ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

ASSOCIATION OF PRE-HOSPITAL CARE AND INJURY SEVERITY AMONG ROAD TRAFFIC INJURED PATIENTS ADMITTED IN ADDIS ABABA PUBLIC HOSPITALS

ADDIS ABABA, ETHIOPIA

BY BETHELHEM FEKADU (B. PHARM)

ADVISOR

MR. SEFONIAS GETACHEW (MPH)

A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES ADDIS ABABA UNIVERSITY SCHOOL OF PUBLIC HEALTH, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH

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Table of Contents

List of tables

List of figures

List of Annex

Abbreviation and acronym

AaBET	Addis Ababa Burn, Emergency and Trauma Unit
AAHB	Addis Ababa Health Bureau
ALERT	All Africa Leprosy, Tuberculosis, Rehabilitation and Training Center
ALS	Advanced Life Support
BLS	Basic Life Support
EMS	Emergency Medical Service
GDP	Gross Domestic Product
RTA	Road Traffic Accidents
RTI	Road Traffic Injuries
SDG	Sustainable Development Goals
TAPHEMS	Tebita Ambulance and Prehospital Emergency Medical Service
TASTH	Tikur Anbessa Specialized Teaching Hospital
WHO	World Health Organization
KTS	Kampala Trauma Score

Abstract

Background: Globally, about 1.25 million people die every year due to road traffic related cases and as many as 50 million more are injured and it is a number one cause for the death among those aged 15-29 years. Ethiopia is one of the countries with the highest number of road traffic injuries in the world. Pre-hospital care play an important role in life support services. The present study was carried out to assess the association of pre-hospital care and injury severity for road traffic accident victims in Addis Ababa public hospitals, Addis Ababa, Ethiopia.

Methods: A facility based cross sectional study design was used. Systematic random sampling was used to reach 391 road traffic injured patients from public hospitals.Both patient medical report and a structured questionnaire which is adopted from standardized tool from WHOwas used. Kampala Trauma Score II (KTS II) was calculated for the outcome variable injury severity and was ranked as severe injury and non-severe injury. Data was entered to Epidata 4.2 and exported and analyzed through Statistical Package for the Social Sciences (SPSS) version 20.Descriptive analysis was conducted to determine with frequency, proportions and summary measure. Bivariate and multivariable logistic regression was used to identify the relation of independent predictors with the injury severity. The p value less than 0.05 was considered for statistical significance.

Results: A total of 385 road traffic injured victims were included. Participants who scored severe injury were 22.9%. The male to female ratio was 2:1. The patient's ages range from 15-80, with a mean of 32 and standard deviation of ± 12 years. Pedestrians (48.6%) who were travelling were the majority of road traffic crash victims. More than half of the patients did not get any kind of pre-hospital care before reaching to health facility. Frequently raised reasons for this were lack of equipment (50.6%) and poor knowledge (36.8%). People who had pre-hospital care were less likely to develop severe injury (AOR 0.4595% CI (0.24,0.842)). Additionally, age of the patient and being a driver significantly influenced injury severity score.

Conclusion: Road traffic accident constitute major public health problem causing a burden in the health care system. Integrating pre-hospital care in the health care system also plays a major role in minimizing further damage caused by RTA.

Key word: Road trafficinjury,Pre-hospital care,Injury severity.

1. Introduction

1.1Background

World Health Organization (WHO) defines, Road Traffic Accident (RTA) as it is an accident which happened on a way or street open to public traffic; resulted in one or more persons being killed or injured, and at least one moving vehicle was involved. Thus, RTA is collisions between vehicles; between vehicles and pedestrians; between vehicles and animals; or between vehicles and fixed obstacles(1).

Road traffic accidents are a human tragedy(2).WorldwideThe number of road traffic deaths is about 1.25 million in 2013 and as many as 50 million more are injured andit is a number one cause for the death among those aged 15-29 years(3, 4).

Injury is the leading cause of lost years of life and is estimated to result in 500 years of lost productivity annually per 100,000 population. Morbidity and mortality from serious injury or trauma can be reduced through improved patient assessment and management systems. Components of contemporary systems include injury prevention, prehospital care, services at trauma centers and other acute care facilities, and post-hospital care(5).

Road traffic injury (RTI) is estimated to be the fifth largest killer worldwideby 2030. Most of those deaths are from low- and middle-income countries (LMIC) (6).In addition to the statistics on death and injuries, road traffic related crashes result in vast pain and suffering and many billions of dollars in medical expenses and lost productivity(7). The global burden of RTIs continues to increase and promises to overtake tropical diseases as a leading cause of death in the developing world(8).

The injury characteristics and severity of road traffic accidents in developing countries varies in important ways from the profile seen in developed countries. Pedestrians are most vulnerable to injury and death(9, 10). This may be due to several factors, including lack of pedestrian facilities in road design, poor knowledge and practice of road safety measures by the general community, recklessness behavior of motorists or drivers, high speed driving, and low levels of vehicle ownership. The high proportions of passenger fatalities appear to be related with extensive use of public transport, types and condition of such vehicles and the driving skill of their operators (10).

Particularly in the developing countries, rates of injury from RTA are high due to several contributing factors. More than 90% of road traffic injury deaths occur in developing countries, where approximately 80% of injury deaths occur in the pre-hospital setting (11).

As indicated above about 85% of mortality is from Low- and middle-income countries and up to 90% of the annual disability-adjusted life years (DALYs) lost due to RTIs with an estimated economic loss of up to 1.5% of the gross national product (GNP)(12). It has been predicted that by 2020, road traffic injuries will rank as high as third among causes of disability adjusted life years (DALYs) lost(13).The fatality rate of road traffic crash in African countries is 26.6 per 100,000 people, which is the uppermost in the world. It is about two times higher than the fatality rate of the Americas and three times higher than Europe(14).

Sub-Saharan African countries already has the world's most dangerous roads, with an estimated road traffic fatality rate of 24.1 per 100,000 people, and yet as Africa's economy grows, supported by expanded road infrastructure, including railway constructions and as more and more vehicles are imported into the continent, the risk of RTI increases every day(6).

WHO (2009) reported that based on modelled numbers, Ethiopia is the 10th country with the highest number of deaths in the world. Victims of fatal road accidents die on the scene of the accident or after they get to the hospital. Survivors also suffer from diverse types of injuries and disabilities which can alter their quality of life. It has been indicated that victims might be passengers or pedestrians and drivers(15).

In 2011, From the African counties, Ethiopia recorded the highest fatality rate 81.6 per 100,000 population, while Nigeria recorded 2.9 per 100,000 population. The lowest death rate was recorded in Nigeria at 1.64 per 100,000 population in the year 2007(16).

A comprehensive emergency medical system includes not only a health facility based care for emergency cases but also a functional pre-hospital care that gives primary care for injuries at the accident scene and while transferring victims to health facilities (17). One of the most important roles of pre-hospital services is life support and prevention of future disabilities in the post-crash phase (18).

Pre-hospital refers to all environments outside an emergency department resuscitation room or a place explicitly designed for resuscitation and/or critical care in a healthcare setting. It usually

relates to an incident scene, but it includes the ambulance environment. Pre-hospital interventions therefore also range from simple first aid to advanced emergency care and prehospital emergency anesthesia(19).

In Addis Ababa, there are governmental institutions which integrateemergency medical service by giving part of pre-hospital care. These are majorly National Red Cross and Fire and Emergency dispatch center which give supplementary ambulance services. The fire and emergency dispatch center has 7 ambulance stations within 10 sub cities and it has 15 ambulances which work for 24 hours(19).

Governmental health care providers also give pre-hospital care. In addition to governmental institution, there are also private institutions which give ambulance services(19).Tebita ambulance and prehospital emergency medical service(TAPHEMS) is the first private ambulance and emergency service of its kind in Ethiopia. TAPHEMS was established in November2008 E.C. Tebita is licensed by the Addis Ababa Health Bureau to provide emergency pre-hospital medical services and more over issuing certified training on First Aid and Health Safety(17).

1.2 Statement of the problem

The best way to reduce rates of death or disability from life-threatening injuries is to prevent them. However, it is often possible to minimize the consequences of serious injury, including long-term morbidity or mortality, by promptly providing effective prehospital care. Unfortunately, most of the world's population does not have access to prehospital trauma care. In many countries, few victims receive treatment at the scene and fewer still can hope to be transported to the hospital in an ambulance(20).

In September 2015, heads of state attending the United Nations General Assembly adopted the historic Sustainable Development Goals (SDGs). One of the new SDG targets (3.6) is to halve the global number of deaths and injuries from road traffic crashes by 2020 (4).

Like other developing countries, injuries from trauma in Ethiopia are common. Road traffic accidents are the commonest cause of injury in urban areas of Ethiopia (11). In Ethiopia, from the emergency medical services, pre-hospital care is not widely developed as in other developed countries(19).

Therefore, it is imperative that organized pre-hospital care system should be established and improved in such countries. Studies found that increasing the number of emergency dispatch units and pre-hospital personnel training, increased the use of emergency medical devices and decreased the percentage of patients who die on the way to the hospital(21).

As the burden of injury is immense, policy-makers can reduce the human and economic toll of injuries by implementing basic, simple prehospital trauma care systems. When these prehospital care systems are linked to a country's existing public health and health-care infrastructure, they can substantially enhance access to care, augment a country's capacity to care for a wide range of emergency conditions, identify opportunities for prevention, and strengthen a country's disaster response capacity(22).

Most researches that are done in Ethiopia, concerning road traffic accident, focus on the hospital treatment and there are little researches done to assess the prehospital care in victims of trauma or road traffic accidents. This research aimed to give an insight which can help to improve

current pre-hospital care system so that it aids to minimize the severity of the injuries related to road traffic injuries.

Studies showed that most of the patients arrive the hospitals with no pre-hospital care(10, 23, 24).In most of the cases road traffic accident injuries are usually transported to the nearest health center or hospital for emergency medical care without any health professional care at the scene of the accident. Transportation of the accident victims are made by the vehicle involved in the accident, volunteer driver or ambulance if there is any around the accident scene. There is little medical care during transportation even when using ambulances for various reasons including lack of medical professionals(17).

Hence, the main aim of this study was to assess the association of pre-hospital care and injury severity among road traffic accident victims in Addis Ababa public hospitals, Addis Ababa, Ethiopia.

1.3 Significance of the study

Assessing the pre-hospital care given to those people who survived from road traffic accident and identifying the association with injury severity was the main aim of this study. This study also assessed other factors related with RTI patients and itsassociationwith injury severity.

The results described the prehospital cares that are being carried out and provide evidence about the pre-hospital care provided to road traffic injured patients from public hospitals, which can help to strengthen the services.

This study was an opportunity to assess the prehospital care service provisions and is helpful to provide an additional data for policy makers and other stakeholders who may wish to undertake interventions to improve the prehospital care system.

2. Literature review

2.1 Global burden of road traffic accident

In 2010, the United Nations General Assembly adopted resolution 64/2551, announcing a Decade of Action for Road Safety. The goal of the Decade (2011–2020) is to stabilize and reduce the growing trend in road traffic fatalities and to save an estimated 5 million lives over the period. This provides a practical tool to help governments and other national stakeholders develop national and local plans of action, while simultaneously providing a framework for coordinating activities at regional and global levels (25).

WHO (2015) showed that the number of road traffic deaths has plateaued since 2007, despite the increase in population and motorization and a predicted increase in deaths. However, low-income countries have fatality rates more than double those in high-income countries and there are a disproportionate number of deaths relative to these countries' level of motorization: 90% of road traffic deaths occur in low- and middle-income countries, yet these countries have just 54% of the world's vehicles(4).

In Africa the severity of road traffic accident is also likely to be much higher than anywhere else because many vulnerable road users are involved, poor transport conditions and infrastructures such as lack of seat belts, overcrowding, and hazardous vehicle environments. The poor reporting system has also masked the magnitude of the problem in Africa. The lack of pre-hospital and hospital emergency care after accidents makes the outcome of car accidents in Africa the worst(26).

The loss in road traffic accident is massive in economy and health related issues. Families having accident victim's shatters with death and the victims seriously injured usually needs medical facilities for the rest of their life and eventually becomes a burden to their family. Road traffic injuries are burdening health care systems in countries around the world(27).

Nonetheless, evidence from many countries shows that dramatic successes in preventing road traffic injuries can be achieved through concerted efforts at national level. Many developed countries, such as Australia, Canada, France, the Netherlands, Sweden and the United Kingdom have achieved steady declines in road traffic death rates through coordinated, multi-sectoral

responses to the problem. Such responses involve implementation of a number of proven measures that address not only the safety of the road user, but also vehicle safety, the road environment and post-crash care (25).

2.2 Road traffic accident in Ethiopia

The 2013 WHO report showed that Ethiopia's Reported road traffic fatalities in 2010 is 2,581, indicating 76% Male and 24% Female. The Estimated GDP(Gross Domestic Product) lost due to road traffic crashes 0.8–1.0%(25).According to the latest WHO data published in 2017 Road Traffic Accidents Deaths in Ethiopia reached 27,140 or 4.27% of total deaths(28). 81% of crashes in Ethiopia are officially attributed to driver error. Driver impairment is not often recorded as a contributory factor and government officials believe Khat (Catha edulis) usage is a major cause of driver error and crashes (29).

With all evidences in low income countries in sub-Saharan Africa region including Ethiopia the mortality and morbidity due to road traffic crashes is higher and even expected to become more worse in the future due to increasing number of vehicles and national development (3).

Results of the study done for 3 consecutive years in Eastern Ethiopia showed the distribution of admission diagnosis was higher with head injury (29.8%) next to Lower extremities injury (54.2%), also number of death increases with head injury. From 402 patients admitted 362 (90%) were alive and discharged. About 304 (75.6%) of patients were discharged improving without any sequel, 60 (15%) were discharged with some disabilities and 38 (9.4%) of them were dead of RTA(23).

Distribution of gender shows that males outnumber the females(23, 29). Most victims were pedestrians which accounted for (71.7%), followed by passengers which consist of (13%) and drivers (12. 2%).The most frequently recorded injury were head, neck, and face; (43.5%) of patients had injuries in these areas. On top of that (25.9%) and (12.9%)of the patients had injuries involving the lower extremity and the upper limbs respectively. The study also found that people with psychological and financial problems and people who drink alcohol were more likely to be injured by road traffic accidents (29).

Among a total of 712 taxi drivers, 188 self-reported involvement in a road traffic accident in thethree years (2011–2013) of a study inNorthern Ethiopia, for a prevalence of 26.4%. Study participants reported 10 human deaths,13 animal deaths, 107 non-fatal injuries, and112 property damage (30).

Traditionally, road traffic accidents have been assumed to be the concern of the transport sector, and public health has been slow to develop involvement. But the health sector would greatly benefit from better road traffic injury prevention in terms of less hospital admissions and a reduced severity of injuries. It would also be the health sector's gain if more people were to adopt the healthier lifestyle of walking or cycling, without fearing for their safety(31).

2.3 Severity of injuries in Road Traffic Accident

Injuries sustained by victims of a road traffic crash vary in type and severity. The World Health Organization uses a severity ratio guideline of 15 serious injuries (requiring hospital admission) and 70 minor injuries for every road death(31). The severity of injuries sustained from road traffic accident ranges from those that can be treated immediately and for which medical care is not needed or sought, to those that result in a permanent disability(32).

A study on the injury pattern among road traffic accident cases in India, the average age of the victims was 31.5 years. The highest number (31.3%) of victims were between 20-29 years of age. About 71 % of the victims were under 40 years age group. Head injuries were the commonest form of internal injuries seen in victims (34.1%) followed by injuries to the lower limbs (13.7%) and face (10.7%). Injuries to the chest (8.5%), pelvis (8.2%) and upper limb (8.1%) were seen in roughly equal proportion of victims. Others sites were back (7.65%), spine (4.3%) and neck (0.9%) (13).

According to another study, the mortality rates in patients with mild, moderate and severe injuries were 6.8% (12 deaths), 23.9% (42 deaths) and 69.3% (122 deaths) respectively. The Glasgow coma scale indicated that most of the patients (487, 55.7%) sustained mild head injury, 302 (34.6%) patients sustained moderate head injury and 85 (9.7%) patients had severe head injury. Patients with severe head injuries had significant high mortality rates (64.2%, 113 deaths) compared with patients who had moderate (33.0%, 58 deaths) and mild (2.8%, 5 deaths) head injuries (10).

In most of the RTAs, injuries were not restricted to a single body part, with maximum injuries being in upper and lower extremities (10, 33). From the body parts lower limb was the most injured site in pedestrians and motorcyclists, 55.5% and 76.9%, Motorcyclists involved in 61.6% of the total 333 head trauma and 44.4% of the total 45 severe head trauma. Head and face injuries had the highest rate in car passengers (55.6%), all of whom were among non-users of seatbelts. In hospital, the mortality of patients was 4.6% (31 cases); and 32.2% of these deaths (10 cases) occurred in emergency department from which brain injury was the most common cause of death (34).

The injury characteristics and severity of road traffic accidents in developing countries varies in important ways from the profile seen in developed countries. Pedestrians are most vulnerable to injury and death. This may be due to several factors, including lack of pedestrian facilities in road design, poor knowledge and practice of road safety measures by the general community, recklessness behavior of motorists or drivers, high speed driving, and low levels of vehicle ownership. The high proportions of passenger fatalities appear to be related with extensive use of public transport, types and condition of such vehicles and the driving skill of their operators (10).

Type and severity of damages wasstudied,and results of the study showed that often accident injuries were mild and 99% of victims were having abrasion in urethra. The study also supports their observation as thoracic vasculature and chest wall injuries were common and varying from mild to critical level of severity (35).

Mackenzie, J. R. R. studied about Characteristics of high injury severity crashes and found out that crashes which occurred during hours of darkness, higher speed zones and dry road crashes showed an increased proportion of high injury severity outcomes across all days of the week (36).

Behavioral factors like driving under the influence of alcohol has been suggested to cause in highly severe injuries(12), participation in high risk activities such as recklessness driving/riding, over-speeding, driving/riding under influence of alcohol, driving/riding while talking or texting on cell phone, and driving/riding without wearing or putting on any protective gears such as seatbelt and helmet has been seen to cause injuries of different severity scales in road traffic accidents(32).

1.1 The provision of pre-hospital care service

Results from a descriptive studyusing worldwide data set at a country levelregarding prehospital care showed that the countries with presence of pre-hospital care system had death rate mean of 17.23, countries with no pre-hospital care system had death rate of 26.49, From this basic statistical analysis, it can be seen that the death rate of existence of pre-hospital care was lower (17.23) than the no pre-hospital care system (26.49) (24).

The ‘golden hour’ is term often used in trauma to advocate that an injured patient has 60 minutes from time of injury to receive definitive care, after which morbidity and mortality significantly increase. Thus, the injured victim/s should be in definite care within 60 minutes after the incident. Efficient emergency medical services usually have a 30-45 minutes interval between the time of the crash and arrival at hospital. The “golden hour” is therefore a prehospital event. The way in which a trauma care system is organized seems to influence the number of deaths after injury (37).

In a study done in Iran, the time interval between the accident and admission to the emergency department was 6.6 ± 3.2 hours which is much higher than the standard, causing a lot of preventable injuries as well deaths (38).

In Northwestern Tanzania, study showed that most of patients (1109, 66.1%) reported to the emergency department within 24 hours after injury (10). Similarly a prospective study done at Tikur Anbessa Hospital Specialized Hospital in Addis Ababa,Ethiopia, indicated that most of the victims (86.96 %) reported to adult emergency department within 24 hours after injury, of which 27 % of these victims arrived with in the first hour which is the golden hour, but none of the patients had received any pre-hospital care and only 22.61% and 3.9% of the victims were brought by ambulance and police car to the hospital respectively (39). In another study 67.2% of RTA victims were brought to hospital in less than 12 hours which is critical time after pre-hospital care (23).

Two studies reported the pre-hospital care of trauma patient to be the most important factor in determining the ultimate outcome after the injury. In these studies Few of the patients had pre-hospital care and the majority of them were brought in by relatives, came to the hospital by themselves, or were brought by good Samaritans (2, 23).

Similarly, the study in Tanzania again showed that none of the patients received any pre-hospital care and majority of them (1284, 76.5%) were brought in by relatives, friends or good Samaritan, 380 (22.6%) by police and only 14 (0.8%) patients were brought in by ambulance (10).

Another study done in Tikur Anbessa Specialized Teaching Hospital (TASTH) on patterns and determinants of pre-hospital care among trauma patients, from total of 437 patients interviewed only 73 (16.70%) patients had witnessed as having got some kind of care before they arrive to definitive care like stopping bleeding 50(68.5%), immobilization or splinting of fracture 22 (30.1%), assisting or making position that the patient wants 6 (8.2%), giving anti- pain (one case), removing foreign body from wound, were types of care given. These cares were given by trained first aider or ambulance staffs 41(51.2%), relatives 24 (30%), police 8 (10%), bystanders 6 (8.7%) (11).

For patients who did not get pre-hospital care (N=364), reasons were asked and most concern was lack of knowledge or fear of procedure 290 (80.1%), lack of equipment 141 (39.0%) and less than 10% of cases haven't got care due to fear of medico-legal case and other reasons like to deliver the victim as fast as possible (11).

It was indicated in a study regarding prehospital care, only 52(14.3%) of the victims had prehospital care. This finding is found to be higher than reports of previous studies in Ethiopia and Tanzania, (10, 24)both of them reported zero percent for victims received prehospital service. The increased number of victims used ambulance and received prehospital service in the present study might be due to establishment of organized prehospital service in Addis Ababa and involvement of private business group in ambulance and pre hospital services such as Tebita Ambulance in Addis Ababa (40).

A study about knowledge, attitude and practice of residents about pre-hospital care in Addis Ababa showed that most of the respondents (86.3%) knew the presence of pre hospital care, most respondents (96%) believed that pre hospital care is important and (37.9%) individuals had encountered in different levels of pre hospital care provision (19).

More than 1000 Ethiopian physicians and nurses have attended Emergency medical symposia (sponsored by AAHB, WHO, Israel and USA) focused on leadership, prehospital care, basic and advanced life support, and the evaluation and treatment of minor and major trauma (41).

According to the study conducted in Thailand based on WHO report of country-level data on estimated traffic death rate per 100,000 population,existence of prehospital care system significantly decrease death rate secondary to traffic accident (24).

In addition, improvements in pre-hospital care may decrease trauma mortality in the first few hours after injury, and it may also reduce the long-term injury severity, mortality and morbidity rates due to RTAs (42).

1.2 Association of Pre-hospital care and injury severity

The US National Highway Traffic Safety Administration created the Emergency medical services (EMS)-symbol or 'Star of Life' symbol which represents the six EMS functions for pre-hospital trauma care including; detection, reporting, response, on-scene care, care in transit and transfer to hospital(43).

Several prehospital systems are set up to give prehospital medical treatment by a doctor. This is the standard pattern of prehospital care throughout Europe and Scandinavia (37).

Pre-hospital trauma care is a strategy which aims to decrease the severity of injury consequences once a road traffic crash has occurred. Minor injury patients will usually need the help of a general practitioner and optimal medical and psychological follow up care is important to alleviate pain and distress. For major injuries, clinical experts define the post-crash care needed as the chain of help starting with action taken by the victims themselves or more commonly by bystanders at the scene of the crash, emergency rescue, access to the prehospital medical care system, and trauma care and helping road crash victims who have suffered debilitating injury re-integrate into work and family life. The effectiveness of such a chain depends upon the strength of each of its links(44).

Prehospital care is usually classified into ALS- (advanced life support) and BLS (basic life support) treatment levels according to the methods used. ALS refers to sophisticated prehospital care using invasive methods, such as intravenous fluids, medications and intubation. The vehicle used in ALS has either been a ground ambulance or a helicopter. Basic Life Support (BLS) is medical care which is used to assure patient's vital functions until the patient has been transported to appropriate medical care (45).

ALS-level prehospital care has usually been implemented by physicians or paramedics, while BLS-level care is given by paramedics or emergency medical technicians. However, in most cases ALS units use the same techniques as BLS units (45).

The staggering morbidity and mortality of severe head injury could remarkably be reduced by simply securing and maintaining the airway and providing ventilation to such patients at the accident scene. When this measure was undertaken, 90% mortality rate in these patients was dramatically decreased to 40%. Morbidity and mortality in these patients has declined during the past decade due to improvement in the prehospital care. This also facilitates timely medical and surgical intervention(46).

1.3Conceptual framework of the study

The Conceptual framework of the study was developed after reviewing earlier similar studies to conceptualize the whole research process and to support as guide for tool development and analysis.

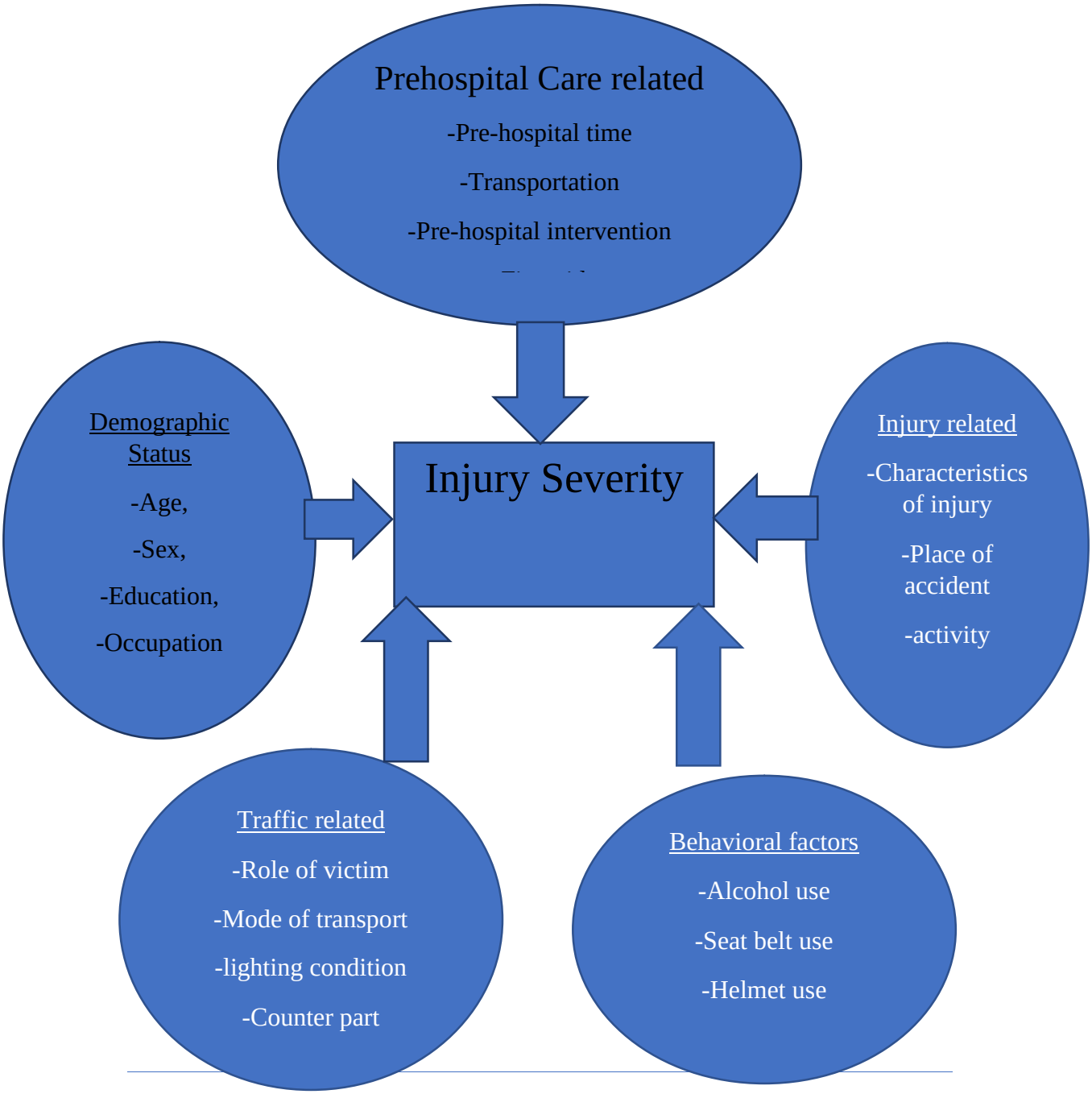

Figure 1Conceptual Framework

2. Objective

2.1 General objective

- To assesstheassociation of prehospital careand injury severityamong road traffic accident victims in Addis Ababapublic hospitals, Addis Ababa, Ethiopia; from January to April, 2018

2.2 Specific objectives

- To determine the magnitude of injury severity among road traffic injured patients in Addis Ababa,public hospitals.
- To determine the association between pre-hospital care and injury severity of RTI victims in Addis Ababa, public hospitals.
- To assess other related factors with injury severity of RTI victims in Addis Ababa, public hospitals.

3. Methodology

3.1 Study Area

This study was conducted in all public hospitals of Addis Ababa city, Ethiopia. Addis Ababa is the capital city of Ethiopia and the seat for Africa union. Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), Addis Ababa had a total population of 2,739,551, of whom 1,305,387 are males and 1,434,164 females(19).The estimated population ofAddis Ababa in 2018 is 7.178 Million(47).

Figure 2: Map of Addis Ababa city (Google Map)

The city is divided into 10 sub cities (Amharic: Kifle Ketema) and 99 woredas. The City has 48hospitals, thirteen public hospitals of which, five are under Addis Ababa Regional Health Bureau (AARHB) and 5 are specialized referral (central) Hospitals. Two are Defense Forces (military) referral hospitals and one hospital under Police Force. There are organizations which give pre-hospital service fire and emergency service, Red Cross and Tebita ambulance.

From 13 public hospitals that delivers health services to the community, 11 of them provide emergency medical care butonly eight hospitals give emergency services to road traffic injured patients. These are Addis Ababa Burn, Emergency and Trauma Unit (AaBET) hospital, All Africa Leprosy, Tuberculosis, Rehabilitation and Training Center (ALERT) hospital,Tikur Anbessa Specialized Teaching Hospital (TASTH), Menilik II hospital, Yekatit 12 hospital, Zewditu Memorial Hospital, Ras Desta Hospital and Tirunesh Beijing hospital. In order to accommodate all areas of the city all eight of them were included in the study.

3.2 Study Period

The study was conducted from January15to April25,2018 atemergency units of public hospitals giving services to RTI patients in Addis Ababa, Ethiopia.

3.3 Study Design

A facility based cross sectional study design was used.

3.3.1 Source population

All adult (age greater than 15) road traffic injured patients attending emergency unitsof public hospitals in Addis Ababa, Ethiopia.

3.3.2 Study Population

Adultroad traffic injured patientsattending theemergency units of public hospitals in Addis Ababa during the study period.

3.4 Inclusion and exclusion criteria

3.4.1 Inclusion criteria

- Road traffic injuredadult patients who came to theemergency units alive, regardless of their injury severity score.
- Road traffic injured patients where the accident happened in Addis Ababa

3.4.2 Exclusion criteria

- Critically ill and unconscious patients where there were no relatives to give information on what happened in relation to RTI.

3.5 Sample size determination and sampling procedure

3.5.1 Sample size determination

The sample size was calculated using single population proportion formula, with the assumption of;the prevalence of injury severity of road traffic injured patients was 36.4 % in three trauma centers of Addis Ababa, the 95% confidence interval, precision of 5% and non-response rate of 10%.

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

P = prevalence of injury severity at 3 emergency centers of public hospital in Addis Ababa= 36.4%(40)

Where; n = Minimum sample size for a statistically significant survey

Z = Normal deviant at the portion of 95% confidence interval two tailed test is; = 1.96,

q= 1-p,

d = margin of error taken as 5%= 0.05

Accordingly, n= 355.73~356

The total sample size is 356 and adding the non-response rate of 10% the sample size found to be 391.

3.5.2 Sampling procedure

From all hospitals giving emergency services, hospitals with the emergency care centers were chosen because they give service predominantly for road traffic injured victims. These hospitals include Addis Ababa Burn, Emergency and Trauma Unit (AaBET) hospital, All Africa Leprosy, Tuberculosis, Rehabilitation and Training Center (ALERT) hospital, Tikur Anbessa Specialized

Teaching Hospital (TASTH), Menilik II hospital, Yekatit 12 hospital, Zewditu Memorial Hospital, Ras Desta Hospital and Tirunesh Beijing hospital.Other hospitals were excluded because they do not give services to RTI patients. Sample was proportionally allocated for the emergencyunits of the selected hospitals by their average RTI patients attending on the emergency center fulfilling the inclusion criteria. Average monthly admission of patients with RTI was found from the triage log book of emergency department and from studies done before. Systematic random sampling to select the patients using day as an interval was used until the pre-determined sample size is obtained.

Table 1:Proportional allocation of sample

Name of hospital	**Average monthly admission due to RTI**	**Proportion**	**Sample allocation**	**Sample**
AaBET hospital	180	0.61	0.61x 391	110
ALERT hospital	112	0.61	0.61 x 391	69
TASTH hospital	99	0.61	0.61 x 391	60
Zewditu hospital	65	0.61	0.61x 391	40
Minilik II hospital	55	0.61	0.61x 391	34
Tirunesh Beijing hospital	53	0.61	0.61x 391	33
Yekatit 12 hospital	41	0.61	0.61 x 391	25
Ras desta hospital	33	0.61	0.61 x 391	20
Total	637			391

3.6 Variables

3.6.1 Independent Variables

- Demographic status
  - ✓ Age
  - ✓ Sex
  - ✓ Education
  - ✓ Occupation
- Prehospital Care
  - ✓ Pre-hospital time
  - ✓ Transportation
  - ✓ Pre-hospital intervention
  - ✓ First aid
- Injury related factors
  - ✓ Characteristic of injury
  - ✓ Place of accident
  - ✓ Activity
- Traffic related factors
  - ✓ Role of the victim
  - ✓ Mode of transport
  - ✓ Counter part
  - ✓ Lighting condition
- Behavioral factors
  - ✓ Alcohol use
  - ✓ Seat belt use
  - ✓ Helmet use
  - ✓ Speed driving

3.6.2 Dependent variables

- Injury severity level of road traffic injured patients.

3.7 Data collection techniques and instrument

Data was collected from both medical record of patients andstructured questionnaire. Data collectors were BSC Nurses who has preferably worked on the emergency department. To access the patients, first the data collector used registered patients of road traffic accident from triage logbook. Then, their card number was taken and set as an ID, and they were accessed accordingly by the data collectors. From the patient medical record, the Kampala Trauma Score

IIwhich is the measurement for the outcome variable (injury severity) was calculatedfor patients who fulfill the inclusion criteria at the time of admission.

Written information sheet and informed consent was given to each study participant if they areconscious and fulfill the inclusion criteria. The interview was carried out after life-threatening condition was managed by their care provider. Moreover, their medical record was reviewed for further information as needed. The structured questionnaire was adopted from standardized tool from world health organization(WHO)(48). The structured questionnaire was used to assess independent variables: pre-hospital care related, demographic related, injury related factors, traffic related factors, and behavioral related factors.

3.8 Measurement

There are numerous methods to score injury severity levels. However, there is no gold standard tool to measure injury severity level(40). The severity scores used in industrialized countries are more complex and often require extensive retrospective review of completed patient records. Therefore, injury surveillance system in Uganda developed a new severity score that will address the issues within a developing country, which is a simplified composite of the Revised Trauma Score (RTS) and injury severity score (ISS) scores, the Kampala Trauma Score (KTS). Since the KTS, developed in light of the limited resource base of sub-Saharan Africa, as it is a simplified composite of the RTS and the ISS it closely resembles the Trauma Score and Injury Severity Score (TRISS)(49).KTS II is able to provide reliable measurement for injury severity classification in emergency setting(50). Therefore, it was found to use KTS II appropriate to use for this study.

Table 2: Kampala Trauma Score II

Label	Description	Score
A	Age (in years)	
	5-55	1
	<5 or >55	0
B	Systolic Blood pressure on admission	
	More than 89 mm Hg	2
	Between 89–50 mm Hg	1
	Equal or below 49 mm Hg	0
C	Respiratory rate on admission	
	0-29/minute	2
	30+	1
	≤9/minutes	0
D	Neurological status	
	Alert	3
	Responds to verbal stimuli	2
	Responds to painful stimuli	1
	Unresponsive	0
E	Score for serious injuries	
	None	2
	One injury	1
	More than one injury	0

Total =A+B+C+D+E
Scores, 9– 10= Mild injury; 7– 8= Moderate injury; 6 or less (≤6)= Severe injury(50)

3.9 Data quality assurance

The quality of data wasguaranteed through careful design, pre-testing of the questionnaire, appropriate training of the interviewers and supervisors, close supervision of the data collecting procedures, proper categorization and coding of the data.Before data collection a pilot study was conducted to pre-test the accessibility of the target population and instrument's capability, to check if the instrument would be able to collect relevant information as desired, to identify potential problem areas, unanticipated interpretations and cultural objections to any of the question. 39(10%) of the sample of road traffic injured adult patient were used from AaBET hospital emergency departmentfor the pre-test which the patients were not included in the study.

Some questions like ethnicity and religion were excluded from the study because of most patient's refusal to answer them.

3.10 Data entry, processing and analysis

The data obtained was checked for completeness.Coded and entered into epidata version 4.2 then exported to Statistical Package for the Social Sciences (SPSS)version 20 for analysis.

Data was summarized in proportions and frequency tables for descriptive analysis. Binary logistic regression was used to identify crude odds ratio and CI. Variables of P less than0.05in the bivariate analysis were said to be statistically significant. Variables of P value less than 0.25 were used in multivariable analysis to determine independent predictors that are associated with outcome variable injury severity.The continuous variable was summarized using meanand standard deviation. The outcome variable injury severity was rated as severe and not severe and analyzed as categorical variable according to Kampala trauma score II.

3.11 Operational Definition and Definition of terms

Severe injury: -any RTA related injury resulted in Kampala Trauma Score II of 6 or less. (50)

Not severe injury: injuries resulted in KTSII of greater than 6 were considered as not severe(50).

Pre-hospital Care: any care that was given to a person with trauma just before reaching to the trauma or emergency center,it can range from simple first aid to very complex emergency medical services.

Pre-hospital time interval: Is the sum of response time (time interval between the occurrences of the RTAs to arrival of the first responding vehicle on the scene) and transport time (time required for reaching the hospital from the site of the accident)

Alcohol use: self-report of aperson claiming of using any type of unmeasured alcohol with in the past 6 hours of accident.

3.12 Ethical clearance

Ethical clearance was secured from Research Ethics Committee (REC) of the public health department as mandated by Addis Ababa University. Letter of permission was obtained from administration officials of the public hospitals.

Informed consent was obtained from all conscious victims or family or friends if unconscious and the selected hospitals prior to proceed data collection from them. This was done after clear description of the objectives of the study and of its procedures. Then, each respondent wasasked to check whether information provided on the purpose of the study had been adequately understood or not. Confidentiality of the information gotten from each participant waspreserved.Participant were told that it is not expected that any harm can happen to the participants because of joining this study. Sometimes whenever he/she felt tired / exhausted, due to the nature of the illness, data collectors made sure that the participants knewthat they could stop the interview temporarily or decline at any time if they feel too uncomfortable. If any bad memories come to their mind and they are disturbed, they were allowed to take time or stop the interview.

3.13 Dissemination plan

This result of the study will be disseminated to the governmental and non-governmental organizations to provide information about the pre-hospital care and injury severity among RTA victims from Public Hospitals of Addis Ababa. In addition, it will be submitted to Addis Ababa University health science library. The study hopefully will be presented on seminars relating to this issue and will be more worked on for publication.

4. Results

From the calculated sample size which is 391, the total number of respondents who were included in the study were 385, with a response rate of 98.4%, six respondents were discarded from the study because of lack of completeness of response to the study. The results described the profiles of the respondents and show association between variables.

5.1Description of Socio-demographic characteristics of respondents

The highest number 198(51.4%) of victims who came to facilities were between 25-40 years of age. About 112(29%) of the victims were between 15-24 years age group, the rest participants were above the age of 40. The mean age of the participants is 32 with standard deviation of ± 12 years, the minimum age included in the study was 15 and maximum was 80 years of age. From the total of 385 respondents more than half of the participants 266(69.1 %) have been found to be male and 119(30.9%)were female participants, giving a ratio of 2:1. People who had secondary school education had higher number 137(35.6%) than people who had primary school education 97(25.2%).People who had university or college and no formal education were 80(20.8%) and 71(18.4%) respectively.

According to this study participants who sustained the RTA were unemployed 159(41.3%) next is self-employed participants130(33.8%)the rest 96(24.9%) were employed to either to governmental or private institutions.(table 1)

Table 3:Description of socio-demographic characteristics of RTI patients in Addis Ababa public hospitals, April 2018.

Variables	Frequency	Percent
Age		
(15-24) young	112	29.1
(25-40) adulthood	198	51.4
(41-60) middle	49	12.7
Greater than 60	26	6.8
Sex		
Male	266	69.1
Female	119	30.9
Education		
No formal education	71	18.4
Primary school	97	25.2

Secondary school	137	35.6
University or college	80	20.8
Occupation		
Self-employed	130	33.8
Unemployed	159	41.3
Employed	96	24.9
Total	385	100

5.2 Prehospital care related factors

More than half of the participants 217(56.4%) claim that they did not have any prehospital care.Severe trauma was scored with 16% of the participants who did not get any prehospital care. Around 168(43.6%) said that they have got prehospital care before reaching to the health facility.

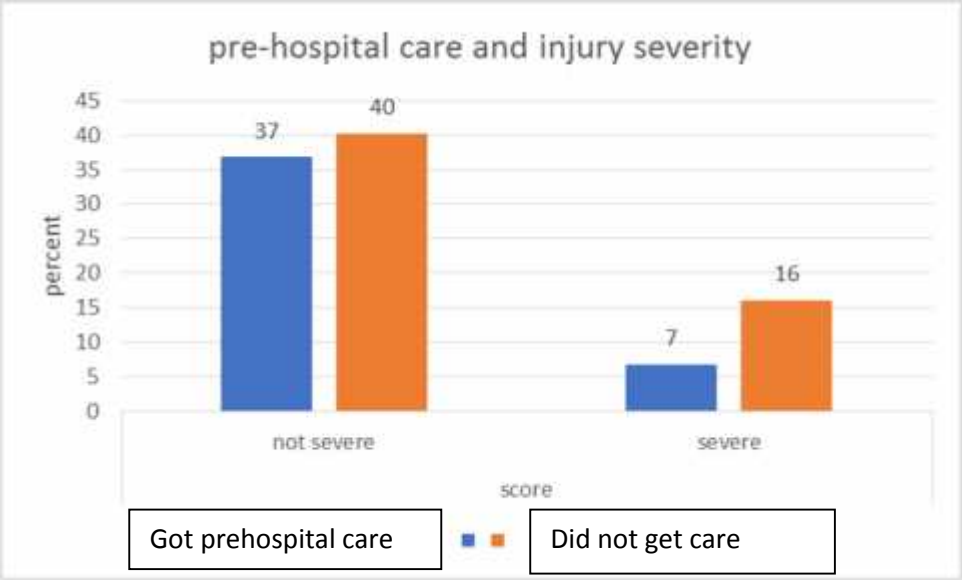

Figure 3: Pre-hospital care and injury severity of road traffic injured patients in Addis Ababa public hospitals,April 2018

From the participants who did not get care, the reasons for not getting the prehospital care were poor knowledge or fear of procedure 80(20.8%), next to lack of equipment to do the pre-hospital care 110(28.6%). Other reasons mentioned were fear of medicolegal issues and unavailability of personnel.

Bystander, friend or family were the most mentioned people to extricate the victim from scene accounting for 230(59.7%). Health professionals were the 2nd mentioned people to have helped the victim having a number of95(24.7%), police and fire brigade personnel accounted for 60(15.6%).

From the type of care given to respondents at the scene after the accident, mostly mentioned care is immobilizing once fracture 98(33.7%), then the next abundant care was covering the wound of the victim 92(31.6%). Type of cares like removing victim from the wreck was also mentioned in 57(19.6%) of the cases.

Result shows that more than half 246(63.9%) of respondents reached the first health facility less than one hour after injury and 108(28.1%) between 1 to 2 hours, the rest of the participants came late after two hours.

More than 3/4th of participants who sustained RTI were transported to the health facility by motorized vehicles like private cars, taxi and bus. Only 68(17.7%) of the participants were transported through an ambulance and the rest were transported by being carried by people or using non-motorized vehicle like animal cart.

Regarding the place where the first medical care is given, hospital has played a major role by giving care for more than half of the participant 195(50.6%).Patients also went to health center first and were brought to hospital with referral were 138(35.8%).48(12.5%) people who sustained the RTA went to nearby clinicsand 4 patients went to traditional healer,these patients were relatively from the areas of rural part of Addis Ababa. (Table 4)

Table 4: Description of the pre-hospital care related factors of RTI patients in Addis Ababa public hospitals, April 2018.

Variables	Frequency	Percent
Pre-hospital care		
Yes	168	43.6
No	217	56.4
Reason for not getting care		
Poor knowledge or fear of procedure	80	36.8
Lack of equipment	110	50.6
Fear of medicolegal issue	8	3.6
Other*	17	7
Person extricate the victim from scene		
Health professionals	95	24.7
Police and fire brigade	60	15.6
Bystander, friend family	230	59.7
Type of care given		
Removed from wreck	57	19.6
Immobilized my fracture	98	33.7

Covered wound	92	31.6
Provided resuscitation	29	10
Other**	15	5.2
Total	**291**	**100**
Time taken to reach facility		
less than 1hour	246	63.9
1-2 hours	108	28.1
2-24 hours	22	5.7
Don't know/don't remember	9	2.3
Transport to health facility		
Ambulance	68	17.7
Other motorized vehicles	297	77.1
Carried by people/non-motorized vehicle)	20	5.2
Place of first medical care is given		
Hospital	195	50.6
Clinic	48	12.5
Health center/post	138	35.8
Traditional healer	4	1

Other *-unavailability of personnel at the scene, crowded environment at the scene

Other **-positioning patient, holding, cleaning …

5.3Description of other related factors

5.3.1 Injury related factors

Concerning injury severity level, 88(22.9%) of the road traffic victims sustained severe injury while the rest of respondents sustained non-severe injury(Figure 4).

Figure 4: Injury severity score of RTI patients in Addis Ababa public hospitals, April 2018

Concerning the place where the accidents happened major streets and highways take more than 75% and minor streets taking about 21%.

From the responses of studying injury characteristics, broken bone was the abundant type of injury which accounts for 185(33.3%) of the response. Next to broken bone, concussion or brain injury was the 2nd most mentioned injury 125(22.5%). Superficial injuries being the third with account of response number of 120(21.6%),other injuries were also encountered like cut or other open wounds 54(9.7%) and strain 35(6.3%).

Table 5: Description of injury characteristics of RTI patients in Addis Ababa public hospitals, April 2018.

Variables	Frequency	Percent
Injurycharacteristics		
Broken bone	185	33.3
Strain	35	6.3
Dislocation	11	2.0
Cut or other open wound	54	9.7
Superficial injury	120	21.6
Burning	2	0.4
Concussion	125	22.5
Internal organ injury	14	2.5
Others*	3	0.5
Unknown	6	1.1

Others*-injuries around the face

5.3.2 Traffic related factors

Regarding the transportations in which people were using while the accident happened, people who were walking accounted higher percentage 190(49.4%), also people who used motor vehicles accounted for a number of 162(42.1%). Motorcycle being the 3rd in the category for about 9% of the transportation methods.

Out of the total 385 people who sustained the road traffic injury, most of them were pedestrians 187(48.6%). Passengers were the 2nd most seen people to come across the road traffic injury 154(40%). Drivers also accounted for 44 number from the participants with having a proportion of 11.4%.

Concerning the lighting condition small number of difference is seen with the dark environment having the higher number 193(50.1%) than the daylight which is 190(49.4%),people who had the accident with dusk/down environment being only 2(0.5%).

Regarding counterpart in which the victim collided with, 229 participants, almost 60%, said that the collision was with a motorized vehicle. Other participants who were either driver or passenger mentioned that they have collided with fixed object(22.6%), bicycle or motorcycle was also the counterpart in 50(13%) of the participants. Other matters like animals and fallingdown from a vehicle was raised to have caused the accident.

Table 6:Description of Traffic related factors of RTI patients in Addis Ababa public hospitals, April 2018.

Variable	Frequency	Percent
Mode of transport		
Motorcycle	29	7.5
Motor vehicle	162	42.1
Walking	190	49.4
Tri/bi cycle	4	1.0
Role of the victim		
Pedestrian	187	48.6
Driver	44	11.4
Passenger	154	40
Lighting condition		
Daylight	190	49.4
Dark	193	50.1
Dusk/down	2	0.5
Counterpart		
Pedestrian	19	4.9
Bicycle/ Motorcycle	50	13
Motorized vehicle	229	59.5
Fixed object/other*	87	22.6
Total	**385**	**100**

Other*- animals, falling down from a vehicle

5.3.3.Behavioral factors

Our study indicates that the alcohol consumption before 6 hours of the participant encountered the accident,only 75(19.5%) admitted having used unmeasured amount of alcohol,almost 70% claim that they haven't used alcohol prior to the accident while 11% of the participants refused to answer this question.

Regarding proper seatbelt utilization respondent number of 156(40%) claimed that they haven't been driving a vehicle with in the past 30 days, 56(14.5%) of the participants admitted of not using the seat belt properly. But 64(16.6%) of participants claim that they use seatbelt properly, while21(5.5%) respondents refused to answer this question.

From the participants only 41(10.6%) people mentioned bicycle or motor cycle as their transportation method. From the whole participants of the study people who claim to use helmet properlywere only 24(6.2%),most 226(58.7%) victims answered that they haven't been in a bicycle or motorcycle, 84(21.8%) of the participants refused to answer about proper helmet utilization.

Participants asked about the driving speed of vehicles during the accident,most 230(59.7%)of these participants think that they themselves or the driver used more speed than the allowed speed for the road during the accident.others 133(34.5%) thought that the drivers used speed under the normal range, while 22(5.7%) participants refused to answer this question.

Table 7: Description of Behavior related factors of RTI patients in Addis Ababa public hospitals, April 2018.

Variable	Frequency	Percent
Alcohol (n=341)		
Yes	75	19.5
no	266	69.1
Seatbelt (n=297)		
Yes	64	16.6
No	56	14.5
Not been driving	156	40.5
Don't know/no seatbelt	21	5.5
Helmet (n=301)		
Yes	24	6.2
No	41	10.6
Not been in motor	226	58.7
Don't know/no helmet	10	2.6
Speed driving (n=363)		
Yes	230	59.7

No	133	34.5

5.4Association ofsocio-demographic characteristics with injury severity

For the bivariate analysis each independent variable was cross matched, crude odds ratios and p-value were calculated. Variables with p-value less than 0.25 were taken entered to multivariable logistic regression analysis to determine independent predictors that are associated with outcome variable injury severity after controlling for possible confounders.

From the socio-demographic variables age is the only variable to have a significant association with injury severity indicating for one-year increment of age the odds of being severely injured increases by 2.2%.

5.5 Association of Pre-hospital care related factors with injury severity

From the pre-hospital care related factors, three variables have been found to be significantly associated with outcome, these are getting pre-hospital care at the scene, being transported to health facility with other motorized vehicles like taxi and bus and time taken to reach health facility between 2-24.

Participants who got prehospital care were 55% less likely to be severely injured than the people who did not get the careCOR 0.458; 95%CI(0.274,0.763). Also, people who used other motor vehicles like taxi, private cars and bus were 61% less likely to be severely injured COR 0.388;95%CI (0.152,0.99).

People who have been taken to the health facility within either 1-2 hours or 2-24 hours were 1.71 and 3.092 times more likely to be severely injured respectively than people who reached to the health facility within an hour of accident COR1.718;95%CI(1.01,2.921),COR 3.092;95%CI(1.246,7.677).

5.6Association of other related factors with injury severity

Injury related factors with injury severity

From the injury related factors only, internal organ injury had a significant association with the outcome variable. People who had internal organ injury were 4.85 times more likely to be scored as severe injury in the trauma score, COR 4.85; 95%CI(1.635,14.383).

Traffic related factors with injury severity

Regarding traffic related factors only being a driver is significantly associated with injury severity. It is further explained as being a driver has over 3 times more likely to be injured severely than other victims, COR 3.306;95%CI(1.622,6.740). Also having a collision with a pedestrian has shown to significantly influence injury severity referring to people who caused a collision with a pedestrian involvement had almost 3 times more likely to cause severe injury, COR 2.995;95%CI (1.044,8.589).

Behavioral factors with injury severity

Two of the behavioral factors have shown significant association with injury severity. People who used alcohol 6 hours prior to the accident were 80% more likely to be injured severely, COR 1.805; 95%CI (1.022,3.188).

Another behavioral factor that has shown significant association is speed driving.People who were speed driving or were speed driven were 1.765 times more likely to be severely injured COR 1.765;95%CI (1.033,3.015).

5.7Multivariable analysis for factors associated with injury severity

From the sociodemographic factors related with injury severity, age as a continuous variable was seen to have a significant association both in the bivariate and multivariable analysis. The result showed that an increase in one year of age will increase the odds of being severely injured by 2.6%(AOR 1.026;95%CI (1.005,1.047)) keeping all other factors constant.

The other factor associated with injury severity after controlling for confounders is the role of the victim. The finding of this variable shows that being a driver increases the likelihood of being severely injured in an accident by 2.845 times than a passenger (AOR 2.84595%CI(1.320,6.133)).

Getting prehospital care is also statistically significantly associated with injury severity maintaining consistencyafter adjusting for potential risk factor in multivariable logistic model, suggesting that participants who have got prehospital care are 55% less likely to score for severeinjury at hospital admission time (AOR 0.45;95%CI (0.24,0.842)). But this result does not show the kind of care which may be associated with the injury severity score.

Table 8:Multivariable logistic regressionanalysis of factors associated with injury severity on RTI patients in Addis Ababa public hospitals, April 2018.

Variables	Categories	Injury Severity score		COR(95%CI)	AOR(95% CI)
		Non-severe	Severe		
Age(years)*				1.022(1.004,1.040)*	1.026(1.005,1.047)*
Concussion	Yes	90(23.4)	35(9.1)	1.519(0.927,2.488)	
	No	207(53.8)	53(13.8)	1	
Role of victim	Pedestrian	147(38.2)	36(9.4)	0.964(0.566,1.642)	
	Driver	24(6.2)	20(5.2)	3.306(1.622,6.740)*	2.845(1.320,6.13)*
	Passenger	126(32.7)	32(8.3)	1	
Pre-hospital care	Yes	142(36.9)	26(6.8)	0.458(0.274,0.763)*	0.45(0.24,0.842)*
	No	155(40.3)	62(16.1)	1	
Transport to health facility	Ambulance	49(12.7)	19(4.9)	0.582(0.206,1.645)	
	Other motorized vehicles	236(61.3)	61(15.8)	0.388(0.152,0.99)*	
	Carried by people	12(3.1)	8(2.1)	1	
Time	less than 1hour	201(52.2)	45(11.7)	1	
	1-2 hours	78(20.3)	30(7.8)	1.718(1.01,2.921)*	
	2-24 hours	13(3.4)	9(2.3)	3.092(1.246,7.677)*	
	Don't know/don't remember	5(1.3)	4(1)	3.573(0.923,13.838)	
Alcohol use	Yes	51(15)	24(7)	1.805(1.022,3.188)*	
	No	211(69)	55(16.1)	1	

Speed driving/speed driven	Yes	168 (46.3)	62(17.1)	1.765(1.033,3.015)*
	No	110(30.3)	23(6.3)	1

NB. *for p< 0.05 -variables that show significant association.

5. Discussion

Our study focuses on injury severity and association with prehospital careand other related factors among survivors of road traffic injury in Addis Ababa public hospitals.This studyshows the association of prehospital care and other affecting factors with injury severity score of people who sustained a road traffic injury.

The prevalence of injury severity in this study has been found to be 22.9% which is higher than a study done in Kenya which is found to be 19%(9) and Ethiopia at TASTH 10.87%(39).But it has been found to be less than other studies done in Tanzania(10) and Ethiopia in three trauma centers of Addis Ababa city (40) with 38.6% and 36.4% respectively. This result might be due to these two studies have been studied in trauma care centers of referral hospitals, many mild traumas can be treated elsewhere but mostly severely injured patients might be referred to this trauma care centers.

In our study majority of the participants who sustained the road traffic injury were young in their reproductive and productive years within age group of 25-40 with a number of 198(51.4%). With regard to sex, male are more prone to be in a road traffic accident than female,this result is consistent with other studies(8, 32, 33, 39, 40).This result might be due to the young age groups and males are engaged in economically active lifestyle adding upon their risky behaviors like speed driving, taking alcohol, violating traffic rules, and being reckless in using protective gears like seatbelt or helmet.

People who had secondary school education had higher number 137(35.6%) than people who had primary school education or no formal education,this is in contrary to other studies done in Tanzania and Iran which indicated people with primary education or with no formal education had higher number(10, 32, 34).This might be because this study has excluded the pediatric age groups less than 14 years old.

Studying for the occupational status of participants, un-employed people were the majority (41.3%) compared to self-employed(33.8%)and employed(24.9%),this result is contradicting with other studies(10, 32), this may be because there were increased number of secondary school studentsand other unemployed participants were seen in this study,since theschoolchildren have to walk varying distances to and from school in crowded roads at peak hours, they might be

prone to road traffic accident. Volunteer traffic students are seen in major roads in Addis Ababa which is a good initiativedeserving to be applauded for giving awareness through school areas and being an additional resource to the traffic system to decrease the immense burden of road traffic accident incidence.

People who received some form of pre-hospital care before reaching the health facility were 43.6% relative to those people who did not come across any care. However 24.6% of these patients had pre-hospital care been provided by trained ambulance personnel or a health professional,there is much higher increase than previous studies in Ethiopia(11, 29, 40).The increased number of victims used ambulance and received prehospital service in the present study might be due to involvement of private business group in ambulance and pre-hospital services such as Tebita Ambulance and other private sectors in Addis Ababa. The higher percentage might also be attributed to our study is that it is done in Addis Ababa, with better prehospital services from either governmental hospitals or private ambulance services.Participants has gained pre-hospital first aid from bystanders or drivers,first aid course being engaged with the driving license school may also have positive impact on this result.

Usually the pre-hospital trauma care does not match the expected standards and thus a very few percentage of victims receive treatment at the crash scene and even fewer receive safe transport to the hospital by an ambulance.

For patients who did not get pre-hospital care reasons for not getting the care were lack of equipment/fear of medico-legal case 50.6% and lack of knowledge/fear of procedure is 36.8%. Similar study in Ethiopia showed due to lack of equipment less than 10% and more than 80% were due to lack of knowledge(11).

The first hour is the most determining factor for injury in any type of trauma. This present study showed that more than half of participants reached to a health facility within one hour of the accident. This has showed improvement from previous study in Addis Ababa(11). The reason might be because of increased health facilities nearby in Addis Ababa, as it is the capital city.

From participants who gained pre-hospital care less proportion (17.7%) of participants reached the health facility with an ambulance, this number is higher than a study done in Addis

Ababa(11),reason for this may be because of increased private sector involvement in the emergency medical care as has been mentioned earlier.

From the place where accidents happened maximum number of participants had the road traffic injury in major streets (79%) while the rest of the accidents happened on minor streets like residential or commercial areas.This value is consistent with other studies (32, 51)). This might be attributed to the fact that people tend to drive with high speed in major streets than in minor streets.

This study revealed that the most kind of injury victims have got is fracture of the bone(33.6%),similar with that of two studies from Tanzania(10, 32). A study done in Dire Dawa and India revealed a higher percentage of head injured victims29.8% and 50.4% respectively(23, 51). Next to fracture of the bone,head injury was the second most injured part in this study125(22.5%).And this may be associated with people not using seat belts, helmet and over-speeding. This observation indicates that there is a need to strengthen preventive measures focusing on safety belt, helmet use and speed reduction.

Concerning the transportation in which people were using while the accident happened, people who were walking accounted fora bit higher number than people who used motor vehicles like taxi, private cars or bus. People who were using motor/bicycle were relatively small in number 29(7.5%). Studies done in most African places show otherwise.This might be because of in most African countries motorcycle is the major transportation method and also cause of much amount of burden in the traffic area.But in Addis Ababa city majority of thepeople in the town usually use transportation methods like cars, taxi, or minibus or bus(40).

The role of the victim in the study, the number seen here is higher for pedestrians 187(48.6%) which are the vulnerable road users because they donot have any protective material than the driver who can have seatbelt and airbags to prevent them from injury.This result is similar with that of a study in Tanzania and Kenya (9, 10).Again this proportion is lower than other studies done in Ethiopia and Iran(29, 34).This study also contradicts with other studies which say either a driver or passenger is at higher risk to be injured(2, 13). The reason behind this difference might be because of difference in time, place and economical status of countries.

In this present study,small number of difference is seen in time of incidence of RTA,being higherwith the dark condition or evening time similar with an Indian study(8). This can be attributed to hurry to get back to home after completion of their work, poor light conditions,less number of traffic polices during night time, fatigue due to all day long work and less traffic and thus people drive beyond the recommended speed limits.Other findings suggest that most of injuries occurred during the daytime(3, 10, 40). Knowing the time of injury in trauma patient is important for creating and implementing prevention strategies to decrease the burden of road traffic injuries in the health care system.

Our study revealed that alcohol use 6 hours prior to the accident is 19.5% similar to a study done in Tanzania (10).Another study from India showed from the road traffic injured participants who used alcohol were 15%(13), while higher proportion of alcohol use was reported in taxi drivers in Mekelle town (34.4%)(30). This result might have been affected with response bias of the participants.

One study depicted that only 21.4% of the vehicle users were using either helmet or had fastened their seat-belt at the time of their accident(33)seatbelt use in this present study is 16.6%which is similar with another study done in Iran with 16.1%(42).

From the participants only 6.2% were using helmet properly,this result is higher than a study done in Iran which was 3.1%(42).The reason for this might be inclusion of those people who do not use bicycle or motorcycle as their main transportation method.

In astudy done in India ‘Excess speed’ was documented as the primary cause of RTIs(12),in another study in Mekelle town stated that 42.58% of road traffic accidents were by a cause of speed driving(30).In this present study 46.3% of road traffic injured patients claimed that they were either speed driving or have been speed driven.

The study found age to have statistically significant association with injury severity.These differences persist after controlling for the confounding effects of all other covariates.

Furthermore, our study found that when the role of the victim is a driver, there is 2.84 times more likely to be injured severely than being a pedestrian and passenger.But the number of drivers seen in this study are less than that of pedestrians,this elucidates the fact that if a driver is in a car crush he/she is more likely to be severely injured.

In contrary with this in another study in Addis Ababa, itwaspossibletoseehowthepeople who used alcohol were more likely to have road traffic injury as compared to those who did not use alcohol even after controlling for other confounders(29).The reason for this variability might be because we used interview(self-report) method to find out if they have used alcohol. They might not tell the truth because of medico-legal issue, and there might be abias.

Existence of prehospital care system significantly decrease injury severity and death rate secondary to traffic accident, a study done at country-level data with a cross-section 150 countries showed the inadequacy of pre-hospital trauma services was a major reason for the high burden of road traffic mortality(24).It has also been reported as the most important factors in predicting ultimate outcome of injury (52).

Similarly, our study has found a relation of getting a pre-hospital care to be statistically significantwith injury severity in both bivariate and multiple variable regression analysis.This result shows that people who had pre-hospital care were 55 % less likely to score for severe injury than people who did not get any type of care.

6. Strength andLimitation of the study

6.1 Strength of the study

Our study used road traffic injured victims from all 8 public hospitals giving emergency services to RTI patients. Being multi-centered is one of the strengths of this present study with an inclusion of larger proportion of area of the study.

The present study used pre-tested standard severity scoring tool to measure the outcome variable which is another strength.

6.2 Limitation of the study

Victims dead at the scene and those didnot seek health care,because their injury is very mild theywere not included to our study,this might have affected the result.This was because it is hard to access the people who died before reaching the hospital or people who didnot come to hospital.

Self-report might have created social desirability bias, especially for the behavioral factor questions like alcohol use or seat belt use. One has a probability of saying “no” for the alcohol use or “yes” for seatbelt use which has a potential for overestimation or underestimation.

Our study did not capture information on unconscious cases with no family, friend or relative that could provide credible information and might be subjected to recall bias, patients might not remember what has happened.

7. Conclusion

According to this study male, people in the young ages and pedestrians have been found to be abundant. This group of people are the most vulnerable groups to have an injury due to road traffic accident. Injury severity has been seen in almostone fourth of cases, indicating for a need of serious care and attention to prevent other complications like death and disability.

Almost half of the victims were walking while the accident happened.While more than half of the accidents happened in major streets and darker(evening) time.

Majority of the victims arrived health care facilities by taxi,private cars or bus. Bystander, family and friends were among the people who mostly extricated injured patient from the scene indicating for the fact that to integrate and organize pre-hospital care is beneficial.

More than one third of the victims received some kind of pre-hospital care, but only few received pre-hospital care by some trained personnel. Covering the wound and stopping the bleeding was the most given care for victims before reaching the hospital facility.

Reaching the health facility within one hour of the accident has been suggested for better outcome after traumatic event. In our study people who reached to a health facility within the first hour of the accident were more than half.

Pre-hospital care has been seen to have statistically significant association with injury severity. Drivers also had significantly decreasedthe injury severity score of participants.

8. Recommendations

Based on the above findings and conclusions concerning prehospital care, other associated factors andinjury severity and the following recommendations are made for action:

- This study has shown most of the victims were young and in the productive age, therefore engaging teaching traffic rules through school at young ages might be beneficial.
- Being a driver has been seen to increase the chance of being injured severely,it would be advantageous if drivers wereadvocated to be careful and obey to the rules and regulations.Since most of the accidents seen in this study was in darker environment the random alcohol test of the government in Addis Ababa should be implemented in higher proportion of drivers.
- People who got any kind of pre-hospital care were one of the determining factors in the injury severity of a road traffic injury. Therefore, the city administration should teach the community about the use of pre-hospital care in decreasing the severity of injury and further disability or death after road traffic accident.
- It would be useful if policy makers work towards decreasing the human and economic burden caused by road traffic accident by implementing organized basic prehospital care systems.
- Government enhancing the health-care capacity and improve access to care for a wide range of emergency problem like RTA can be helpful by closely linking these systems to the existing public health and health-care infrastructures in the country.
- Since bystanders around the scene are the most available persons, providing eachcitizen with the knowledge and skills they need to provide first aid to people with injuriesmight be advantageous.
- Engaging voluntary or nonprofit organizationsin the emergency service provision of to provide prehospital care may add a value for decreasing the burden of injuries caused by RTI.
- Generally public education campaign in first aid, target-group training for professional drivers, police officers and volunteers are encouraged to minimize injury severity secondary to extrication after road traffic injury.

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Annex 1: Information sheet for patients (English version)

Addis Ababa University

College of Health Science

School of Public Health

Written Consent to participate in a study on the assessment of the association of pre-hospital care and injury severity for road traffic accident patients.

Greetings! My name is ……. I am here on behalf of Bethelhem Fekadu, 2nd year student GMPH, at Addis Ababa University, college of health science, school of public health, working on this research project for the partial fulfillment of second degree. You are chosen to participate in this study. The choice is made randomly. Before you decide whether to participate or not in this study, I would like to explain to you the objective of the study, any risks, benefits, procedure and what is expected from you.

Introduction

This information sheet is prepared by the investigator whose main aim is to study on the assessment of the association of pre-hospital care and severity of injury given to those who are victims of road traffic accidents.

Procedureand period

The study involves a face-to-face interview with the data collector that will ask you a set of questions using a structured questionnaire. After signing the consent form, the Data collector will then ask you the relevant questions and your responses will be written on the questionnaire. The interview will take about 20 minutes. So, I kindly request you to spare me this time for the interview.

Confidentiality

The information collected from you will be confidential. The finding of this study will be general for the study community and will not reflect anything of individual persons. The questionnaire will be coded to exclude showing your names. No reference will be made in oral or written reports that could relate you to the research.

Rights to withdraw and alternatives

Participation in this study is only on voluntary basis. Considering the importance of the research to your community, you are free to decide on it. If you choose not to participate in the study or if you decide to stop participating in the study, you will continue to receive all services that you would normally get from hospital. You can stop participating in this study at any time even if you have already given your consent.

Risks: We do not expect that any harm will happen to you because of joining this study. Sometimes you may feel tired / exhausted, due to the nature of the illness, but you will be able to stop the interview temporarily or decline at any time if you feel too uncomfortable.

Benefits: There will be no direct benefit to you from participating in this study. However, the information that you provide may help health care teams and others of the nature of the prehospital care to better understand the baseline pre-hospital care package

If there are any questions or enquires any time about the study or the procedures, please contact:

Principal investigator

Name - Bethelhem Fekadu

Phone no. 0911195401

Email -bettyfek2010@gmail.com

Would you want to take part in the study?

1- No (say thank you) 2- Yes (take informed consent)

Annex 2: Informed consent

The objective, benefits, harms, procedures and confidentially of the study has been read and explained to me in the language I comprehend. I further understand that, taking part in this study and withdraw from participating in any time without having reason is purely voluntary.
I agree to participate in this study.

Participant:
Sign (signature or thumb print).....Date.....

Annex 3: Information sheet for the heads of the hospital

Information Sheet for Heads of Hospital

My name is Bethelhem Fekadu, MPH student at Addis Ababa University. I am here to conduct the study in your hospital. I will conduct a study under Addis Ababa University, college of health sciences for partial fulfilment of Master of public health. The study will have an importance to understand the association of pre-hospital care and injury severity of road traffic accident in Ethiopia. So, I kindly request your permission to do the study on road traffic accident victims who come to this hospital.

Study/project title: Association of Pre-Hospital Care and Injury Severity of Road Traffic Injured Patients in Addis Ababa Public Hospitals

Objective – The major objective of this study is to determinethe association betweenpre-hospital care and severity of injuries of road traffic injured patients in selected public hospitals in Addis Ababa

Benefit: The study may have no direct benefit for the participants. But the information generated from the study help the government administrators to improve the status of pre-hospital care, to minimize the burden of road traffic accident.Moreover, it is used as base line data for further investigation. Indeed, it will help the researcher to write up the thesis for partial fulfillment of Master of Public Health. There wouldn't be any direct payment for the hospital or for the participant as a result of participating to the study.

Harm: The study has no harm to the hospital and to the participant. The participants do not have any harm by participating to the study or for not participating to the study, except taking few minute from his/her time.

Procedures and duration:

The study will be conducted from January to March 2018 on road traffic accident patient who come to emergency department of this hospital. To access the patients, first the data collector will use register of road traffic accident victims from triage logbook. Then, their card number will be taken and they will be accessed accordingly by the data collectors. Written informed consent will be taken from each study participant if they are conscious. The interview will be

done after life threatening condition is managed by their care provider. Moreover, their medical record will be reviewed for further information as needed.

Confidentiality

The information gathered from participants will be confidential. The finding of this study will be general for the study community and will not reflect anything particular of individual persons. The questionnaire will be coded to exclude showing names. No reference will be made in oral or written reports that could link participants to the research.

Rights

Participation in this study is voluntary basis. Considering the importance of the research for the community you are free to decide on it. If any violation of rules and conduct is seen throughout the study, your hospital has full right to withdraw the study at any time.

If there are any questions or enquires any time about the study or the procedures, please contact:

Principal investigator

Name: Bethelhem Fekadu

Tel: 0911195401

E- mail: bettyfek2010@gmail.com

Sign_____

Annex 4: Informed consent for the heads of the hospital

The objective, benefits, harms, procedures and confidentially of the study has been read and explained. I further understand that, taking part in this study and withdraw from participating in any time without having reason is purely voluntary.

I agree to participate in this study.

Name of Hospital: _____

Head of the Hospital:_____

Tel: _____

E-mail:_____

Sign:_____

Annex 5: Questionnaire (English version)

Questionnaire for the study of assessment of pre-hospital care given for road traffic accident patients(48).

1	ID number	
2	Age (years)	
3	Sex	01. Male 02. Female
4	Education	00. No formal education 01. Primary school education 02. Secondary school education 03. University/ College education
5	Occupation (what is/was your current occupation?)	01. Farmer 02. Civil servant 03. Merchant 04. Street vendor 05. Professional 06. Student 07. Homemaker 08. Non-paid worker/volunteer 09. Retired 10. Unemployed (able to work) 11. Unemployed (unable to work) 12. Other (specify) 13. Unknown

6	**Injury event factors** Place (where were you when the accident happened?)	01. Home 02. School 03. Street/highway 04. Residential institution 05. Sports and athletic area 06. Industrial or construction 07. Farm (excluding home) 08. Commercial area (shop, store, hotel, bar, office) 09. Other (specify) 10. Unknown
7	Activity (what were you doing when the accident happened?)	01. Paid work (including travel to and from work) 02. Unpaid work (including travel to and from work) 03. Education 04. Sports 05. Travelling 06. Unspecified activities (hanging around, doing nothing) 07. Other (specify)
8	Injury characteristic	01. Fracture (broken bone) 02. Sprain or strain 03. Dislocation 04. Cut, or other open wound 05. Bruise or superficial injury 06. Burn 07. Concussion/head injury 08. Internal injury/internal organ injury

		09. Other (specify) 10. Unknown
9	**Traffic-related injuries** Mode of transport How were you travelling at the time you were injured?	01. Walking 02. Non-motorized vehicle 03. Bicycle 04. Motorcycle 05. Car 06. Pickup, van, jeep or minibus (vehicle that seats less than 10 people) 07. Truck /lorry 08. Bus 09. Three-wheel motorized vehicle 10. Other (specify) 11. Don‘t know/can‘t remember
10	Role of the victim What was your role in the traffic accident?	01. Pedestrian 02. Driver 03. Passenger
11	Counterpart What did you (or your vehicle) collide with?	01. Pedestrian 02. Bicycle 03. Motorcycle 04. Motorized vehicle 05. Fixed object 06. Other (specify)
12	What was the lighting condition?	01. Daylight 02. Dark 03. Dusk/down
13	**Pre-hospital care**	01. No

	Did anyone give you any pre-hospital care (first aid)?	02. Yes
14	Reasons raised for not giving or getting pre-hospital care.	01. Lack of knowledge or fear of procedure 02. Lack of equipment 03. Fear of medico-legal case 04. Others
15	Who provided the pre-hospital care?	01. Bystander 02. Friend/family 03. Teacher 04. Police 05. Ambulance personnel 06. Doctor 07. Nurse 08. Fire brigade personnel 09. Refused (to answer) 10. Other (specify) 11. Do not know
16	What kind of pre-hospital care (lifesaving intervention) did you receive?	01. Removed from wreck 02. Immobilized my fracture 03. Stopped bleeding/covered wound 04. Provided resuscitation 05. Other (specify)
17	Transport to the health facility How did you get to the health facility?	01. By foot 02. By private car 03. By taxi 04. By public transport

		05. By ambulance 06. By bicycle 07. By animal cart 08. Did not go to a health facility 09. Refused (to answer) 10. Other (specify) 11. Don‘t know
18	Transport time How long did it take you to get to the health facility?	01. Less than 1 hour 02. 1–2 hours 03. 2–6 hours 04. 6–9 hours 05. 9–12 hours 06. 12–24 hours 07. More than 24 hours 08. Did not go to health facility 09. Refused (to answer) 10. Don‘t know
19	Place where medical care is given Where did you first seek up medical treatment?	01. Hospital 02. Health clinic 03. Health centre or health post 04. General medical practitioner 05. Community health worker 06. Traditional practitioner/healer/bone setter 07. Pharmacy/drug store 08. Refused 09. Other (specify) 10. Don‘t know/can‘t remember
29	**Behavioral factors**	01. Yes

	Alcohol use In the past 6 hours, did u have any alcohol to drink?	02. No
21	The proper use of seat belt In the past 30 days, how often did you properly use seat belts?	01. All the time 02. Sometimes 03. Never 04. Have not been in a vehicle in the past 30 days 05. There is no seat belt in the car 06. Refused 07. Don‘t know/unsure
22	Do you use motorcycle more often?	01. Yes 02. No
23	The proper use of helmet In the past 30 days how often did you wear a helmet properlywhen you drove or rode as a passenger on a motorcycle or motor-scooter?	01. All the time 02. Sometimes 03. Never 04. Have not been on a motorcycle or motor-scooter in the past 30 days 05. Do not own a helmet 06. Refused 07. Don‘t know /unsure
22	Speed driving Were you speed driving or driven when the accident happened (more than the allowed speed)?	01. Yes 02. No

Annex 6:Questionnaire (Amharic version)

በአዲስ አበባዩኒቨርሲቲ

የጤና ሣይንስኮሌጅ

የህብረተሰብ ጤና ትምህርት ቤት

አባሪ ፤ የመረጃ ቅፅ - ለህሙማን

በቅድመ ሆስፒታል እንክብካቤ አና በጎዳና ትራፊክ አደጋ የጉዳት መባባስ መካከል ያለውን ተዛምዶ ለመመርመር በሚደረግ ጥናት ላይ ለመሳተፍ የተዘጋጀ የጽሁፍ ስምምነት

ጤና ይስጥልኝ፡- እኔ ----------እባላለሁ ከዚህ የተገኘሁት በአዲስ አበባ ዩኒቨርሲቲ የጤና ሳይንስ ኮሌጅ የህብረተሰብ ጤና ትምህርት ቤት የ2ኛ ዲግሪ ማሟያ የሆነውን የዚህ ጥናት መሪ - ተመራማሪ ቤቴልሔም ፍቃዱ በመወከል ነው፡፡ በዚህ ጥናት ላይ ለመሳተፍ እርስዎ ተመርጠዋል፡፡ ምርጫው ያለ ልዩ መስፈርት የተደረገ ነው ::

በጥናቱ መሳተፍ አለመሳተፍዎን ከመወሰንዎ በፊት የጥናቱን አላማ ፣ ስጋቶች ፣ ጥቅማጥቅሞች ቅደም ተከተሉን እና ከርስዎ የሚጠበቀውን ላብራራልዎት እወዳለሁ፡፡

መግቢያ

ይህ የመረጃ ቅፅ የተዘጋጀው ለጎዳና ትራፊክ አደጋ ተጠቂዎች በምሰጠው የቅደመ ሆስፒታል እንክብካቤና በደረሰው የጉዳት መባባስ መካከል ያለውን ተዛምዶ ማጥናት ዋና አላማ ባደረገች መሪ ተመራማሪዋ ነው፡፡

ቅድመ ተከተሉንና የጊዜ ተመን

ጥናቱ የሚካሄደው ከመረጃ ሰብሳቢው/ዋ ጋር ሰብሳቢው/ዋ በጥንቃቄ የተመረጡ ጥያቄዎችን በያዘ መጠይቅ መሰረት ጥያቄዎች ይቀርባሉ :: ስምምነትዎን በፊርማዎ ካረጋገጡ በኋላ መረጃ ሰብሳቢው/ዋ ከጥናቱ ጋር ተያያዥነት ያላቸውን ጥያቄዎች ያቀረቡልዎት እና ምላሽዎ በመጠይቅ ላይ ይሰፍራል፡፡ ቃለ መጠይቁ ወደ ሃያ ደቂቃዎች ገደማ ይወስዳል፡፡ ስለዚህ ለቃለ መጠይቁ ፈቃደኛ እንዲሆኑልኝ በትህትና እጠይቅዎታለሁ፡፡

የሚሰጢር አጠባበቅ

ከርስዎ የሚወሰደው መረጃ በጥብቅ ምስጢርነት የሚያዝ ነው፡፡ ከጥናቱ የሚገኘው ውጤት በአጠቃላይ ጥናቱ በሚያተኩርበት ማህበረሰብ ላይ እንጂ በፍፁም በአንድ ወይም በጥቂት ግለሰቦች ላይ የሚንፀባረቅ አይደለም፡፡ የጥናቱ

ተሳታፊ ስም በቀጥታ ሳይጠቀስ በመመስጠሪያ አሀዝ ወይም ቁጥሮች ይወከላል፡፡ እርስዎን ከምርምሩ ጋር አያይዞ የሚጠቅስ ምንም አይነት የቃል ወይም የጽሁፍ መግለጫ አይሰጥም ::

<u>ተሳትፎን የማቋረጥ መብት እና አማራጮች</u>

በጥናቱ ላይ እንዲሳተፉ የሚፈለገው በፈቃደኝነትዎ መሠረት ብቻ ነው :: ለሚገኙበት ማህበረሰብ ምርምሩ ያለውን ፋይዳ ከገመገሙ በኋላ ተሳትፎዎን ለመወሰን ነፃ ነዎት፡፡ ላለመሳተፍ ቢወስኑ ወይንም ለማቋረጥ ቢፈልጉ በሆስፒታል የሚያገኙአቸውን ሁሉንም አገልግሎቶች አይቋረጡም፡፡ ምንም እንኳን ለማሳተፍ ስምምነትዎን በፊርማዎ ቢያረጋግጡም ተሳትፎዎን በፈለጉት ጊዜ ማቋረጥ ይችላሉ፡፡

<u>ስ ጋ ቶ ች</u>

በዚህ ጥናት በመሣተፍዎ የሚያጋጥም ጉዳት ይኖራል ተብሎ አይጠበቀም :: አንዳንድ ጊዜ ከህመምዎ የተነሣ ድካም እና መሰላቸት ሊሰማዎ ይችላል፡፡ ነገር ግን ቃለ መጠይቅን ፋታ ለመውሰድ ማቆም፤ እንዲሁም በጣም ሞቾት ከነሣዎት ሙሉ በሙሉ ማቆም ይችላሉ፡፡

<u>ጥቅማጥቅሞት</u>

በዚህ ጥናት በመሳተፍዎ የሚያገኙት ቀጥተኛ ጥቅም የለም፡፡ ሆኖም ግን ከእርስዎ የሚገኘው መረጃ የጤና እንክብካቤ ቡድኖችንና ሌሎች ባለድርሻ አካላትም ስለ ቅድመ ሆስፒታል እንክብካቤ ጥቅሎች የተሻለ መረዳት እንዲኖራቸውሊያደርግ ይችላል፡፡ ስለ ጥናቱ ወይም ስለ ጥናቱ ቅደም ተከተል ጥያቄ ካለዎት በማንኛውም ወቅት መሪ ተመራማሪዋን በአድራሻዋ ማግኘት ይችላሉ፡፡

ስም ቤተልሔም ፍቃዱ

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በጥናቱ ለመሳተፍ ፈቅደዋል?

1- አይደለሁም /አመስግነው ይሰናበቱ/

2- አዎ /በመረጃ ላይ የተመሰረተ ስምምነት ያድርጉ/

አባሪ 2 ፡- በመረጃ ላይ የተመሰረተ ስምምነት የጥናቱ አላማ ጥቅማ ጥቅሞች ፣ ስጋቶች ቅደም ተከተል እና ሚስጥራዊነት በሚገባኝ ቋንቋ ተነቦልኝ እና ማብራሪያ ተሰጥቶኛል፡፡ በዚህ ጥናት ላይ የመሳተፍም ሆነ በፈለኩት ሰአት ለማቋረጥ ሙሉ በሙሉ ነፃ ፈቃድ እንዳለኝ ተረድቻለሁ፡፡

እናም በጥናቱ ለመሳተፍ ተስማምቻለሁ፡፡

ተሳታፊ መለያ ፊርማ ወይም የጣት አሻራ

አባሪ 3- መጠይቅ

በጎዳና የትራፊክ አደጋ በደረሰባቸው ታካሚዎች ቅድመ ሆስፒታል እንክብካቤ ለመገምገም እና በደረሰው የጉዳት መባባስ መካከል ያለውን ተዛምዶ ለማጥናት የተዘጋጀ መጠይቅ

ነ	መለያ ቁጥር	
2	እድሜ /በአመት/	
3	ፆታ	01 ወንድ 02 ሴት
4	የትምህርት ደረጃ	01 መደበኛ ትምህርት ያላገኘ /ያላገኘች 02 የመጀመሪያ ደረጃ ትምህርት 03 2ኛ ደረጃ ትምህርት 04 የከፍተኛ ትምህርት ተቋም ትምህርት
5	መተዳደሪያ ሥራ/በአደጋ ወቅት ወይም አሁን በምን ሥራ ይተዳደራሉ?	01 ግብርና 02 የመንግሥት ሠራተኛ 03 ነጋዴ 04 የጎዳና ነጋዴ 05 ባለሙያ 06 ተማሪ 07 የቤት ሰራተኛ 08 የበጎ ፈቃድ ሰራተኛ 09 ጡረተኛ 10 ሥራ አጥ/መሥራት የሚችል/ 11 ሥራ አጥ /መሥራት የማይችል/ 12 ሌላ /ካለ ይገለጽ/
6	የአደጋ ክስተት ሁኔታዎች ቦታ/አደጋው ሲከሰት የት ነበሩ?	01 ቤት 02 ት/ቤት 03 ጎዳና /ከፍተኛ አውራ ጎዳና/ 04 የመኖሪያ ተቋም ውስጥ 05 የስፖርት ማዘውተሪያ ስፍራ 06 ፋብሪካ ወይም ግንባታ ቦታ 07 እርሻ ቦታ 08 የንግድ ቦታ/ሱቅ፣መደብር፣ሆቴል፣ቡናቤት ወዘተ... 09 ሌላ /ካለይገለጽ/ 10 የማይታወቅ
7	ድርጊት አደጋው ሲፈጠር በምን ሥራ ላይ ነበሩ?	01 መደበኛ ክፍያ ያለው ስራ /ወደ ሥራና ከሥራ መልስ ጉዞን ይጨምራል/ 02 ክፍያ የሌለው ሥራ /ወደ ሥራና ከሥራ መልስ ጉዞን ይጨምራል/ 03 ትምህርት ላይ 04 የስፖርት እንቅስቃሴ 05 ጉዞ 06 መደበኛ ያልሆነ እንቅስቃሴ/የእግር ሽርሽር/ 07 ሌላ/ካለ ይገለጽ/

8	የአካል ጉዳት ሁኔታዎች	01 ሥብራት/የአጥንት/ 02 ወለምታ ወይም የጡንቻ መወጠር 03 ውልቃት 04 ቁስለት 05 መላላጥ 06 ቃጠሎ 07 መናጋት ወይም የጭንቅላት ጉዳት 08 የውስጥ ወሳኝ አካላቶች ጉዳት 09 ሌላ ካለ ይገለጽ 10 ያልታወቀ
9	የትራፊክ ተዛማጅ የሆኑ ጉዳቶች የመጓጓዣ አይነት በአደጋ ወቅት ምን አይነት መጓጓዣ ይጠቀሙ ነበር	01 የእግር ጉዞ 02 በሞተር የማይሰራ ተሽከርካሪ 03 ብስክሌት 04 የሞተር ብስክሌት 05 የቤት መኪና 06 ከ10 ሰው በታች የሚይዝ መለስተኛ መኪና /ፒክአፕ፣ ሚኒባስ ወዘተ.../ 07 ከባድ መኪና/የጭነት/ 08 አውቶብስ 09 ባለ3 ጎማ ተሽከርካሪ 10 ሌላ/ ካለ ይገለጽ/ 11 አላውቅም /አላስታውስም/
10	የተጎጂው ሚና በትራፊክ አደጋው የእርስዎ ሚና ምን ነበር?	01 እግረኛ 02 አሽከርካሪ 03 ተሣፋሪ
11	የአደጋው ተጣማሪ እርስዎ ወይም ተሽከርካሪዎ ከምን ጋር ተጋጫችሁ	01 እግረኛ 02ብስክሌት 03 የሞተር ብስክሌት 04 በሞተር የሚሰራ ተሽከርካሪ/መኪና፣ አውቶብስ፣ የጭነት መኪና / 05 የቆመ ግኡዝ አካል 06 ሌላ ካለ ይገለጽ
12	የመብራት ሁኔታ በአካባቢው የነበረዉ የመብራት ሁኔታ?	01 ብርሀናማ 02 ጨለማ 03 ማምሻ
13	የቅድመ ሆስፒታል እንክብካቤ	01 የለም

	የቅድመ ሆስፒታል እንክብካቤ ወይም የመጀመሪያ እርዳታ የሰጠዎት ሰው አለ?	02 አለ
14	የቅድመ ሆስፒታል እንክብካቤ ላለማግኘትዎ የሚሰጡት ምክንያት	01 የእውቀት ማነስ ወይም የሚመጣውን እርዳታ አይነት መፍራት /መስጋት 02 የእርዳታ መስጫ መገልገያ እጥረት 03 የሕክምና ሰጪነት ፍቃድ አለመኖር በመፍራት 04 ሌላ ካለ ይገለጽ
15	የቅድመ ሆስፒታል እንክብካቤ ማን አደረገልዎት?	01 አልፎ ሂያጅ መንገደኛ 02 ጓደኛ ወይም ቤተሰብ 03 መምህር 04 የፖሊስ መኮንን 05 አምቡላንስ ሰራተኞች 06 ሃኪም 07 ነርስ 08 የእሳት አደጋ መከላከያ ባለሙያዎች 09 ለመመለስ ፈቃደኛ አይደለሁም 10 ሌላ ካለ ይገለጽ 11 አላውቅም ወይም አላስታውስም
16	ምን አይነት ሕይወት አድን ቅድመ ሆስፒታል እንክብካቤ ተደረገልዎት?	01 ከስብርባሪ ውስጥ አወጡኝ 02 ስብራቴ እንዳይንቀሣቀስ አደረጉልኝ 03 ደሜን አቁመው ቁስሌን በጨርቅ ሸፈኑልኝ 04 የመልሶ ማገገም ህክምና ሰጡኝ 05 ሌላ ካለ ይገለጽ
17	ወደ ተቋም መጓጓዣ ወደ ጤና ተቋም እንዴት ተወሰዱ/ሄዱ?	01 በእግር 02 በግል መኪና 03 በታክሲ 04 በህዝብ መጓጓዣ መኪና 05 በአንቡላንስ 06 በብስክሌት 07 በእንሰሳ በሚመራ ሰረገላ 08 ወደ ጤና ተቋም አልሄድኩም 09 መመለስ አልፈልግም 10 ሌላ ካለ ይገለጽ 11 አላውቅም /አላስታውስም/
18	ጉዞው የወሰደው ጊዜ ወደ ጤና ተቋም ለመድረስ ምን ያክል ጊዜ ፈጅብዎት ?	01 ከአንድ ሰዓት በታች 02 ከአንድ እስከ ሁለትሰአታት 03 ከሁለት እስከ ስድስት ሰአታት 04 ከስድስት እስከ ዘጠኝ ሰአታት 05 ከዘጠኝ እስከ አሥራ ሁለት ሰአታት 06 ከአሥራ ሁለት እስከ ሃያ አራት ሰአታት 07 ከሃያ አራት ሰአታት በላይ 08 መመለስ አልፈልግም

		09 አላውቅም/እርግጠኛ አይደለሁም/
19	የሕክምና እንክብካቤ ያገኙበት ተቋም ወይም ቦታ መጀመሪያ ሕክምና ያገኙት የትነበር ወይም ማን ሰጠዎት?	01 ሆስፒታል 02 የጤና ክሊኒክ 03 የጤና ጣቢያ ወይም ጤና ኬላ 04 ጠቅላላ ሃኪም 05 የማህበረሰብ ጤና ሰራተኛ 06 የልምድ ወጌሻ 07 የመድሃኒት መደብር ወይም ፈርማሲ 08 መመለስ አልፈልግም 09 ሌላ ካለ ይገለጽ 10 አላውቅም ወይም አላስታውስም
20	አጋላጭ ባህሪያት አልኮሆል አጠቃቀም ባለፉት ስድስት ሰአታት ማንኛውንም አይነት የአልኮል መጠጥ ቀምሰዋል?	01 አዎን 02 የለም
21	ትክክለኛየደህንነት ቀበቶአጠቃቀም ባለፉት ሰላሣ ቀናት የደህንነት ቀበቶ አጠቃቀም እንዴት ነበር?	01 ሁልግዜ እጠቀማለሁ 02 አንዳንድ ጊዜ እጠቀማለሁ 03 በጭራሽ ተጠቅሜ አላውቅም 04 ባለፉት ሰላሣ ቀናት ውስጥ መኪና ውስጥ ሆኜ አላውቅም 05 መኪናዬ የደህንነት ቀበቶ የለውም 06 መመለስ አልፈልግም 07 እርግጠኛ አይደለሁም ወይም አላውቅም
22	የሞተር ብስክሌት በብዛት የሚጠቀሙት የትራንስፖርት አይነት ነው	01. አዎ 02. አይደለም
23	ትክክለኛየራስ ቅል መከላከያ ቆብ አጠቃቀም ባለፉት ሰላሣ ቀናት ሞተር ብስክሌት ሲያሽከረክሩ አብረው ሲጓዙ የራስ ቅል መከላከያ ቆብ ምን ያህል ጊዜ ተጠቅመዋል?	01 ሁልጊዜ 02 አንዳንድ ጊዜ 03 በጭራሽ ተጠቅሜ አላውቅም 04 ባለፉት ሰላሣ ቀናት በሞተር ብስክሌት ተሳፍሬ ሆነ አሽከርክሬ አላውቅም 05 የራስ ቅል መከላከያ ቆብ የለኝም
24	በፍጥነት መንዳት አደጋው ሲከሰት ከተፈቀደው በላይ ፍጥነት ተጠቅመው/ተጠቀመውቦት ነበር?	01. አዎ 02. የለም

Declaration

I, the undersigned,MPH student declare that this thesis is my original work in partial fulfillment of the requirement for the Master of General Public Health

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Approval of the primary Advisor

This thesis work has been submitted for examination with my/our approval as university advisor.

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