ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XI Issue III March 2024

Practice, Awareness and Attittude of Helmet Use and Associated Factors among Motorcycle Riders in Yirgalem, Ethiopia.

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DOI: https://doi.org/10.51244/IJRSI.2024.1103050

Received: 06 March 2024; Accepted: 18 March 2024; Published: 20 April 2024

ABSTRACT

Introduction: In low-income and middle-income countries, car ownership and use rates are generally much lower than in high-income countries. However, the ownership and use of motorcycles and other two-wheelers is generally relatively high and users of two-wheelers make up a large proportion of those injured or killed on the roads. Motorcycle and bicycle riders are at an increased risk of being involved in a crash. Lack of physical protection makes them particularly vulnerable to being injured if they are involved in a collision. Therefore, this study was aimed to assess awareness and attitude of helmet use among motorcycle riders in Yirgalem town.

Objectives: This study was aimed at assessing the awareness and attitude of helmet use and associated factors among motorcycle riders in Yirgalem town, Ethiopia, 2019 GC.

Methodology: A cross-sectional study was conducted among motorcycle riders in Yirgalem, southern Ethiopia from Nov 1 to 20, 2019 GC. Convenience sampling method was used to identify the subjects of the study. Data was collected using structured questionnaires and then the data was compiled and analyzed by SPSS 20 computer software. Descriptive analysis was conducted and data were presented using tables and figures. Bivariate and multivariable logistic regression analysis were conducted to identify factors associated with outcome variables.

Result: About 79.9% of the riders involved in our study have good awareness about the use of helmet during motorcycle riding. About 55% of the riders have good attitude towards helmet wearing while driving. Commercial motorcyclists have more positive attitude towards helmet use than non-commercial motorcycle riders. People in age group 37-47 have negative attitude towards helmet wearing than other age groups.

Conclusion: Most motorcycle riders in Yirgalem are male, educated and young people who have good knowledge about helmet use and have positive attitude towards helmet use compared to negative attitude, however, helmet wearing is not consistent among motorcycle riders in Yirgalem. The town transport and road office as well as other stake holders should give motorcycle riders skilled training and education. The traffic police officers should also be strict on motorcycle riders not wearing helmet in order to properly implement the helmet laws. Policy makers should also ensure that feasible and good quality helmets are available and accessible in market for user.

1. INTRODUCTION

1.1. Background

Road traffic accidents have become a huge global public health and development problem killing nearly 1.2

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million people a year and injuring or disabling between 20–50 million people worldwide; thus making the loss of 518 billion US $ globally (WHO fact sheet, 2017). The report written by WHO in 2013 showed that more than 1.24 million people die every year as a result of road traffic injuries, making it the eighth leading cause of death globally, and the leading cause of death for young people aged 15–29. Based on current trends, it is projected to be the fifth leading cause of death globally by 2030(WHO fact sheet, 2017).

Motorcycle is a type of motor vehicle with two wheels which is used to transport passenger and for locomotion (A Road Safety Manual for Decision-makers and Practitioners. WHO, Geneva, Switzerland. 2006). In middle and low-income countries, motorcycles form a common means of transport. Motorcyclists form a significant proportion of people who are affected by road traffic crashes. The reason behind the reported increase in number of commercial motorcycles is the fact that motorcycles are sold at relatively cheaper prices than other vehicles and good earnings from the motorcycle taxi business encourages more people especially youths to join this business (Dee T. 2009).

Regarding risk factors for motorcycle injuries, the non-use of helmet has been identified as a specific factor leading to head injuries and fatalities resulting from motorcycle crashes. Injuries to the head, following motorcycle crashes, are a common cause of severe morbidity and mortality (Keng S. 2005).

Helmet as a protective measure has been identified to be effective towards head injury prevention and reduces the fatality of motorcycle riders. The fatality risk is reduced by 34% (World Health Organization, 2006).

To be protected from head injury, motorcyclists need to consistently and properly wear helmets according to the prescribed standards. However, non-consistent use of helmet has been evident in several studies. It has been shown that motorcyclists are likely to put on helmets when they are driving on the highways (Corad P, Bradshaw Y, Lamsudin R, Kasniayh N, Costello C, 1996) travelling on a long trip and if they anticipate meeting a traffic police during the day rather than night hours and during weekdays rather than weekends (Kulanthayan S et al. 2000, 55:40–44)

Arguments against helmets for motorcycle riders include the possibility that they increase the risk of neck injuries in crashes and could decrease rider visibility. Negative attitudes towards helmet use among other factors; explain the reason behind the reported low rate of use. (O.A Olakulehin, A.A Adeomi, O.Oakanbi, C.J Itie, O.O Olanipekun ,O.Silori, 2015)

Some reasons for non-adherence and non-use of helmet include feelings of discomfort due to heat during the hot weather, and lateral vision and hearing ability impairment. However, it has been shown that helmets do not impair hearing ability and the lateral vision can be complemented by lateral head rotation (Dee T. 2009).

According to Global Status Report On Road Safety, WHO, 2018, Ethiopia, with a population of 102,403,200 experiences a road traffic death rate of 26.7 per 100,000 populations. The percent contribution of motorcycle accidents is not known. There is national helmet law which applies both to riders and passengers, even though Helmet standards are not set and helmet wearing rate is not known.

Yirgalem town is found 40 kilometers south of Hawassa in the Sidama Zone of the Southern Nations, Nationalities, and Peoples Region. The population of the town is estimated at 79, 506(CSA, 2007)

1.2. Statement of the problem

Trauma is the number one cause of death in the age group 15-44, RTA contributing the larger role, especially in the developing world. Nearly a quarter (23%) of the world's road traffic deaths occurs among motorcycle riders. Per mile traveled, motorcycle riders have a 34-fold higher risk of death in a crash than

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people driving other types of motor vehicles. In Ethiopia helmet use among motorcycle riders and passengers is not known and the law enforcement is cited to be poor (WHO, 2018).

Most of the fatalities in motorcycles riders is due to head injury which could be reduced with proper use of helmets. Wearing a helmet is the single most effective way of reducing head injuries and fatalities resulting from motorcycle and bicycle crashes. Motorcyclists are 26 times more likely to die in a traffic crash than the riders of passenger cars. Wearing an appropriate helmet improves their chances of survival by 42 per cent and helps avoid 69 per cent of injuries to riders (Geneva, 2016). Motorcyclists who do not wear helmets are at a much higher risk of sustaining head injuries and from dying from these injuries. Wearing helmet decreases the risk and severity of injuries by about 72%; decreases the likelihood of death by up to 39%, with the probability depending on the speed of the motorcycle involved; decreases the costs of health care associated with crashes (World Health Organization, 2006).

1.3. Significance of the Study

The intention of this study is to assess the awareness of helmet use and associated factors among motorcycle riders and passengers in Yirgalem, Ethiopia. To the level of our knowledge such a study has never been conducted in Yirgalem or nearby areas, thereby recognizing the need to establish baseline information so that it can subsequently be used by local road safety measures and stake holders to identify priorities and devise targeted interventions and preventive measures to improve road safety among road users.

We strongly believe that results of study will help in understanding magnitude of helmet use and the factors which influence use of helmet use among motorcycle riders and passengers of different demography. We believe that the results of study would be used by the concerned local authorities in the formulation of rules and regulation regarding the use helmet among motorcycle riders. In addition to this, it can also be used as making a sole input to the literature.

2. LITERATURE REVIEW

2.1. Introduction

This chapter gives literature related to the historical background of the study. It gives literature based on the helmet with its types and its importance. It also briefly states the prevalence or magnitude of helmet use. In addition, it describes the awareness and attitude of helmet use among population. It looks over factors affecting/associated with prevalence, awareness and attitude of helmet use and the legal provision of helmet use.

2.2. How a helmet works

A helmet aims to reduce the risk of serious head and brain injuries by reducing the impact of a force or collision to the head.

A helmet works in three main ways. The firstly, it reduces the deceleration of the skull, and hence the brain movement, by managing the impact. Secondly, it spreads the forces of the impact over a greater surface area so that they are not concentrated on particular areas of the skull. Lastly it prevents direct contact between the skull and the impacting object by acting as a mechanical barrier between the head and the object.

These three functions are achieved by combining the properties of four basic components of the helmet that are described below. The shell is the strong outer surface of the helmet that distributes the impact over a large surface area, and therefore lessens the force before it reaches the head.

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The second part, impact-absorbing liner is made of a soft, crushable padded material – usually expanded polystyrene, commonly called "Styrofoam".

The comfort padding is the soft foam-and-cloth layer that sits next to the head. It helps keep the head comfortable and the helmet fitting snugly.

The retention system, or chin strap is the mechanism that keeps the helmet on the head in a crash. A strap is connected to each side of the shell.

2.2.1 Motorcycle helmet design

In addition to meeting the previously described functions and conforming to, a helmet needs to be designed to suit the local weather and traffic conditions. The following are some of the considerations usually addressed by helmet designers:

Materials used in the construction of a helmet should not degrade over time, or through exposure to weather, nor should they be toxic or cause allergic reactions. Currently, the plastic materials commonly used are Expanded Poly-Styrene (EPS), Acrylonitrile Butadiene Styrene (ABS), Poly Carbon (PC) and Poly Propylene (PP). While the material of the helmet shell generally contains PC, PVC, ABS or fiber glass, the crushable liner inside the shell is often made out of EPS – a material that can absorb shock and impact.

The four most common types of helmets are: Full-face helmets offer facial protection in addition to impact protection; Open-face helmets give standard protection from impact; Half-head helmets provide protection by means of a hard outer shell and a crushable inner liner. They do not offer protection for the chin or jaw area; Helmets for tropical use are half-head helmets with ventilation holes to provide a maximum flow of air so as to reduce the heat.

Few countries have helmets specifically designed for children, which results in children either not wearing helmets or else being force to wear adult-size helmets. In some countries, however, children's helmets are now being designed.

2.3. Prevalence, awareness and attitude of Helmet-wearing

Evidence that wearing a proper helmet significantly improves the chances of surviving an accident is overwhelming. Yet a large number of riders persist in riding without helmets, or with the chinstrap undone. In markets where motorcycles are a new phenomenon, this reluctance to wear helmets or to wear them correctly is often the result of a lack of knowledge. Therefore, suitable education program would improve the situation. Where motorcycles have been part of the transport system for some time, education remains an issue for each new generation of riders, but other arguments and myths also develop to resist the pressure to wear helmets. The reasons vary in their content and sophistication according to the type and maturity of the motorcycle market and the legislation on protective helmets in place. Where there is substantial resistance to helmet-wearing, governments tend to legislate mandatory wearing of helmets at all times while riding motorcycles.

However, this step is a political one because it involves constraints on the freedom of citizens. Similar opposition has arisen with safety-belt wearing in passenger cars. Experience has shown that a combination of persuasive/voluntary measures followed by a second stage of compulsory requirements produces good results. The persuasive arguments provide understanding and create acceptance, and serve as a justification for introducing compulsory measures for those who remain resistant. Some of the reasons for rejecting to wear helmets are: Peer pressure among young riders, e.g. ridiculing helmet-wearers; Helmets are only

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needed for long trips (even though most accidents occur close to home);

Helmets are considered hot and uncomfortable, e.g. in regions with tropical climates. Some mention the damaging effect on women's hairstyles, whether it is a traditional hairstyle or simply fashion and the issue of special headgear, e.g. turban. The practical issue of what to do with the helmet when it is not being worn: theft, damage or sheer inconvenience when, for example, shopping and hygiene, if the helmet is not owned by the rider are among reasons given by those not wearing helmets.

Possible countermeasures include improving the image of helmet-wearing (making it "cool"); changing helmet design; and looking for solutions to the "what do I do with it now" problem, e.g. under-seat storage, top-boxes, helmet parks, helmet-carrying and securing devices. Educating riders through awareness raising campaigns are also important to motivate riders to wear helmets.

A study in Malaysia examined the compliance of helmet use in a typical Malaysian town. Of the 5000 motorcyclists studied, only 54% used helmets properly, 21% used them improperly, and 24% did not wear them at all. Younger people, men and those with less formal education were more likely to not wear helmets properly.

Particularly in mature markets, a number of myths surrounding helmet use have increased. They believe that helmets cause neck or spinal cord injuries, impair hearing and sight and motorcycle helmet laws violate individual rights are widely held among motorcycle riders. But research has proven that helmets conforming to international regulations and correctly worn do not cause neck or spinal cord injuries and that do not affect peripheral vision or contribute to crashes. Helmets may reduce the loudness of noises, but do not affect the ability of a rider to distinguish between sounds. Some studies have indicated that properly fitted helmets can actually improve the ability to hear by reducing noise from the wind (UN Regulation No. 22 10 covers both these points). In addition, all road safety laws require some action from individuals—e.g. wearing safety-belts, not driving while impaired, strapping a child into a child restraint system, or stopping at a stop sign. These traffic rules are accepted, because all motorists recognize that failing to obey them could create a serious danger to themselves and others. Motorcycle helmet laws have exactly the same purpose.

The myth fatality rates are lower without helmet laws have also disproved by studies conducted in two states in the United States that recently repealed their motorcycle helmet laws showed that deaths from head injuries actually increased following the repeal of the law.

The wrong believe that any helmet is better than no helmet is also widely widespread. A low-quality helmet might give the rider a false sense of protection. In case of a crash, a rider using a low-quality helmet could get more severely injured or even killed, sending the false message that all helmets are useless, and thus threatening helmet-wearing campaigns.

The myth that UN Regulation No. 22 will encourage the sale of fake helmets is also wrong. The following elements are established within the type approval system: the conformity of production procedures; exchange of information among T.A.A. son type approvals granted, counterfeit products and products not meeting the requirements. All this aims to prevent the delivery of fake helmets to the market.

Some also erroneously believe that there is no need to make helmet use mandatory for all: age-specific motorcycle helmet laws are effective / sufficient. When in reality age-specific helmet laws are more difficult to enforce, because it is difficult for the enforcement community to identify the age of a child when he or she is riding past on a motorcycle. Consequently, age-specific laws are less effective than those which are

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related to society as a whole.

The argument that motorcycles are a small percentage of registered vehicles; thus, motorcycle crashes represent a minor burden to society is also not acceptable. Because whether motorcycles make up a small proportion of vehicles (as in some high-income countries) or the bulk of vehicle fleets (as in many Asian countries), the fact is that motorcyclists are about 27 times more likely than passenger car occupants to die in a traffic crash and about 6 times more likely to be injured, means that crashes are a significant problem in all societies where their use is common. (WHO, 2006)

Some believe that UN Regulation No. 22 approved helmets are not suitable for tropical climate. But the fact is that ECE 22 helmet requirements are performance oriented and not design oriented. Therefore, they do not prevent sufficient ventilation making these helmets suitable for tropical climate by keeping the level of safety.

Myth that is impairing the use of motorcycle helmets is that motorcycle helmets in accordance with UN Regulation No. 22 are too expensive for users in low-income countries. In defense of the regulation, the relative costs of helmets go as low as one percent and as high as 10 percent of the motorcycle price. Therefore, helmets should be affordable for buyers of new or second-hand motorcycles in low-income countries too.

In European countries, by the time helmet-wearing became mandatory, there was often already a very high rate of use, resulting from previous education efforts and campaigns. Such efforts are now widely accepted and the consensus is that voluntary helmet use should be increased first and then be followed by the introduction of mandatory legislation.

Measures to increase voluntary helmet-wearing

Public education on all aspects of helmet performance, use, benefits, etc. for motorcyclists and even cyclists. Not only do such efforts reach the target group but they influence societal views, which is very important if legislation is considered; Simple commercial marketing, advertising campaigns and “product placement” in films can all get the message across;

As a variant of the point above, using role models can be very significant for particular groups of riders, especially young riders; examples include motorcycle racers, actors or politicians. The key point is that unanticipated people use motorcycles and if this becomes known they influence “their” segment of society;

Incentives/instructions to employees, which in the case of well-known employers can add to the role-model point. Government measures to remove barriers, e.g. by subsidizing helmets for children. Once the situation has developed to the point that compulsory helmet-wearing should be introduced by the government, there are some basic activities that need to be undertaken: The introduction of a regulation for helmets with a clear marking requirement, e.g. Regulation No. 22. It creates conditions that thwart riders wearing any kind of helmet to comply with the law, e.g. construction site helmets, children’s toy helmets, etc., which will have no effect at all;

The dissemination of information before the law is introduced; once introduced, the law needs to be enforced, with appropriate fines and other disciplinary measures for repeat offenders. Enforcement has to be consistent and well-advertised, with repeated efforts on a regular basis. Studies have shown that the fear of being caught makes people obey laws.

To increase the use of helmets a mix of measures has to be used successively and in combination. However, there is a particular practical issue undermining the willingness of riders to use helmets in emerging

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economies — the issue of affordability

2.4. Factors associated with prevalence, awareness and attitude of helmet wearing.

In general, the practice of carrying children as passengers on motorcycles is controversial. At the same time, the reality in many low-income countries is that the motorcycle is the family's only means of transport. Indeed, in many low-income countries' motorcycles are the only way for families to get access to education and health care, or meet other social and economic needs. And wearing of helmet in children as well as young motorbike riders are behind adult counterparts.

Laws making helmet use compulsory are important in increasing the wearing of helmets, especially in low-income and middle-income countries where helmet-wearing rates are low, and where there are large numbers of users of motorized two-wheelers. There have been many studies that have evaluated the impact of motorcycle helmet laws on helmet-wearing rates, head injury or death. When mandatory helmet laws are enforced, helmet-wearing rates have been found to increase to 90% or higher; when such laws are repealed, wearing rates fall back to generally less than 60%.

There is no information available on whether counterfeit versions of motorcycle helmets have been sold. In case of such an event, it would lie outside vehicle regulations and would probably fall in the area of trademark abuse. The more general definition of counterfeiting is, however, applicable in this analysis. There have been instances where helmets have been put on the market with a false type approval mark/number and without type approval. There are also cases where helmets have been type approved and then subsequently produced but not in conformity with the type approval. Clearly, both of these cases can be addressed within the current provisions to re-ensure the conformity of production and the validity of approval marks.

Factors such as educational level, income level, marital status and affordability and accessibility are essential in determining helmet wearing particularly in this area of study. There is no previous study in Yirgalem available on above factors.

3. OBJECTIVE

3.1. General objective

The main objective of the study is to determine the awareness and attitude of helmet use and associated factors among motorcycle riders in Yirgalem, Southern Ethiopia, 2019 GC.

3.2. Specific objective

- To determine awareness about the importance of wearing helmet among motorcycle riders in Yirgalem, Ethiopia 2019 GC.
- To determine attitude of motorcycle riders toward helmet use in Yirgalem, Ethiopia 2019 GC.
- To identify factors associated with the awareness about the importance of wearing helmet among motorcycle riders in Yirgalem, Ethiopia 2019 GC.
- To identify factors associated with attitude towards helmet use among motorcycle riders in Yirgalem, Ethiopia 2019 GC

4. METHODS AND MATERIALS

4.1 Study area

The study was conducted at Yirgalem, Ethiopia. Yirgalem town is located 47km south of Hawassa city and

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320km south of the capital Addis Ababa in Sidama zone. The town has three districts and 13 kebeles According to the new plan the total area of the town currently fall with in the planning boundary is 3834 hectar. Based on housing and population census of Ethiopia in 2007 the total population of Yirgalem is 79,506(CSA,2007). The total density is 13.29/ hectar or 1329 per square km. this makes the town one of the densely populated areas. It was established in 1924 E.C. It serves as Dalle woreda administrative and commercial center. The town is located o6 degree 45 N latitude, and 38 degrees 24 E longitude. The town has got a municipal status since 1934 E.C and reform town administration status in 1996 E.C for administrative purpose.

Traditionally the climate of Yirgalem town is classified into Woynadega type. The annual rainfall is 1237 mm. and monthly temperature that ranges from 12.6 – 25 degree Celsius, and the annual average temperature is 18.5 degree Celsius. The largest ethnic group in the town is Sidama. Sidamigna and Amharic are the two most widely spoken languages. The Sidama language is spoken as 1st language by most of the inhabitants. 80% of the populations are Protestant by religion, Orthodox and Muslim religion followers constitute 13% and 5% respectively

4.2 Study period

The study period was from November 1 to 20, 2019 GC.

4.3 Study design

A cross-sectional studywas conducted among motorcycle riders in Yirgalem, Ethiopia.

4.4 Population

4.4.1. Source population

The source population was the whole motorcycle riders of Yirgalem town.

4.4.2. Study population

The study population was all motorcycle riders available during data collection in Yirgalem town.

4.5 Sample size determination

The sample size was determined by using a standard formula for a single population proportion. 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.

$$n = \frac{(Z_{\alpha/2})^2 \times P(1-P)}{d^2}$$

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 riders (0.5) d = the margin error between the sample and the population (0.05).

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Therefore = $(1.96)^2(0.5)\ (0.5)/\ (0.05)^2 = 384$

Because of the total population size of the study area were greater than 10,000, and the exact figure is not known, we could not apply the population correction formula: n= 384 by adding 5% non-response rate.

Totally 384+384×0.05=384+19,

nf= 403 sample was taken.

4.5 Sampling Method and Sampling Procedure

Sampling method

Convenience sampling technique was used to identify participants of the study. The lottery method was used to identify the location of the study and the questionnaires distributed to the volunteers available at the study area.

Sampling procedure

Yirgalem town has three districts. The motor cycle riders and passengers in all the three districts were included randomly in the study. The number of motor cycle riders which were included in the study from the districts was based on sample size obtained above.

The responders were selected from motorcycle riders identified from all the commercial pick and drop points, work institutions and along the main roads based on the lottery method as mentioned above.

We identified 15 offices and 6 pick and drop points in the town. This gives us a total of 21 locations. Out of these 21 locations 7 were selected using the lottery method; 5 of the locations being offices and the other two being pick and drop points. Motorcycle riders available at these locations at the time of study were asked to fill the questionnaires.

4.7 Eligibility Criteria

4.7.1. Inclusion Criteria

All motorcycle riders available at the study location at the time of study were included in our study.

4.7.2. Exclusion Criteria

No motorcycle riders were excluded from the study

4.8 Study Variables

4.8.1 Dependent variable

- Awareness about importance of helmet use
- Attitude

4.8.2 Independent variable

- Age
- Sex

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- Residency area
- Literacy level
- Marital status
- occupation

4.9 Data collection plan

Data were collected using structured questionnaires. The questionnaire was prepared in Amharic.

Four group members were involved in the data collection and one supervisor crosschecked for completeness and consistency of collected data. Information regarding participant's details including demographic characteristics (age, sex and residency), helmet use, and awareness about the importance of wearing helmet were collected using the prepared questionnaire.

4.10 Operational Definitions

Awareness: will be measured in terms of the level of understanding they have on the types of helmets, protective effect helmets during motorcycle accidents and risks of not wearing helmets. It is graded based on individual's knowledge about benefits and necessities of helmet wearing, the helmets themselves and the risks of not wearing helmets.

We took respondents those who scored 4 and more awareness of the 8 questions right to have good knowledge about helmet use where as those who scored less than 4 considered to have poor knowledge.

Attitude: will be measured in terms of vigilance and the desire to wear helmets. Individuals values and beliefs about helmet wearing.

We took respondents those who scored 4 and more of the 7 questions right to have positive attitude towards helmet use whereas those scored less than 4 considered to have negative attitudes towards helmet use.

4.11 Data analysis plan

Data was collected and checked for completeness and accuracy by group members manually and the data was compiled and analyzed by SPSS computer software on the basis of specific and general objectives. 95% confidence interval and chi-square test were used to test statistical association.

4.12 Ethical consideration

The purpose of the study and the right of the respondent not to answer the questions for which he/she may not want to respond, was carefully and entirely explained to the respondents prior to asking for consent to conduct the study. Strict confidentiality was assured via anonymous recording and coding of questionnaires and was placed in safe place after they have been collected and was utilized for the purpose of the study only.

4.13 Result dissemination plan

The final report of this study was submitted to Hawassa University College of Medicine and Health Sciences, CBE Office. There will be presentation of results to the university academicians, Report to the concerned authorities including road and transportation office of Yirgalem town and other stake holders. We will attempt to publish our paper on national and international journals. We will also release the result on internet.

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5. RESULTS

Socio-demographic characteristics of the respondents

A total of 403 motorcycle Riders were included in the study with 100% response rate. Out of which 194(48.1%) of them were found in the age group of 26-36 years followed by 15-25 years which accounted 133(33%). The mean age of participants was 29.5 years with standard deviation +_ 7.9 years. Out of the total respondents 375(93.1%) were males and 28(6.9%) were females. 222(55.1%) of the respondents are married. Regarding the educational level 217(53.8%) of them attended higher education. Out of the total respondents 387(96.8%) of them reside in Yirgalem town and 15(3.7%) reside outside Yirgalem town. As for occupation 208(51.6%) of the respondents are government employees followed by 129(32.0%) commercial motorcyclists.

Of the 6 independent variables we considered to see association with our dependent variables, we found only occupation is associated with awareness within confidence interval whereas we found age group, education and occupation are associated with attitude within confidence interval.

Table 1. Sociodemographic characteristics of motorcycle riders in Yirgalem town, 2019 GC

Sociodemographic characteristics	Awareness		
	Good knowledge	Poor knowledge	Total
Age groups			
15-25	113	20	133
26-36	134	60	194
37-47	58	1	59
>47	17	0	17
Total	322	81	403
Sex			
Male	296	79	375
Female	26	2	28
Total	322	81	403
Marital status			
Married	171	51	222
Single	144	30	174
Divorced	7	0	7
Total	322	81	403

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Education			
Primary	65	25	90
Secondary	69	15	84
Tertiary	178	39	217
Other	10	2	12
Total	322	81	403
Occupation			
Government employee	175	33	208
Commercial motorcyclist	90	39	129
Merchant	21	6	27
Student	17	2	19
Other	19	1	20
Total	322	81	403
Residency			
Yirgalem town	311	76	387
Outside Yirgalem town	10	5	15
Total	322	81	403

Table 2. Socio-demographic characteristics of motorcycle drivers in Yirgalem town, 2019 GC

Socio-demographic characteristics	Attitude		Total
	Positive	Negative	
Age groups			
15-25	81	52	133
26-36	100	94	194
37-47	36	23	59
>47	4	13	17
Total	221	182	403

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Sex			
Male	207	168	375
Female	14	14	28
Total	221	182	403
Marital status			
Married	85	137	222
Single	132	42	174
Divorced	4	3	7
Total	221	182	403
Education			
Primary	70	20	90
Secondary	58	26	84
Tertiary	85	132	217
Other	8	4	12
Total	221	182	403
Occupation			
Government employee	94	114	208
Commercial motorcyclist	92	37	129
Merchant	15	12	27
Student	14	5	19
Other	6	14	20
Total	221	182	403
Residency			
Yirgalem town	210	177	387
Outside Yirgalem town	11	5	15
Total	221	182	403

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Awareness of motorcycle riders in Yirgalem town about safety helmets

Of the total 403 respondents involved in the study, 335 (83.1%) of the respondents agree that safety helmets protect from serious head injury. 358 (88.8%) of the respondents agree that not wearing safety helmets is against the law. But only 270 (67%) of the respondents think that wearing safety helmets protect from harassment by law enforcement. Only 176 (43.7%) of the respondents think that the law enforcement agents are strict about helmet wearing. 153(38%) of the respondent know the current laws of helmet use of the country.

Only 75 (18.6%) of the respondent report that they have received education on the use of helmets; and only 102 (25.3%) of the respondents know the prescribed types of helmets.

Table 2: the results of awareness related questions of motorcycle riders in Yirgalem, Ethiopia, 2019 GC

Questions	Yes		No		Not sure	
	frequency	Percent	frequency	percent	frequency	Percent
Do you think helmets protect against serious head injury?	335	83.1%	7	1.7%	61	15.1%
Do you think helmets prevent harassment? from law enforcement agents?	279	67%	123	30.5%	10	2.5%
Are you aware of prescribed type of helmets?	102	25.3%	282(	70.0%	19	4.7%
Do you know not wearing helmets is against the law?	358	88.8%	42	10.4%	3	0.7%
Are law enforcement agents being strict about helmet wearing?	176(	43.7%	212	52.6%	15	3.7%
Do you rush to wear your helmet on sighting law enforcement agents?	132	32.8%	246	61.0%	25	6.2%
Have you ever received education on helmet use?	75	18.6%	316	78.4%	12	3%
Do you know the rules/law about helmet wearing?	153	38.0%	239	59.3%	11	2.7%

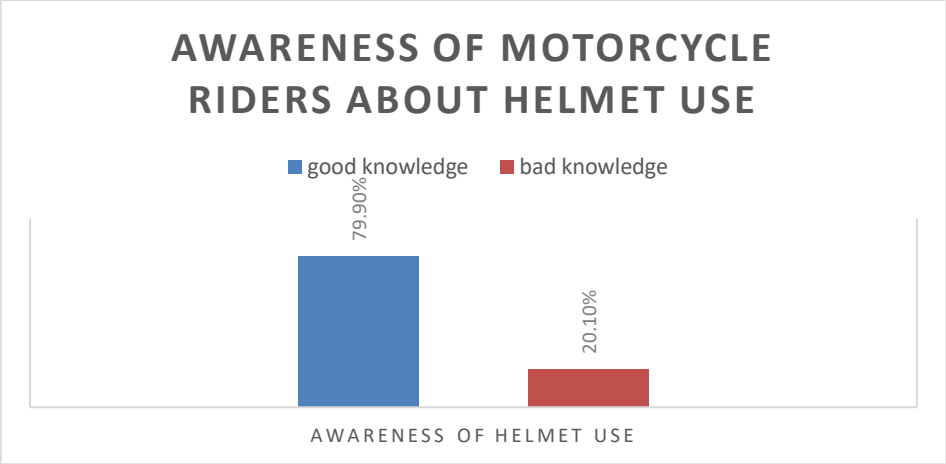

Figure 1: The awareness of motorcycle riders about helmet wearing in Yirgalem, Ethiopia, 2019 GC.

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Attitude of motorcycle riders in Yirgalem town about safety helmets

Only 302 (74.9%) of the respondents think that helmets are truly protective. 64 (15.9%) of the respondents believe that helmets are needed only on highways. 281 (67.9%) of the respondents believe that helmets generate lots of heats on the head while 177 (43.7%) of the respondents believe that helmets obstruct the riders view. 206 (51.1%) of the respondents think helmets impair the riders hearing while driving, whereas 176 (43.7%) of the respondents believe that wearing helmet is generally uncomfortable.

288 (71.5%) of the respondents believe that wearing helmet should be mandatory and not wearing helmets should result in serious penalty.

Table 4. The results of attitude related questions of motorcycle riders in Yirgalem, Ethiopia, 2019 GC.

Lists of questions	Yes		No		Not sure	
	Frequency	percent	Frequency	percent	Frequency	Percent
Do you think helmets are truly protective?	302	74.9%	42	10.4%	59	14.6%
Do you think helmets are needed only in high ways?	64	15.9%	332	82.4%	7	1.7%
Do you think wearing helmet obstruct the rider's view?	177	43.9%	215	53.3%	11	2.7%
Do helmet generate a lots of heat on the head?	281	69.7%	107	26.6%	15	3.7%
Do you think wearing helmet impairs hearing?	206	51.1%	176	43.7%	21	5.2%
Do you think wearing helmet is uncomfortable?	176	43.7%	209	51.9%	18	4.5%
Do you think failure to wear helmet should attract serious penalty?	288	71.5%	107	26.6%	8	2.0%

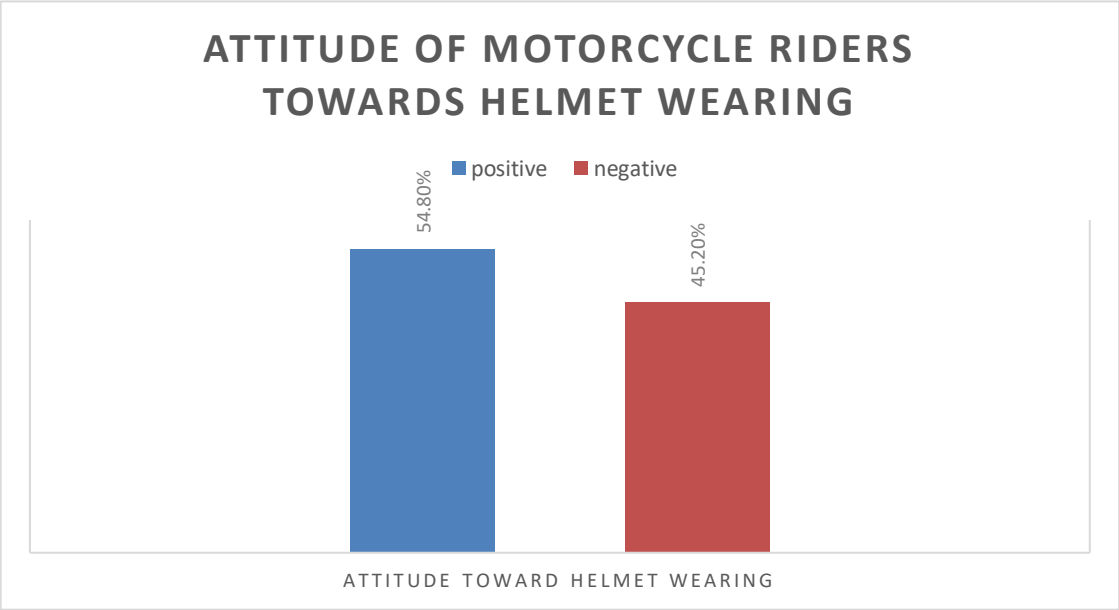

Figure 2: The attitude of motorcycle riders towards helmet wearing in Yirgalem, Ethiopia, 2019 GC.

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Associated factors with awareness and attitude about helmet wearing

Of the 6 independent variables we considered to see association with our dependent variables, we found only occupation is associated with awareness within confidence interval whereas we found age group is associated with attitude within confidence interval.

Table5. Awareness about helmet wearing and associated factors among motorcycle riders in Yirgalem, 2019 GC

Variable	Awareness					
	Good	Poor	COR P-value	COR	AOR	AOR P-value
Age groups						
15-25	113	20	0.98	0.0		
26-36	134	60	0.98	0.0		
37-47	58	1	0.99	0.0		
>47	17	0	1	1		
Sex						
Male	296	79	0.095	0.288	0.393	0.221
Female	26	2	1	1	1	1
Marital status						
Married	171	51	0.999	0.00		
Single	144	30	0.999	0.00		
Divorced	7	0	1	1		
Education						
Primary	65	25	0.419	0.520		
Secondary	69	15	0.920	0.920		
Tertiary	178	39	0.909	0.913		
Other	10	2	1	1		

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Occupation						
Government employee	175	33	0.221	0.279	0.269	0.210
Commercial motorcyclist	90	39	0.043	0.121	0.120	0.042
Merchant	21	6	0.133	0.184	0.219	0.161
Student	17	2	0.526	0.447	0.514	0.602
Other	19	1	1	1	1	1
Residency						
Yirgalem town	312	76	0.203	2.046	2.606	0.104
Outside Yirgalem town	10	5	1	1	1	1

Table 6. Attitude towards helmet wearing and associated factors among motorcycle riders in Yirgalem, 2019 GC

Variable	Attitude					
	positive	Negative	COR P-value	COR	AOR	AOR P-value
Age groups						
15-25	81	52	0.07	5.062	2.626	0.138
26-36	100	94	0.035	3.457	2.866	0.093
37-47	36	23	0.010	5.087	5.365	0.011
>47	4	13	1	1	1	1
Sex						
Male	207	168	0.594	1.232		
Female	14	14	1	1		
Marital status						
Married	85	137	0.324	0.465		
Single	132	42	0.274	2.357		
Divorced	4	3	1	1		

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Education						
Primary	70	20	0.398	1.750	3.032	0.419
Secondary	58	26	0.868	1.115	2.433	0.717
Tertiary	85	137	0.071	0.322	0.636	0.244
Other	8	4	1	1	1	1
Occupation						
Government employee	94	114	0.197	1.924	2.000	0.206
Commercial motorcyclist	92	37	0.001	5.802	2.47	0.122
Merchant	15	12	0.086	2.917	1.672	0.454
Student	14	5	0.009	6.533	3.810	0.087
Other	6	14	1	1	1	1
Residency						
Yirgalem town	210	177	0.349	0.593		
Outside Yirgalem town	11	5	1	1		

Prevalence of using helmets among motorcyclists in Yirgalem town.

Less than a quarter (19.4%) of the respondents have their motorcycle equipped with helmet. Only 251 (62.3%) of the respondents use helmets during driving. The major reasons for not wearing helmets were: not thinking it was important to wear (16.1%) of the respondents, because it is expensive (6.9%) of the respondents and it is not readily available on the market (2.7%) of the respondents. Of the those who wear helmet only a quarter (25.4%) wear their helmet every time they drive whereas 42.1% of them wear helmet only when they are driving long drives and 25.8% of them wear helmet when they expect law enforcement. Only 5% of commercial motorcycle riders ask their passengers to wear helmets.

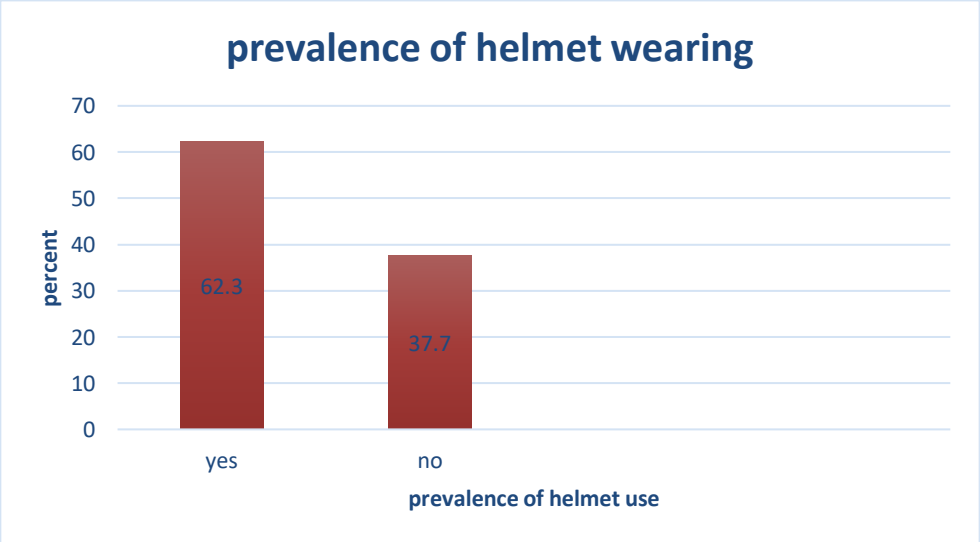

Figure 3. The prevalence of helmet wearing among motorcycle riders in Yirgalem town 2019 GC.

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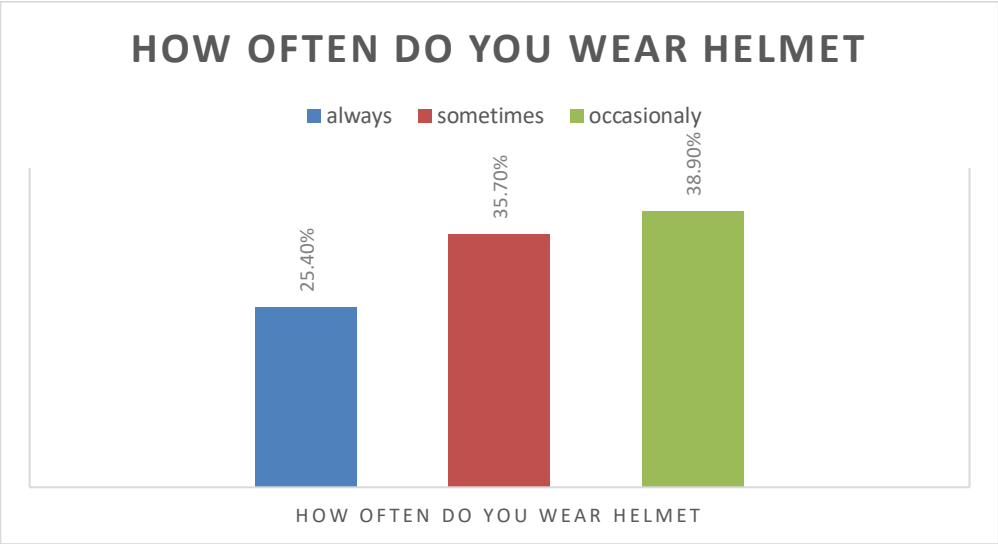

Fig 4: how often motorcycle riders wear helmet in Yirgalem town, 2019 GC.

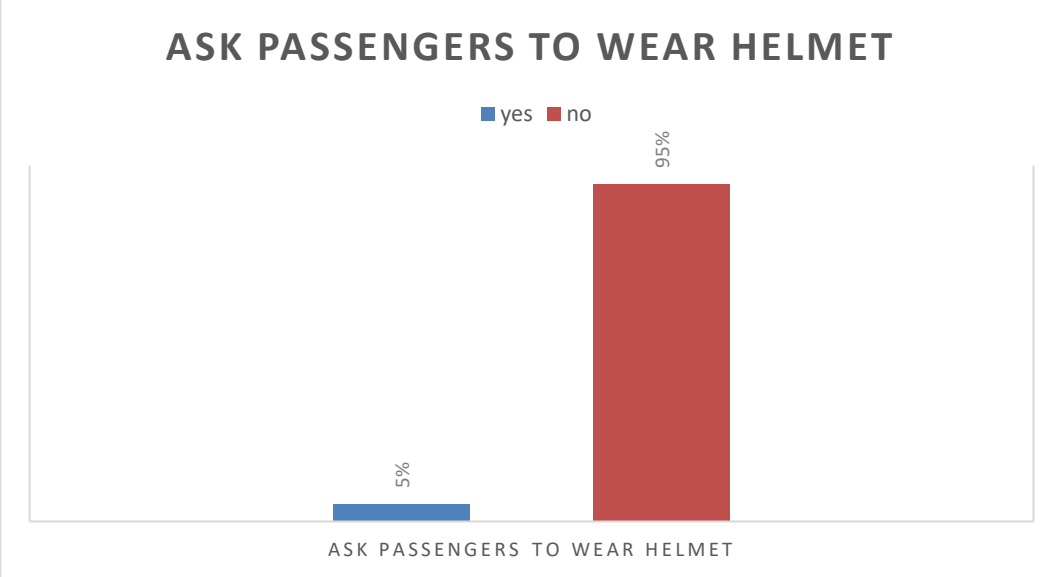

Fig 5: helmet wearing of passengers using motorcycle in Yirgalem, 2019 GC.

6. DISCUSSION

Although it is generally accepted that it is not possible to totally prevent motorcycle accidents, the resultant injuries and severity can be reduced by protective devices like safety helmets when properly used by motorcyclists. This study was therefore undertaken to determine the level on the usage of safety helmet among motorcyclist in Yirgalem town and to assess the awareness, attitude and associated factors in helmet use among motorcyclists in the town.

As stated in the results 62.3% of the respondent wear safety helmets while driving. This is in comparison with 60% wearing rate according to the Global Status Report on Road Safety, 2017. This is lower than the rate of helmet use in Indian cities (70%) and Chinese cities (90%)(Investigation of helmet use behavior of motorcyclists and effectiveness of enforcement Campaign using CART approach, 2019). But helmet use in Yirgalem is higher than in Kenyan cities which is 35.12% in Thika and 37.42% in Navaisha city (Helmet wearing in Kenya: prevalence, knowledge, attitude, practice and implications, 2016). However, most of

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them wear helmet either occasionally and sometimes than always. Consequently, it is hardly existing good habit of helmet wearing in Yirgalem.

80% of motorcycle riders in Yirgalem have good awareness about helmet use. This is lower than that found in Kenyan cities Thika and Naivasha where 90.3% of the motorcycle riders have good awareness about helmet use. The awareness of motorcycle riders in urban areas of Nigeria which is 88.9%(perception and practice of helmet use among motorcycle riders in semiurban community in southwestern Nigeria) is also higher than that of Yirgalem town.

In our study we found that low helmet use in passengers than riders and in the city than outside the city. While the passengers helmet use is in comparison with study done in Ghana (A cross-sectional observational study of helmet use among motorcyclists in Wa, Ghana, 2013) and that done in Kenya (Mixed binary logit analysis of motorcycle helmet usage observations in Nairobi, Kenya, 2016)

55% of the motorcycle riders in Yirgalem have positive attitude towards helmet use. This is comparable to Kenyan cities Thika and Naivasha where 52.4% and 54.2% of the riders have positive attitude towards helmet use.

Out of the total respondents 375(93.1%) were males and 28(6.9%) were females. This shows huge male preponderance. This may be due to the fact that it is a common observed phenomenon and customary to see more male than female gender motorcycling in African cultural context. Furthermore, since motorcycling is a high-risk venture, males tend to engage more in risky ventures than their female's counter parts do. Majority of the motorcyclists were between the age 26 to 36 years. This shows that many motorcyclists are young adults, in productive age groups.

Commercial motorcycle riders have good knowledge about helmet use than those non-commercial motorcycle riders. People in age group 37-47 have negative attitude towards helmet wearing than other age groups. This is in comparison with the result found by Muhammad Adnan and UnebGazder (Investigation of helmet use behavior of motorcyclists and effectiveness of enforcement campaign using CART approach, 2018).

As for the awareness of helmet wearing, even though 83.1% of the respondents told us that they are aware of the protective effect of helmet wearing and 88.8% of the respondent know that not wearing helmet is against the law; only 62.3% of them use helmets while driving. Despite the awareness of the benefits of helmet wearing among motorcyclists, the most frequently mentioned reasons for wearing helmet were when riding for a long distance and anticipating a law enforcement.

Most the respondents agreed that serious penalties should be imposed on motorcyclists riding without helmets. This is in comparison with study done by Turkson R F, Akple M S, Biscoff R, Dzokoto S T K, Klomegah W. (Helmet usage among motorcycle riders in Ghana. (IJSETR), 2013).

7. LIMITATIONS

Our questionnaires provide close ended yes or no type of questions so that we were forced to take our responder for what they have told us than pinpointing their awareness by ourselves.

We were also unable to get qualitative data to see how quality related aspect of helmet affect its use such as color, shape, availability, feasibility; how characters in movies, songs, TV programs, etc… are shown etc…

Due to difficulty of obtaining the exact number of motorcycles with their license, as most motorcycles are not registered and have no identification plate, we were forced to use convenience sampling method. Since

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our sampling technique is not probability sampling method the result might fail to be representative of the motorcycle riders in Yirgalem.

We weren't unable to find sufficient amount of data on gender and outliers of ages to see how they are related with helmet use.

8. CONCLUSION

We conclude that most motorcycle riders in Yirgalem are male, educated and young people who have good knowledge about helmet use and have positive attitude towards helmet use compared to negative attitude, however, helmet wearing is not consistent among motorcycle riders in Yirgalem. In addition, passengers are almost totally excluded from being protected head injuries by wearing helmet.

9. RECOMMENDATION

Since most of motorcycle riders in Yirgalem town are educated adults who have the necessary attitude and awareness about helmet use, there should be provision on law enforcement agents to ensure that they are actually enforcing the laws formulated. As motor cycles are one form of commercial transport system in Yirgalem, there should be a legal provision to enforce helmet wearing of passengers by law.

Policy makers also need to target commercial motor cycle riders who are prone to motor vehicle accidents and have low awareness about helmet use compared to other motorcycle riders. This group can benefit from awareness raising campaigns, and local officials should play their parts by setting good practices. In addition, young people tend to have good attitude about helmet use and accounts for majority of motorcycle riders. Policy makers should engage young people to find viable solutions, and use influencers to establish a culture of helmet use among young motorcycle riders.

Policy makers should also ensure feasible and good quality helmets should be available and accessible in market for users.

For the future, more researches should be done on helmet use on wider area than we did as well as researchers should consider to find out exact awareness and attitude of motorcycle riders with better method.

A Research Paper Submitted to Hawassa University College of Medicine and Health Sciences School of Public Health in Partial Fulfillement of the Requirements for the Degree of Bachelor of Science in Medicine.

10. ACRONYMS AND ABBREVIATIONS

RTA	Road Traffic Accident
HUCSH	Hawassa University Comprehensive Specialized Hospital
TBI	Traumatic Brain Injury
EDHS	Ethiopian Demographic and Health Survey
GCS	Glasgow coma scale
CSA	Central Statistics Agency

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WHO World Health Organization

NGO: Non-Governmental Organization

SNNPR South Nations, Nationalities and Peoples Region

SPSS Statistical Package for Social Sciences

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LIST OF FIGURES

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ANNEX

Questionnaire

Hawassa University Comprehensive Specialized Hospital 6th year medical students research study questionnaires.

This questionnaire is prepared by Hawassa university 6th year medical students to assess the awareness and attitude of helmet use in Yirgalem town. It is provided for volunteers to fill on consent. There is no risk involved in this study. Dear participant, we will appreciate your participation. All your responses will be fully confidential. Your name will not be attached to anything that you say and all your responses we get here is for research purposes only. Thank you for your participation.

Socio-demographic information

1. Age: ☐
2. Sex: Male ☐

Female ☐

3. Education: Primary ☐

Secondary ☐

Tertiary ☐

Other(specify)

4. Marital status: Married ☐

Single ☐

Divorced ☐

Widowed ☐

5. Where do you live?

In Yirgalem town ☐

in outskirt of town ☐

outside the town (specific place) ☐

6. What is your occupation?

7. Is motorcycle driving your source of income? Yes No ☐

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8. If your answer to q. 7 is yes, is it your only source of income

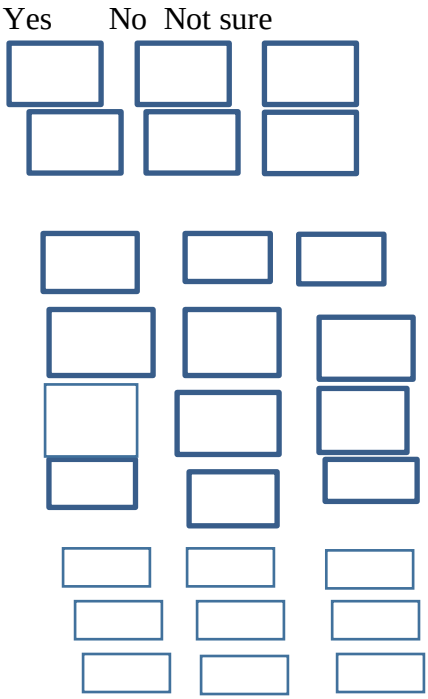
Yes No ☐

9. If your answer to q. 9 is no, specify your other source of in come

_____.

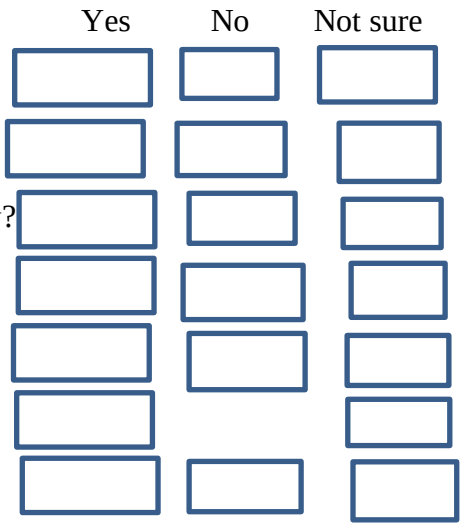
Awareness and attitude of helmet wearing among motorcycle riders

Awareness of helmet wearing among motorcycle riders



10. Do you think helmets protect against serious head injury?
11. Do you think helmets prevent harassment from law enforcement agents?
12. Are you aware of prescribed type of helmets?
13. Do you know not wearing helmets is against the law?
14. Are law enforcement agents being strict about helmet wearing?
15. Do you rush to wear your helmet on sighting law enforcement agents?
16. Have you ever received education on helmet use?
17. Do you know the rules /lawabout helmet wearing?
18. Do you know how helmet works?

Attitude towards helmet wearing among motorcycle riders



19. Do you think helmets are truly protective?
20. Do you think helmets are needed only in high ways?
21. Do you think wearing helmet obstruct the rider's view?
22. Do helmet generate a lots of heat on the head?
23. Do you think wearing helmet impairs hearing?
24. Do you think wearing helmet is uncomfortable?
25. Do you think failure to wear helmet should attract serious penalty?

Prevalence and practices of helmet use

26. How long have you drived motorcycle?

(state in years) _____.

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25. Do you think failure to wear helmet should attract serious penalty? ☐ ☐

Prevalence and practices of helmet use

26. How long have you drived motorcycle?

(state in years) _____.

27. Is your motorcycle equipped with a helmet? Yes ☐ No ☐

28. If your answer to q. 26 is no, why?

Because it is expensive ☐

Because you do not think it is helpful ☐

Because it is not available on the market ☐

Other reason (specify)

29. If your answer to q. 26 is yes, how often do you use your helmet?

Always ☐

Sometimes ☐

Occasionally ☐

30. When do you use your helmets?

Always ☐

Only on long drives ☐

Only when I expect law enforcement ☐

Only when I am driving in the town ☐

Other time(specify):_____.

Answer the question below only if you are commercial motorcycle rider.

31. Do you ask your passengers to wear helmets? Yes No ☐

32. If your answer to the q.31 is yes, how often?

Always ☐

Only on long drives ☐

Only when I expect law enforcement ☐

Only when I am driving in the town ☐

Other time(specify):_____.