

**DETERMINANTS OF MOTORCYCLE INJURIES AMONG MOTORCYCLES
DRIVERS IN JIMMA ZONE SELECTED PUBLIC HOSPITALS, SOUTH WEST
ETHIOPIA**

BY:

MULAT NEGASH

**A Research thesis submitted to Institute of Health, Faculty of Public Health,
Department of Epidemiology, Jimma University; in partial Fulfillment for the
Requirement for Masters of General Public Health (GMPH)**

DECEMBER, 2018

JIMMA, ETHIOPIA

**JIMMA UNIVERSITY, INSTITUTE OF HEALTH, FACULTY OF PUBLIC
HEALTH, DEPARTMENT OF EPIDEMIOLOGY**

**DETERMINANTS OF MOTORCYCLE INJURIES AMONG MOTORCYCLES
DRIVERS IN JIMMA ZONE SELECTED PUBLIC HOSPITALS, SOUTH WEST
ETHIOPIA**

**BY:
MULAT NEGASH (BSc)**

ADVISORS:

LELISA SENA (PhD)

SOLOMON BERHANU (MPH)

**A Research thesis submitted to Institute of Health, Faculty of Public Health,
Department of Epidemiology, Jimma University; in partial Fulfillment for the
Requirement for Masters of General Public Health (GMPH)**

DECEMBER, 2018

JIMMA, ETHIOPIA

ABSTRACT

Background: motorcycle crashes are among the leading causes of unnatural deaths worldwide. Motorcycle accidents therefore threaten the health of human beings. Data on determinants of injuries are needed to support policy and program recommendations. Studies on socio-demographic, motorcyclists and environmental related determinants of motorcycle injuries among motorcycle drivers were not undertaken in the study area.

Objective: to assess determinants of motorcycle injuries among motorcycle drivers in Jimma Zone selected public hospitals, Southwest Ethiopia, 2018.

Methods: the study was conducted in four public hospitals of Jimma Zone, from April to May 2018. Case control study design was used to assess determinants of motorcycle injuries among motorcycle drivers. Consecutive sampling technique was used to select sample of 87 cases. The 174 controls were selected considering similarity of exposure status as cases. Data was collected by interviewer administered structured questionnaires. The ratio of cases to controls were used 1:2. Bivariate logistic regression was conducted and variables nominated for multivariate using p -value <0.2 . Multivariate logistic regression was used to assess the association between dependent and independent variables. Adjusted Odds ratio (AOR) with corresponding 95% CI was used to assess associations and P -value <0.05 was used to identify level of significance.

Results- this study attempted to determine determinants of motorcycle injuries were; not using helmet (AOR: 5.2 ; 95% CI: 1.1, 23.5), driver violated right way of road side (AOR: 2.1; 95% CI: 1.05, 4.1) and safety tools used (AOR: 0.3; 95% CI: 0.1, 0.6) found to be strong predictors of motorcycle injuries.

Conclusion- not using helmet, driver violated recommended right way and safety tools utilization were predictors of motorcycle injuries. Interventions are required for; towns health, traffic polices and road transportation offices should work to improve the existing driving practices and to enhance receptiveness of legal driving rules.

Key words - motorcycle injury, motorcycle driver, Jimma zone

ACKNOWLEDGEMENTS

First, I would like to thank the Almighty God, who helped me from the beginning to the end of preparation of this thesis.

I would like to express my sincere gratitude to my advisors Dr. Lelisa Sena and Mr. Solomon Berhanu for their constructive support, sharing their valuable knowledge and experiences throughout my thesis development; without them this work wouldn't be accomplished. I would like to extend my gratitude to the department of epidemiology for their valuable arrangements of time schedule for working this thesis.

I would like to acknowledge the four hospitals medical directors and staffs for their support during data collection.. I would also like to extend my thank to my wife Ms. Abenet Dereje for her unreserved support during paper work and Ms. Chaltu Jebel for her continuous support during data collection.

Finally, I would like to acknowledged the study participants for devoted, honest response and contribution for sources of information.

TABLE OF CONTENTS

ABSTRACT	i
ACKNOWLEDGEMENTS	ii
TABLE OF CONTENTS	iii
LIST OF FIGURES ON DETERMINANTS OF MOTORCYCLES INJURIES .. Error! Bookmark not defined.	
LIST OF TABLES ON DETERMINANTS OF MOTORCYCLES INJURIES AMONG MOTORCYCLES DRIVERS	vii
LIST OF ABBREVIATIONS	viii
1. INTRODUCTION	1
1.1. Background.....	1
1.2. Statement of the problem.....	2
1.3. Significance of the Study	4
2. LITERATURE REVIEW.....	5
2.1. Over view.....	5
2.2 Conceptual Framework	8
3.OBJECTIVE.....	9
3.1. General	9
3.2. Specific Objective	9
4. METHODS AND MATERIALS.....	10
4.1. Study area and period	10
4.2. Study design	10
4.3. Population	10
4.3.1 Source Population	10

4.3.2. Study population	11
4.4. Inclusion and exclusion criteria	11
4.4.1 Inclusion criteria	11
4.4.2 Exclusion criteria.....	11
4.5. Sample size determination and sampling procedures	11
4.5.1. Sample size determination	11
4.5.2. Sampling procedures.....	12
4.6. Data Collection technique and procedure	13
4.7. Variables	13
4.7.1. Dependent Variable.....	13
4.7.2. Independent Variable	14
4.8. Operational definition	14
4.9. Data processing and analysis.....	15
4.10. Data quality assurance	16
4.11. Ethical Consideration.....	16
4.12. Dissemination Plan	16
5. Results	17
5.1. Socio demographic related characteristics of respondents	17
5.2 Motorcyclist characteristics of respondents.....	18
5.3 Environmental related characteristics of respondents.....	19
5.4. Bivariate and multivariate analysis	21
5.4.1. Bi variate analysis	21
5.4.2. Bivariate analysis of socio demographic related variables	21
5.4.3. Bivariate analysis of motorcyclist related variables.	22
5.4.4. Bivariate analysis of Environmental related variables	23

5.5. Multivariate analysis.....	24
6. Discussion	26
6.1. Limitation of the study	27
7. Conclusion and Recommendations	27
7.1. Conclusions.....	27
7.2. Recommendations.....	27
References.....	29
ANNEXES 1.....	31
Annex – 2.....	34
Annex – 3.....	38



LIST OF FIGURES

Figure 01. Conceptual frame work to describe factors that cause motorcycle injuries in Jimma zone public hospitals ,December,2018-----	8
Figure02. Proportional distribution of respondents collision type about motorcycle injuries, December,2018-----	21

**LIST OF TABLES ON DETERMINANTS OF MOTORCYCLES INJURIES
AMONG MOTORCYCES DRIVERS**

Table 1. Required sample size for studies of determinants of motorcycle injuries in four hospitals, december, 2018-----13

Table 2. Description of socio demographic characteristics of respondents december,2018-----18

Table 3. Distribution of individual related characteristics of respondents december, 2018-----19

Table 4. Distribution of environemental related characteristics of respondents december,2018-----20

Table 5. Bivariate analysis of socio-demographic related respondents december,2018--22

Table 6. Bivariate analysis of motorcyclist related respondents december,2018-----22

Table 7. Bivariate analysis of environmental respondents december,2018-----23

Table 8. Multivariate analysis of motorcyclists and environmental related determinants of respondents december, 2018-----25

LIST OF ABBREVIATIONS

AA	Addis Ababa
AOR	Adjusted Odd Ratio
COR	Crude Odd Ratio
GDP	Gross Domestic Product
HISS	High Injury Severity Score
JU	Jimma University
JUSH	Jimma University specialized hospital
LLHS	Longer Length of Hospital Stay
LMIC	Low and Middle Income Countries
OPD	Out Patient Department
RTA	Road Traffic Accidents
SGH	Shenen Gibe Hospital
SPSS	Statistical Package for Social Science
USA	United States of America
WHO	World Health Organization

1. INTRODUCTION

1.1. Background

Road transportation provides benefits both to nations and to individuals by facilitating the movement of goods and people. It enables increased access to jobs, economic markets, education, recreation and health. However, the increased road transportation has also placed a considerable burden on people's health in the form of road traffic injuries and also damaging the property that leads economic losses. Road traffic accidents are among the leading causes of death and injury worldwide, causing an estimated 1.2 deaths and 50 million injuries each year(World Health Organization (WHO), 2004). Low and middle income countries estimated 5% GDP losses for all road traffic accidents and injuries. Motorcycle crashes are among the leading causes of unnatural deaths worldwide. Almost half of the deaths on the world's roads are among those with the least protection: motorcyclist 23%, pedestrians 22% and cyclist 4%[1]. The risk of road traffic death varies significantly by region the highest rates are still in African region which are 26.6 per 100,000 population. While the European region has a rate far below the global average 9.3 per 100,000[1].

Riding motorcycle for some people may be the only affordable form of motorized motorcycles are the most common motor vehicle in the most populous countries, including India, China and Indonesia of all motorcycles 58% are in the Asia pacific and southern & Eastern Asia regions except Japan. Motorcycles are mainly luxury good in developed nations, where they are used mostly for recreation, as a lifestyle accessory or a symbol of personal identity. Beyond being a mode of motor transportation or sport motorcycle has become a subculture and lifestyle [2].

1.2. Statement of the problem

Globally, nearly a quarter of all road traffic deaths are among motorcyclists. However, this too is disproportionately distributed across the world, with the South Asian Region and Western Pacific Region each accounting for 34% of the world's motorcyclist deaths compared to the African which account for 7%. This reflects the continuing situation where by the uses of motorcycles is much higher in Asian countries than elsewhere. The data showed that the proportion of motorcyclist deaths is largely unchanged except in the region of the Americas: the proportion of motorcycle deaths has increased from 15% to 20% of the total road traffic deaths over three years period between 2010 and 2013, reflecting rapid growth in the number of motorcycles in the region's fleet. At country level many African nations data arise in motorcyclists use of motorcycles. Tanzania has seen motorcycles rise from 46% to 54% of its fleet in the last three years, and motorcycle deaths rises from 13% to 22% of its total number of road traffic deaths [1].

Car drivers fail to give way to motorcycles at T-junctions. The typical response of the car driver is that they looked in the appropriate direction but simply failed to see the motorcycle [2]. Study was conducted to assess the visual skills of drivers in such scenarios they compared the behavior of novice and experienced drivers to a group of dual drivers (with both car and motorcycle experience). The results confirmed that dual drivers had the safest responses at junctions, especially in the presence of conflicting motorcycles. On a range of visual measures both novice and experienced drivers appeared inferior to dual drivers [3].

The increase use of motorcycles particularly for commercial services are sources of concern because motorcycles cause many more fatal road crashes than other vehicles worldwide. As motorcycles are relatively unsafe vehicles, the riders must be considered as unprotected vehicle users and their injuries are usually severe. However, their use is increasing given that motorcycle is an economical transportation among the youth especially in third world country like Pakistan [4].

From 9734 medical records of patients hospitalized for external causes at the regional emergency and Trauma Hospital of Camping Grande, Paraiba, Brazil was done the cases of accidents with motorcycles accounted for 20% of all hospital care, mostly affected men 85.8 % and aged 21-29 years old 33.9%. Legs and feet (55.8%) and arm and hands (26.9%) where the most affected parts of the body [5].

Motorcycle accidents are the major economic burden of most countries. In Northern Ghana from vehicles registered during 2004-2008 ninety eight percent were motorcycles. The motorcycles were significantly more than the cars registered. The economic burden of motorcycle accidents was estimated to be about US\$1.2million of which, 52% were accident related costs (property damage and administration) and 48% causality related costs (medical cost, out of pocket expenses, lost labor out puts, and intangible costs).

The main motorcycle injuries were head injuries, fractures, lacerations and contusions. Majority of the accidents were caused by lack of formal motorcycle riding training, abuse of alcohol ,unrestrained animals and donkey carts [6].

Since in Ethiopia, road traffic accident is one of the critical road transportation problem. According to the Federal Police Commission report of 2007 states that road traffic fatalities were 2517 of which 78% males and 22% females. In addition non-fatal road traffic injuries were 24792. On the other hand, cross sectional study was conducted in Addis Ababa since 2017 showed that motorcycle accidents accounted 10.7%[7]. However, in Ethiopia including the study area determinants of injury of motorcycles among motorcycles drivers remains less studied. Therefore, by considering the gap this study was aimed to assess factors that influencing motorcycles injuries among motorcycles drivers in Jimma Zone, Southwest Ethiopia.

1.3. Significance of the Study

Previously, there was no significant studies undertaken to show determinants of motorcycles injuries among motorcycle drivers in Jimma Zone, Oromia regional state. In this regard identifying determinants of motorcycle injuries among motorcycles drivers are essential to challenge the existing driving practices.

Therefore, this study is believed to be important in the following ways. It can help the police traffic and road transportation authority to shape their approach for changing harmful driving practices of motorcycle drivers and recommendations drawn from the study can initiate policy makers to design policies that can tackle the existing practices. It also helps as a base line data for studies will be conducted in similar setting for the future.

2. LITERATURE REVIEW

2.1. Over view

A wide variety of factors have been explored including the demographic attributes of motorcyclist, traffic characteristics, road geometry and environmental features. However, generally the following factors were reported to significantly increase motorcycle injury severity sustained by motorcyclist: increased age, alcohol use, riding without helmets and driving without license, collisions with stationary objects or heavier vehicles and motorcyclists at fault [5].

Age has association with motorcycle injures. To substantiate this argument an institutional based cross sectional study was conducted in Areba minch hospital, road traffic accident victims were predominantly males (68.1%) and people aged 20-29 years. The majority of them were from urban areas. The victim sex, age and occupation were significantly associated with RTA in a bivariate analysis [6]. In addition to this, study conducted since 2011 in Turkey overall traffic accident, 7.58% were motorcycle accidents. Among ninety one people involved in motorcycle accidents, with a mean age of 28.47 years were studied. This reflects the risk of accident increases with young adults. Similarly, study conducted in A.A the age group 21 to 30 were the most affected age group by road traffic accident followed by age group of 12 to 20 and of them accounted 38.8% and 20.4%, respectively.

Helmet utilization by motorist was associated with road traffic accident injury. Motorist who did not use helmet were nearly five times $AOR.4.7= 95\%CI(1.04-21.09)$ more likely to sustain severely injury than those used helmet[7]. In China the involvement of motorcyclist riders over 60 years old were found to have a significant effect on motorcycle injury. Hence elder riders being usually weaker in terms of physiological condition and perception of safety and slower to react in hazardous situations are to be severely injured [8]. Similarly, retrospective study conducted in USA, there was a

significant correlation between greater age and high injury severity score (HISS) and longer length of hospital stay (LLHS) [9].

Alcohol and other substances have been found to be major risk factors in all types of motor vehicle crashes. According to the traffic safety facts these factors appear to weigh age [10]. A motorcycle riders wearing an approved helmet reducing risk of death by 37%. In Europe, head injuries lead to death in about 75% of fatal motorcycle accidents. The same number for low and middle income countries (LMIC) are 88%. A prospectively study was conducted at the emergency department of Akdeniz University hospital, among 122 motorcycle accident victims only 11 victims declared use of a helmet. Pakistan has both laws requiring driver and passenger to wear a helmet and regulation on helmet standards. Still only 10% of all riders wear a helmet [11]. Similarly, study conducted in AA motorcycle riders were used helmet about 43.6% and helmeted motorist were less likely injured.

Motorcycle injuries constitute a major but neglected emerging public health problem in developing countries and contribute significantly to the overall road traffic injuries. A cross sectional hospital based study was conducted on all injured conscious motorcyclists who were admitted to the emergency department of Benha university hospital, Egypt from December 2012 up to December 2013. Of these, 67.5% did not have motorcycle license and friends or family were the source of training for 56.9% of them. There was highly significantly association between source of training and age, education, occupation and marital status $p < 0.001$ for all [12]. On the other hand, study conducted in Nigeria out of four hundred fifty motorcycles drivers, proportion of licensed drivers were 96 and had not license 354 respectively [13]. .

Motorcyclists are at an increased risk because they often share the traffic space with fast-moving cars, buses and trucks and because they are less visible. In addition their lack of physical protection makes them vulnerable to injury [14]. The study conducted in Hunan China in 2014 a total of 20027 crashes of these, about 81% were motorcycle motor-vehicle crashes. In comparison, single motorcycle crashes and motorcycles

colliding with non-motor vehicle crashes, respectively, represented 6% and 13%. Given that motorcyclists involved in motor vehicle crashes tend to sustain severe causality.

One of the determinants of the occurrence of road traffic accident is environmental related factors. Some of environmental determinants that cause road traffic accidents are weather condition, time of accident, types of road, safety tools utilization and lighting condition. Study conducted in AA 2013/2014 among the climate conditions good weather were present 80.1% and cold weather accounted 16.2% crashes fatal. In addition day time scored 53.1% and 29.6% night with road side light was recorded in road fatality [15]. In addition, study conducted in Hong Kong a total of 774 motorcyclist were recruited, of whom 292 had been involved in active motorcycle accident. The result of study revealed three dimensions of accident causes driving related, environment related and belief related. These motorcycle accident causes were correlated with risk taking acts while driving a motorcycle.

A logistic regression analysis showed that risk taking acts while driving OR=0.941, 95% CI(0.916-0.967) and belief related OR=1.134, 95% CI(1.088-1.182) were significantly factors contributing to involvement in active accidents by motorcycle riders [16]. The study conducted in Brazil 750 couriers were analyzed by bivariate and multivariate in order to measure the association between factors and motorcyclist injury. After analysis speeding (OR=1.48) and uses of cell phones while driving (OR=1.43) were assessed [17]. Analysis of motorcycle crashes in Victoria shown that the majority of weekday motorcycle casualty crashes occurred during morning [18].

Safety methods were statistically significant associated with the occurrence of road traffic injury in severe cases. Study conducted in Malaysia safety tools was associated with motorcycle injuries AOR=.44, 95% CI(.23-.84) [19]. Driving motorcycle at high speed was associated with injury and helmet usage reduces the chance for death in an accident by 40% and the risk of serious injury by 70%.

Helmet utilization and speed was statistically associated with motorcycle injuries, where study conducted in Barcelona driving speed AOR=6.29, 95% CI(4.87-8.13) and helmet

used AOR=.65,95%CI(.52-.81), respectively [20]. On the other hand, study conducted in Tabriz, Iran, helmet wearing was statistically associated with motorcycle injury with p-value<0.001 and AOR =0.22, 95%CI(0.1-0.46). Driving motorcycle who had license was associated with motorcycle injury AOR=1.56,95%CI(0.67-3.4) [21]. Irresponsible motorcycle driving was strongly and significantly associated with deaths and severe injuries. Study conducted in Tiran, Albania, irresponsible driving associated with motorcycle injury p-value<0.018 and AOR=1.69,95%CI(1.10-2.61) [22].

2.2 Conceptual Framework

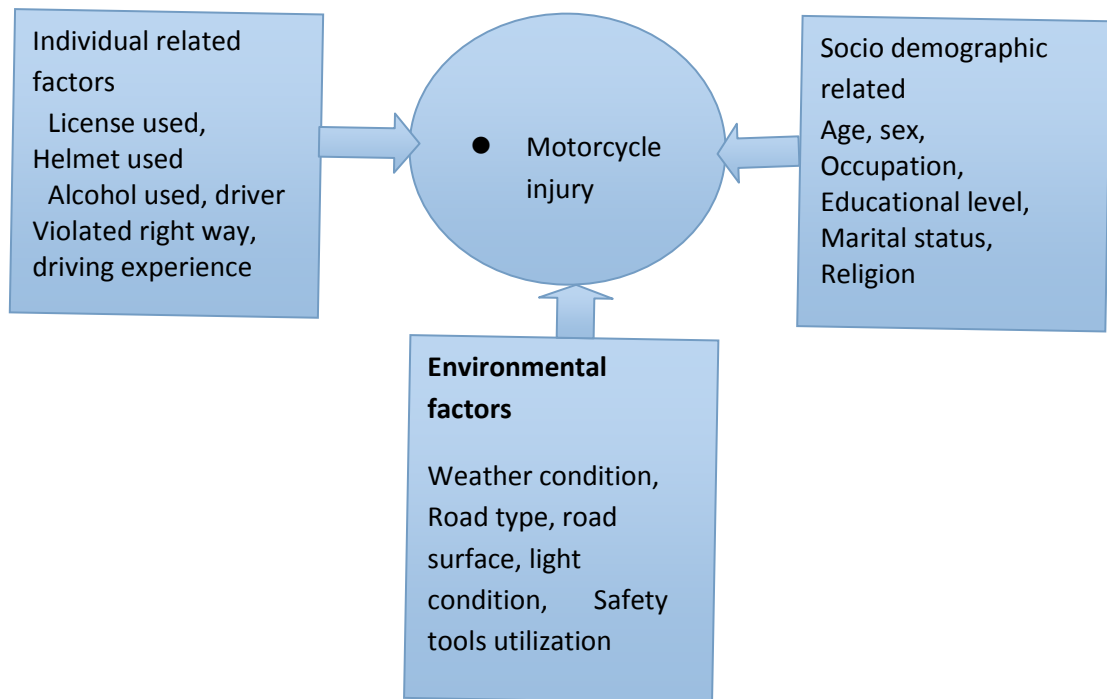


Figure 1. A conceptual frame work to describe factors that cause motorcycle injuries in Jimma Zone selected public hospitals

3.OBJECTIVE

3.1. General

- To assess determinants of motorcycle injury in Jimma Zone selected public hospitals, South West Ethiopia.

3.2. Specific Objective

- To determine socio demographic related determinants that cause motorcycle injuries
- To determine individual related determinants that cause motorcycle injuries.
- To determine environmental related determinants that cause motorcycle injuries

4. METHODS AND MATERIALS

4.1. Study area and period

Jimma zone is found in Oromia Regional State, South west Ethiopia. In the zone there are a total of six public hospitals that provides health services to the community. Out of six hospitals only four public hospitals were selected purposively for the study; two of which Jimma university specialized hospital (JUSH) and Shenen Gibe hospital (SGH) are in Jimma town far from 352 km South west of Addis Ababa (AA). Similarly, Agaro and Limu Genet district hospitals are located at a distance 45km West and 75km North of Jimma town, respectively. Among those hospitals Jimma university specialized hospital (JUSH) is the only specialized teaching hospital in Southwest parts of the country. The zone has a total population of 3,345,112.

The study was conducted from April 1 to May 1, 2018 at selected four public hospitals in Jimma zone, South west Ethiopia.

4.2. Study design

Facility based case control study design was used to assess determinants of motorcycle injures. Cases were motorcycle drivers who came to emergency surgery OPD at four hospitals in complain of motorcycle accidents. Whereas, community controls were those motorcyclist who had not sustained accidents related to motorcycle driving .

4.3. Population

4.3.1 Source Population

The source population for Cases were those motorcycle drivers who were injured by motorcycle accident and he /she became a patient. For controls those who were not injured by motorcycle accident during the study period in Jimma zone, southwest Ethiopia.

4.3.2. Study population

The study population for cases were motorcycle drivers who got medical service in the selected public hospitals with motorcycle accidents and community controls were motorcycle drivers without injury in Jimma zone.

4.4. Inclusion and exclusion criteria

4.4.1 Inclusion criteria

Those cases who were injured by motorcycle accident and he/she was treated as a patient at emergency surgery OPD in selected public hospitals. Controls were motorcycle drivers but had not injured.

4.4.2 Exclusion criteria

Those cases who were severely injured by motorcycle accident with surrogate care giver were excluded. Cases were not volunteer for interviewed and so do controls.

4.5. Sample size determination and sampling procedures

4.5.1. Sample size determination

Sample size (n) has been determined based on two population proportion formula.

$$n = \frac{\left[Z_{\alpha/2} \sqrt{\left[\left(1 + \frac{1}{r} \right) P(1-p) \right]} + Z_{\beta} \sqrt{\left[P_1(1-P_1) + \frac{P_2(1-P_2)}{r} \right]} \right]^2}{(P_1 - P_2)^2}$$

Based on the previous studies, driving license, helmet used and alcohol used were assumed as factors that affect motorcycle injuries. Sample size was calculated for each factors, finally driving license was chosen as exposure factor to calculate optimal sample size using EPINFO stat calculation. The following assumptions have been considered that

number of cases and controls ratio of 1:2, with the power of 80% and a two-sided 5% test. If driving license as exposure factor from study conducted in Nigeria(13), proportion of motorcycle driver injury ;

P_1 = proportion of cases exposure- 0.354

P_2 = proportion of controls exposure- 0.096

$P = \frac{p_1 + rp_2}{1+r}$

r = the ratio of cases to controls which is 1:2

Z_{β} = the power of the test is 1.28

$Z_{\alpha/2}$ = 95% confidence interval of two sided test which is=1.96

n_1 = sample size for cases

n_2 sample size for controls

$n_1=81$ and $n_2=162$. After adding 10% non-response rate the required sample size was $n_1=89$ and $n_2=178$ which gave total sample size of 267.

4.5.2. Sampling procedures

Based on the weight of motorcycle injury or needed samples consecutive sampling /study of total population at a given time/ technique was selected the total 87 cases from four public hospitals. A total of 174 motorcycle drivers but none injured controls were selected considering similarity of exposure status as cases.

Proportion allocation of total calculated sample size in four hospitals were based on the 2017 yearly motorcycles injury report in those hospitals.

Table 1. Required sample size for studies of determinants of motorcycle injures in four hospitals

No	Name of hospital	Yearly injured report	Required sample size
1	Limmu Genet	497	93
2	Agaro	534	99
3	Jimma medical center	216	42
4	Shenen Gibie	195	33
		1442	267

4.6. Data Collection technique and procedure

Data were collected by interviewer administered structured questionnaires for motorcycle drivers at selected public hospitals for cases and in their home for controls. Face to face interview with standard structured questionnaires prepared by adopting from similar studies was used. The English version was translated both to Afan Oromo and Amharic each by different language experts, to check consistency. Translated Afan Oromo and Amharic version was used for data collection accordingly based on the preference of respondents.

4.7. Variables

4.7.1. Dependent Variable

- Motor cycle Injury

4.7.2. Independent Variable

- Sex
- Age
- Occupation
- Educational level
- Marital status
- Religion
- . Alcohol used
- Helmet used
- Driver Violated right way
- Driving license
- Driving experience
- Weather condition
- Road type
- Road surface
- Safety tools utilization
- Lighting condition

4.8. Operational definition

- Injury: any physical damage on the body of motorcycle driver.
- Cases: motorcycles drivers who injured by accident
- Controls: motorcycle drivers but not injured by accident.
- Safety tools utilization: a sign used to show such type of road location like T-junction that indicate drive slow or need care (zebra cross).
- Lighting condition - the occurrence of motorcycle accident in such a way that day time, sunset or sunrises.
- Road type:- a driver who used either of road(urban, rural).

- Road surface- the material where roads are constructed (Asphalt ,Gravel or soil) where the motorcycle accident was happened.
- Weather condition - in which type of weather condition the motorcycle accident occurred /raining or not raining/
- Pedestrian - a person who injured by motorcyclists at any of the road parts.
- Motorcyclist: some body who rides a motorcycle.
- Alcohol used: beverage consumed by motorcycle driver that promote driving more speedy and finally accident will be faced.
- Helmet used: Personal protective equipment for motorcyclist that prevent head injury and death.
- License: recommended paper given from respected organization for knowledge and skill test for motorcycle drivers.
- Driving experience: time of duration when some body drives a motorcycle.
- Violated right way:- motorcyclists who loss his driving direction of road side.

4.9. Data processing and analysis

Data were checked for completeness, consistencies, clean and coded. The collected data was entered into EPI data version 3.1 and then exported to SPSS version 20 for statistical analysis. Descriptive and inferential statistics was used. Frequencies, proportion and summary statistics was used to describe the population in relation to relevant variables. Bivariate logistic regression was conducted and variables for multivariate logistic regression was nominated using p-value < 0.2. Multivariate logistic regression was used to see the association between dependent and independent variables. Adjusted Odds ratio (AOR) with 95% confidence interval were calculated to assess associations and P-value< 0.05 was used for level of significance.

4.10. Data quality assurance

The quality of data was assured through careful design, selection of data collectors on the basis of knowledge local language and data collection experience, proper trained of the interviewers, pretesting of the questionnaire. The questionnaire was pretested before data collection with in six motorcycle drivers where in the place of health center out of the selected hospitals in order to checked the tools. Data was collected under close supervision of principal investigator.

4.11. Ethical Consideration

Ethical clearance was obtained from Ethical Board committee of Jimma University, Institute of Health. Letter of permission was obtained from Jimma medical center, Shenen Gibie, Agaro and Limmu Genet hospitals administration officials. Informed consent were obtained from all conscious cases and disease free motorcycle drivers prior to proceeding data collection from them. This was done after description of the objectives of the study and of its procedures. Then each respondent was asked to check whether information providing on the purpose of the study was adequately understood or not. Confidentiality of the information obtained from each respondent was maintained.

4.12. Dissemination Plan

The findings from this study will be disseminated to the governmental and non-governmental organizations to provide information about determinants of motorcycle injuries of public hospitals of Jimma Zone. In addition it will be submitted to Jimma University health Science library and Epidemiology department. Further efforts will be made to publish the findings on national journal.

5. Results

5.1. Socio demographic related characteristics of respondents

A total of 267 motorcycles drivers were planned for study and 261 study participants responded to the questionnaires, making response rate 98%. Among which 87 and 174 represented cases and controls respectively. Six respondents were excluded from the study as a result of incomplete response during the study.

The mean age of motorcycle drivers during data collection was 22.5 SD \pm 3 years with the range of 10 to 55 years for cases and 24.4 SD \pm 4.7 years with the range of 10 to 52 years for controls. Majority of respondents were in the age group of 18 to 24 years which accounted 40.2% for cases and 48.8% for controls. Similarly, age group 25 to 29 years accounted 24% for cases and 16.7%for controls while age group 30 to 34 responded 10.3% for cases and 8% for controls. Generally, 18% and 8% of them were less than 18 years and greater than 34 years, respectively.

Regarding martial status majority of respondents 58.6% of cases and 55.2%of controls were singled while 41.4% of cases and 44.8% of controls were married. From the total respondents, 2%(n=6) and (n=1) of them were divorced and widowed, respectively. Furthermore, most respondents were merchants which accounted 35.7% of cases and 44.8%of controls while drivers constituted 33.6%of cases and 22.4%of controls, respectively. Five percent of (n=261) were constituted Government employees.

Moreover, majority of respondents 57.6%of cases and 63.2% of controls were an able to read and write while illiterate respondents were 16%of cases and 22.4%of controls, respectively. Similarly, 26.4% of cases and 14.4% of controls were reported as formal education (Table 2).

Table 2. Description of socio demographic characteristics of respondents in Jimma zone selected public hospitals, November 2018.

Variable	Category	Motorcycle drivers injured		Total N(%)
		Yes=cases (n=87) N(%)	No=Controls (n=174) N(%)	
		Age	<18	
	18 to 24	35(40.2)	85(48.8)	120(46)
	25 to 29	21(24)	29(16.7)	50(19.2)
	30 to 34	9(10.3)	14(8)	23(8.8)
	>34	6(7.1)	15(8.7)	21(8)
Marital Status	Single	51(58.6)	96(55.2)	147(56.3)
	Married	36(41.4)	78(44.8)	114(43.7)
Occupation	Drivers	34(39)	49(28.2)	83(33)
	Farmers	22(25.3)	47(27)	69(26.4)
	Merchants	31(35.7)	78(44.8)	109(48.6)
Education	Illiterate	14(16)	39(22.4)	53(20.3)
	read and write	50(57.6)	110(63.2)	160(61.3)
	Formal Education	23(26.4)	25(14.4)	48(18.4)
Religion	Christian	21(24.1)	44(25.3)	65(24.9)
	Muslim	66(75.9)	130(74.7)	196(75.1)

5.2 Motorcyclist characteristics of respondents

Most respondents 88.5% of cases and 81% of controls were not have driving license while 11.5% of cases and 19% of controls had license. Similarly, most respondents accounted 96.6% of cases and 86.2% of controls had not used helmet only 3.4% of cases and 13.8% of controls were used helmet during driving. Furthermore, more respondents 67% of cases and 78.7% of controls had not lost recommended right way while 33% of cases and 21.3% of controls were violated recommended right way (Table 3).

Table 3. Distribution of motorcyclists related characteristics of respondents in Jimma zone selected public hospitals, November 2018.

Variable	Category	Motorcycle drivers injured		Total N(%)
		yes=cases (n=87) N(%)	No=Controls (n=174) N(%)	
Had license	Yes	10(11.5)	33(19)	43(16.5)
	No	77(88.5)	141(81)	218(83.5)
Helmet utilization	Yes	3(3.4)	24(13.8)	27(10.3)
	No	84(96.6)	150(86.2)	234(89.7)
Alcohol used	Yes	31(35.6)	60(34.5)	91(35)
	No	56(64.4)	114(5.5)	170(65)
Violated way	Yes	29(33)	37(21.3)	66(25.3)
	No	58(67)	137(78.7)	95(74.7)

5.3 Environmental related characteristics of respondents

Regarding road types were assessed more or less equal. Likewise, 41.4% of cases and 53.4% of controls were used urban roads while 58.6% of cases and 46.6% of controls used rural roads, respectively. Similarly, most respondents 72.4% of cases and 75.3% of controls driving motorcycle in the absence of rain while 27.6% cases and 24.7% controls were driving in the raining time. Moreover, majority of respondents 86.2% of cases and 63.2% of controls did not used safety tools during driving while only 13.8% of cases and 36.8% controls were used safety tools (Table 4).

Table 4. Distribution of environmental related characteristics of respondents in Jimma zone selected public hospitals, November 2018.

Variable	Category	Motorcycle drivers injured		Total N(%)
		Yes=cases (n=87) N(%)	No=Controls (n=174) N(%)	
Types of road	Urban road	36(41.4)	93(53.4)	129(49)
	Rural road	51(58.6)	81(46.6)	132(51)
R/ surface condition	Asphalt	34(39)	80(46)	114(44)
	Gravel	42(48.8)	78(44.8)	120(46)
	Soil	11(12.6)	16(9.2)	27(10)
Weather Condition	raining	24(27.6)	43(24.7)	67(26)
	No training	63(72.4)	131(75.3)	194(74)
S/tools utilization	Yes	12(13.8)	64(36.8)	76(29)
	No	75(86.2)	110(63.2)	185(71)

Motorcycle accident collision types were indicated that collision with pedestrian 19(21.8%), collision with bicycle 5(6%), collision with motor vehicle other than motorcycle 12(14%), collision with animals 25(28%), fixed object 6(7%), with cart 12(14%), with falling from moving motorcycle 2(2.2%) and collision with motorcycle 6(7%) were responded accordingly during data collection.

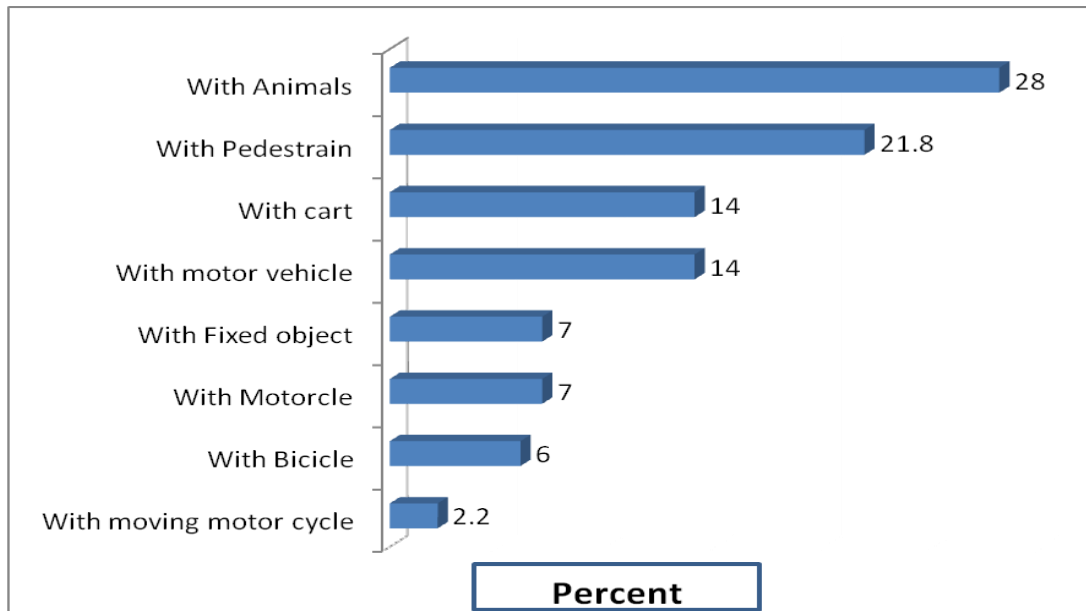


Fig 02- Proportional distributions of respondents collision type for motorcycle accident injuries in Jimma zone selected public hospitals, November 2018 (n=87)

5.4. *Bivariate and multivariate analysis*

5.4.1. Bi variate analysis

Among those socio-demographic related variables, age, occupation, martial status, education and religion: driver violated recommended right way, driving license, helmet used and alcohol used in motorcyclist and weather condition at the time of driving, road type utilization, road surface, light condition and safety tools utilization were environmental related variables included in Bivariate logistic regression analysis. Accordingly, educational level, occupation status, religion, driving license, helmet driver violated right way and safety tools utilization were variables nominated for adjusted model to control effect of covariates.

5.4.2. Bivariate analysis of socio demographic related variables

Among the socio demographic related variables considered in Bivariate logistic regression analysis; occupational status, educational level and religion were nominated for multivariate to see wether the presence of association between variables or not and to identify level of significance.

Table 5. Bivariate analysis of Socio-demographic related variables of motorcycles injury respondents in Jimma zone selected public hospitals, November, 2018.

Variable	Category	Motorcycle drivers injured		Crude OR (95%CI)
		Yes=cases (n=87) N(%)	No=Controls (n=174) N(%)	
Age	<18	16(18.4)	31(17.8)	0.75(0.2-2.3)
	18 to 24	35(40.2)	85(48.8)	1(0.4-2.7)
	25 to 29	21(24)	29(16.7)	0.5(0.2-1.6)
	30 to 34	9(10.3)	14(8)	0.7(0.2-2.3)
	>34	6(7.1)	15(8.7)	1
Marital Status	Single	51(58.6)	96(55.2)	2.4(0.5-12.3)
	Married	36(41.4)	78(44.8)	1.8(0.4-9.4)
Occupation	Drivers	34(39)	49(28.2)	0.6(0.4-1.2)*
	Farmers	22(25.3)	47(27)	0.8(0.4-1.7)
	Merchants	31(35.7)	78(44.8)	1
Education	Illiterate	14(16)	37(22.4)	1.8(0.5-5.7)
	Read & write	50(57.5)	110(63.2)	1.3(0.4-3.7)
	F/education	23(26.5)	27(14.4)	0.3(0.8-1.4)*
Religion	Christian	21(24.1)	44(25.3)	4(0.8-19.6)*
	Muslim	66(75.9)	130(74.7)	3.3(0.7-15.1)*

* P value < 0.2, * (indicate nominated variables for multivariate)

5.4.3. Bivariate analysis of motorcyclist related variables.

Those motorcyclist related variables considered in Bivariate logistic regression analysis; helmet utilization, violated right way road side and driving license were nominated for multivariate to know whether the presence of association between variables or not and to identify level of significance.

Table 6. Bivariate analysis of motorcyclist related variables of motorcycles injury respondents in Jimma zone selected public hospitals, November, 2018.

Variable	Category	Motorcycle drivers injured		Crude OR (95%CI)
		Yes=cases (n=87) N(%)	No=Controls (n=174) N(%)	
Helmet used	Yes	3(3)	24(14)	1
	No	84(97)	150(86)	4.3(1-19.2)*

Violated right way	Yes	29(33)	37(21)	2(1.04-3.3)*
	No	58(67)	137(79)	1
License used	Yes	10(12)	24(14)	0.6(0.3-1.2)*
	No	77(88)	150(86)	1
Alcohol used	Yes	31(35.6)	60(34.5)	0.5(0.3-2)
	No	56(64.4)	114(5.5)	1

* P-value < 0.2, * (indicate variables nominated for multivariate).

5.4.4. Bivariate analysis of Environmental related variables

From environmental related variables considered in Bivariate logistic regression analysis, only safety tools utilization was nominated for multivariate to know whether the presence of association between variables or not, and to identify significance level.

Table 7. Bivariate analysis of environmental related variables of motorcycles injury respondents in Jimma zone selected public hospitals, November, 2018.

Variable	Category	Motorcycle drivers injured		COR (95%CI)
		Yes=cases (n=87) N(%)	No=Controls (n=174) N(%)	
S/ tools	Yes	12(13.8)	64(36.8)	0.3(0.1-0.5)*
	No	75(86.2)	110(63.2)	1
Types of road	Urban road	36(41.4)	93(53.4)	1.2(0.7-2)
	Rural road	51(58.6)	81(46.6)	1
R/ surface condition	Asphalt	34(39)	80(46)	1(0.5-2.3)
	Gravel	42(48.8)	78(44.8)	0.8(0.4-1.8)
	Soil	11(12.6)	16(9.2)	1
Weather Condition	raining	24(27.6)	43(24.7)	1(0.6-1.8)
	No training	63(72.4)	131(75.3)	1

* p-value < 0.2, * / indicate variables nominated for multivariate/

5.5. Multivariate analysis

From the total variables (safety tools utilization, driver violated right way, helmet used, driver license, occupational status, educational level and driver religion) included in the multivariate analysis only three variables show statistically significant association with motorcycle injury. Those variables are safety tools utilization, driver violated recommended right way of road side and helmet used.

Motorcycle injury has shown strong statistically significant association with safety tools utilization. Respondents who had used safety tools during driving were (AOR : 0.3 ; 95% CI: 0.1, 0.6) less likely to be injured when compared with those who had not used safety tools. Similarly, driver violated recommended right way of road side has shown statistically significant association with motorcycle injury. Respondents who had lost recommended right way of road side were more likely to be injured (AOR:2.1;95% CI:1.05,4.1) when compared with those who had not violated recommended right way of road side. Moreover, helmet utilization has shown strong association with motorcycle injuries. Respondents who had not used helmet were (AOR:5.2 ;95%CI: 1.1, 23.5) more likely to be injured when compared with those who had used helmet.

Table 8. Multivariate logistic regression analysis of motorcycle injuries among motorcycles drivers at selected public hospitals of Jimma zone, november, 2018

Variable	Category	Motorcycle drivers injured		COR (95%CI)	P-value	AOR(95%CI)	P-value
		Yes=cases (n=87) N(%)	No=Controls (n=174) N(%)				
Helmet used	Yes	3(3)	24(14)	1		1	
	No	84(97)	150(86)	4.3(1-19.2)	0.055	5.2(1.1-23.5)*	0.035
D/violated way	Yes	29(33)	37(21.3)	2(1.1-3.6)	0.036	2.1(1.04-4.1)*	0.026
	No	58(67)	137(78.7)	1		1	
Safety tools utilization	Yes	12(13.8)	64(36.8)	0.3(0.1-0.5)		0.3(0.1-0.6)**	
	No	75(86.2)	110(63.2)	1	0.000	1	0.000

P-Value < 0.05*, P-value < 0.01** and P-Value < 0.001*** (*,** and *** indicate significant level at specified level)

6. Discussion

Institutional based case control study has attempted to identify the determinants of motorcycle injury at selected public hospitals, in Jimma zone, southwest, Ethiopia. Motorcycle injury as a result of road traffic accidents is now a serious public health problem especially in developing world including Ethiopia. However, road traffic accident can be predictable and preventive

Among those variables occupational status, educational level, religion, driving license, helmet utilization, driver violated recommended right way and safety tools utilization considered in Bivariate analysis for multivariate analysis. However, driver violated recommended right way road side, helmet utilization and safety tools utilization were variables show statistically significant association with motorcycle injuries.

Though driving license found to be associated with motorcycle injuries in Bivariate analysis but disappeared in adjusted model. This might be due to the confounding effect of violated road side and not used safety tools. Similarly, educational level and occupation have found to be associated with motorcycle injuries in Bivariate analysis but disappeared in adjusted model in this study but significant association in another study(12).

Accordingly, the present finding shows that motorcycle driver violated recommended right way of road side(AOR:2.1;95 % CI:1.04,4.1) found to be strong independent variable that determine motorcycle injury. Motorcycle driver violated right way of road side found to injured two times more than those who have not violated recommended right way of road side. Our study finding were slightly higher than study conducted from Tiran, Albania (22). This discrepancy might be due to the presence of very small number of licensed motorcycle drivers in our findings which was thirteen percent that increased driver road direction violation. Because of this reason our finding become higher than from other studies.

Likewise, the current study finding (AOR:5.2;95 % CI:1.1,23.5) revealed that helmet utilization was statistically significant association with motorcycle injuries. Motorcycle

drivers who did not use helmet during driving found to be injured five times more than those who had used helmet. This finding is in line with a study conducted in Ethiopia AA(7).

The present findings (AOR:0.3;95%CI:0.1,0.6) also has shown statistically significant association with motorcycle injury. Moreover, those motorcycle drivers who had used safety tools found to be injured less than those who had not used safety tools during driving. This study is nearly similar to other studies from Malaysia (19).

6.1. Limitation of the study

- Lack of similar studies in our country to make comparative discussion.
- Due to past events recall bias may be occurred
- Case to control sources were different, there may be a chance of misclassification.

7. Conclusion and Recommendations

7.1. Conclusions

This findings concluded that motorcyclists and environmental related determinants influencing motorcycle injuries. Likewise, driver violated recommended right way of road side and helmet utilization were strong predictors among motorcyclist related determinants. Furthermore, safety tools utilization was also strong predictor of motorcycle injuries among environmental related variables.

7.2. Recommendations

Findings such determinants against motorcycle injuries among motorcycles drivers cause serious concern and developing long term strategies for creating learning environments and should enforce strict traffic rules for those motorcycle drivers. Interventions are required for; Zone and towns traffic, transportation authority and health offices should

work to improve the existing motorcycles driving practices and to enhance respectiveness of legal driving rules which minimize the negative impact of motorcycle injuries.

Regarding areas for future research, the focus of this study was only determinants of motorcycle injuries in four hospitals. Since the study was also new and the untouched part. As a result of this, determinants of such injuries in other facilities were not estimated. Therefore, there will be a need for undertaking further study on the problems of these groups or motorcycle drivers.

Reference

1. World Health Organization. Global Status Report on Road Safety 2015. [(accessed on 19 October 2015)]. Availableonline: http://www.who.int/violence_injury_prevention/road_safety_status/2015/GSRRS2015_Summary_EN_final2.pdf?ua=1
2. Barrionuevo, Alexei (3 November 2008). "[That Roar in the Jungle Is 15,000 Motorbikes](#)". The New York Times. Retrieved 11 March 2009.
3. Crundall, David, Crundall, Elizabeth, Clarke, David, Shahar, Amit [Why do car drivers fail to give way to motorcycles at t-junctions?](#) Int J Environ Res Public Health. 2012, 01-01.
4. Chalya PL, Mabula JB, Ngayomela IH, Kanumba ES, Chandika AB, Giiti G, Mawala B, Balumuka DD: Motorcycle injuries as an emerging public health problem in Mwanza City, north-western Tanzania. Tanzan J HealthRes 2010, 12:214-221.
5. Schneider W.H., Savolainen P.T. Comparison of severity of motorcyclist injury by crash types. Transp. Res. Rec. J. 2011;2265:70–80. doi: 10.3141/2265-08.
6. Direslgne Misker*, Abayneh Tunje, Achamyesh Mengistu, Fikeru Abera, Matiyas Yalelet, Misganaw Gebrie, Mohammed Yimam, Sara Ayalew and Solomon Anemaw Magnitude and Factors Associated with Road Traffic Accident among Traumatized Patients in Arba Minch General hospital, 2017 Misker et al., Int J Pub Health Safe 2017, 2:3
7. Ararso B. Injury Severity Levels and Associated Factors among Road Traffic Accident Victims Referred To Emergency Departments of Selected Public Hospitals in Addis Ababa, Ethiopia. The Study Based On Haddon Matrix ,2017.
8. Chang F, Li M, Xu P, Zhou H, Haque M. Injury Severity of Motorcycle Riders Involved in Traffic Crashes in Hunan , China : A Mixed Ordered Log it Approach. Int J Environ Res Public Health. 2016;13(7):1–15.
9. Pai, Chih-Wei. Motorcycle [right-of-way](#) accidents A [literature review](#). Int J Environ RES Public Health. 2011,05-01.
10. National Highway Traffic Safety Administration . Traffic Safety Facts 2013 Data: Motorcycle. Washington, DC, USA: 2015.
11. GÃ¼ngÃ¼r, Faruk, Oktay, Cem, TopaktaÃ, Zafer, AkÃimen, Mehmet [Analysis of motorcycle accident victims presenting to the emergency department](#). Int J Environ Res Public Health.2009,07-01.
12. Shaker, R H, Eldesouky, R Sh, Hasan, O M, Bayomy, H .[Motorcycle crashes, attitudes of the motorcyclists regarding riders' experience and safety measures](#). Int J Environ RES Public Health . 2014, 12-01.
13. Akinola, Johon Olubenga. Factors influencing hihg rate of commercial motorcycle accidents in Nigeria. Int J of contmporary, Vol. 2 No-11, November 2012.

14. Oliveira, Amanda Lima de, Petroianu, Andy, Gonsalves, Dafne Maria Villar, Pereira, Gisele Arajo, Alberti, Luiz Ronaldo. [Characteristics of motorcyclists involved in accidents between motorcycles and automobiles.](#) Int J Environ Res Public Health. 2015, 01-01
15. Anteneh Kebede Sebsbie BSN, (MSc.Candidate) Road Traffic Accident related Fatalities in Addis Ababa City, Ethiopia: An Analysis of Police Report 2013/14
16. Cheng, Andy S K; Ng, Terry C K [Risky driving and the perception of motorcycle accident causes among Chinese motorcyclists in Hong Kong.](#) Int J Environ Res Public Health. 2012,09-01.
17. da Silva, Daniela Wosiack; de Andrade, Selma Maffei; Soares, Dorotia Ftima Pelissari de Paula; Mathias, Thais Aidar de Freitas; Matsuo, Tiemi; de Souza, Regina Kazue Tanno [Factors associated with road accidents among Brazilian motorcycle couriers.](#) Int J Environ Res Public Health. 2012-01-01.
18. Narelle Haworth, Joan Ozanne-Smith, Barbara Fox Irene brumen monash university accident Research center. Motorcycle-related injuries to children and adolescents. Report No, 56. May 1994.
19. Milad T, Tehran university of medical science: Determinants of traffic injuries in drivers and motorcyclists involved in an accident. Malaysia J Health Res, 2017.
20. Daniel Albalate & Laura Fernndez-Villadangos Exploring Determinants of Urban Motorcycle Accident Severity: The Case of Barcelona University of Barcelona , 2002-2008.
21. Abedi L, Khorasani-Zavareh D, Sadeghi-Bazargani H. Epidemiological pattern of motorcycle injuries with focus on riding purpose: Experience from a middle-income country. J Anal Res Clin Med 2015; 3(3): 149-56.
22. Gentiana Qirjako, Genc Burazeri, Bajram Hysa, Enver Roshi Factors Associated with Fatal Traffic Accidents in Tirana, Albania: Cross sectional study. Department of Public Health, Faculty of Medicine, Tirana, Albania, 2000-2005.

ANNEXES

Jimma University Institute of health, faculty of public health, Department of Epidemiology, Questionnaire to assess determinants of motorcycle injury in Jimma Zone selected public Hospitals, Southwest Ethiopia.

Consent Form

My name is -----and I am from Jimma University. I am conducting assessment on determinants of motorcycle injury in Jimma Zone selected public hospitals. And -----hospital is as part of this you are kindly requested to be included in the assessment which has great importance in improving the burden of health of the community. The interview will take a maximum of 30-40 minutes. No information concerning you as an individual will be passed to another individual or institution. Your participation will be based on your willingness and you have the right not to participate fully or partially. If you agree to be included in the study, I will start my question by asking general identification questions.

Name of interviewer-----Signature-----Date-----

Name of supervisor-----Signature-----Date-----

Annex 1 English Version

Name of Hospital -----Name of district-----

Name of Keble-----Town-----Village-----

Part one: Socio-demographic characteristics			
So	Questions	Response	Code
101	Sex of the respondent?	1. Male 2. Female	
102	Age of the respondent?		
103	What is your marital status?	1. Married 2. Single 3. Divorced 4. Widowed	
104	What is your occupation?	1. Driver 2. Farmer 3. Merchant 4. Government employee	
105	What is your Educational level?	1. Illiterate 2. read and write 3.Primary 4. Secondary 5. Diploma and above	
106	What is your religion?	1. Orthodox 2. Muslim 3. Protestant 4. Others specify---	
Part Two: Motorcyclist related characteristics			
201	Does the driver have driving license?	1. Yes 2. No	
202	For how long you have been driving?-	----- Year	
203	Are used helmet at the moment of accident t?	1. Yes 2. No	
204	Are you used alcohol at the day of accident?	1. Yes 2. No	
205	Does the driver violated recommended road side during driving?	1.Yes 2.No	

Part three: Types of collision with motorcycles			
301	In which type of road traffic accident [with motorcycle] you classify the accident?	1. Collision with pedestrian 2. Collision with bicycle 3. Vehicle collision with motorcycle 4. Collision with animal 5. Fixed object collision 6. Falling from moving motorcycle 7. Collision with cart 8. Collision with motorcycles 9.Others----	
Part Four. Environment related characteristics			
401	What was the status of the place where accident took place?	1.urban roads 2.rural roads	
402	Can you tell me the road surface condition of the place where accident took place?	1.asphalt 2.gravel 3.other	
403	What was the lighting condition at the moment of accident?	1.Daylight 2.Dark 3.Dusk/dawn	
404	Is there a motorist used safety tools at accident location?	1.Yes 2.No	
405	What was the weather condition at the moment of accident ?	1.raining 2.Not raining	

Thank you for Your Cooperation

Annex – 2 Vaarshiinii ooromiifaa

Yunversitii Jimmaatti: Damee barumsa Fayyaa hawaasaa

Waa’ee sababa miidhaa konkolaachistota motor siyikilaa adde baasuuf gaaffannoo qopho’e

Formaatii Ragaa:

Akkam Jirtu Maqaan koo_____ Jedhamaa

Yunversitii Jimmaatti barataa Digirii lammaffotii qorannoo digirii lammaffatiif gaggeessaa Jirra. Qorannoon keerolaa ka’umsa Aakkoo Balaa konkolaahisitoota motor siyikilaa baruuf. Kaayyoon isaas waa’ee ka’umsa balaa konkolachisaa motor sikilaa beekudha. Qorannoon kun kan gaggeeffamu Hosipitaalota godina Jimmaa keessotti argaman afur keessatti yoo ta’u yeroon qorannoo Ji’a Eebilaa hanga Ji’a caamsaa bairo 2010 ta’a. Hirmattotni qorannoo kanaa fedhii isaanitin kan hirmaton ta’a /dirqemahinqabu namootni qorannoo kana irate hirmaatin gaaffilee dhiyaataniif, guutummaa guufu tti, ykn wale kkaa akkasumas deebisu dhiisuun mirga.

Bu’aan qorannoo kanaa kaayyoo barumsaaf ykn tajaajila Fayyaa fooyyessuuf tajaaji’luu danda’a.

Qorannoo gegeesuuf

Mulaat Nagaashi

Bilibilaa: 0967795604

<u>Lakk</u>	<u>Gaafanno</u>	<u>deebii</u>
101	Umurii keasson naaf Ibsaa _____	
102	Haala gaahilaa naaf Ibsaa 1. Kan hin fuune 2. Kan fuudhe 3. Kan gaahila hiikan	
103	Hojiin keessan maalii? 1. Kankolachisaa 2. Qonnaan bulaa 3. Daldaalaa	
104	Sadarkaa barumsaa 1. Kan hin barannee 2. Dubbisuufibarressuu kan dan da'u 3. Barumsa Idilee kan barate	
105	Amantaa kam hordoftu? 1. Amantaa ortodoksii 2. Amantaa Musilimaa 3. Amantaa Pirotestantii	

201	Hayyama konkolachisummaa qabduu? 1. Qabaa 2. Hin qabu	
202	Waggae meeqa konkolachiftan?-----	
203	Yeroo konkolachiftan helmeetii fayyodamitu 1. Eeyyee 2. Hin fayyedamu	
204	Yeroo konkolachiftan alkoliin ni fayyadamitu 1. Eeyyee 2. Hin fayyadamu	
205	Yeroo konkolachiftan sarara mirqaa elgidaniiti konkolachiftuu? 1. Eeyyee 2. Mitii	
301	Motora yeroo konkolachiftan /aafan/ maal wajjin walitti buutan? 1. Lafo deemtota waliin 2. Bisikileta waliin 3. Konkolataa waliin 4. Beeladoota Walii 5. Waan hin sochoone waliin 6. Motora irraa kufuun 7. Gaarii waliin 8. Motor siikila waliin	
401	Karaa akkamii irra konkolachisaa turtan?	

	1. Magaala keessa 2. Baadiyyaa keessa	
402	Karaan irra konkolaachiftan maal irraa hojjatame? 1. Asipaltii 2. Koro konchii 3. Biyyoo qofa	
403	Yeroo konkolachiftan haalli ifaa maal turee? 1. Guyyaa /Ifa/ 2. Dukkan 3. Gara dhiyaa /brii/	
404	Karaa qaxxamuraa irra yeroo korrko laachiftan ofeggannoo ni gootuu? 1. Eeyyee 2. Mitii	
405	Yeroo konkolachiftan haalli qilleensaa akkam turee? 1. Rooba 2. Gogaa	

Ragaa nuu keentaaniif nigalaatifanaa !

Annex – 3 Amharic version

በጅማ ዩኒቨርሲቲ የጤና ኢንስቲትዩት፣የህብረትሰብ ጤና ትምህርት ዘርፍ

ሥለ ሞተርሳይክል ነጂዎች ጉዳት ዋና ዋና መንስኤዎችን ለመለየት የተዘጋጀ መጠይቅ፡-

1. የመረጃ ቅጽ

ጤና ይስጥልኝ! ስሜ _____ እባላለሁ፡

በጅማ ዩኒቨርሲቲ የድህረ ምረቃ ተማሪ ነኝ። ይህ ለድህረ ምረቃ ጥናት እያካሄድኝ ነው። ጥናቱም ስለ ሞተር ሳይክል ነጂዎች አደጋ መንስኤውን ለመረዳት ይሆናል። አላማውም ስለአደጋው ምንጭ ምን እንደሚመስል ማጥናት ነው።

ጥናቱ የሚካሄደው በጅማ ዞን በሚገኙ አራት የመንግስት ሆስፒታሎች ሲሆን የማጥኔያ ጊዜም ከሚያዚያ እስከ ግንቦት ወር 2010 ዓ.ም ይሆናል። የጥናቱ ተሳታፊ በፍቃዳቸው ብቻ ይሆናል። ማንኛውም የጥናቱ ተሳታፊ ጥያቄዎችን ሙሉ በሙሉ ሆነ በከፊል ያለመመለስ መብቱ የተጠበቀ ነው። የጥናቱ ውጤት በጋራ እንጂ በተናጠል አይገለፅም። ውጤቱም ለትምህርታዊ አላማ ወይም የጤና አገልግሎትን ለማሻሻል ሊጠቀም ይችላል።

ጥናቱን የሚያካሄደው አድራሻ

ሙላት ነጋሽ

ስልክ ቁጥር: 0967795604

ተ.ቁ	መጠይቆች	
101	ዕድሜውን ቢገልጽልኝ? _____	
102	የጋብቻ ሁኔታ ቢገልጽልኝ? 1. ያላገባ 2. ያገባ 3. የተፋቱ 4. የተለያዩ	
103	ሥራዎች ምንድን ነው? 1. ሾፌር 2. ገበሬ 3. ነጋዴ	
104	የትምህርት ደረጃዎስ? 1. ያልተማረ 2. ማንበብ መፃፍ የሚችል 3. መደበኛ ትምህርት የተማረ	
105	የትኛው ሃይማኖት ተከታይ ነዎት? 1. የኦርቶዶክስ 2. የእስልምና 3. የኻርቲስታንት	
201	የመንጃ ፍቃድ አለዎት? 1. አለኝ 2. የለኝም	
202	ሞተር ሥንት አመት ነድተዋል? _____	
203	ሲነዱ ሄልሜት ይጠቀማሉ? 1. አዎ 2. አልጠቀምም	
204	ሲነዱ አልኮል ይጠጣሉ? 1. አዎ 2. አልጠቀምም	
205	ሲነዱ የቀኝ መስመረዎችን ይዘው ነው? 1. አዎ 2. አልጠቀምም	

301	<p>ሞተር ሲነዱ የተጋጨት ከምን ጋር ነው?</p> <p>1. እግረኛ ጋር 2. ከሳይክል ጋር 3. ከመኪና ጋር</p> <p>4. ከእንስሳት ጋር 5. ከማይንቀሳቀስ/ከቆመ ነገር ጋር</p> <p>6. ከሞተር ላይ መውደቅ</p> <p>7. ከጋሪ ጋሪ</p> <p>8. ከሞተር ሳይክል ጋር</p>	
401	<p>በየትኛው መንገድ ነው የነዱ?</p> <p>1. በከተማ መንገድ 2. በገጠር መንገድ</p>	
402	<p>የሚነዱበት መንገድ የተሰራው ከምንድን ነው?</p> <p>1. አስፓልት 2. ጠጠር 3. አፈር</p>	
403	<p>ሲነዱ የነበረው ብርሃን ምን ነበር?</p> <p>1. ቀን 2. ጨለማ 3. ወገግ ሲል</p>	
404	<p>ሲነዱ ማቋረጫ መንገዶችን ይጠነቀቃሉ?</p> <p>1. አዎ 2. አልጠነቀቅም</p>	
405	<p>የአየር ንብረቱ ምን ይመስላል ሲነዱ?</p> <p>1. ዝናባማ 2. ፀሃያማ</p>	

ሥለት-ብብርዎ በጣም እናመሰግናለን።