated with motor riding.

4: 2 Demographic information

The study had 200 respondents who after seeking their consent responded to the survey., Most of the respondents who were involved in a motor accident fell within the age bracket of 18-24 years 66(33%), followed by 31-34 years 48(24%). Those in the older age groupings accounted for less of the reported cases of accidents reporting to the Accident Unit at KBTH. Those in Junior High School (33.0%) formed the majority among the accident victims. This was followed by Senior High School graduates (32.5%). The least (8.5%) had no formal education.

Regarding the gender distribution of the study participants, the majority were males (99.0%) while two females representing one per cent (1%) were also involved in fatal motor accidents. The singles (56.5%) accounted for the majority concerning marital status, while only 4% accounted for those divorced. The majority of the victims were Christians (68.5%) followed by Islam (30.5%), while those in the "Other" category accounted for only 1.0%. About 85% had various livelihood activities ranging from artisanship (33.5%) to petty trading. Meanwhile, (7.5%) were unemployed while students also accounted for 7. 5percent. Those who ride motors as their main livelihood accounted for 24.5% of the accident victims (see Table 4: 1)

Table 4: 1 Demographics of the respondents

Age	Freq. (N=200)	Per cent (%)
18-24	66	33
26-29	38	19
31-34	48	24
36-39	18	9
41-44	4	2
46-49	20	10
>50	6	3
Education		
JHS	66	33
Primary	19	9.5
SHS	65	32.5
Tertiary	33	16.5
None	17	8.5
Gender		
Female	2	1.0
Male	198	99.0
Marital		
Divorced	8	4,0
Married	79	39.5
Single	113	56.5
Religion		
Christian	137	68.5

Islamic	61	30.5
Others	2	1.0
Occupation		
Artisan	67	33.5
Motor Rider	49	24.5
Office Worker	31	15.5
Trader	23	11.5
Unemployed	15	7.5
Student	15	7.5

Source: *Field Data, 2020*

4:3 Background Information of the Motor Riders

Regarding the riders' experience on motor riding (in years), the majority (84.5%) had 15 years and below riding experience. Six of the respondents had as long as over 26 years of riding experience, which accounted for (3.0%). Again, 40% had no rider's license, and those who had an invalid license (27.0%) (expired) had not renewed their license at the time of responding to the survey. Upon close observation, 33% had a valid riding license. The majority (47.5%) of the respondents were enrolled in the National Health Insurance Scheme (NHIS) but had not renewed their membership while 21.0% of them had not enrolled in the scheme.

Most of the accidents reported at the Accident Unit occurred during the night (52.0%). The death rate of the victims accounted for 2.5%, while 30.5% fell within the critically injured category. The majority, (67.0%) sustained slight injuries. About 56.5% were in a crashed helmet before the accident occurred. The majority (54.5%)

of the accident victims were rightful owners of the motorbikes (ownership). (*see*

Table 4:2*)*

Table 4:2 Background Information of the Motor Riders

Duration for bike riding	Freq. (N=200)	Percent (%)
16-20	21	10.5
21-25	4	2.0
<15	169	84.5
>26	6	3.0
License Status		
Invalid	54	27.0
None	80	40.0
Valid	66	33.0
NHIS Status		
Active	63	31.5
Inactive	95	47.5
Never Enrolled	42	21.0
Time of Accident		
Day	96	48.0
Night	104	52.0
Outcome of Accident		
Critical Injury	61	30.5
Dead	5	2.5
Slight Injury	134	67.0
Helmet Usage		

No	87	43.5
Yes	113	56.5
Owner of the motorbike		
No	91	45.5
Yes	109	54.5

4:4 Section B: Knowledge of cyclist on-road regulations

From *Table 4:3*, the majority of 156(78.05%) of the respondents had heard of road regulations. Out of the 156 who had heard of road regulation on motor riding, workshops attendance accounted for the least (7.67%). However, those who attributed their source of information on motor riding to "*Other sources*" represented the majority. The respondents were assessed on various road signs. These were categorized as follows;

- **A**-Prohibitory Signs
- **B** -Mandatory Signs
- **C** -Informatory Signs and
- **D**- Breakdowns and Accident Signs.

The riders were more familiar with the Prohibitory, Mandatory, and Informatory signs with a few of them having some knowledge on the Breakdown signs. Even though the respondents claimed they knew the Prohibiting signs, upon further assessment, the majority could not remember the signs or responded as "I don't know" (65.0%).

Table 4:3 Regulatory information

Have you ever heard about road regulations	Freq. (200)	Per cent (%)
No	44	22.00
Yes	156	78.00
Which source provided you with the information	**(N=156)**	
Seminars	36	23.08
Television	28	17.95
Workshop	12	7.69
Others	80	51.28
What of the following are part of the road regulation signs		
A	2	1.0
AB	8	4.0
ABC	27	13.5
ABCD	34	17,0
AC	1	0.5
ACD	2	1.0
AD	1	0.5
B	3	1.5
C	5	2.5
CD	3	1.5
D	2	1.0
I don't know	112	56.0

Which of the following is a prohibitory sign?

A	12	6.0
AB	16	8.0
ABC	18	9.0
AC	13	6.5
B	6	3.0
BC	2	1.0
C	3	1.5
I don't know	130	65.0

Which of the following forms part of a mandatory sign?

A	19	9.5
AB	14	7
ABC	16	8
AC	10	5
BC	2	1
C	5	2.5
I don't know	134	67

4:5 Section C: Perceived factors contributing to motorcycle Accident

The perceived factors that may play a role in a motor accident were critically assessed using Likert scales. The majority of the respondents disagreed (58.0%) that motor accidents occurred as the result of the riders being inexperienced. In contrast, (14.5%) believed that some riders are inexperienced and that may contribute to a motorcycle accident.

Responding to dazzling lights on the riders as a contributing factor, the majority (74.5%) disagreed about this assertion, while 20.5% also strongly disagreed.

However, only 29 (2.0%) agreed with the assertion. About 53% disagreed obstruction on the part of the riders could contribute to a motor accident. Only a handful agreed (19.0 %) that, the obstruction could lead to road accident during riding.

About 46(23.0%) thought that excessive speeding is one of the major causes of a motor accident. Defective lights assessment obtained a rating of 10(5.0%). The respondents (5.0%) expressed that defective light was a risk factor of a motor accident. Pedestrians on the roads accounted for 15.5% of motor accidents, according to the respondents. The respondents, on the other hand, thought that apart from the variables mentioned above, mechanical fault (3.0%), improper overtaking (5.5%), the use of alcohol (21.0%) during riding also account for motor accidents. Negligence by the motor riders on our roads have accounted for (11.0%) of road accidents.

Table 4:4 Motor accident contributory factor

Inexperience on the side of the rider	Freq(200)	Percent(%)
Agree	29	14.5
Disagree	116	58.0
None	3	1.5
Strongly Agree	8	4.0
Strongly Disagree	44	22.0
Dazzling lights		
Agree	4	2.0
Disagree	149	74.5
None	4	2.0
Strongly Agree	1	0.5
Strongly Disagree	41	20.5
Obstruction		
Agree	38	19.0
Disagree	106	53.0
None	3	1.5
Strongly Agree	16	8.0
Strongly Disagree	37	18.5
Excessive speeding		
Agree	46	23.0
Disagree	85	42.5
None	6	3.0

Strongly Agree	18	9.0
Strongly Disagree	45	22.5

Defective lights

Agree	10	5.0
Disagree	134	67.0
None	1	0.5
Strongly Agree	4	2.0
Strongly Disagree	51	25.5

Pedestrians

Agree	31	15.5
Disagree	94	47
None	5	2.5
Strongly Agree	15	7.5
Strongly Disagree	55	27.5

Mechanical defects

Agree	6	3.0
Disagree	128	64.0
None	3	1.5
Strongly Agree	3	1.5
Strongly Disagree	60	30.0

Negligence by the motor

rider

Agree	22	11.0
Disagree	106	53.0
None	6	3.0

Strongly Agree	6	3.0
Strongly Disagree	60	30.0

Improper overtaking

Agree	11	5.5
Disagree	125	62.5
None	1	0.5
Strongly Agree	3	1.5
Strongly Disagree	60	30

Level erosions

Agree	16	8.0
Disagree	126	63.0
None	2	1.0
Strongly Disagree	56	28.0

Poor roads

Agree	16	8.0
Disagree	127	63.5
None	1	0.5
Strongly Agree	2	1.0
Strongly Disagree	54	27.0

Overloading

Agree	8	4
Disagree	123	61.5
None	1	0.5
Strongly Agree	2	1
Strongly Disagree	66	33

Confusion

Agree	31	15.58
Disagree	121	60.8
None	2	1.01
Strongly Agree	3	1.51
Strongly Disagree	42	21.11

Talking of alcohol or other substances

Agree	42	21
Disagree	99	49.5
None	1	0.5
Strongly Agree	8	4
Strongly Disagree	50	25

Does not know road signs

Agree	60	30
Disagree	100	50
None	9	4.5
Strongly Agree	3	1.5
Strongly Disagree	28	14

4:6 BIVARIATE ANALYSIS OF DEMOGRAPHIC INFORMATION AND USAGE OF HELMET

Demographic information associated with helmet usage was analyzed using Pearson's Chi-Square test at 95% Confidence interval (CI). After critical analysis of the data, it was realized that variables such as Victim's age ($p = 0.001$), Marital Status ($p = 0.001$), Educational level ($p = 0.035$) and Occupation ($p = 0.002$) were statistically

associated with helmet usage during riding. Meanwhile the respondent's gender (p = 0.852) and Religion (p = 0.544) showed no association with helmet usage. *(Table 4:5)*

Table 4:5 Association between demographic information and helmet usage

Age	Helmet Usage		p-value
	No	Yes	
18-25	40 (60.61)	26(39.39%	
26-30	14(36.84)	24(63.16)	
31-35	24(50.0)	24(50.0)	
36-40	3 (16.67)	15(83.33)	**0.001**
41-45	0 (0.))	4(100.0)	
46-50	4 (20.0)	16(80.0)	
>51	2(33.33)	4(66.67)	
Marital Status			
Divorced	5(62.5)	3 (37.5)	
Married	22 (27.85)	57 (72.15)	**0.001**
Single	60 (53.1)	53 (46.9)	
Sex			
Female	1 (50.0)	1 (50.0)	**0.852**
Male	86 (43.43)	112 (56.57)	
Education			
Junior High School	28 (42.42)	38 (57.58)	
Primary	13 9(68.42)	6 (31.58)	**0.035**
Senior High School	31(47.69)	34 (52.37)	
Tertiary	8 (24.24)	25 (75.76)	

None	7 (41.18)	10 (58.82)	
Religion			
Christian	56 (40.88)	81 (59.12)	
Islamic	30 (49.18)	31 (50.82)	0.544
Others	1 (50.0)	1 (50.0)	
Occupation			
Artisan	25 (37.31)	42 (62.69)	
Office Worker	8 (25.81)	23 (74.19)	
Motor rider	20 (40.82)	29 (59.18)	0.002
Trader	11 (47.83)	12 (52.17)	
Unemployed	11(73.33)	4(26.67)	
Student	12(80.00)	3(20.00)	

Pearson Chi-Square analysis

4:7 ASSOCIATIONS BETWEEN VICTIM'S DEMOGRAPHY INFORMATION AND ROAD REGULATIONS

Bivariate analysis was conducted on whether the victim's demography is associated with the respondents' knowledge level on road regulations. As seen in the above analysis, the same result was seen in this section of the analysis. The victims' Age (p= 0.173), Marital Status (p=0.286), Sex (p=0.450) were not statistically associated with road regulations however, their Education(p=**<0.001),** Religion (**<0.001) and** occupation had a strong statistical association with road regulations (Table 4:6).

Table 4:6 Associations between victim's demography data and road regulations

Age	Road Regulations		Pr.-Value
	No	Yes	
18-25	18-25	21 (31.82)	
26-30	26-30	8 (21.05)	
31-35	31-35	7(14.58)	
36-40	36-40	2(11.11	**0.173**
41-45	41-45	2(50.0)	
46-50	46-50	3(15.00)	
>51	>51	1(16.67)	
Marital Status			
Divorced	0(0.00)	8(100.00)	
Married	17(21.52)	62(78.48)	**0.286**
Single	27(23.89)	86(76.11)	
Sex			
Female	0(0.00)	2(100.00)	**0.450**
Male	44(22.22)	154(77.78)	
Education			
Junior High School	21(31.82)	45(68.18)	
Primary	10(31.82)	9(31.82)	
Senior High School	3(4.62)	62(95,38)	**<0.001**
Tertiary	0(0.00)	33(100.00)	
None	10(22.00)	7(78.00)	
Religion			**<0.001**

Christian	44(32.12)	83(67.88)	
Islamic	0(0.00)	61(100.00)	
Others	44(22.0)	156(78.0)	
Occupation			
Artisan	15(22.39)	52(77.61)	
Office Worker	0(0.00)	31(100.00)	
Motor rider	18(36.73)	31(63.27)	**0.007**
Trader	5(21.74)	18(78.26)	
Unemployed	4(26.67)	11(73.33)	
Student	2(13.33)	13(86.67)	

Pearson chi2 analysis

CHAPTER FIVE

5.0 DISCUSSION

5.1 Introduction

The study assessed factors contributing to the high incidence of motorcycle accidents presenting to the Korle-Bu teaching hospital. The most common means of transport in the Greater Accra are motorcycles. The law requires such motorcycles to be licensed and drivers to comply with road traffic regulations.

5.2 Demographic information of the victims

From the study, it was realized that 33% of the victims were within the age bracket of 18 to 24years with most of them having completed Junior High School. The most affected victims were single males, of which the majority were Christians. The victims were artisans by profession while some were motor riders. This means they earn their living from riding motorcycles. Begg (2010), in his study, noted that motor victims in New Zealand who reported at health facilities with multiple injuries were mainly males with lower educational background. In a study by Braddock, (2015), he reported that most victims of the motor accidents were less educated hence, the state should play a role in assisting them with road signs. In Nigeria Okeniyi, (2005) noted that most victims were of Islamic (79%) background and with low levels of education – primary/ Junior High (68%) and the majority of them were not married (56%).

The data presented in this study depict that most of the respondents (99.0%) were males in their reproductive (18-24) years which is consistent with Sowa (2013), who revealed that about 99% of motorcyclists were men and also Chalya (2010), who found out that over two-thirds (69.5%) of the patients were males (Male: Female ratio = 2.3:1). Adisa (2010) and Nakahara et al., (2005) however found in other studies

that, motorcyclists were more dominated by males than their female counterparts. Also, Ngim and Udosen, (2007); Chang and Yeh, (2007); Yannis, et al., (2005); and Horswill and Helman (2003) confirm that age of motorcycle riders was a determinant factor responsible for the causes of accidents.

This research revealed 68.5% of the motorcyclists were Christians; this is not consistent with findings of Sowa (2013) who researched 'Road safety practices of commercial motorcyclists in Accra where a total of 273 motorcyclists were involved. Sowa (2013) revealed that the Islamic religion represented 67.4% of motorcyclists. Every motor rider, by law, should have a valid rider's license, and know road signs and practice safety measures. This study revealed that most of the riders have been riding for almost 15years (84.5%). Yet, only 33.0% had a valid licence with 31.5% having National Health Insurance (NHI). It was observed that most of the accidents occurred during the night, with 30.5% reporting in critical medical conditions. Kudebong et al., (2011) reported that about 71% of motor riders do not possess valid licences and only 13% of riders had insured their motors and possessed valid motor insurance. A study conducted by WHO (2004) indicated that victims of road traffic injuries were from developing countries who did not have the requisite skills of riding and had no formal training on motor riding. According to the report, the riders were mainly single (87%). Evidence shows that most (54%) of the cases of road traffic accidents are motorcycle related (UK Department for Transport, 2004 & NHTSA, 2000). The UK Department of Transport (2004) and Sowa (2013), for respectively, study that the probability of motorcycle crash death was 16-35 times higher than in vehicles. Likewise, in 2006, in NHTSA, 13.10 out of 100,000 vehicles were killed and 72.34 out of the 100,000 registered engines were destroyed. Furthermore, the report showed that bikes are more dangerous than vehicles. Wearing a helmet is a

single most effective way of reducing head injuries and fatalities resulting from motorcycle crashes. From this study, 56.5% were in helmets when the accident occurred. Motorcyclists who don't wear helmets are at a much higher risk of suffering from a head injury and dying from those injuries according to Janmohammadi, (2016). The expense of riders who do not wear helmets in hospitals increases, while the resulting injury involves costs for individuals, families and society. The unhelmed motorcyclist is 40 % more likely to have a fatal head injury than helmed motorcyclists and 15 per cent more likely to experience non - fatal injustice in the case of the same crash. Pickrell and Starnes (2008) pointed out They also calculated that the risk of an accident death is 37 per cent reduced by a helmet. Oluwadiya, (2015), in his study, pointed out that 70% of Nigerians do not wear helmets when riding. In India, Wang,(1999), the situation is different. Most riders wear helmets, and according to the report they do so because of insurance package should anything untoward occurred.

Most of the motors that were involved in an accident were used by their rightful owners (54.5%). This is similar to a report by Bolgatanga Municipal Health Administration, Annual Report, (2008) that about 95% of the accident victims own the motorbikes. In a study conducted at LEKMA hospital in Accra, about 77% Sowa,(2013) owned the motorbikes. This is similar to a study in India where almost all riders involved in accidents owned the motorcycles (98.7%)

5.3 Knowledge of Cyclist On-Road Regulations

The knowledge levels of motorcyclists on roads signs were 78.0%, with the majority hearing of road signs from other sources. About 14.5% thought that motor accidents occur as a result of inexperience on the part of the riders. The commonest sign known by the riders was the prohibitory sign. This supports the findings of a study at LEKMA Hospital Sowa, (2013) and also in Abuja Nigeria (Ogunlesi, 2015).

According to Ngim and Udozen (2007), motorbike accident occurs as a result of non-adherence to traffic regulation. Also, Udozen (2007) stated that lack of education is a direct factor that accounts for the motor accident. In Iran, it was recorded that, negligence on the part of the riders causes 34% of motor accidents (Pourhossein, 2009).

5.4 Perceived Factors Contributing to Motorcycle Accident

The findings of this study indicated that 14.5% of the respondents said that inexperience and over speeding were contributory factors to a motor accident. However, the majority (58.0%) disagreed with this assertion. But in contrast with the findings of a report by Aworemi et al. (2019) in Nigeria, over 75% of the accident situations in Nigeria can be attributed to drivers ' inexperience. Also, Huang and Preston (2014) confirmed this by revealing that in 2016, almost all motor accidents were caused by inexperienced riders in the Tamale metropolis. Furthermore, a study of motorcycle accident typology suggested that risky behaviours and errors contributed to over 80% of fatal motorcycle accidents in the US; the accidents were reportedly due to riders' error and risky behaviours (Huang and Preston, 2004). This result is consistent with the findings of Odero et al. (2014) which has shown that human error has fallen from 74 to 95% of all traffic collision triggers in developing countries in a road accident.

A recent study by the Royal Automobile Club (RAC) found that an estimated 16.1% drivers in the UK experienced some form of headlight dazzle, with 91% of motorists who said they get distracted by incoming high vehicle lights. About six in ten drivers said they were unable to tell if headlights were dim or on full beam. The problem seems to be getting worse – more than half of drivers (54%) are dazzled more regularly now than a year ago, according to a study (Scurfield, 2004). The latest

government data show that flashing headlamps play a role each year in road accidents. In 2017, blistering headlights in 315 recorded incidents were identified as contributing factors. Six fatal accidents were recorded as more serious, 71 of which were registered. Only 2.0 per cent in this study agreed that jets contribute to a motor accident. Recent reports by the NRSC have shown that over 20 cases of road accidents in Ghana have been identified, including unnecessary speed, lack of proper driving judgment, insufficient experience, carelessness, faulty overtaking, recklessness, intoxication, overloading, machine failure, obstruction, blindness, and faulty light. A report has been released by the NRSC. Additional factors include insufficient regulation, the use of mobile telephones while driving, the failure to buckle the seatbelt and corruption in road transport legislation (2017 National Road Safety Committee). Environmental factors deal with the location and careful examination of motorcycles and other vehicle pre-crash paths of travel. This helped to assess the obstructions, pavement irregularities, and climatic conditions such as bad weather, solar glare and many more (Soderstrom et al., 2015). After assessing the respondents on whether obstruction could cause accidents, they were of the view that obstruction could cause motor accidents, however, only 19.9% agreed with the assertion. Motor Traffic and Transport Unit (MTTU) department of the Ghana Police service assessed the reasons for a road traffic accident in the Techiman Municipality. It was recorded that human error, mechanical fault, obstruction by others, obstruction due to noise and obstruction due to animals crossing are major factors (MTTU Report, 2017).

The National Highway Traffic Safety Authority (NHTSA) (2009) reports the 37 per cent over-speed in motorcycle accidents in 2006. Nearly half of all motorcycle accidents concern no other automobile. The discrepancies in bikes would only render motorcyclists more likely to die in the event of an accident, because motorcyclists had the same physical protection as a car driver, according to Horswill and Helman (2001a). Nevertheless, this study found that 23,0% of those surveyed believed that the auto accident victims taken to KBTH were caused by excessive driving. According to Haddon,(2018), the physical layout of the road and its surroundings could stimulate and discourage speed in India, when a traffic accident was becoming rife. Haddon also observed that the probability of crash increases with increasing pace, especially at road intersections and overtaking, as road users minimize pace and overestimate the distance from a nearby automobile. Factors related to roads and automobiles (road layout, surfaces, vehicle capacity, maximum velocity, etc.); traffic and environmental variables (density and structure, the prevailing speed, conditions of climate) (Krug, 20 years) are determined by driver speed choices which are correlated with drivers (age, sex, amount of alcohol, number of persons on the motor vehicle).In their research, Sabahaih & Fujii (2011). The impact of actions on intentional behaviours, especially concerning the Theory of Intended Comportement (Elliot et al., 2003; Elliot, 2010; Forward, 2009,) has been robustly demonstrated in many studies, confirming previous results by demonstrating that as many motorcyclists did not like caskets and over-speed, the more likely were t Several researchers in Ghana and elsewhere have identified the causes, consequences and suggestions for motor accidents. Ayeboo (2009), for example, has noted that the recurrent road network injuries were linked to different factors, such as altitude, alcohol, mistaken overtaking, bad roads and rickety cars travelling on our highway. Driving above a planned speed limit could lead to

90% of the motor and other vehicles accidents, Papadimitrious (2005) stated. In this analysis, road loss could not be underestimated. Some 8.0% of those affected by the crash considered that they had been motorized because of the bad nature of our roads and their failure to maintain roads. A study on the impact of road networks on the economy has been conducted in Tanzania. The report looked at 85,000 kilometres, of which 10,897 kilometres were badly shaped. The recorded and unrecorded statistics showed that, regardless of the efforts of various institutions to combat and ease the situation, the district of Kivaha has a rather poor road safety record (Malekela, 2005). EOLBREAK the lack of travelling lights and the unavailability of traffic signs, as well as a frequent motorcycle accident in the region, was reported by one of the accident victims interviewed. About 30% of the victims said that the ridders did not follow the road signs. Some have ignored and speeded up the warning. Accra believes that, under the government of responsible ministries, road signs should be rehabilitated and replaced, especially in populous cities in Accra, where necessary. Roundabouts and traffic lights are essential features for the improvement of the road system.

5.5 Bivariate analysis of demographic information and usage of helmet and road regulations

The demographic (age) data tended to be associated with the use of the helmet statistically (p=<0.001). This shows how important the rider's age is. This is research (Huang, 2016), in which a 0.011 p-valve for fences was recorded. In Mali's capital, Bamako 567 riders have been questioned if their age was a factor in motorcycling; the report showed that you were responsible when you were grown-up, and those who ride without caring do not have a family (Dissanayakes, 2004). Age of ridding after the evaluation also firmly supports Tanzania (p=0,031). A traumatic brain injury (

TBI) is a hit, a jolt on the head or a penetrating head injury, according to the CDC, which disrupts the normal brain function. The report also states that one way to avoid TBI is for all to put on a helmet when riding a bike, motorcycle, snowmobile, scooter, or all-terrain vehicle (CDC, 2014). The goal of CDC legislation on bike helmet regulations is, in the interests of riders involved in bicycle accidents, to reduce the number of severe and fatal head injuries. When used properly, motor helmets prevent head injury and death. The research studies conducted between 1987 and 1998 have all been reviewed by Attewell, Glase and McFadden (2001). Helmets have decreased head injury by approximately 60% and death by approximately 73% t. A review and meta-analysis of Cochrane reported a decrease in injury levels from 63 to 88% (Thompson and Rivara, 2001). It has also been found that increased age is linked to helmet usage in Jamaica (Spearman's rho= 0.261; p= < 0.001).

Levels of education (p=0.035) and employment (p=0.002) were statistically linked with the use of the helmet during riding.

In Wa, helmet use was 46 per cent (95 per cent confidence interval (CI), 40.2–52.0) amongst the 271 sampled riders. Important socio-demographic correlates of helmet use were gender age, marital status and occupation. Unmarried riders were five (5) times less likely to use a helmet compared to currently married riders. There has been no significant link between the educational achievement of riders and the use of the helmet. The use of helmet was also positive with the ownership of motorcycles and licenses (Alaateba. 2015). Their use was also positive. Nonetheless, statistical associations with road legislation were highly significant in terms of the victim's age (p= 0.173), marital status (p=0.286), sex (p=0.450) and road legislation, education (p=<0.001, "ethnicity and occupation (< 0.001), and road legislation. The bivariate analysis carried out in the Municipality of Bolgatanga with demographics and street

legislation showed that the schooling (p=0.021) and the age of respondents (p=<0.001) was statistically related to road regulatory measures with the rest of population attributes (Ayuekanbey) not correlated with the road regulation (p=<0.001) in 871 respondents consisting of 588 males and 283 females.

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

Passengers, drivers and motorcyclists are involved in the increase in road accidents. Traffic injuries and deaths are thus a rising global public health issue (Agnihotri & Joshi, 2006). Road crashes are the second leading cause of death and disability among young people worldwide (most of them male) according to the World Health Organization (WHO,2004) and Banthia et al., (2006). A WHO report (2004) indicates that road traffic accidents have been suffered by developing countries. The study analyzed factors that contribute to the high incidence of KBTH motorcycle accidents.

6.2 Conclusions

From the data gathered and the in-depth analysis made, it was noticed that most of the respondents do not adhere to road traffic regulations. This could be attributed to the age factor and marital status. From the report, the married and middle-aged respondents are more compliant with traffic regulations than the young and the single. Also, the respondents had a very low level of education. Another observation made was over speeding, non-compliance to road signs and poor road network. Lastly, non-helmet usage contributed to serious and critical and fatal medical conditions compared to other factors causing road accidents.

6.3 Recommendations

Since the trend of motorcycle inflow into the region as well as the motorcycle accidents are increasing fairly steadily, it is therefore recommended that:

1. Road safety commission should play its future campaign message on road safety to the general public to help mitigate road accidents within the region.

2. The public should be educated on-road regulations, signs and acquiring licences and the importance of insuring their motor bikes

3. The road and transport ministry should make the necessary effort to do regular road maintenance on all rough and patch existing road for proper use.

4. All drivers and motor riders should also adjust the lights to minimize obstructions caused by high lights

5. MTTD should enforce helmet wearing amongst all motorcyclist

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APPENDIX A

QUESTIONNAIRE

SECTION A: DEMOGRAPHIC DATA

Instructions: Please tick [√] the appropriate space in your response and provide answers where necessary.

1. Age of respondent

    a. 18- 25yrs [ ]

    b. 26 – 30yrs [ ]

    c. 31 – 35yrs [ ]

    d. 36- 45   [ ]

    e. 46 – 50yrs [   ]

    f. 51yrs and above [ ]

2. Educational level

    a. None [ ]

    b. Primary [ ]

    c. J.H.S [ ]

    d. S.H.S [   ]

    e. Tertiary [ ]

3. Gender

    a. Male [ ]

    b. Female [ ]

4. Marital status

    a. Married [   ]

    b. Divorced [ ]

    c. Single [ ]

    d. Widowed [ ]

5. Religion
   a) Christianity [ ]
   b) Islamic   [ ]
   c) Traditional
6. Occupation
   a) Office worker
   b) Artisan
   c) Unemployed
   d) Others………….

7. The primary use of the motorbike
   a) Commercial
   b) Private

8. How long have you been riding motor?

   a. Less than 15years [ ]

   b. 16-20years [ ]

   c. 21-25years [ ]

   d. 26years and above [   ]

9. License status
    a) Valid   [ ]
    b) Invalid
    c) None

10. NHIS status

   a) Active   [   ]
   b) Inactive
   c) Never enrolled

11. Time of accident

   a) Day time   [ ]
   b) Night

12. Outcome of accident

   a) Slightly injured   [   ]
   b) Critically injured   [   ]
   c) Dead

       13. Helmet use?
       a. Yes,

b. No

14. Are you the owner of the motorbike?

a. Yes,

b. No

SECTION B: KNOWLEDGE OF CYCLIST ON ROAD REGULATIONS

Instructions: Please tick [√] the appropriate space in your response and provide answers where necessary.

15. Have you ever heard about road regulations?
   a. Yes [ ]
   b. No [ ]

16. Which source provided you with the information?
   a. Seminars [ ]
   b. Workshop [ ]
   c. Television [ ]
   d. Others (specify)…………………...

17. What of the following are part of the road regulation signs? Tick all that applies

   a) Prohibitory signs [ ]
   b) Mandatory signs [ ]
   c) Informatory signs [ ]
   d) Breakdowns and accident signs [ ]

18. Which of the following is a prohibitory sign
   a) No entry for motorcycles [ ]
   b) Give way [ ]
   c) No through road [ ]

19. Which of the following forms part of a mandatory sign?
   a) One way [ ]

b) Hospital [   ]

c) Left bend [   ]

SECTION C: FACTORS CONTRIBUTING TO MOTORCYCLE ACCIDENT

Instructions: Please tick [√] the appropriate space in your response SA= Strongly Agree A= Agree N=None D = Disagree SD = Strongly Disagree

STATEMENTS	SA	A	N	D	SD
20. Inexperience on the side of the rider					
21. Dazzling lights					
22. Obstruction					
23. Excessive speeding					
24. Defective lights					
25. Pedestrians					
26. Mechanical defects					
27. Negligence by the motor rider					
28. Improper overtaking					
29.Level erosions					
30. Poor roads					
31.Overloading					
32. Confusion					
33. Talking of alcohol or other substances					
34. Does not know road signs					

APPENDIX B

INFORMATION SHEET AND INFORM CONSENT

My name is Abigail Ladjer Marnah a student of Ensign College of Public Health. I am conducting a research on **factors contributing to high incidence of motorcycle accidents presenting to Korle Bu Teaching Hospital of the Greater Accra region of Ghana.** You are being asked to take part in this study and we will be explaining all about the study to you.

Motorcycle accidents constitute a major category of motor traffic accidents. The use of motorcycles for commercial purposes in the country has increased particularly in the Greater Accra region. Many Ghanaians have lost their lives through road traffic crashes, the majority of these people are vulnerable road users, pedestrians, motorcyclists, and cyclists. This study is to identify the factors contributing to increase motorcycle accident cases and the knowledge of motorcyclists on road regulations. I will be grateful if you can help me with your experiences.

Confidentiality

The information that we will collect from this research project will be kept private and all information given to us will not be shared with anyone outside the research team. We will lock all information with a lock and key. Questionnaires and informed consent forms will not be labelled and respondents will be given a unique study identification number. Information on respondents will have a number on it instead of

their names and will only be made known to the research team on this study.

Possible risk and Discomforts

This research poses minimal risk. We will be asking you to share personal
information and experiences about yourself in this study. You do not have to answer
any question if you do not wish to do so. You can refuse to take part in the study
anytime you wish.

Benefits

The study may not bring you direct benefits, however your experience, attitude and
knowledge will help us identify the factors contributing to increased motorcycle
accident cases in the country. This will help make better policies to curb motorcycle
accidents. Your consent to participate in this study will not earn you any monetary
compensation.

Duration

This research will involve your participation in answering a structured questionnaire
through an interview that will take approximately 30 to 45 minutes to complete.

Participation in this research is voluntary and you can choose not to answer any
question or all of the questions.

At this time, do you want to ask me anything about the interview?

Would you want to participate now? ☐ **YES** ☐   **NO**

ANSWER ANY QUESTIONS AND ADDRESS RESPONDENT'S CONCERNS.

RESPONDENT *AGREES* TO BE INTERVIEWED

| 1 | -- - - - → BEGIN

<div align="center">

OR

</div>

RESPONDENT *DOES NOT AGREE* TO BE INTERVIEWED

2	- - → END

Name of Interviewer _____

Date: _____

THUMB PRINT
PRINT

RESPONDENT'S SIGNATURE: _____

DATE_____