ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCE
DEPARTMENT OF EMERGENCY MEDICINE

PREVALENCE AND ASSOCIATED FACTORS OF ROAD TRAFFIC ACCIDENT AMONG MOTORCYCLE DRIVERS OF ADDIS ABABA CITY, ETHIOPIA, 2018

BY: HINDU ARGETA (BSC)

A THESIS SUBMITTED TO GRADUATE STUDIES OF ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCES, DEPARTMENT OF EMERGENCY MEDICINE FOR PARTIAL FULFILMENT OF THE REQUIRMENT OF MASTER DEGREE IN EMERGENCY MEDICINE AND CRITICAL CARE NURSING.

JUNE, 2018
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MASTERS DEGREE IN EMERGENCY MEDCINE AND CRTICAL CARE NURSING

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ABBREVIATIONS

AAU	Addis Ababa University
AOR	Adjusted Odds Ratio
BSC	Bachelor of Science
CI	Confidence Interval
COR	Crude Odds Ratio
CSA	Central Statically Agency
EMCCN	Emergency Medicine and Critical care Nursing
GDP	Gross Development Product
LMICS	Low and Middle Income Country
MTI	Motor Traffic Injury
NHTSA	National highway Traffic Safety Administration
RTA	Road Traffic Accident
RTCs	Road Traffic Crashes
SPSS	Stastical Package of Social Science
SSA	Sub Sara Africa
TASH	Tikur Anbesa Specialized Hospital
USA	United State of America

ABSTRACT

Background: Motorcycle is a type of motor vehicle with two wheels which is used to transport passenger and for locomotion. Motorcycle accidents are becoming a public health problem in developing world. Motorcycle injuries constitute a major but neglected emerging public health problem in developing countries. They are among the leading causes of disability and deaths, the main victims being motorcycle drivers, passengers and pedestrians in the young reproductive age group.

Objective: The objective of this study was to assess prevalence and associated factors of road traffic accident among motorcycle drivers of Addis Ababa, Ethiopia, 2018.

Methods: Cross-sectional study design was used. Across-sectional quantitative study was carried out among 590 motorcycle drivers working in Addis Ababa city from February19, to March 31, 2018. Multi stage sampling techniques was used. The questionnaire with close ended question's including about Socio demographic variables, driver's characteristics, motorcycle condition and road traffic accident condition was used. Data collection was conducted at the workplaces of the motorcycle drivers by face-to-face interviewing of motor cycle drivers. EPI info version 7 was used for data entry and SPSS version 21 for analysis. Logistic regression was done to assess the association between the variables.

Result: The study found that prevalence of road traffic accident among motor cycle drivers of Addis Ababa city was 33.8% with 95% CI 30.3% to 69.7% during the last one year. Failure to follow write hand rule was the most reported cause of accident (32.5%), followed by over speed driving (31.5%) and alcohol driving (22.5%) respectively. The occurrence of motorcycle accidents was significantly associated with: Having previous history of punishment by traffic police AOR= 2.871 (95% CI, 1.632, and 5.051), over speed driving AOR=3.730 (95% CI, 2.239, and 6.215), having monthly income, 1000-2000 Ethiopian birr AOR = 0.540 (95% CI, 0.303, and 0.961), and 3001-4000 Ethiopian birr (AOR = 0.426(95% CI, 0.220, and 0.828) respectively with ($p \leq 0.05$).

Conclusion: The proportion of road traffic accident among motor cycle drivers was found to be high in the last one year in Addis Ababa, Ethiopia.

Key word: motor cycle, motor cycle drivers, road traffic accident.

CHAPTER ONE

1. INTRODUCTION

1.1. Background

Road Traffic Accident (RTA) can be defined as an accident that occurs on a way or street open to public traffic, resulting in one or more persons being killed or injured, and involving at least one moving vehicle (1).

Accordingly, RTAs are collisions between vehicles, between vehicles and pedestrians, between vehicles and animals, or between vehicles and geographical obstacles (2). Road traffic accident poses enormous challenges. Globally 1.3 million fatal and up to 50 million non-fatal injuries are reported (3).

Trauma is a major cause of morbidity and mortality in worldwide for death of majority of victims in road traffic accidents (RTA). According to World Health Organization more than 90% of deaths occur in low and middle income countries (4).

Motorcycle is a type of motor vehicle with two wheels which is used to transport passenger and for locomotion (5). According to the U.S National Highway Traffic Safety Administration (NHTSA) an estimated 148,000 motorcycle drivers have died in traffic crashes. Motorcycles made up of nearly 3% of all registered vehicles in the United States in 2008 and accounted for only 0.4% of all vehicles miles traveled. The number of motorcycle accident in the U.S increased by 1.5% from 2,116 in 1997 to 5,290 in 2008. Considering per miles traveled in 2008, motorcycle drivers were 37 % more likely than drivers of cars to die in a motor vehicle crash and nine times more likely to be injured. This high accident rates are in part attributed due to consumption of alcohol (6).

In 2006, in Europe, motorcycle accident represented 22% of the total number of road traffic accident fatalities. This risk may be influenced by several individual and environmental factors that apply to motor cycle users (7, 8).

In Brazil, most of the population makes use of motorcycles to move around. Motorcycles are also used as means of transport and delivery men. Moreover, this means of transport has lower cost compared to others and is accessible to low-income people who use it as locomotion (9).

In France, as in other industrialized countries, although the users of motor cycle represent less than 2% of the vehicles on the road, but they account for a very high proportion of the individuals who are injured and killed on the roads (10, 11).

Motorcycle injuries constitute a major but neglected emerging public health problem in developing countries (12). They are among the leading causes of disability and deaths, the main victims being motorcycle drivers, passengers and pedestrians in the young reproductive age group (13).

Injuries related to motorcycle contribute significantly to the number of road traffic injuries seen. The increase in use of motorcycle as forms of transport have been attributed to their accessibility, affordability and an unregulated market in developing countries like Kenya (14, 15). In Nigeria, prevalence of motorcycle injury ranging from 12.8-60% has been reported in different studies (16).

According to a report published by the World Health Organization (WHO) Ethiopia has one of the highest traffic accidents rate in the world. In 2006, 2,517 people were killed in road traffic accidents in Ethiopia and 24,792 suffered injuries. Ethiopia has 244,257 registered vehicles as of 2007, 29% of these are motorcycles, 34% minibus, vans ,27% of the registered vehicles are trucks and etc. Ethiopia has a speed limit of 60km/hr in urban roads but does not have national legislation that requires motorcycles helmet use (17). According to report from Addis Ababa police commission only one in three motorcycle drivers wore helmets correctly (18).

1.2. Statement of the problem

Road traffic injuries are the eighth leading cause of death globally and the leading cause of death among young people aged 15–29. Nearly 3,400 people die on the world's roads every day (19). Low-income countries with small numbers of vehicles experience a huge burden of fatalities (20). Ethiopia, according to WHO report, is considered one of the worst countries in the world where road transportation kills and injures a large number of road users every year (21) .

A middle aged male is more likely to die from injuries received in traffic accident than from any other cause and motor cycle accidents are single leading cause of death. Motor cycle drivers are about 25 times more likely than passenger car occupants to die in traffic crashes. Currently motor cycle accidents rank ninth in order of disease burden and are projected to be ranked third in the year 2020 (22).

About 20% of deaths in RTA are in motor cycle accidents globally. Most of the people were young males who are in the productive period of life. This places heavy burden on the family, social and medical resources (23). Motor cycle drivers are more vulnerable to RTA and for sustaining injuries. This group of road users does not have protective shell around them and therefore are more at risk than those inside vehicles (24).

Motorcycle drivers are among the most vulnerable road users. Nearly a quarter (23%) of the world's road traffic deaths occurs among motorcycle drivers. Per mile traveled, motorcycle drivers have a 34-fold higher risk of death in a crash than people driving other types of motor vehicles (25). Motorcycles drivers face higher dangers from several different road hazards than do cars and other vehicles (26).

Due to the smaller size and less stable nature of the motorcycle, potholes, dead animals, uneven heights between lanes, and other irregularities or unexpected objects in the road pose a serious safety threat to motorcycle drivers. Again, because the motorcycle is not surrounded by a metal case and is likely to be thrown far and hard, such crashes are more deadly than those involving other vehicle types. Motorcycle injuries constitute a major

but neglected public health problem in rapidly motorizing LMICs, and the relevant risk factors have not been adequately examined in these countries (25).In Malaysia, a study reported that motorcycle drivers constituted about 55-57% of total number of road accidents and 60% of traffic fatalities (27).

Several studies in developing countries like southern Nigeria and Uganda have also shown that helmet use by motorcycle driver is low. Majority of motorcycle driver have been reported not to wear any protective gear, hence aggravating the risks of getting severe head injuries (28). Use of alcohol while driving is also a common practice among motorcycle drivers. A similar study done in Nigeria, Ondo State among motorcycle drivers, up to 30% of them engaged in drunk riding (16). While another study in Oyo State stated that 20.4% of motorcycle driver reported current use of alcohol (29).

Injury due to road traffic crash is a major cause of ill health and premature deaths in developing countries. According similar study conducted in Kenya among 200 motor cycle drivers, 33% of them were injured and not wearing any protective equipment. Negligence was the most reported cause of crash (33%), followed by slippery roads 21.0% and speeding (17.5%). People injured at night were 5 times more likely to sustain a bodily injury compared to those injured during the day (30).

In Addis Ababa this risk taking behavior have continued to lead to the occurrence of accidents among motorcycle drivers. However, despite this burden, the public traffic policy responses to this problem have been low, probably because of lack of local data regarding the problem. No academic studies have focused on motorcycle drivers despite the fact that motorcycles are the mode of transportation within all Ethiopian cities.
Since the majority of motorcycle injuries are preventable, a clear understanding of the prevalence and contributing factors for motor cycle related road traffic accident is essential for establishment of prevention strategies, so this study will give base line information for researchers and policy makers on road traffic accident prevention strategies and to fill the information gap on RTCs among motorcycle drivers in Addis Ababa, Ethiopia.

1.3. Significance of the study

There is limited accident data especially scientific work about traffic safety in Ethiopia. Besides, nothing has been said about quantitative understanding and factors which involves motorcycle drivers' in road traffic accidents.

As a strategy of finding ways of alleviating motorcycle accidents and minimizing their consequences this study sets out to help in understanding the underlying factors influencing motorcycle accidents with possible solutions in the endeavor to curb the increasing number of injuries due to motorcycle accidents. Therefore the findings from this study will be hoped to be beneficial to the; the motorcycle drivers, passengers, government, and public.

Above all it will be hoped that this study would identify new areas of concern within the motorcycle transport sector which will trigger interest for more research in the areas and subsequently lead to insights to transport stakeholders. The study will also enhance the motorcycle drivers to use safety measures, and policymakers to create preventive measures for traffic accidents. General as the research findings identify the possible ways of how to curb motorcycle accidents.

CHAPTER TWO

2. LITERATURE REVIEW

2.1. Prevalence of road traffic accident among motorcycle drivers

The reported prevalence of motorcycle accident varies around the world. According to study conducted in Brazil among the motorcycle drivers, there was a high prevalence of accidents, with these professionals being subjected to high workload, given the need for productivity, often traffic violations can be observed such as speeding, which increases the vulnerability not only of drivers, but also of passengers. The prevalence of road traffic accidents involving motorcycle drivers was 63.6% among 420 motor cycle drivers. More frequently in the younger age group (20 to 30 years). Regarding the use of helmets, 97.4% of respondents use helmet (31).

According the findings of the study conducted in china the reported prevalence of motor cycle accident was , 22.8% in (32). And 62% in Vietnam (15). Similar study conducted India where the prevalence of motorcycle accident was reported to be 56.1% (33).

Study conducted in Southern Nigeria showed that 68% had been involved in road traffic accidents since they started riding motorcycles. Up to 34.5% of them had accidents 4 or more times and 87.5% were involved in accident in the year prior to the study. Among those who were ever involved in accidents, 64.7% attributed the last accident to over speeding and 47.1% of them reported colliding with another motorcycle during the most recent accident. Majority, 91.9% motorcycle drivers were not wearing helmet during the most recent accident and 39.0% admitted to carrying more than one passenger during the accident (34).

According to study conducted in Rwanda the prevalence of motorcycle injuries was found to be, 73.05% and most of accident occur during the day time (35). Similar study conducted in Uganda also showed that prevalence of RTA among motorcycle drivers was 45.3% of (36).

2.1. Associated factors of road traffic accident among motorcycle drivers

According to study conducted in France motorcycle driver, being male, not wearing a helmet, exceeding the legal limit for alcohol and travelling for leisure purposes increased the risk of accident involvement. Among motorcycle users, riders without a license had twice the risk of being involved in an accident than those holding a valid license. However, the number of years the motor cycle drivers had held a license reduced the risk of accident involvement (8).

According to similar study conducted in Brazil showed that motorcycle drivers have a high level of daily working hours (12 hours on average), and it was found that 63.6% were involved in at least one motorcycling accident. The occurrence of accidents involving motorcycle drivers showed significant association with level of education, both in the Chi-square test ($p<0.001$) and the Logistic Regression ($p=0.001$) with no significant association with the other variables, such as age ($p=0.132$) and working hours ($p=0.830$) (31).

Motor traffic injuries are recognized as a major public health problem in developing countries. MTI's continue to cause morbidity, mortality and disability in Sub Saharan Africa (1).The causes of MTIs are categorized into three main aspects; Human factors: These include reckless driving, excessive speed, overtaking errors, alcohol driving , negligent pedestrians, passengers, and motorcycle drivers. External factors: Poor road condition, bad surfaces, Poor road engineering and alignment like having narrow width which makes it difficult to overtake especially long trucks and cars with broad width. Poor mechanical condition of motorcycle like nondurable tyres, defective brakes and steer (37).

Study conducted in Southern Nigeria showed that 68.0% had been involved in RTAs since they started driving. 64.7% attributed the last accident to excessive speeding. Majority, 125(91.9%), were not wearing helmets when the accident occurred. Speed reduction was identified 69.0% motorcycle drivers as the single most important way of reducing RTAs among motorcycle drivers. Road traffic accidents were observed to occur

more commonly among 96.6% of motorcycle drivers who drank alcohol, compared to 56% who did not, ($\chi 2 = 31.5$, $p < 0.05$). Accident rate was also higher among those who were speeding excessively, 80.0%, compared to those who did not, 45.7% ($\chi 2 = 24.8$, $p < 0.05$). There is need for legislation against alcohol consumption among motorcycle drivers during driving hours and enforcement of speed limits by government in order to reduce RTAs among motorcycle drivers. Road traffic accidents was observed to occur most amongst those aged <30 years, though the difference was not statistically significant ($\chi 2 = 0.93$, $p > 0.05$) (34).

According to urban comparative study conducted in Oyo State, Nigeria, commercial motorcycle drivers over speeding was identified as a common cause of RTA by 37.3% of the motorcycle drivers in the urban area (19). Use of excessive speed is therefore a common cause of motorcycle accidents. Several studies in developing countries like in southern Nigeria have also shown that helmet use by motorcycle drivers is low. Majority of motorcycle drivers have been reported not to wear any protective gear, hence aggravating the risks of getting severe head injuries. Use of alcohol while driving is also a common practice among motorcycle drivers (25, 38).

According to similar study conducted in Kampala city Uganda factors independently associated with injury among motorcycle drivers were younger age group, being a current alcohol drinker (OR = 2.30, 95%CI: 1.19–4.45), riding experience of less than 3 years, not changing a motorcycle in past 1 year (OR = 2.04, 95%CI: 1.19–3.52), riding for a longer time in a day (OR = 6.05, 95%CI: 2.58–14.18), sharing a motorcycle (OR = 8.25, 95%CI:2.62– 25.9) and other factors associated with accident were low level of knowledge of traffic rules and history of punishment by traffic police (39).

2.3 Conceptual framework

The factors associated with motor cycle road traffic accident were classified as socio-demographic factors like, age, marital status and etc. Life style factors like drinking alcohol, chewing chat. Occupational factors like year of experiences speed of driving, license, driving time at night and external factors (32, 36) (figure 1).

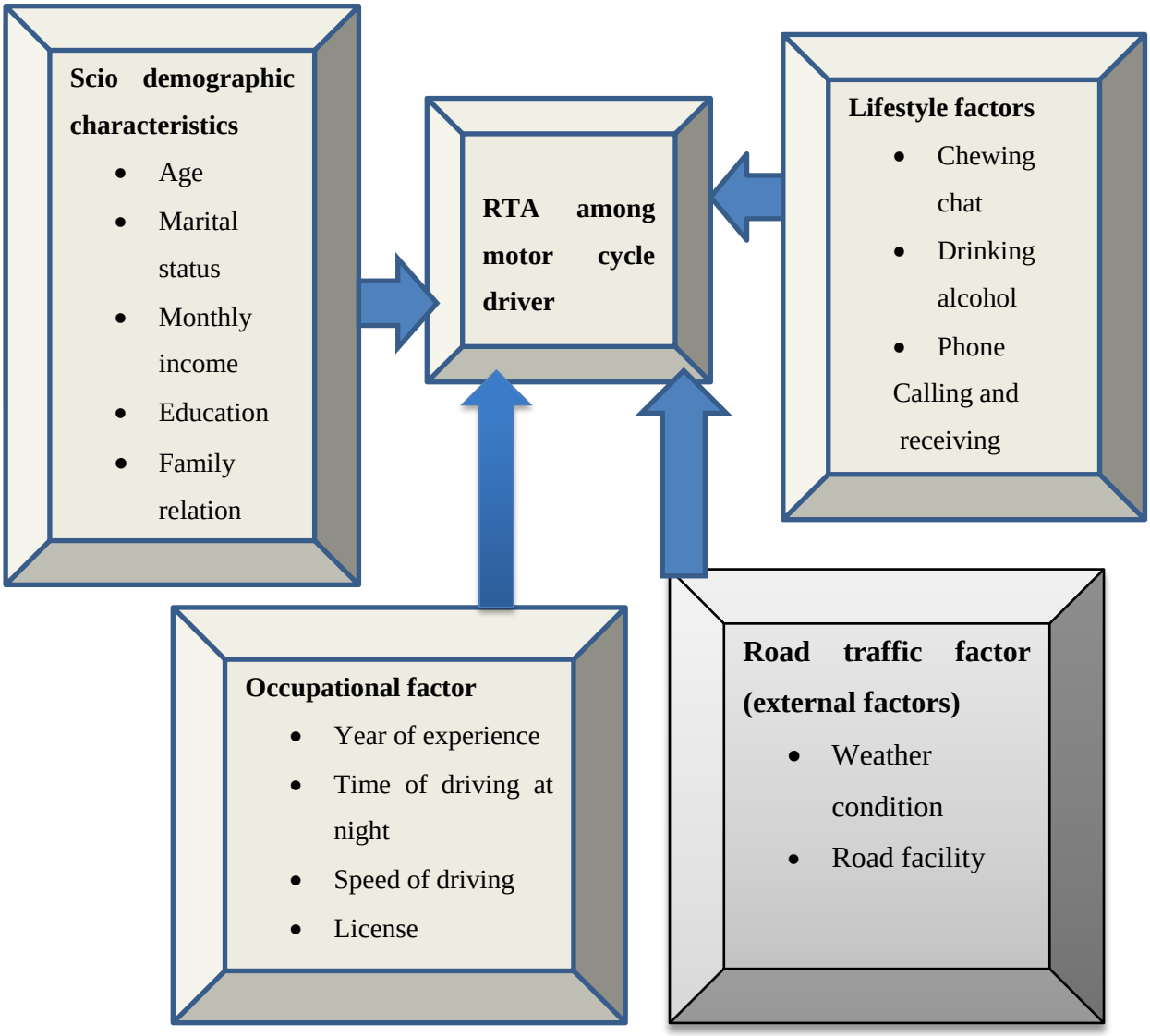

Figure 1: Conceptual framework for the determinants of RTA among motorcycle drivers Addis Ababa, Ethiopia, June, 2018.

CHAPTER THREE

3. OBJECTIVES

3.1. General Objective

Assessment of prevalence and associated factors of road traffic accident among motorcycle drivers of Addis Ababa city, Ethiopia, 2018

3.2. Specific Objectives

- To determine Prevalence of road traffic accident among motorcycle drivers of Addis Ababa city, Ethiopia from February, 19 to March, 2018.
- To identify associated factors of road traffic accident among motorcycle drivers of Addis Ababa city, Ethiopia, from February, 19 to March, 2018.
- To describe socio demographic characteristics of motorcycle drivers of Addis Ababa city, Ethiopia, from February, 19 to March, 2018.

CHAPTER FOUR

4. METHODS AND MATERIALS

4.1. Study area

The study was conducted in Addis Ababa the capital city of Ethiopia which has an area of 530.14 squares Kilometer divided into 10 sub cities. According to the 2007 national census, the population of Ethiopia has reached 73,909,355 of which urban population was 11,956,170 accounting for 16.1% of the total Population. Having a growth rate of 2.1%, the population of Addis Ababa has 2,738,248 which accounted for 32.27% of the total urban population of the country CSA. The expansion of the city, increasing population size coupled with the economic growth has required respective transport service supply for the increasing mobility needs of the People .The city's population is estimated to be 3 million with the current population growth rate of 2.1% the city population is estimated to reach 5 million after 10 years.

Addis Ababa is exhibiting high social, economic and structural change and found to be a fast growing city. Taking into account Addis Ababa's fast growth and to enable the transport sector to play its required role, the government has invested a huge resource to construct roads so as to expand the road network (40). Based on data from Addis Ababa city road and transport authority the total number of registered motor cycle that works in Addis Ababa city accounts, 22,838. Addis Ababa has ten sub cities among them four of them were study areas namely Lideta, Arada ,Kirkos and Nifasilik Lafto sub cities (41).

4.2 .Study Design and Period

A descriptive cross-sectional study was conducted from February 19 to March 31, 2018.

4.3. Source population

The source populations for the study were all motorcycle drivers in, Addis Ababa city, Ethiopia.

4.4. Study Population

The study population comprises of those motorcycle drivers in four selected sub cities, namely Lideta, Arada, Kirkos and Nifasilik Lafto sub cities, who were driving motorcycle in Addis Ababa city 2017/18.

4.5. Sample population

All selected Participants who fulfill inclusion criteria and who were driving motor cycle at the time of data collection from February 19 to March 31, 2018

4.6. Inclusion Criteria and Exclusion Criteria

4.6.1. Inclusion criteria

Subjects in the age group of 18-60 years, considered as acceptable working age and driving at least for one year, minimum year of exposure was required.

4.6.2. Exclusion criteria

- Age greater than 60 years old were not included to control ageing effect.
- Females were not included due to less number of females in motor cycle driving.
- Subject with driving experience less than one year.

4.7. Sample size determination

Sample size was calculated using sample size determination for single population Proportion. The following formula used to estimate the minimum number of motorcycle drivers required for the study. Considering proportion of 50%, 5% marginal error and 95% confidence interval. 5% was added to compensate for non-response rate. Based on this assumption, the actual sample size for the study was computed using the formula for single population proportion as indicated below.

$n = (Z\ \alpha/2)^2\ p\ (1-p)/\ d^2 +$ 5% non-response.

Where,

n = the maximum sample size which represent large population

Z α/2= standard normal distribution curve value for 95% CI which is 1.96 (where, α= 0.05)

p = proportion of road traffic accident among motorcycle drivers (0.5)

d = the margin error between the sample and the population (0.05)

$n = (1.96)^2 \times 0.5(1-0.5)/ (0.05)^2 = (3.8416 \times 0.5 \times 0.5)/0.0025 = 384.$

Because of the total population size of the study area were greater than 10,000, which was 22,838, we could not apply the population correction formula:

n= 384 by adding 5% non-response rat**e**.

Totally $384+384 \times 0.05=384+19$, nf= 403, Since multi stage sampling technique used rather than using simple random technique as result decrease in precision of data was considered. In order to increase precision of the data, calculated sample size was multiplied by 1.5 design effect. Finally the required sample size became 605.

4.8. Sampling method and Sampling procedure

4.8.1. Sampling Method

Multistage sampling technique was used to identify those participants of the study.

4.8.2. Sampling procedure

Addis Ababa city administration has 10 sub cities. First out of ten sub cities four sub cities namely: Lideta, Arada, Kiros and Nifasilik lafto sub cities were selected using simple random sampling technique. A sampling frame of motorcycle drivers found in four sub cities was obtained from Addis Ababa city road and transport authority bureau. Secondly, the number of motor cycle divers which included in the study from the selected sub cities was determined using proportion to size allocation technique on the basis of data from Addis Ababa city road and transportation authority bureau. Thirdly systematic random sampling technique was used to select motor cycle drivers who included in the study. Interval (K) value was calculated for each selected sub cities by using sampling frame of motor cycle drivers from each selected sub cities. To identify the interval (K) value the total number of motorcycle drivers found in each selected sub cities divided by to the number of the motorcycle divers who were intervened from each selected sub cities. Finally the first respondent was selected by lottery method then after every k interval.

Lideta (k_1) =770/168=4 Arada (K_2) =655/143=4

Kirkos (k_3) =565/123=4 Nifasilik (k_4) =625/136=4.

4.8.3. Sampling Procedure

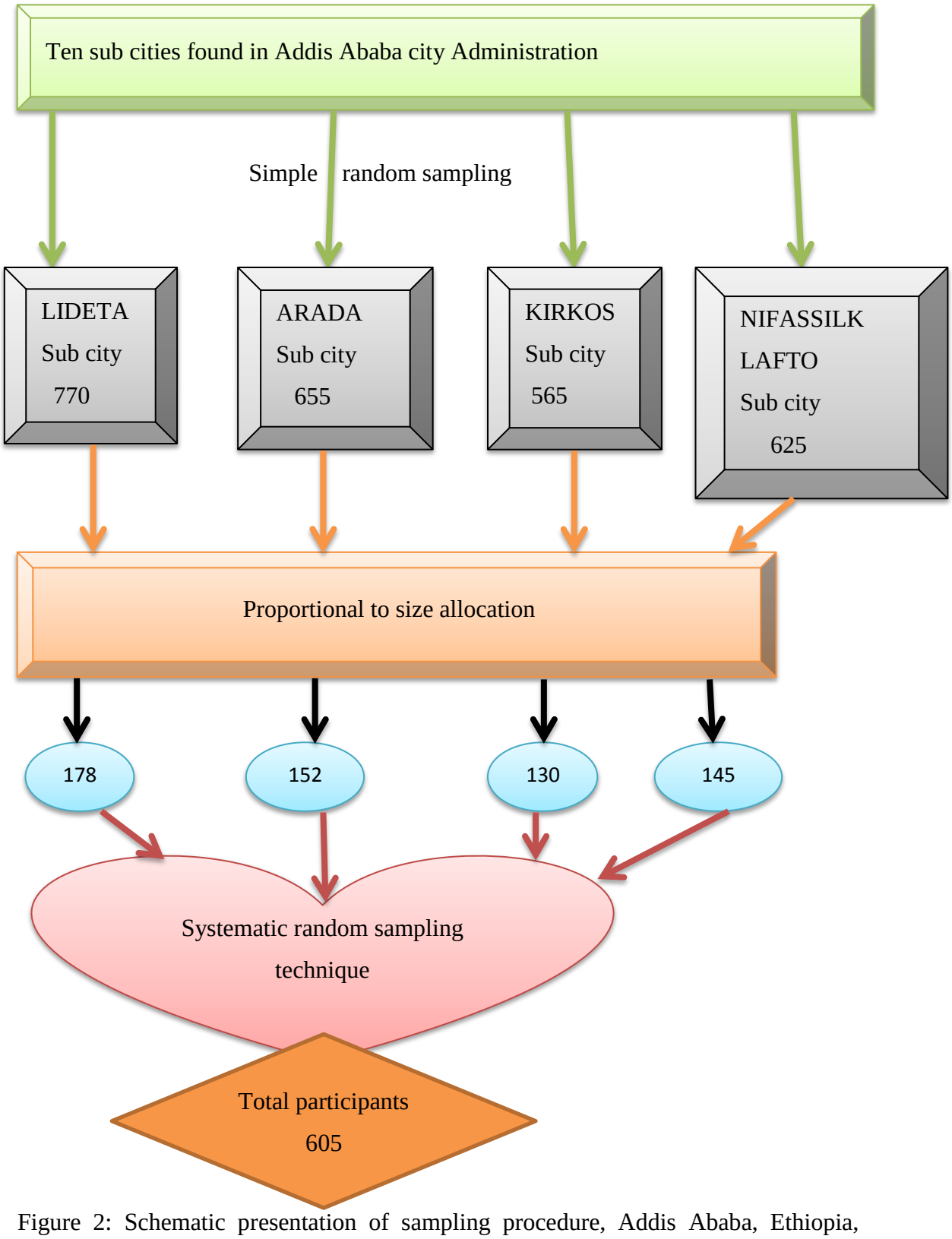

Figure 2: Schematic presentation of sampling procedure, Addis Ababa, Ethiopia, June, 2018.

4.9. Variables of the study

4.9.1 Dependent Variable

- Road traffic accident among motorcycle drivers

4.9.2. Independent Variables

Socio –demographic factors

- Age
- Educational status
- Marital status
- Religion
- Monthly income
- Family relation

Lifestyle factors

- Chewing chat
- Drinking alcohol

Occupational factor

- Year of experience
- License
- Speedy driving

4.10. Operational Definition

Prevalence of road traffic accident: Is defined as frequency of study subjects who were response experiences of RTA in the past one year.

Driver factors: Driver personal elements /attributes that may contribute to road traffic accidents.

Environmental factors: Aspects in the environment that can influence accidents

Motorcycle: It is a type of motor vehicle with two wheels which is used to transport passenger and for locomotion.

Motorcycle drivers: People who transport passengers and messages to set destination area by motorcycle (5).

Serious injuries: Fractures, concussions, internal injuries, crushing, severe cuts and lacerations, severe general shock ,necessitating medical treatment and any other injury involving removal to and detention in hospital.

Minor injuries: Injuries of a minor nature such as sprains and bruises (42).

4.11. Data collection tool and procedures

Data was collected by standardized questionnaire which adopted from other similar researches done in Uganda and modified as in our situation before the actual data collection. The questionnaire was written in English and translated to local language Amharic, and then translated back into English to insure its consistency. A data was collected by face-to-face interviewing of motor cycle drivers using closed ended questionnaires to gather relevant information. Data collection was conducted at the workplaces of the motorcycle drivers. To reduce the loss of the respondents, each selected sub city was visited up to five times. The principal investigator was given half day training for three data collectors (i.e. three BSC nurses) and two supervisors (i.e. two MSc nurses) prior to data collection. The training was includes how to interview respondents, how to collect & record data and how to supervise the data collectors.

4.12. Data Quality Assurance

Pre-testing of the questionnaire was done in Hawassa city on 5% of the total sample size but the respondents were not included in the actual study. The collected data was checked for completeness, accuracy and clarity. A code was given to the each questionnaires so that any identified errors could get traced back using the codes. Super visors were closely monitor data collectors daily during data collection. In addition, the principal investigator together with supervisors was checking the collected data daily.

4.13. Data Processing and Analysis

First, the data was checked for completeness then cleaned and coded before entered to Epi info. Next data from completed questionnaire was entered (double entry) in to Epi info version 7.2 and transferred in to SPSS version 23 for analysis. Both descriptive statistics and analytical statistical procedures were used. Descriptive statistics like percentage, mean, and standard deviation was used in order to characterize respondents with different variables of interest and tables and graphs were used to present the information.

All explanatory variables with p-value of ≤ 0.2 from bivariate logistic regression model were fitted in to the multivariate logistic regression model to control the possible effect of confounders and finally the variables which had independent

association with road traffic accident among motor cycle drivers was identified on the basis of AOR, with 95%CI and p-value less than 0.05. The variables were entered in the multivariate model using the Backward Stepwise regression method. Model fitness was checked by using Hosmer and Lemeshow goodness of a fit test.

4.14. Ethical Consideration

Ethical clearance was obtained from institutional review board of department of emergency medicine and critical care, college of health sciences, Addis Ababa University. After this, support letter was written by TASH to conduct this research in Addis Ababa town. In addition, informed verbal consent was obtained from the respondents before interviewing. Respondents were told about the aim of the study and confidentiality of the information which they given. In addition, they were told that they have full right to withdraw from the study at any time if they feel that uncomfortable.

4.15. Dissemination of Results

The findings of this study will be presented and submitted to Addis Ababa University, college of health sciences, department of emergency medicine. In addition it will be submitted to Addis Ababa road and transport authority and presented in different seminars and attempts will also be made to publish.

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CHAPTER FIVE

5. RESULT

5.1 Socio demographic characteristics of motor cycle drivers

A total of 605 motor cycle driver were included in the study, 590 (97.5%) response rates were obtained. The mean age of the respondents was 26.62 (SD ±5.860) years with the majority of them 316 (75.4%) were between 18 and 24 years of age. The majority of the respondents 424 (71.9%) were single. Regarding to the religion majority of the respondents 400 (67.6%) were orthodox. Related to educational status 259 (43.9%) were educated to at secondary school level. The average monthly income of the study respondents was 3373.90 (±SD= 1723.993) Ethiopian Birr (ETB) and 182 (31%) respondents earned 1000-2000 Ethiopian birr per month. About 272 (46.1%) of respondents were support their family from their monthly income (table1).

Table 1: Socio-demographic characteristics among motor cycle drivers in Addis Ababa, Ethiopia, June, 2018 (n= 590).

Variables	Category	Frequency(n=590)	Percent (%)
Age	18-24	268	45.4
	25-29	132	22.4
	30-34	131	22.2
	35-39	45	7.6
	>40	14	2.4
	Total	590	100
Religion	Orthodox	400	67.8
	Muslim	111	18.8
	Protestant	66	11.2
	Catholic	13	2.2
	Total	590	100
Marital status	Single	424	71.9
	Married	140	23.7
	Divorced	21	3.6
	Windowed	5	0.8
	Total	590	100

Number of children	≤2	98	16.6
	3-4	56	9.5
	≥5	9	1.5
	Total	163	27.6
Education	Unable to read and write	28	4.7
	Read and write	101	17.1
	Elementary	110	18.6
	Secondary	259	44
	Tertiary	42	7.1
	Diploma and above	50	8.5
	Total	590	100
Number of family support	1-2	184	31.6
	3-4	272	46.1
	>5	118	20.0
	Total	574	97.7
Monthly income	1000-2000	182	31
	2001-3000	178	30
	30001-4000	97	16
	>4000	133	23
	Total	590	100

5.2. Drivers characteristics and motor cycle condition

Majority of the respondents 429 (72.7%) motor cycle drivers had history of punishment by traffic police. More than half of the respondents, 323 (54.7%) were engaged in alcohol driving and 273 (46.3%) of respondents were reported chewing chat and engaged in driving within three hour after chat chewing. According to the current study the mean of motor cycle drivers experience year was 3.50(± 2.793). More than one third of the respondents 258 (43.7%) had 3-4 years of driving experience.

More than half of the respondents, 354 (60%) were driving more than limited speed and 421(71%) were drive at night 1-2pm local time.

Regarding to using of protective equipment while driving from the total of 590 respondents 471 (79.8%) use helmet from thus, 200(42%) use helmet always,117(25%) most of the times and 154(33%) use helmet some times while driving. Related to driving license 557 (94.4%) had driving license. Respondents who had life insurance were 54 (9.2%) and 91 (15.4%) of the respondents was drive motor cycle with mechanical problem. The reported mean service year of motor cycle was 1.55 (±0.937) (table2)

Table 2: Motor cycle drivers characteristics and motor cycle condition in Addis Ababa, Ethiopia, June, 2018 (n= 590).

Variable	Category	Frequency(n=590)	Percent (%)
Life insurance	Yes	54	9.2
	No	536	90.8
	Total	590	100
Use helmet	Yes	471	79.8
	No	119	20.2
	Total	590	100
Drink alcohol	Yes	323	54.7
	No	267	45.3
	Total	590	100
Punished by traffic police	Yes	429	72.7
	No	161	27.3
	Total	590	100
Chew chat	Yes	273	46.3
	No	317	53.7
	Total	590	100
Over speed driving	Yes	354	60.0
	No	236	40.0
	Total	590	100
Driving license	Yes	557	94.4
	No	33	5.6
	Total	590	100

Driving experience	≤2 year	228	38
	3-4 year	258	44
	5-7 year	64	11
	≥8 year	40	7
	Total	590	100
Driving at night time	1-2	421	71
	3-4	153	26
	5-6	16	3
	Total	590	100
Service year of motor cycle	<2	425	72
	3-4	162	27.5
	5-7	3	0.5
	Total	590	100
Mechanical problem of motor cycle	Yes	91	15.4
	No	499	84.6
	Total	590	100

5.3. Prevalence of Road traffic accident among motor cycle drivers

This study found that prevalence of RTA among motor cycle drivers in the past one year was, 200 (33.8%) with 95% CI 30.3% to 69.7% were reported (figure2).

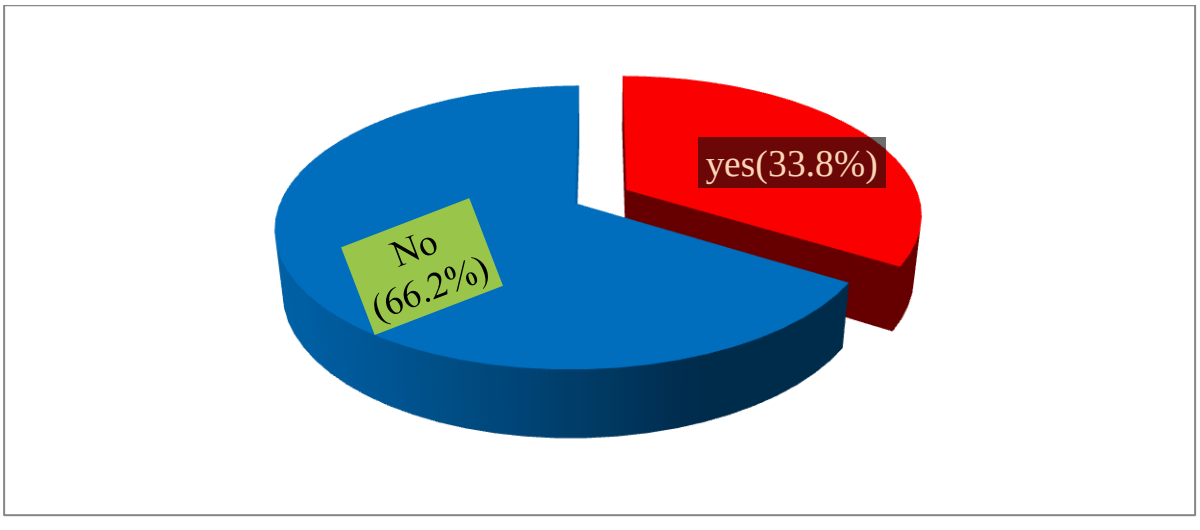

Figure 3**:** Prevalence of Road traffic accident among motor cycle drivers in Addis Ababa, Ethiopia, June, 2018(n= 590).

Among the respondents who had experienced RTA the reported consequence of the accident were 4 (1.6%) animal deaths, 44 (18.0%) people serious injury, 72 (29.5%) people minor injury and, 124 (50.8%) property damage. Regarding to injured group, 99 (70.7%) motor cycle drives, 38 (27.1%) pedestrian, 3 (2.1%) passengers were injured during the accident respectively and 28 (14%) of respondents mentioned rainy weather conditions as one of contributing cause for the occurrence of the accident .

Out of 590 respondents 273 (46.3%) of them chew chat for different reason and drive within 3hr after chewing chat. The reported reason why they chew chat was, 58 (21.2%) for energize, 91(33.3%) for pleasure and 139 (50.9%) to feel free respectively (figure4).

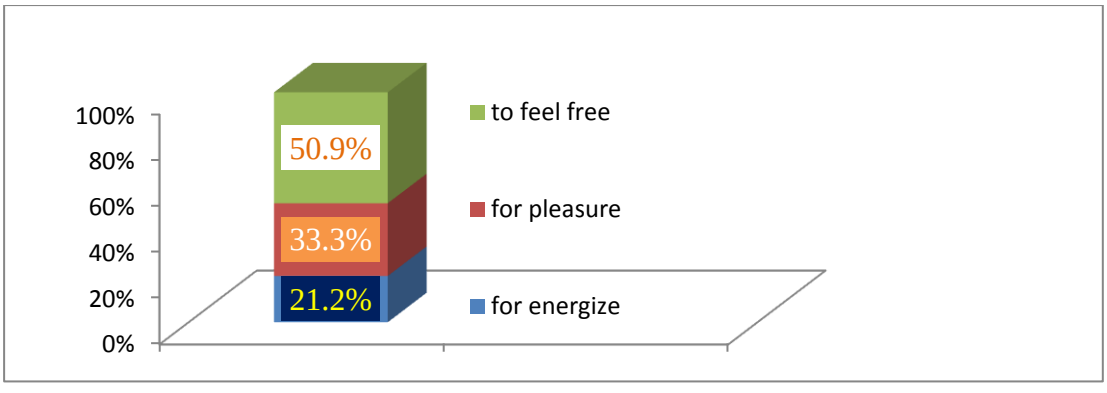

Figure 4: Reason for chat chewing among motor cycle drivers in Addis Ababa, Ethiopia, June, 2018**.**

Related to over speed driving from 590 respondents 354 (60%) of them drive more than limited speed. More than half of the respondents 227(64.1%) reported that the reason for speedy driving were to increase income, followed by for short queue 134(37.8%) and to racing with another drivers 16(4.5%) respectively (figure5).

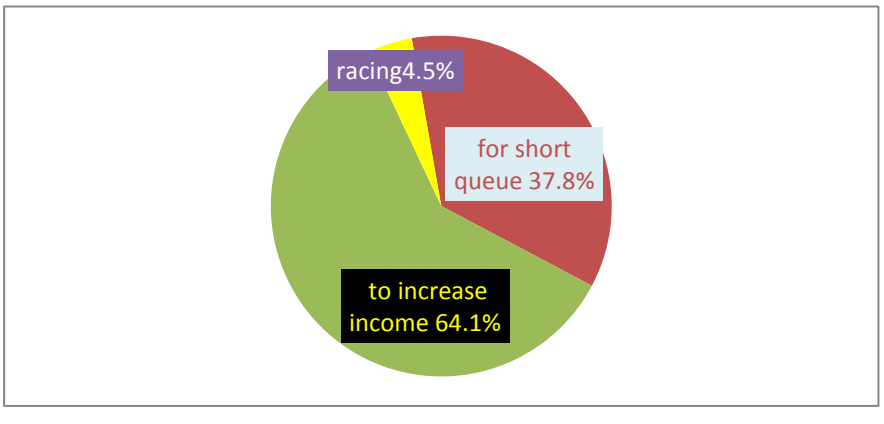

Figure 4: Reason for over speed driving among motor cycle drivers Addis Ababa, Ethiopia, June, 2018.

The most reported cause of the accident was failure to follow right hand rule while driving 65 (32.5%) followed by over speed driving 63 (31.5%) and alcohol driving 45(22.5%) respectively (table 3).

Table 3: Causes of road traffic accident among motor cycle drivers in Addis Ababa, Ethiopia, June, 2018(n= 200).

Cause for road traffic accident	Frequency	Percent (%)
Failure to follow right hand rule	65	32.5
Over speed	63	31.5
Alcohol driving	45	22.5
Chat chewing	17	8.5
Pedestrian carelessness	14	7
Mechanical problem of motor cycle	13	6.5
Failure to give way to pedestrian	12	6
Phone use while driving	11	5.5
Quality of road	10	5
Following too close	7	3.5

From the total of 590 respondents 87 (14.7%) of them drive motor cycle with mechanical problem, among them , 27 (31.0%) were drive motor cycle with brake problem, 24 (27.6%) of them drive motor cycle with lighting problem ,14 (16.1%) and 22 (25.3%) respondents drive motor cycle with steer and tire problem respectively.

Related to road trip among the respondents who experienced RTA (200), 186 (93%) of them faced RTA on asphalt and the rest 14 (7%) of the respondents experienced RTA on non-asphalt road trip (figure5).

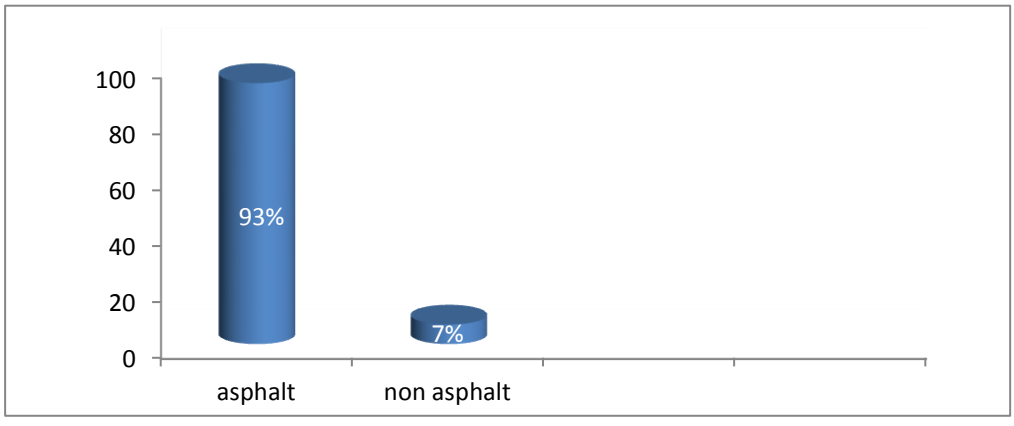

Figure 5: Road trip condition during accident among motor cycle drivers in Addis Ababa, Ethiopia, June, 2018.

From the respondents who experienced RTA (200) the most reported type of road junction during the accident was straight 155 (77.5%), two junction 28 (14%), square 13 (6.5%) and three junction 7 (3.5%) respectively (figure6).

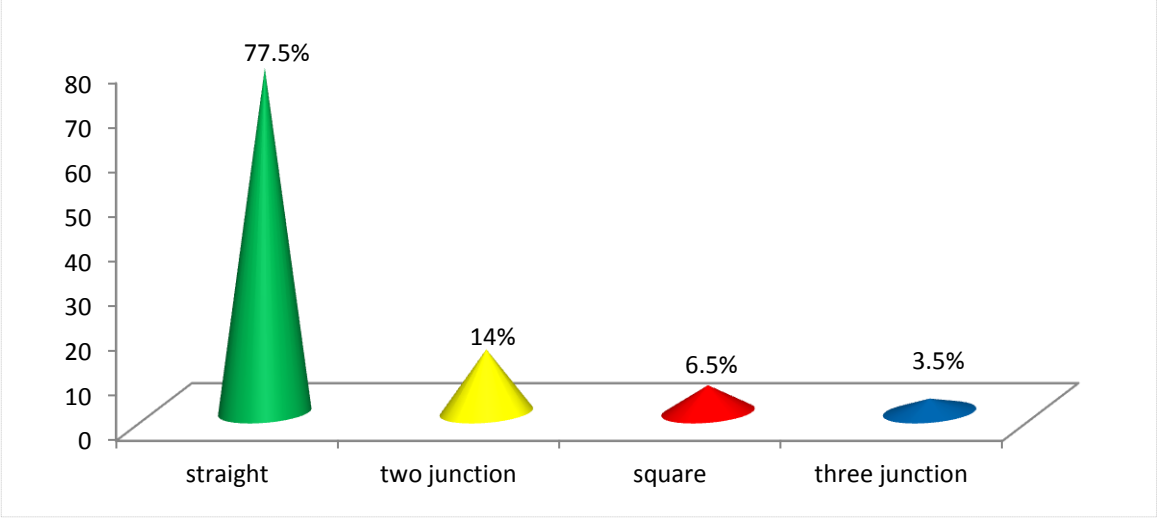

Figure 6: Road junction condition during accident occurrence among motor cycle drivers in Addis Ababa Ethiopia, June, 2018.

Out of 590 respondents 80 (24.8%) of them were engaged in driving for most of the time within 3hr after drinking alcohol and 91(33.3%) of them chew chat for most of the time while driving and also drive within 3 hours after chewing chat (table 4).

Table 4: Frequency distribution of alcohol driving, chat chewing and helmet use among motor cycle drivers in Addis Ababa Ethiopia, June 2018.

Variables	Yes(n=323)	Frequency	Percent (%)
Alcohol driving	Always	21	6.5
	Most of the time	80	24.8
	Some times	222	68.7
	Total	323	100
Chat chewing while driving	Yes(n=273)		
	Always	25	9
	Most of the time	91	33
	Some times	157	58
	Total	273	100

Regarding to the type of collision during the accident mostly reported collision type was motor cycle with another vehicle 140 (70%) followed by collision with obstacle 36 (18%), with human pedestrian 29(14.5%) and with animal 3(1.5%) (figure7).

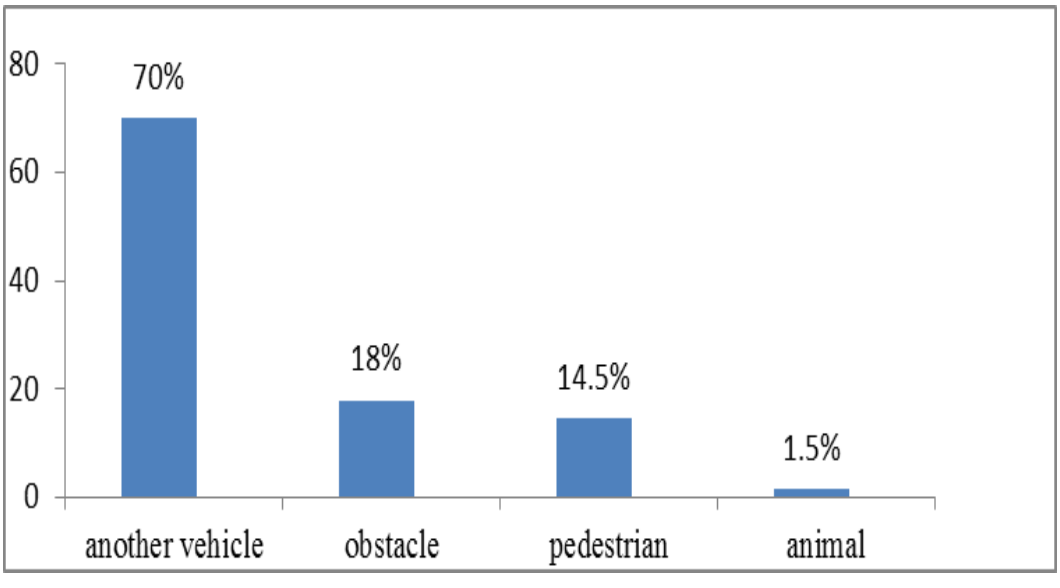

Figure 7: Types of collision during RTA among motor cycle drivers in Addis Ababa, Ethiopia, June, 2018.

From the total of 590 respondents 119(20.2%) were not use helmet while driving and the most reported reason not to use helmet was , not functional 57(48%), followed by no helmet at all 32(27%),it has no benefit 18(15.1%) and I fed up 12(10.1%) respectively (figure8).

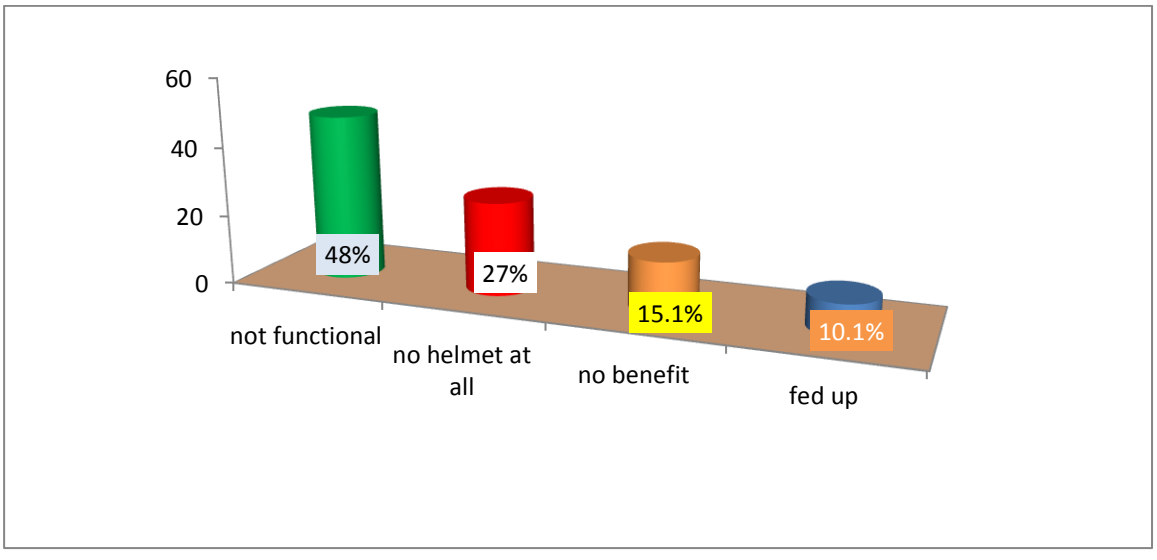

Figure 8: Reason for not to use helmet during driving motor cycle among motor cycle drivers in Addis Ababa, Ethiopia, June, 2018.

Out of 590 respondents regarding to phone call receiving while driving most of motor cycle driver 187 (32%) were stop driving and receive call and 154 (26%) of them receive call with driving motor cycle at normal speed. The rest 147 (25%) of them reduce speed while receiving call and 102 (17%) were disconnect ringing while driving motor cycle (figure9).

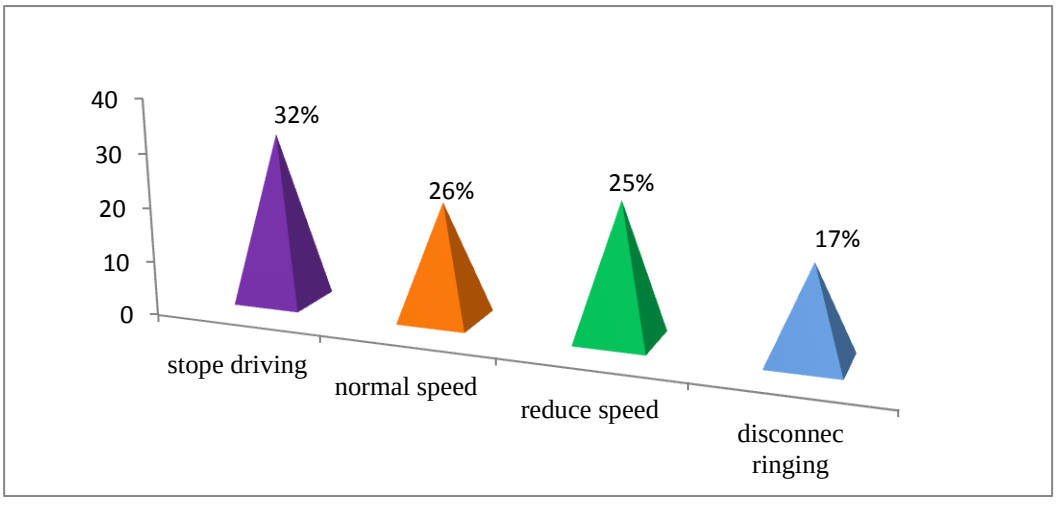

Figure 9**:** Phone call receiving while driving among motor cycle drivers in Addis Ababa, Ethiopia, June, 2018(n=590)**.**

5.4. Cross tabulation of Prevalence of road traffic accident within the past one year among motor cycle drivers.

This study found that over speed driving, chat chewing, alcohol drinking, history of punishment by traffic police, life insurance, driving experience and education were significantly associated with occurrence of RTA in chi square with p value less than 0.05**.**

The highest prevalence of road traffic accidents was observed among those with age of 18-24years, though the difference was not statistically significant ($\chi 2 = 12.383$, $p > 0.05$). The occurrence of accident was higher among those who drank alcohol, 150 (46.4%), than among those who did not, 50 (18.7%) the difference was statistically significant ($\chi 2 = 48.871$, $p < 0.05$). Accident rate was also higher among those who were speeding excessively, 171 (48.1%), compared to those who did not, 29 (12.3%) and the difference was statistically significant ($\chi 2 = 80.376$,
$P < 0.05$).

Related to the year of driving experience, accident rate was higher among those who were between 3-4 year of driving experience and the difference was statistically significant ($\chi 2 = 9.009$, $p < 0.05$) and also high rate of accident occurrence were experienced among who had history of punishment by traffic police, 178 (41.5%) than who had no history of punishment by traffic police, 22 (13.7%) and the difference was statistically significant ($\chi 2 = 39.223$, $p < 0.05$) (table 5).

Table 5: Cross-tabulation of prevalence of RTA among motor cycle drivers in the past one year in Addis Ababa, Ethiopia June, 2018 (n = 590).

Variables	**Category**	**Frequency of RTA**			
		Yes	NO	X^2	**P value**
Age in year	18-24	82(30.6%)	186(64.4%)		
	25-29	50(37.9%)	82(62.1%)		
	30-34	56(42.7%)	75(57.3%)	12.383	**0.115**
	35-39	10(22.2%)	37(77.8%)		
	≥40	2(14.3%)	12(85.7%)		
Marital status	Single	150(35.4)	274(64.6%)		
	Married	43(30.7%)	97(69.3%)		
	Divorced	5(23.8%)	16(76.2%)	2.148	**0.542**
	Widowed	2(40.0%)	3(60.0%)		
Education	Un able to read and write	14(50%)	14(50%)		
	Read and write	41(46.6%)	60(59.4%)		
	Elementary	31(28.2%)	79(71.8%)		
	Secondary	81(31.3%)	178(68.7%)	7.821	**0.00**
	Tertiary	15(35.7%)	27(64.3%)		
	Diploma and above	18(36%)	32(64%)		
Monthly income	1000-2000	53(29.1%)	129(70.9%)		
	2001-3000	68(38.2%)	110(61.8%)	4.222	**0.239**
	3001-4000	30(30.9%)	67(69.1%)		
	>4000	49(36.8)	84(63.2%)		
Insurance	Yes	25(46.3%)	29(53.7%)		
	No	175(32.6%)	361(67.4%)	3.491	**0.002**

Helmet use	Yes	158(33.5%)	313(66.5%)		
	No	42(35.3%)	77(64.7%)	0.06	**0.801**
Alcohol drinking	Yes	150(46.4%)	173(53.6%)		
	No	50(18.7%)	217(81.3%)	48.871	**0.000**
Punishment by traffic police	Yes	178(41.5%)	251(58.5%)		
	No	22(13.7%)	139(86.3%)	39.223	**0.000**
Chat chewing	Yes	134(49.1%)	139(50.9%)		
	No	66(20.8%)	251(79.2%)	51.04	**0.000**
Over speed driving	Yes	171(48.1%)	183(51.7%)		
	No	29(12.3%)	207(87.7%)	80.376	**0.000**
Driving License	Yes	186(33.4%)	371(66.6%)		
	No	14(42.4%)	19(57.6%)	2.148	**0.542**
Driving experience in year	≤2	81(35.5%)	147(64.5%)		
	3-5	93(36.0%)	165(64.0%)		
	5-7	21(32.8%)	43(67.21%)	9.009	**0.029**
	≥8	5(12.5%)	35(87.5%)		
Service year of motor cycle	≤2	139(32.7%)	286(67.3%)		
	3-4	60(37.0%)	102(63.0%)	0.974	**0.614**
	≥5	1(33.3%)	2(66.7%)		
Motor cycle mechanical problem	Yes	58(61.7%)	36(38.3%)		
	No	142(28.6%)	354(71.4%)	0.000	**0.521**

5. 5. Factors associated with RTA in Bivariate and multivariate analysis of logistic regression

5.5.1 Bivariate logistic regression

The major risk factors associated with motorcycle accident in bivariate analysis with ($p \leq 0.05$) were found to be: Alcohol driving(COR = 3.763, 95% CI: 2.550, 5.488), chat chewing (COR = 3.66,95% CI: 2.557, 5.256), over speed driving (COR =6.670, 95% CI: 4.291,10.367), driving experience <2 year (COR =3.57 , 95% CI: 1.454, 22.5) and driving experience 3-4 years (COR=3.9459, CI: 1.49, 10.417), having history of traffic police punishment (COR = 4.481, 95%CI: 2.748, 7.307), life insurance (COR = 1.778, 95%CI: 1.011, 3.127), education with elementary school (COR = 0.392, 95% CI: 0.168,0 .917) and secondary school(COR=0.455,95% CI:0.168,0.917). Factors that did not have any relation with road traffic accident among motor cycle drivers in bivariate analysis include age, marital status, monthly income, helmet use, driving license and motor cycle service year (table 6).

Table 6: Bivariate analysis of factors related with road traffic accident among motor cycle drivers in Addis Ababa, Ethiopia, June 2018(n=590)**.**

Variable	Category	RTA		COR(95%CI) 95% CI	P value
		Yes	No		
Age	18-24	82	186	1	
	25-29	50	82	1.383(0.893,2.142)	0.146*
	30-34	56	75	1.694(1.099,2.611)	0.17*
	35-39	10	35	0.648(0.306,1.371)	0.257
	40^{+}	2	12	0.378(0.83,1.727)	0.210
Marital status	Single	150	274	0.821 (0.136,4.969)	0.830
	Married	43	97	0.665 (0.170,4.124)	0.661
	Divorced	5	16	0.469(0.060,3.648)	
	Widowed	2	3	1	
Education	Diploma and above	18	32	0.563(0.220,1.439)	0.230
	Read and write	41	60	0.683(0.295, 1.584	0.375

	Elementary	31	79	0.392(0.168,0.917	0.031**
	Secondary	81	178	0.455(0.207,0.99)	0.050**
	Tertiary	15	27	0.556(0.210,1.470)	0.237
	Unable to read and write	14	14	1	
Monthly income	1000-2000	53	129	0.704 (0.438, 1.133)	0.149*
	2001-3000	68	110	1.066 (0.66, 1.860)	0.806
	3001-4000	30	67	0.768(0.440, 1.339)	0.351
	>4000	49	84	1	
Life insurance	Yes	25	29	1.778 (1.011, 3.127)	0.046**
	No	175	361	1	
Helmet	Yes	158	313	0,925 (0.607 ,1.411)	0.719
	No	42	77	1	
Alcohol driving	Yes	150	173	3.763 (2.550, 5.488)	0.000**
	No	50	217	1	
Traffic	Yes	178	251	4.481(2.748, 7.3070)	0.000**
punishment	No	22	139	1	
Chat chewing	Yes	134	139	3.66 (2.557, 5.256)	0.000**
	No	66	251	1	
Speedy driving	Yes	171	183	6.670 (4.291 ,10.3670)	0.000**
	No	29	207	1	
Driving license	Yes	186	371	0.680 (0.334, 1.3870)	0.289
	No	14	19	1	
Driving	<2	82	147	3.57 (1.454, 10.231)	0.007**
Experience	3-4	93	165	3.9459(1.494, 10.417)	0.0068**
	5-7	21	43	3.419(1.170, 9.992)	0.025**
	>8	5	35	1	
Motorcycle	<2	139	286	0.972(0.87,10.812	0.982
service year	3-4	60	102	1.176(0.104,13.251)	0.895
	5-7	1	2	1	

* Significant at p≤0.2, ** significant at p≤0.05

5.5.2. Multivariate regression

5.5.2.1. Factors associated with RTA by multivariate analysis

To avoid excessive number of variables and unstable estimate in the final model, variables with P-value less than 0.2 in the bivariate analysis were taken in the multivariate analysis. The multivariate binary logistic regression analysis identified that, history of punishment by traffic police, over speed driving and monthly income with 1000-2000 Ethiopian birr and 3001-4000 Ethiopian birr were significantly associated with RTA among motor cycle drivers. Other factors such as age, helmet use, driving hour at night, chat chewing, alcohol driving, life insurance, driving experience, driving license and mechanical problem of motor cycle were not significantly associated with RTA among motor cycle drivers.

The odds of RTA was 2.871 times more likely among motor cycle drivers who had history of punishment by traffic police than motor cycle drivers who had no history of punishment by traffic police; AOR=2.871, (95% CI,1.632-5.051).

The odds of road traffic accident was 54% more likely among motor cycle drivers who had monthly income 1000-2000 Ethiopian birr than motor cycle drivers who had monthly income greater than 4000 Ethiopian birr with ;AOR= 0.540, (95% CI, 0.303, 0.961) and the odds of RTA was 42.6% more likely among the respondents who had monthly income 3001-4000 Ethiopian birr with AOR= 0.426, (95% CI, 0.220, 0.828) when compared to these respondents who had monthly income greater than 4000 Ethiopian birr respectively.

The odds of RTA was 3.73 higher among motor cycle drivers who had driving more than limited speed than those motor cycle drivers who had not engaged in over speed driving ; AOR=3.730 (95% CI, 2.239,6.215) (table7).

The total model was significant (p=<0.001). All the values of the standard errors in the model (0.087) were below 5 which indicated no multi-co linearity among variables. The results of the Hosmer–Lemeshowtest (p=0.693) indicated the goodness of fit of the model.

Table 7: Multivariate logistic regression of factors associated with road traffic accident among motor cycle drivers in Addis Ababa, Ethiopia, June, 2018(n=590).

Variable	Category	RTA		AOR(95%CI) 95% CI	P value
		Yes	No		
Age	18-24	82	186	1.124(0.179,7.048)	0.900
	25-29	50	82	1.481(0.2349.381)	0.676
	30-34	56	75	1.663(0.265,10.413)	0.587
	35-39	10	35	0.679(0.97,4.760)	0.697
	40^{+}	2	12	1	
Education	Tertiary	18	32	0.618(0.193,1.978)	0.418
	Diploma	41	60	0.709(0.237,2.1250	0.539
	Elementary	31	79	0.534(0.204,1.401)	0.202
	Read, write	81	178	0.650(0.254,1.665)	0.370
	Secondary	15	27	0.149(0.170,1.030)	0.058
	Unable read	14	14	1	
Monthly income	1000-2000	53	129	0.540(0.303,0.961)	0.036**
	2001-3000	68	110	0.632(0.361,1.107)	0.108
	3001-4000	30	67	0.426(0.220,0.828)	0.012**
	>4000	49	84	1	
Life insurance	Yes	25	29	1.825(0.948,3.514)	0.072
	No	175	361	1	
Alcohol	Yes	150	173	1.590(0.964,2.624)	0.069
	No	50	217	1	
Traffic punishment	Yes	178	251	2.871(1.632,5.051)	0.000**
	No	22	139	1	
Chat chewing	Yes	134	139	1.581(0.943,2.651)	0.082
	No	66	251	1	
Speedy driving	Yes	171	183	3.730(2.239,6.215)	0.0008**
	No	29	207	1	
Driving experience	<2	82	147	1.866(0.567,6.135)	0.305
	3-4	93	165	1.622(0.497,5.294)	0.423
	5-7	21	43	1.538(0.432,5.471)	0.507
	>8	5	35	1	

CHAPTER SIX

6. DISCUSSION

In this study the prevalence of road traffic accident among motor cycle drivers in the past one year was found to be (33.8%, 95% CI 30.3% to 69.7%) in Addis Ababa, Ethiopia.

The prevalence rate of RTA in this study was (33.8%), less compared to previous study conducted in southern Nigeria, 68% , Rwanda ,73.05%, Uganda, 45.3%, India (56.1%), Brazil 63.6%, Vietnam 62% (15, 31, 33-36). But the prevalence of RTA among motor cycle drivers recorded in current study was high when compared to china which is 22.8%. These variations may be due to differences in methodology, sample size, differences in risk factors for motorcycle accidents between the study settings, large number of motor cycle drivers in the previous study and their driving habits (32, 43).

In this study, more than one third of the respondents nearly 42% of drivers had a history of at least one traffic punishment reporting, and 72.7% of the total study respondents had received punishment as well. Previous history of punishment by traffic police was found significantly associated with RTA in this study and 2.871 times risk for experiencing RTA among motorcycle drivers who had history of punishment by traffic police than who had no previous history of punishment. AOR: 2.871(95% CI 1.632, 5.051). This reveals a high level of risky driving among the motor cycle drivers, and a persistent habit of violating traffic laws. Therefore, the results of this study may have implications for modifying the type, severity, and enforcement level of traffic violation punishments used in the Ethiopian context. This finding consistent with previous study conducted in Kampala city Uganda (39) .

This study identified an association between over speed driving and RTA. Increased odds of developing RTA with increased speed of driving were observed among motor cycle drivers. Respondents who engaged in over speed driving were 3.73 times more likely to experience RTA than who did not engaged in driving more than limited speed: AOR=3.73 (95% CI, 2.239, and 6.215). This could be due to economic status of the motor cycle drivers, road user mix, traffic pattern or density, legal framework.

This study result was consistent with previous similar study that conducted in Southern Nigeria among motor cycle driver over speed driving was significantly related to RTA but this study finding was contrary with the finding of the study which conducted in kampal city Uganda, Brazil and France (8, 34) .

According to current study monthly income from 1000-2000 Ethiopian birr and 3001-4000 Ethiopian birr were significantly associated with experiencing RTA. Motor cycle drivers who had monthly income 1000-2000 Ethiopian birr were 54% more likely to experience RTA than motor cycle drivers with monthly income greater than 4000 birr. And also motor cycle drivers with monthly income 3001-4000 Ethiopian birr were 42.6% more likely to experience RTA compared to respondents who gets monthly income greater than 4000 Ethiopian birr. This might be related to productivity and increasing income, related to that respondents engaged in to dis obeying traffic rule as result become more vulnerable to road traffic accident. This study result contrary with study conducted in Nigeria and kampal city Uganda. Not many studies have established the influence of monthly income on road traffic injury among motorcycle drivers but bivariate analysis in a study conducted in Nigeria found that those who had other jobs and income had higher odds of getting road traffic injuries and also similar study conducted in kampal city, Uganda reported that in multivariate analysis those who had higher income experienced higher odds of getting road traffic accident compared to their counterparts (34, 39).

The mean age of the motor cycle driver in this study was (26.62, ±5.860). Age was not significantly associated with RTA in this study which is consistent with the result of similar study which conducted in Brazil (31). However, previous cross-sectional study on prevalence and determinants factors of road traffic accident among motor cycle conducted in Uganda with mean age (46.8, ±8.9) found that age was significantly associated with RTA which is contrary with the result of current study. This is probably due to the age difference between the study groups. According to current study nearly one third of the accident (30.6%) were occurred among motor cycle drivers of age 18-24 years. This might be due to this group of having been attributed to a wide range of activities engaged in by this class of people. They are more likely to have reasons to move from one place to another. They represent the

active group that partake in high risk-taking activities such as over-speed driving and disobedience traffic law (36).

Present study found that helmet use was 79.8% among motor cycle drivers which is lower compared to previous similar study conducted in Brazil, 97.4% (31). On the contrary, Poor helmet use among motor cycle drivers has been recorded in several studies, especially in developing countries. Study conducted among motorcycle driver in the Southern Nigeria, helmet use was less than 10%. These differences in the rate of helmet use reflect differences in awareness of the role of helmet and poor enforcement of traffic laws. It could also be due to difference in attitudes to helmet wearing, cost of the helmet, ignorance, toward lawlessness, impaired driver vision of motor cycle drivers between these countries (34).

In the present study, the collision between motorcycles with another vehicle was the common mechanism of injury followed by collision between motorcycle with obstacle and pedestrians respectively. Motorcycle-vehicle and motorcycle-pedestrian collisions occur commonly because the majority of the drivers often ignore safety measures, making them more vulnerable to accidents with other motorized vehicles. In the present study, 26.1% of accidents were occurred during the day time. Increased rate of accident during the day can be explained by increased traffic density as well as increased human activities in the city during the day time. Similar trend was also reported from study conducted in Rwanda (35).

CHAPTER SEVEN

7. LIMITATION AND STRENGTH OF THE STUDY

7.1. Strength of the study

- This study had reported for the first time the prevalence of RTA among motor cycle drivers in Addis Ababa, Ethiopia.
- Most of earlier studies concentrate on secondary data based finding but this study try to find out the prevalence and associated factors of RTA among motor cycle drivers by using primary data source.
- Considering multiple factors for the assessment of outcome is also strength of this study

7.2. Limitation of the study

- The study only included living drivers and who sustained minor injuries, which through survival bias can lead to under-estimation of the effect magnitude.
- Data collected was self-reported hence the results may have been biased since the accuracy of respondents' description on circumstances of the accident could not be independently verified.
- The study was based on self-report of the past one year circumstances of the accident therefore may have been subject to recall bias.
- From the finding of previous studies there was determination of the number of times that individuals suffered an accident, but no determination of the number of times that individuals suffered an accident in current study.
- No study has been conducted in Ethiopia before this study so the study also lack comparison group.
- The cross-sectional nature of study design doesn't confirm definitive cause and effect relationship.

CHAPTER EIGHT

8. CONCLUSION AND RECOMMENDATION

8.1. Conclusion

The prevalence of road traffic accident among motor cycle accident in the last one year was found to be high. The study found that over speed driving, history of punishment by traffic police, and having monthly income 1000-2000 Ethiopian birr and 3001-4000 Ethiopian birr had significant association with road traffic accident among motor cycle drivers. This shows that there are still great deficiencies concerning implementation of traffic rule and regulation, deficiencies concerning speed limitation in traffic police.

In this context, this research can guide actions that involve this group of workers, generally neglected, and which require attention from urban mobility agencies concerning supervision, control and implementation of public traffic policies.

8.2. Recommendation

Since the majority of motorcycle injuries are preventable, there is need for legislation against driving more than limited speed among motorcycle drivers during driving hours and strict enforcement of traffic laws regarding to obeying traffic police law and regular rule with preventive strategies could be necessary in order to reduce road traffic accident among motorcycle drivers.

At individual level: Motor cycle drivers might have obeyed all traffic law and not engaged in distractive driving habit like over speed driving. Motor cycle drivers could have a sense of respect for others and for their own lives which is vital in the prevention of RTI's. Pedestrians could be aware of all the road traffic signs and follow the road safety rules.

Media: Advocacy and awareness creation for motor cycle drivers and pedestrians.

Police commission: Further traffic law enforcement for motor cycle drivers in line with speed limitation, controlling risky behaviors while driving and advocacy.

Fire and emergency department: Rapid deployment of pre hospital service at the scene and possible integration with traffic police department.

Recommendation for further research: Further study with alternative design is recommended to investigate other risk factors of road traffic accident among motor cycle drivers.

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10. ANNEXES

Annex I: Information sheet and consent form

Information sheet

Hello: my name is ----------and I am MSc student at Addis Ababa university college of health science and medicine department of emergency medicine and critical care nursing and I am conducting a research by the mentioned university on the prevalence and associated factors of road traffic accident among motor cycle drivers. The research is aimed to help government and the Addis Ababa city road and transportation bureau beside that the community including the people who participate in the study. And will introduce no risk to the participants. The questioners may take maximum 30 minute. I need to get your consent to participate in this study since it is entirely based on your volunteer and you can out from the study at any time you want. You will not have any penalty if you failed to show desire to participate. I however do hope that you will participate in the study since the data will come from you will be important for us. Your name will not be written anywhere in the questionnaire. I would like to inform you that all information you give us is confidential. Except for the purpose of the study it will never be abused to the third part. If you have any question regarding to this study you can ask immediately to interviewer or the investigator using the contact address.

May I know begin interviewing?

If yes, continue intertwining. If no, thanks and stop interviewing.

Name of interviewer _____

Sign _____date_____

Address

Phone number: 0926323943

Email: hindarge@gmail.com

Consent form

Would you be willing to participate in the study? (Indicate by taking the appropriate response). I hereby agree to participate in this study and give my voluntary consent.

Yes_____

No_____

Annex II: Questionnaire form (English version)

Date _____Question code_____

Part One: Socio-demographic information of drivers

1. What is your age? _____Years

2. What is your religion?

1. Orthodox 2. Muslim

3. Catholic 4. Protestant 5. Other, _____

3. What is your marital status?

1. Single 2. Divorced

3. Married 4. Widowed 5. Other, _____

4. How many children do you have_____?

5. What is your level of education?

1. Un able to Read and write 2. Read and write 3. Elementary school

4. Secondary school 5. Tertiary school 6. Diploma and above

6. How many family members do you support_____?

7. What is your monthly income while driving? _____Birr

Part Two. Driver's characteristics and associated factors

8. Do you have life insurance? 1. Yes 2. No

9. Do you use your helmet? 1. Yes 2. No

10. If your answer to question number 9 is YES, how often do you use your helmet?

1. Always 2. Most of the time 3. Sometimes

11. If your answer to question number 9is NO, what is your reason?

1. I fed up

2. It is not functional

3. It does not have benefits

4. No helmet at all

5. Other, specify, _____

12. Do you drink any alcoholic beverages? 1. Yes 2. No

13. If your answer to question number 12 is “Yes”, how often do you drive within 3 hours of having one or more alcoholic drinks?

1. Always 3. Some times
2. Most of the time 4. Never

14. Have you ever been punished by traffic police for any disregarding traffic rules?

1. Yes 2. No.

15. If your answer to question number 14 is “Yes”, how many times_____?

16. Do you chew *Chat*? 1. Yes 2. No

17. If your answer to question number 16 is “Yes”, how often do you drive within 3 hour after chewing *Chat?*

1. Always 2. Most of the time 3. Sometimes

18. If your answer to question number 16 is “Yes”, what do you think is the benefit of Chewing Chat while driving?

1. It energizes me
2. for pleasure
3. I feel free
4. Other, specify _____

19. Do you drive more than the limited speed? 1. Yes 2. No

20. If your answer to question number 19 is “Yes”, how often do you drive more than limited speed?

1. Always 2. Most of the time 3. Sometimes

21. If your answer to question number 19 is “Yes”, what do you think is the reason?

1. for short queue
2. To increase income
3. Racing with another driver
4. Other, specify _____

22. If your cell phone rang while driving, how you receive your calls?

1. Reduces speed and receive calls 3. Receiving calls at normal speed
2. Stop driving and receive calls 4. I disconnect ringing

23. Until what time do you drive at night? _____ Pm

24. Do you have driving license _____? 1. Yes 2. No

25. What is your driving experience as a motor cycle driver? _____ Years

Part Three. Motors cycle condition

26. How many years are the services of your motor cycle? _____Years

27. Does your motor encounter a mechanical problem? 1. Yes 2. No

28. If your answer to question number 27 is "Yes", what common mechanical problem does the motor cycle encounter?

1. Brake 4. Lighting
2. Steer 3. Tire

Part Four. About road traffic accident condition

29. Have you ever had road traffic accident in the last 12 month?

1. Yes 2. No

30. If your answer to question number 29 is "Yes", what was the cause of the accident? More than one choice is possible.

1. Over-speed driving
2. Alcohol driving
3. Chat chewing
4. Pedestrians carelessness
5. Failure to follow the right hand rule
6. Failure to give way for pedestrian
7. Phone use while driving
8. Following too close
9. Quality of road
10. Motor cycle mechanical problem
11. Other, specify _____

31. If your answer to question number 29 is "Yes", what type of collision was it?

1. with human/pedestrian
2. with another vehicle
3. with Animal
4. with obstacle

32. If your answer to question number 29 is “Yes”, what was the consequence of the accident?

1. Death ____people
2. Death ____ animal/s
3. Serious injury _____ people
4. Minor injury _____ people
5. Property damage only

33. If your answer to question number 29 is “Yes”, who was injured?

1. Passenger 2. Driver 3. Pedestrian

34. If your answer to question number 29 is “Yes”, what was the road trip?

1. Asphalt 2. None asphalt

35. If your answer to question number 29 is “Yes”, what was the junction of the road?

1. Straight 4. Three junctions
2. Square 5. Other, specify _____
3. Two junctions

36. If your answer to question number 29 is “Yes”, what was the weather condition during the accident?

1. Normal weather condition 4. Fog
2. Rainy 5.Windy
3. Cloudy

37. If your answer to question number 29 is “Yes”, at what time was the accident occur_____

Thank you very much!

Annex III ፡ Questionnaire form (Amharic version)

<u>የመረጃ ገለፃና ማብራሪያ</u>

ጤና ይስጥልኝ እኔ_____ አባላለሁ በአዲስ አበባ ዩኒቨርስቲ ህክምና ፋካሊቲ በድንገተኛ የትምርት ክፍል የሁለተኛ ዓመት የማስተርስ ዲግሪ ተማሪ ስሆን ፡፡ ከዚህ ጥናት የሚገኙት መረጃዎች ለመንግስትና ለዚህ ከተማ የጤና ቢሮ የሞተር ዐዳጋን ለመግታት አስፈላጊ የሆኑ እቅዶችን እና ስልቶችን ለመንደፍ ጥቅም ላይ ይውላል፡፡ በዚህ ጥናት ውስጥ መሳተፍ ቀጥተኛ የሆነ ጥቅም የሌለ ሲሆን ጥናት ውስጥ በመሳተፍ የሚመጣ ምንም አይነት ችግር ወይም ጉዳት ግን የለውም፡፡ የጥናት መጠይቅ ቢበዛ 20 ደቂቃ ይወስዳል፡፡

ጥናቱ ውስጥ ሊሳተፉ የሚችሉት በተመራመረው አማካኝነት ከጠቅላላው በእጣ የተለዩ ናቸው፡፡

ጥናቱ ውስጥ መሣተፍ የሚፈልጉ ሞተረኞች በፍቃደኝነት ላይ ብቻ የተመሠረተ ተሣትፍ መሆኑን መገንዘብ አለባቸው፡፡ ባመሳተፎ ምክንያት የሚመጣ ምንም ዓይነት ቅጣት የለውም ፡፡ ነገር ግን ከእርሶ የምናገኘው መረጃ አስፈላጊ ስለሆነ ጥናት ውስጥ እንደሚሳተፉ ተስፋ አደርጋለሁ፡፡ ከእርሶ የምናገኘው ማንኛውም አይነት መረጃ ከእኛ ጥናት ውስጥ የምንሳተፍ ሰዎች ውጭ ለማንኛውም ሶስተኛ ወገን እንደማይደርስ እና ሚስጥራዊነቱ የተጠበቀ እንደሚሆን ላረጋግጥላችሁ እወዳለሁ፡፡ መጠየቅ ለሚፈልጉት ማንኛውም ዓይነት ጥያቄ የሚከተለውን አዳራሽ መጠቀም ይችላሉ አሁን ቃለ መጠየቅ መጀመር እችላለሁ፡፡አዎ ካ መጠይቆን ይቀጥሉ አይሆንም ካሉ ዳግም ያመስግኑና መጠይቁን ያቁሙ፡፡

ቃለመጠይቅ የሚያደርገው ሰው ስም_____ ፊርማ_____ቀን_____

የተቀጣጠረው ሰው ስም _____ ፊርማ_____ቀን_____አድራሻ_____

_____ ስልክ_____ኢሜል_____

ከላይ ጥናቱ ያቀረበውን መረጃ አንብቤ በመረዳት ለመሳተፍ ፈቃደኛነቴን እገልጻለሁ(መልሶች ላይ ምልክት ያድርጉ)

አዎ_____

አይደለም_____

ክፍል አንድ ማህበራዊ እና ግለሠባዊ መገለጫ

1. እድሜህ ስንት ነው_____ በአመት

2. ሃይማኖትህ ምንድነው

ሀ) ኦርቶዶክስ ለ) ሙስሊም

ሐ) ሙስሊም መ) ፕሮቴስታንት ሰ) ሌላ ካለ

3. የጋብቻ ሁኔታ

ሀ) ያላገባ ለ) ያገባ

ሐ) የተፋታ መ) የሞተበት ሰ) ሌላ ካለ

4. ስንት ልጆች አሉህ

5. የትምህርት ደረጃ

ሀ) ማንበብና መፃፍአ አልችልም ለ) ማንበብና መፃፍአ ኧችላለሁ ሐ) 1ኛ- 8ማ ክፍ

መ) ሰሪቲፍከት አለን ሰ) ዲፕላማና ከዚያ በላይ

6. ስንት የቤተሰብ አባላት ትረዳለህ----------

7. የወር ገቢህ ስንት ነው_____ብር

ክፍል ሁለት የሹፈሩ መግለጫ

8. የህይወት አደጋ ሲገጥምህ (ኢንሹራንስ) አለህ

ሀ) አዎ ለ) የለም

9. የራስ መከላከያ ኬፕ ትለብሳለህ

ሀ) አዎ ለ) የለም

10. ለጥያቄ 9 መልስህ አዎ ከሆነ ስንት ጊዜ ኬፕ ታደርጋለህ

ሀ) ሁል ጊዜ ለ) አንዳንድ ጊዜ ሐ) አብዛኛውን ሰኣት

11. ለጥያቄ 9 መልሶ የለም ከሆነ ምክንያትህ ምንድነው

ሀ) ቀለሙ ስለለቀቀ ለ) አገልግሎት አይሰጥም

ሐ) ጥቅም የለውም መ) ሌላ ካለ

12. ማንኛውንም አልኮል ትጠጣለህ

ሀ) አዎ ለ) የለም

13. ለጥያቄ 12 አዎ ከሆነ መልስህ ስንት ጊዜ

ሀ)በጣም ብዙ ጊዜ ለ) አንዳንድ ጊዜ

ሐ) ምንም መ) በጭራሽ

14. በትራፊክ ህግ አስከባሪ ህግ ጥሠህ ተቀጥተህ ተውቃለህ

ሀ)አዎ ለ) የለም

15. ለጥያቄ ቁጥር 14 አዎ ከሆነ ስንት ጊዜ

ሀ)1-2 ለ) 3-4 ሐ) ከ 4 በላይ

16. ጫት ትቅማለህ

ሀ) አዎ ለ) የለም

17. ለጥያቄ 16 አዎ ከሆነ መልስህ ስትነዳ ለስንት ጊዜ ትቅማለ

ሀ) ሁል ጊዜ ለ) አንዳንድ ጊዜ ሐ)አብዛኛውን ጊዜ

18. ለጥያቄ 16 አዎ ከሆነ መልስ ጫት መቃም ጥቅሙ ምን ይመስላል

ሀ) ሃይል ይሰጠኛል ለ)ደስታን ይሰጠኛል

ሐ) ነፃነት ይሰጠኛል መ)ሌላ ካለ ግለጽ

19. ከተፈቀደ ፍጥነት በላይ ትነዳለህ

ሀ) አዎ ለ) የለም

20. ለጥያቄ 19 አዎ ከሆነ መልስህ ስንት ጊዜ

ሀ) በጣም ሁል ጊዜ ለ) በጭራሽ

ሐ) አንዳንድ ጊዜ መ) ምንም

21. ለጥያቄ 19 አዎ ከሆነ መልስህ ምክንያትህ ምንድነው

ሀ) በአጭር ጊዜ ለመድረስ

ለ) ገንዘብ ለመጨመር

ሐ) ሌላውን ለመቅደም

መ) ሌላ ካለ ይግለጹ

22. እየነዳህ ስልክህ ቢጠራ ምን ታደርጋለህ

ሀ) ፍጥነት ቀንሼ ስልክ አነሳለሁ፡፡

ለ) መንዳቴን አቁሜ ስልክ አነሳለሁ፡፡

ሐ) በትክክለኛ ፍጥነት እየነዳሁ ስልክ አነሳለሁ፡፡

መ) ስልኩን እዘጋዋለሁ

23. ከመሸ እሰከ ሰንት ሰአት ትነዳለህ ----------?

24. መንጃ ፈቃድ _____? ሀ) አዎ ለ) የለም

25. ለስንት አመት ሞተር ነድተሃል?_____?

ክፍል 3 የሞተር ሳይክል ሁኔታ

26. ሞተር ሳይክል ለስንት ጊዜ አገለገለች ----------?

27. ሞተር ሳይክልህ የቴክኒክ ችግር ገጥሟታል?

ሀ) አዎ ለ) የለም

28. ለጥያቄ 27 አዎ ከሆነ መልስህ የትኛው ክፍል ነው የተነዳው?

ሀ) ብሬክ ለ) ላይቲንግ

ሐ) ሰቲር መ) ጎማ

ክፍል 4 የአደጋ ሁኔታ

29. ከ 12 ወር በፊት የመኪና አደጋ ደርሶብህ ያውቃል?

ሀ) አዎ ለ) አይደለም

30. ለጥያቄ 29 አዎ ከሆነ መልስ ለአደጋው መንስኤ ምክንያት ምንድነው

ሀ) ከፍጥነት በላይ ማሽከርከር

ለ) ጠጥቶ በመንዳት

ሐ) ጫት መቃም

መ) የመንገደኛ መዘናጋት

ሰ) የቀኝ መንገድን ህግ ያለመከተል

ረ) ለመንገደኛ ቅድሚያ አለመስጠት

ሠ) ስልክ እያወራሁ ስነዳ

ሸ) ፍሬን ችግር

ቀ)የመንገድ ጥራት

በ) የሞተሯ ችግር

ተ) ሌላ ካለ

31. ለጥያቄ ቁጥር 29 አዎ ከሆነ ምን አይነት አደጋ ገጠመህ ?

ሀ) ከመንገደኛ /እግረኛ/

ለ) ከሌላ ተሸከርካሪ

ሐ)ከእንስሳት

መ) ከሌላ እንቅፋት ጋር

32. ለጥያቄ ቁጥር 29 አዎ ከሆነ የአደጋው ውጤት ምንድን ነው

ሀ) ሞት------ሠው

ለ) ሞት--------እንስሳት

ሐ) ከፍተኛ ጉዳት -----ሠው

መ) ዝቅተኛ ጉዳት------ሠው

ሰ) የንብረት አደጋ ብቻ

33. ለጥያቄ ቁር 29 አዎ ከሆነ ማን ተነዳ

ሀ) እግረኛ ለ) አቨከሪካሪ ሐ) ተሣፋሪ

34. ለጥያቄ ቁጥር 29 አዎ ከሆነ የመንገድ ሁኔታ

ሀ) አስፋልት ለ) አስፋልት ያልሆነው

35. ለጥያቄ ቁጥር 29 የመንገዱ መገናኛ ምን ይመስላል?

ሀ) ቀጥ ያለ ለ) 3 መገናኛ

ሐ) ክብ መ) ሌላ ካለ

36. ለጥያቄ 29 አዎ ከሆነ መልስህ የአየር ንብረቱ እንዴት ነበረ?

ሀ) ትክክለኛ የአየር ንብረት ለ) ዝናባማ

ሐ) ደመናማ መ) ጭጋግ ሠ) ንፋሳማ

37. ለጥያቄ ቁ.29 አዎ ከሆነ አደጋ የተከሰተበት ሰአተ ----------

እናመሰግናለን!!!!

Annex IV: Assurance Form

I under signed, assert that this thesis is my original work, has not been presented for a degree in any other university and that all sources of materials used for the study have been acknowledged accordingly.

MSc candidate: Hindu Argeta **(**BSc**)** Signature: _____ Date_____

Advisors: Dr. Assefu Weldetsadik (MD, Assistant professor)

Signature: _____ Date_____

Mr. Kibatu Gebre (BSc, MSc in EMCC, Lecturer)

Signature: _____ Date_____