

ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

DEPARTMENT OF EMERGENCY MEDICINE AND CRITICAL CARE



HOSPITAL MORTALITY AND ASSOCIATED FACTORS OF ROAD TRAFFIC ACCIDENT VICTIMS ADMITTED AT THE TWO TRAUMA CENTERS IN ADDIS ABABA, ETHIOPIA 2021.

PRINCIPAL INVESTIGATOR: - BY ABRAHAM SAMUEL (BSC).

A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCE DEPARTMENT OF EMERGENCY MEDICINE AND CRITICAL CARE, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF SCIENCE IN EMERGENCY MEDICINE AND CRITICAL CARE.

JUNE, 2021

ADDIS ABABA, ETHIOPIA

ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCES
DEPARTMENT OF EMERGENCY MEDICINE AND CRITICAL CARE

Name of investigator:

Abraham Samuel ID NO GSR/6337/12

Name of Advisor(s):

Dr. Haywet Engida (MD, Emergency Medicine and Critical care Specialist)

Sr. Heyria Hussien (BSc, MSc in Emergency Medicine and Critical Care)

Declaration

I, Abraham Samuel declare that this thesis is my original work and has never been presented in this or any other university and all resources and materials herein used have been duly acknowledged.

Name of principal investigator: Abraham Samuel

-----/-----/-----

Signature: -

Advisors: Hywet Engida

-----/-----/-----

Signature: -

Heyira Kider

-----/-----/-----

Signature: -

Name of Examiners

-----/-----/-----

Signature: -

Department head

-----/-----/-----

Signature: -

Acknowledgment

I would like to acknowledge Addis Ababa university college health science department of emergency medicine and critical care for giving chance to conduct this research paper

My special thank goes to my advisors Dr. Hywet Egnida (MD, EMCC Specialist) for providing me valuable comments and advice.

Also, I want to give special recognition to Sr. Hyeria Hussien (BSC, EMCCN) for her continuous suggestion and inputs for the betterment of my research paper.

My final thanks go to my beloved friends who contribute to the development of this research paper.

Contents

Acknowledgment.....	I
List of Tables	IV
List of Figure.....	V
Abstract VIII	
1. Introduction	1
1.1. Background	1
1.2. Statement of the problem	3
1.3. Significance of the study	5
2. Literature review	6
2.1. Prevalence of hospital fatality of road traffic accident.....	6
2.2. Factors associated with hospital mortality among road traffic accident victims.....	8
2.3. Conceptual framework.....	11
3. Objectives	12
3.1. General objective.....	12
3.2. Specific objectives	12
4. Methodology.....	13
4.1. Study Area and Period	13
4.2. Study Design	13
4.4. Study population	13
4.6. Sample Size Determination and Sampling Technique.....	14
4.6.1. Sample size calculation	14
4.7. Study Variables	16
4.8. Operational definitions.....	16
4.9. Data collection procedure.....	17
4.10. Data collection instrument.	17
4.11. Data quality management	17
4.12. Data Entry, Processing, and Analysis	17
4.13. Ethical consideration	18
4.14. Dissemination of result	18
5. Result 19	
5.1. Socio-demographic characteristics.....	19

5.2. Prevalence of hospital fatality from RTA victims admitted at AaBET and TASH hospitals in AA, Ethiopia from Dec 31st, 2018 to January 1st, 2021.	20
5.3. Factor associated with hospital fatality from RTA in bivariate and multivariate logistic regression.	26
5.3.1. Bivariate and Multivariate logistic regression.	26
6. Discussion	28
7. Recommendation	31
8. References	32
Annex I: Checklist for data collection	35
Annex II: Data retrieving form	35
Annex III: Information Sheet	40

List of Tables

Table 1. sampling procedure of RTA victims admitted in AaBET and TASH.	15
Table 2. Socio-demographic characters of RTA Victims at the AaBET and TASH in Addis Ababa, Ethiopia, from December 31 st ,2018 to January 1 st , 2021	19
Table 3. mode of arrival to the emergency room of RTA Victims at the AaBET and TASH in Addis Ababa, Ethiopia, from Dece 31 st 2018 and January 1 st , 2021.	21
Table 4. mechanism of injury of RTA Victims at the AaBET and TASH in Addis Ababa, Ethiopia, from Dece 31 st 2018 to and January 1 st 2021.	23
Table 5. Body region involved of RTA Victims at the AaBET and TASH in Addis Ababa, Ethiopia, from Dece 31 st 2018 to and Jan 1 st ,2021.	24
Table 6. types of fracture of RTA Victims at the AaBET and TASH in Addis Ababa, Ethiopia, from Dece 31 st 2018 to January 1 st ,2021.	25
Table 7. Crosstabulation of head injury state severity of RTA Victims at the AaBET and TASH in Addis Ababa, Ethiopia, from Dece 31 st 2018 to January 1 st 2021. Error! Bookmark not defined.	
Table 8. Crosstabulation of endotracheal intubation status of RTA Victims at the AaBET and TASH in Addis Ababa, Ethiopia, from Dece 31 st 2018 to January 1 st , 2021. Error! Bookmark not defined.	
Table 9. Factors associated with hospital fatality of RTA Victims at the AaBET and TASH in Addis Ababa, Ethiopia, from Dece 31 st 2018 to January 1 st 2021.	27

List of Figure

Figure 1. The conceptual framework for assessing the factors for hospital fatality of RTA, developed after the literature review.	Error! Bookmark not defined.
Figure 2. Schematic presentation of sampling procedure of RTA victims admitted in AaBET and TASH from Dece 31 st 2018 to Jan 1 st , 2021.	15
Figure 3: Place of an accident with specific hospital treatment among RTA victims at the AaBET and TASH in Addis Ababa, Ethiopia from December 31 st ,2018 to January 1st, 2021	Error! Bookmark not defined.
Figure 4: prevalence of hospital fatality among victims at the AaBET and TASH in Addis Ababa, Ethiopia from Dece 31 st 2018 to January 1 st ,2021.....	20
figure 5:Total duration of time from accident to ER arrival among RTA victims at AaBET and TASH from Dece 31 st 2018 to January 1st,2021.	22
figure 6: Type of road user and type of vehicle involved of RTA Victims at the AaBET and TASH in Addis Ababa, Ethiopia, from Dece 31 st 2018, and January 1 st ,2021.	Error! Bookmark not defined.
Figure 7: role of victims during accident of RTA Victims at the AaBET and TASH in Addis Ababa, Ethiopia, from Dece 31 st 20 to January 1 st , 2021.	23
Figure 8: Head injury state severity of RTA Victims at the AaBET and TASH in Addis Ababa, Ethiopia, from Dece 31 st 2018 to January 1 st ,2021.....	26

Abbreviations/Acronyms

AA.....ADDIS ABABA

AaBET.....ADDIS ABABA BURN AND EMERGENCY TRAUMA

AAU.....ADDIS ABABA UNIVERSITY

ALERT.....ALL AFRICA LEPROSY, TUBERCULOSIS, AND REHABILITATION
TRAINING CENTER

DOA..... DEATH ON ARRIVAL

ESEP.....ETHIOPIAN SOCIETY OF EMERGENCY PROFESSIONALS

EDHS..... ETHIOPIA DEMOGRAPHIC HEALTH SURVEY

ECA.....ECONOMIC COMMISSION FOR AFRICA

FMOH..... FEDERAL MINISTER OF HEALTH

GDP.....GROSS DOMESTIC PRODUCT

ICU.....INTENSIVE CARE UNIT

LMICs.....LOW AND MIDDLE-INCOME COUNTRIES

OAU.....ORGANIZATION OF AFRICA UNION

RTA.....ROAD TRAFFIC ACCIDENT

RRS.....REPORT ON ROAD SAFETY

TASH.....TIKUR ANBESA SPECIALIZED HOSPITAL

WHO.....WORLD HEALTH ORGANIZATION

YLEL.....YEAR OF LIFE EXPECTANCY LOST

Abstract

About 1.35 million peoples deceased every year as a consequence of road traffic accidents (RTA). Half of all road traffic deaths occur among susceptible road users: walkers, bikers, and racers. 93% of the world's mortalities on the streets occur in low- and middle-income countries (LMICs), although these nations have a small number of the world's vehicles.

Objective: To determine hospital mortality and associated factors of RTA victims admitted at the Addis Ababa Burn and emergency trauma and Tikur Anbesa specialized hospital in Addis Ababa, Ethiopia 2021.

Methods: The study was conducted in Addis Ababa Burn and emergency trauma (AaBET), and Tikur Anbesa specialized hospital (TASH) in Addis Ababa, Ethiopia from March 13, 2021 to April 23, 2021. Hospital-based retrospective cross-sectional chart review methods were implemented from Dec 31st 2018 to January 1st 2021. 398 RTA victims were selected using simple random sampling method. Structured checklists were used to collect the data. The collected data was cleaned and entered into Epi-data ver.4.6 and exported to SSPS ver.26 for analysis. Binary logistic regression analyses were used to determine the association between variables.

Result: the study found that hospital mortality of road traffic accident victims admitted at AaBET and TASH in AA, Ethiopia, were 31.6% during the last two years. Among RTA victims who had severe head injury was more than 30 times (AOR=30.79, 95%CL: 6.62, 143.25) likely to cause hospital mortality as compared to those who had a mild head injury. The hospital fatality of RTA victims who were admitted for ≥ 1 day more than 24 times (AOR= 24.88, 95%CI: 5.13, 114.37) likely to die as compared to those who had a length of hospital stay > 3 days.

Conclusion and recommendation: This research clearly illustrates that the hospital mortality of RTA in the last 3 years was found to be high. The study revealed that head injury state severity, endotracheal intubation status, and length of hospital stay significantly determined hospital mortality of road traffic accidents.

Keywords: - Hospital fatality, road traffic accident

1. Introduction

1.1. Background

A road traffic accident (RTA) could be a car accident, automobile accident, or automotive crash, happens once a vehicle collides with another vehicle, pedestrian, animal, road dust, or alternative stationary obstacles, like a tree, pole, or construction. RTAs usually result in injury, disability, fatality, and property harm moreover as money prices to each society and therefore the people concerned. (1)

About 1.35 million peoples deceased every year as a consequence of RTAs. Half of all road traffic deaths (RTDs) occur among susceptible road users: walkers, bikers, and racers. 93% of the world's mortalities on the roads occur in low- and middle-income countries (LMICs), although these nations have a small number of the world's vehicles. RTAs are the principal cause of decease among kids and young adults aged 5-29 years(2).

RTAs cause increase financial losses to individuals, their relatives, and countries as an entire. These losses get up from the worth of treatment still as lost productivity for those slews or disabled by their injuries. RTAs expense most countries 3% of their gross domestic product (GDP). Over the ninetieth of RTDs occur in LMICs. Road traffic injury (RTI) death rates are peak in African. (2, 3).

In Africa, the quantity of ARTs and demises are increasing over the last 3 decades (4). consistent with the 2015 worldwide standing report on road safety(RRS), the World Health Organization(WHO) African Region had the greatest rate of fatalities from RTAs worldwide at 26.6 per 100, 000 population for the year 2013(4,5).

The Sub-Saharan continent is the world principal for RTDs. Certainly, there has been no improvement in reducing the number of deaths from RTAs in any LMICs between 2013 and 2016, consistent with the WHO's 2018 world standing Report on RRS(6). As the report points out, there's a major relationship between the chance of RTDs and a country's financial gain level. whereas RTDs in developed countries average 8.3 demises per 100,000 people, in LMICs the common is 27.5 demises per 100,000—a quite three-fold increase(6).

Like several African countries, Ethiopia is facing a vast road safety crisis. Annually thousands of road users are slew and the majority of them are economically active populations (8). According to the estimate of WHO, in 2013 the frequency of RTDs in the African nation was 25.3 per 100,000 population and the rate is among the greatest within the world (9). Factors that contribute to the high frequency of RTAs in the African nation include rampant reckless driving behaviors, poor road system, substandard road conditions, failure to implement traffic laws, and poor conditions of cars (10).

According to the latest WHO information revealed, in 2018 death from RTAs in Ethiopia reached 29,386 or 4.81%. The age-adjusted Death Rate is 36.78 per 100,000 population ranks and number 24 in the world(7).

1.2. Statement of the problem

Every day thousands of peoples are slew on the roads. Males, females, or youths walking, biking, or riding to high school or work, enjoying within the roads or taking off on long journeys, never come back home. Numerous individuals every year can stay long weeks in the hospital once severe crashes and plenty of them never be ready to live, work, or produce as they want to do (8).

According to the study which was conducted in Iran, Road-traffic fatalities are the causes of 14% and 5.5% of masculine and feminine mortality, respectively. The deaths resulting from RTAs have been assigned to 12% of the deaths over the past 7 years (12). A similar study was done in west India also, the year-to-year variation within the number of fatal accidents was 5.6 - 10.4%. Over 56% of the crashes (1,170) and 56% of the mortalities (1,323) happened during the period 2004-2009(9).

In Ethiopia, RTA is a common public health problem. According to a WHO report, Ethiopia is taken into account one of all the worst countries within the world where RTA kills and injures a large number of road users per annual nearly 2000 people die because of RTAs where, 48% are walkers, 45% passengers and 7% drivers and over 400 to 500 Million ETB are lost yearly, as a result, of RTA(10).

The fatality or severity of RTAs is directly linked with an average increase in haste. For example, every 1% rise in mean speed produces a 4% escalation of the fatal crash risk and a 3% rise within the severe crash risk. The demise risk for walkers hit by car fronts increases promptly (4.5 times from 50 km/h to 65 km/h). In car-to-car side collisions, the mortality risk for car occupants is 85% at 65 km/h(2).

According to the study which was based on the secondary data of Ethiopian demographic and health survey (EDHS) conducted in 2016. The incidence of RTAs within the past 12 months of the study was assessed among 75,271 followers of the 16,650 homes involved within the study. It had been found that 123 RTAs happened at a rate of 163 (95% CI: 136-195) per 100,000 population. Of the 123 casualties, 28 were mortal injuries, making the RTD rate 37 (95% CI: 25-54) per 100,000 population. The speed of RTA-related injuries and mortalities was provided per 100,000 peoples and per 100,000 vehicles. Were 21,681 (95% CI: 18,090-25,938) and 4,922 (95% CI: 3325-7183), respectively(3).

Studies on hospital mortality and associated factors (AFs) of RTAs are almost not done before this study (study area). As result, this study will be baseline information for future researchers. Although RTA is being recognized as an ever-increasing public health problem, its fatality patterns and AFs in Ethiopia's health care setup have not been well documented(7,11,12).

Therefore, the goal of this study was to determine the prevalence of hospital mortality and associated factors s of RTAs victims admitted at AaBET and TASH hospitals in AA, Ethiopia, from Dec 31st 2018 to January 1st, 2021.

1.3. Significance of the study

Locally the prevalence of hospital mortality of RTAs is not known. Despite, many research in the past about RTA and their magnitudes, but there is no study about the prevalence of hospital fatality and associated factors of RTAs. So, this study successfully filling the gap.

This study aims to assess the prevalence of hospital fatality and associated factors of RTA victims admitted at AaBET and TASH hospitals in AA.

This study plays a great role in tackle/alleviating hospital mortality and associated factors of an RTA with possible solutions in the utilization to curb the increasing hospital mortality of RTA. Therefore, the result of this research will be very important to identify the prevalence of hospital mortality and associated factors of RTAs and to improve the quality of health care for RTA victims.

Additionally, this research was very crucial to provide baseline information for another study that will be done in the future in this study area as well as the country as a whole.

2. Literature review

2.1. Prevalence of hospital fatality of road traffic accident

RTAs are the primary cause of demise among young adults aged 5-29. Young males under 25 years are more likely to be involved in road traffic crashes than females, with 73% of all road traffic deaths occurring among young males in this age, with a higher rate of 93% of fatalities coming from LAMICs(13).

A quantitative study Conducted in Colombia on mortality in RTAs of elder adults shows that among the 100,758 Columbian RTA demises between 1998 and 2012, 18.5% were elder adults. Most demises were males (79.5%) and 74.1% were 60years or older. The government of Antioquia had 15.1% of entire demises and Valle del Cauca had 15.2% of the older adult population demises. The government of Vaupés revealed fewer RTA demises within the entire population, and Amazonas had a smaller number of demises from elder adults(14).

According to Great Britain reported in 2018, there were 1,784 reported road demises from RTA related to the level seen since 2012 and in 2018, from the total reported fatalities car occupants accounts for 44% of road deaths, pedestrians 26%, motorcyclists 20%, and pedal cyclists 6% (15).

Preliminary figures published in June 2020 by the European Commission show that an estimated 22 800 people deceased in a road crash last year, with almost 7 000 fewer mortalities than in 2010(16).

A study done in China in 2009, revealed that a total of 67,759 peoples died from RTAs in China, the death rate was 5.1 per 100,000 population(17).

An epidemiological study done on RTI fatalities in East Azerbaijan of Iran in 2018 show that a complete of 3051 (39%) car users were involved in an exceedingly fatal RTA. This figure reached 52% excluding the walkers. Males comprised about 71% (95% CI: 0.7-0.73) of the victims(18). In 2016, age-adjusted transport injuries in Iran accounted for 35.6 (UI: 29.64. -43.44) of deaths per 100000, compared to 60.8 (UI: 51.04–72.49) of deaths in 1990(19).

A five-year study done between 2011-2015 in Iran shows that 1437 people died due to RTA (20). A similar study done in the Kashan region from 2006-2013 revealed that 928 people died due to RTA giving a male: female ratio of 4.7:1(21).

The African Region remains the smallest amount motorized of the six world regions, but suffers the greatest rates of road traffic fatalities, with 37 of 44 surveyed countries having death rates well above the world average of 18.0 demises per 100 000 population. While the regional average is 24.1 demises per 100 000 population, for the 19 nations within the LMICs, covering 44% of the Region's population, the speed is 27.8 deaths per 100 000 population. By comparison, the worldwide average for LMICs is 20.1 deaths per 100 000 population(5,22).

A systematic review on the burden of RTAs, and demise in Africa they have identified 39 studies from 15 African nations including Ethiopia, so from all registry-based studies, Nigeria documented the lowest total crash rate at 716.57 per 100 000 population 2.9 per 100 000 population, in 1990 and 2011, respectively. 39,42 Ethiopia documented a very high demise rate at 81.6 per 100 000 population in 2011,11 while a study from the United Republic of Tanzania reported the lowest, at 0.12 and 3.12 per 100 000 population, respectively.8,13 The pooled rates showed that motorized four-wheeler occupants had a very high road traffic death rate, closely followed by walkers. The pooled RTI and death rates among walkers were 10.8 and 3.4 per 100 000 population, respectively (23).

a retrospective descriptive study on death from RTA in Guinea revealed that in 2011 RTA was liable for a total number of 1655 demises, with an overall demise rate of 15 per 100,000 population (24). Similar a reviewing study on trends of RTAs, mortalities, and injuries in three Municipalities of Dares Salaam Region,Tanzania between 2014-2018 done to show that the info on RTIs and deceases in Ilala municipality between the year 2014 and 2018 is revealed in a complete of 6,772 RTAs were reported at Ilala municipality in Tanzania between 2014 and 2018. The year 2014 documented the lowest number of road mortalities of 2, 516 compared to the year 2017 which documented the last number of road injuries (699) within the municipality. a detailed comparative analysis of knowledge recovered from the Road crash data system shows a key difference ($P<0.05$) within the number of RTAs among the municipalities with Ilala Municipality recording the greatest number of accidents (15,301) compared to 13,613 and 11,292 in Kinondoni and Temeke respectively (25).

The study conducted in Ethiopia based on the secondary data of the EDHS in 2016 shows that the RTA-related injuries and mortalities per 100,000 motor vehicles were estimated as 21,681 (95% CI: 18,090–25,938) and 4,922 (95% CI: 3325–7183), respectively(26,27).

The study conducted in Finot Selam town (northwest Ethiopia) revealed that there were 255 vehicle accidents. Of which 60 (23.5%) were mortal, 103(40.4%) were severe injuries, and 92(36.1%) were minor injuries from 2009 - 2018(28).

2.2. Factors associated with hospital mortality among road traffic accident victims.

The study conducted in Brazil shows that the majority of victims were within the cohort 21-29 years old (33.9%) with 41.9% of cases reported to own occurred over the weekend days (Saturday and Sunday). the chances of motorbike accidents were higher within the following age groups: 21-29 years (33.9%), 30 to 39 years (28.3%), and 40-49 (22.2%) and also the lowest within the cohort 0- 9 years (0.9%) and 60 or older (9.5%). There was a relationship between the incidence of motorbike accidents with injuries on the face ($p = 0.001$), thorax ($p < 0.001$)(29).

The study done on Risk Factors for Lethal and Nonlethal Road accidents in Iran revealed that the death rate of women was about 2.6 times as high as that of men. Their analysis bared that 70.6% and 47.5% of involved women and men, respectively, were dead ($P = 0.068$). Data analysis for age and rate presented that folks who were < 24 yrs old had a lower rate than those that were ≥ 55 yrs old ($P < 0.001$). There was no significant relationship between the death rate and also the day of the month when accidents had occurred (30).

A cross-sectional study conducted on Factors related to Fatal RTAs in Tirana, Albania shows that the age of the responsible party was inversely and consistently associated with the fatality of episodes (P for linear trend < 0.005). Surprisingly, women were more likely to perpetrate fatal RTAs than men, although this finding wasn't statistically significant (age-adjusted OR, 1.39; 95% CI, 0.84-2.28(31).

The study done on Basic Characteristics of Road Traffic Demises in China show that entire road traffic demises in 2009, compared with nighttime, a significantly higher proportion of daytime reported RTDs

(53.3% vs. 46.7%, $P < 0.001$). From Monday to Sunday, the proportion of RTDs varied from the bottom 13.2% on Saturday, to the best 15.0% on Wednesday. The distribution of season from RTDs involved Spring (22.0%), Summer (23.1%), Autumn (27.1%), and Winter (27.8%)(32).

The study conducted in Ethiopia supported the secondary data of the EDHS in 2016 show that among RTA casualties, 21.9% were drivers, 35.0% were passenger vehicle occupants and 36.0% were susceptible road users including motorcyclists (21.0%), walkers (12.1%) and cyclists (2.9%). Approximately half (47.1%) of the casualties were between 15-29 years old and 15.3% were either minors younger than 15 years or seniors older than 64 years old. Nearly two-thirds (65.0%) of the casualties were men(27).

A similar study conducted in Ethiopia shows that among 123 individuals who sustained RTAs within the reference period, 21.9% were drivers and 35.0% were passenger vehicle occupants. Further, 36.0% of the victims were susceptible road users: motorcyclists (21.0%), walkers (12.1%), and cyclists (2.9%). Young adults 15 and 29 years constituted 47.1% of all RTAs; further, 15.3% of the casualties were either children younger than 15 years or seniors older than 64 yrs. Two-thirds (65.0%) of the victims were males(33).

According to cross-sectional study which was conducted in northern Ethiopia revealed that almost all of the accidents happened on Monday, 22 (38.60%) and Friday, 13 (22.81%) although accidents were reported altogether in the 7days. About 22/57 (38.60%), 13/57 (22.81%), 10/57 (17.54%), and 9/57 (15.79%) of the reported causes of RTAs were thanks to violation of traffic laws, lack of car maintenance, lack of general safety awareness on walkers and violation of speed limit(34).

According to a study done in the southern part of Ethiopia: Of the full 423 RTAs, motorcycle accident injuries were 213 (50.4%) and followed by Minibus 90 (21.3%) and Bajaj 64(15.3%). Poor road conditions like loose gravel, steep descent, and rough road were accountable for 95(44.6%) of motorcycle accident injuries(35).

An institution-based Cross-sectional study conducted in Arbaminch shows that the victim's sex, age, occupation were significantly related to RTA in bivariate analysis. Additionally day and whether a condition of trauma was also significantly related to RTA. So in step with the analysis males are 18.16

times high risk for RTA [COR=18.16 (7.83- 42.13)]. The age brackets 0-9 have 93% less risk for RTA than the age group above 60 [COR=0.071(0.008-0.663)](36).

The study was done in Burayu town found that RTAs Fire following accidents is 6 times more likely to cause mortality than accidents that happened without fire [AOR 9, 95% CI; 2.45–21]. Driving without using a seatbelt is additionally 4.7 times more likely to cause mortality than drivers who use it while driving [AOR 4.25, 95% CI; 2.6–8.6]. Failure to convey priority for other vehicles is 3 times more likely to cause fatality of RTAs than giving priority with [AOR 3, 1.55, 5.9]. The last contributing factor for the fatality of RTA within the town was the time at which attention given for the victims that are victims who get aid with 10 min of accidents were 0.99 times less likely to be lethal than those that did not get tending [AOR 0.0045, 95% CI; 0. 923–0.045-0.663]](37)

However, RTA deaths are being recognized as a major public health problem. Death rates from RTAs are more than anywhere else and Sub-Saharan Africa is that the global capital for road traffic death(38). In Ethiopia, there has been no progress in reducing the number of deaths from RTAs like other LMICs. Therefore, this study will identify the prevalence of hospital fatality of RTA and assess associations between fatalities of RTAs.

2.3. Conceptual framework

Factors that contribute to the hospital fatality of RTA were classified as socio-demographic factors, like age sex residence, etc. Factors like mode hospital arrival, types of collision (MOI), types of vehicle, length of stay, etc.

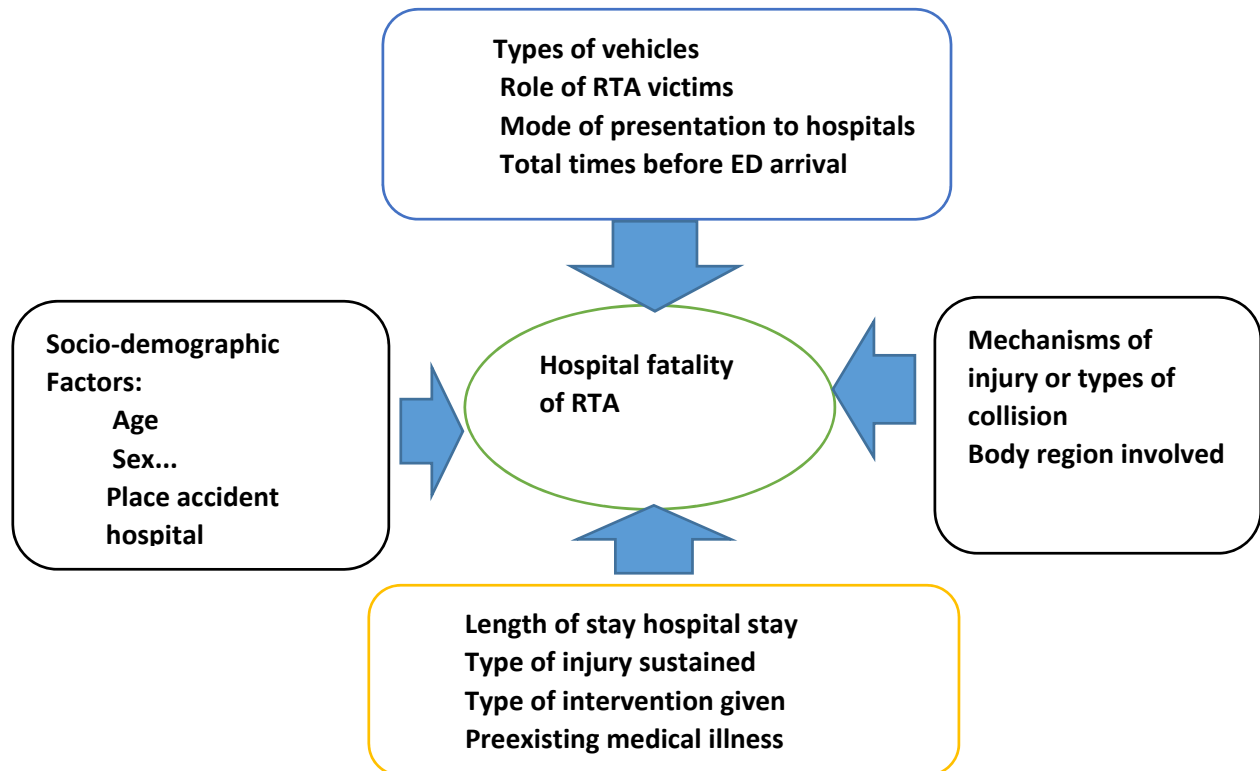


Figure 1. The conceptual framework for assessing the factors for hospital fatality of RTA, developed after the literature review.

3. Objectives

3.1. General objective

- The main goal of this study was to determine hospital mortality and AFs of RTA victims admitted at AaBET and TASH hospitals in AA, Ethiopia 2021

3.2. Specific objectives

- ❖ To determine hospital mortality of RTA victims admitted at AaBET and TASH hospitals in AA, Ethiopia.
- ❖ To identify FA with hospital mortality among RTA victims admitted at AaBET and TASH hospitals in AA, Ethiopia.

4. Methodology

4.1. Study Area and Period

4.1.1. Study Area

This study was conducted at AaBET and TASH hospitals in AA. These hospitals are giving general emergency services and are additionally acknowledged to be Tertiary Level Trauma centers within the town and the country as a whole. So they were providing Trauma services not just for AA dwellers however conjointly for the entire country by receiving referral cases from different regions and town administrations of the Country.

Thus, the study conducted at the two hospitals in Addis Ababa in which serves the country as Tertiary care, give education in numerous health and connected fields as well as specialty and sub-specialty for several professionals of the country yet as neighborhood countries and famous to be Trauma Centers within the town and within the country yet. Namely: TASH, and AaBET Hospitals.

4.1.2. Study period

The study was conducted from March 13, 2021, to April 23, 2021.

4.2. Study Design

A hospital-based retrospective cross-sectional chart review method was conducted.

4.3. Source Population

The source populations for the study were all RTA victims admitted at AaBET and TASH in AA, Ethiopia, from December 31st, 2018 to January 1st, 2021.

4.4. Study population

The study population was all sampled RTA victims admitted at AaBET and TASH in AA, Ethiopia, from December 31st, 2018 to January 1st, 2021.

4.5. Eligibility criteria

4.5.1. Inclusion criteria

- All charts of RTA victims from December 31st, 2018 to January 1st, 2021.

4.5.2. Exclusion criteria

- Charts of RTA victims with an incomplete record/lost.

4.6. Sample Size Determination and Sampling Technique

The sample size was determined using the single population proportion method.

4.6.1. Sample size calculation

Emergency room fatality pattern and AFs among RTA Proportion of 37.65%(p=0.38) was taken from a previous study report conducted in AA, Ethiopia(12). 95% level of significance, 5% margin of error, and 10% for incomplete or contingency data were used as parameters. These parameters were used to determine sample size using a single population proportion formula

Where

n = the required sample size

$(Z\alpha/2)^2$ =critical value at 95%confidence interval (1.96)

Proportion (P) = proportion emergency room fatality pattern and associated factor of RTA is 0.38.

d = margin of error (0.05)

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

$$n = (1.96)^2 \times 0.38 (1-0.38) / (0.05)^2 = 362$$

The 10% for incomplete records were considered and the overall calculated sample size was 398.

4.6.2. Sampling Technique and procedure

AaBET and TASH hospitals were selected purposively and the sample size proportionally allocated according to the total number of their respective RTA victims from December 31st, 2018 to January 1st, 2021

Table 1. Sampling procedure of RTA victims admitted at AaBET and TASH.

s. no	AaBET	TASH	Total
1.	11040	4216	15256
2.	288	110	398

Proportion allocation = Total sample size x Total population with strata / total population

For AaBET = $398 \times 11040/15256 = 288$

For TASH = $398 \times 4216/15256 = 110$

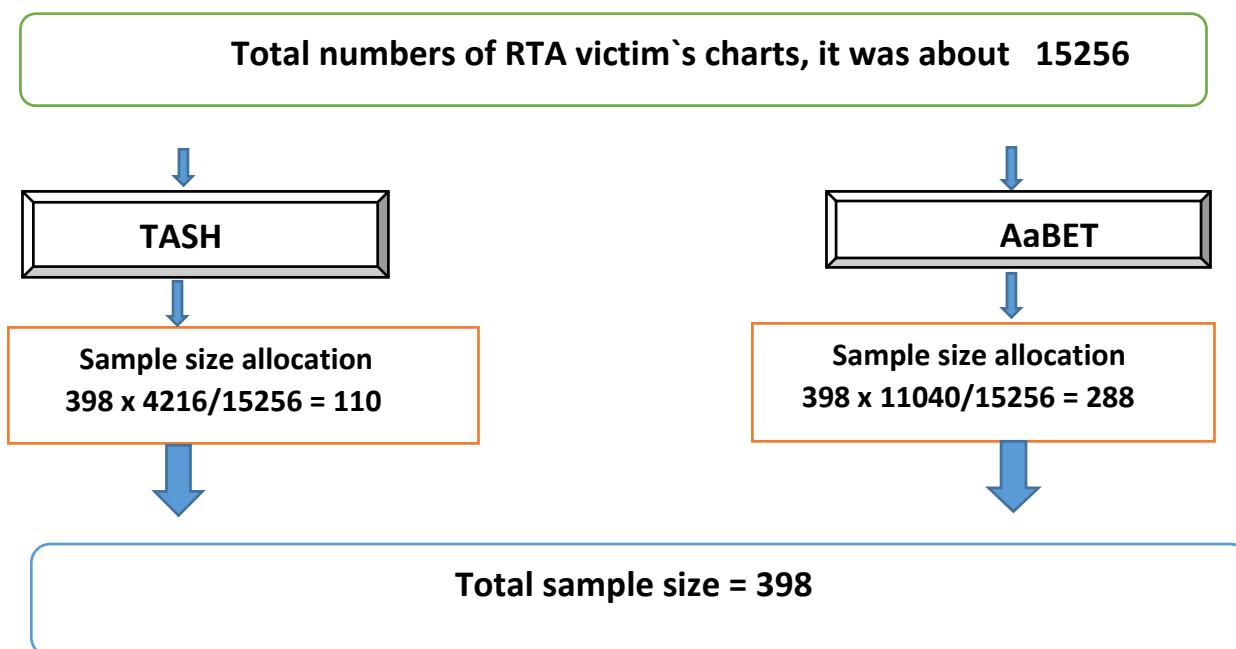


Figure 2. Schematic presentation of sampling procedure of RTA victims admitted at AaBET and TASH from Dece 31st 2018 to Jan 1st, 2021.

The list of all RTA patients' card number who had RTAs during the study period was prepared for the sampling frame and the study subjects were selected by simple random sampling technique using a computer-generated random number

4.7. Study Variables







4.7.1. Dependent Variables

- hospital fatality due to RTA

4.7.2. Independent variable

- Age
- Sex
- The victim's role (Pedestrian, passenger, driver)
- Duration of time from accident to ED Arrival
- Mode of presentation to hospital
- Preexisting Medical Comorbidity
- Site of injuries/Body region affected
- Type of injury sustained
- Type of Intervention

4.8. Operational definitions

-  **Road traffic fatality:** any person died as a result of an RTA.
-  **Road traffic hospital fatality:** any person died as a result of an RTA after hospital admission
-  **Road traffic accident:** An accident occurred in which it involves one or more motor vehicle or bicycle
-  **Vulnerable road users:** are those who are not car occupants but includes pedestrians, cart pushers, motorbike, and bicycle riders
-  **Non- vulnerable road users:** – are those vehicle occupants including drivers and passengers who are protected by the body of the vehicle
-  **Incomplete record:** This is a record that lacks at least place, time, person, and cause of fatal and non-fatal(37).

- **Death on arrival (DOA):** patients who had no baseline vitals and as a result were excluded from the study.

4.9. Data collection procedure

Two teams containing six data collectors and two supervisors were selected and recruited; one supervisor and three data collectors were formed as a separate group for each respective study area/selected hospital (TASH, and AaBET Hospitals). Three days of training were given on the tools and techniques of data collection for supervisors and data collectors. The checklist and individual code were used for supervisors at the end of each checklist to know who filled it and to get clarification if there was any ambiguity during analysis.

4.10. Data collection instrument.

Data were collected using structured checklists which were adapted based on study objectives after literature review

4.11. Data quality management

At the end of the day, data were checked for completeness, accuracy, and consistency. Respective supervisors have conducted onsite close supervisions to clarify any ambiguity and misunderstanding regarding data collection procedures and that they provided sound explanations accordingly. All collected data were manually checked and cleaned before importing to a computer for analysis

4.12. Data Entry, Processing, and Analysis

First, the data obtained were checked and edited manually. Data were entered and cleaned using Epi-data Version 4.6 and exported to SPSS Version 26 for analysis. Binary logistic regression was used to assess associations between fatalities of RTAs and their AFs. 95% confidence intervals (CI) and P-value < 0.05 was considered as statistically significant.

4.13. Ethical consideration

The study was conducted after approval by AAU, the college of health science, the department of emergency medicine, and the critical care ethical committee. An official support letter was obtained from the AAU college of health science, department of emergency medicine, and critical care to each hospital's administration offices.

Further approval and authorization were taken from emergency services directorates and the record-keeping officers of the respective hospitals accordingly after fully explaining the nature and design of the study and confidentiality was maintained very strictly.

4.14. Dissemination of result

The result of the study was submitted to the college of medicine and health science of AAU, TASH, FMOH, Ethiopian Society of emergency professionals' (ESEP), and other responsible bodies. The result was going to be presented at the college of medicine and health sciences in different seminars, meetings, conferences, and workshops. Moreover, efforts were done to publish the findings of the study and disseminated them through different journals and scientific publications.

5. Result

5.1. Socio-demographic characteristics

From December 31st, 2018 to January 1st, 2021. There were a total of 15,256 RTA victims at AaBET and TASH 11,040 and 4,216 respectively. 398 RTA victims' charts were sampled 288 from AaBET and 110 from TASH included in the study. Regarding the sex of the victims, 295(74.1%) and 103(25.9%) were male and female respectively. The victim's ages range from 13to87years old with a mean age of 37 ± 2.42 years old.185(46.5%)of road traffic accidents occur from Addis Ababa, 128(32.2%)from Oromia, and 34(8.5%) from SNNPR (see table 1).

Table 2. Socio-demographic characters of RTA Victims at AaBET and TASH in Addis Ababa, Ethiopia, from December 31st, 2018 to January 1st, 2021.

Variable	Category	Frequency	Percent (%)
Age	10-19	36	9.0
	20-29	131	32.9
	30-39	81	20.4
	40-49	63	15.8
	50-59	29	7.3
	60-69	48	12.1
	70-79	8	2.0
	80-89	2	0.5
	Total	398	100
Hospitals	AaBET	288	72.3
	TASH	110	27.7
	Total	398	100
Sex	Male	295	74.1
	Female	103	25.9
	Total	398	100
Place of accident	Addis Ababa	185	46.5

	Oromia	128	32.2
	Amhara	33	8.3
	SNNP	34	8.5
	Others	15	3.5
	Unknown	3	0.8
	Total	398	100

5.2. Prevalence of hospital fatality from RTA victims admitted at AaBET and TASH hospitals in AA, Ethiopia from Dec 31st, 2018 to January 1st, 2021.

A total of 126(31.7%) RTA victims died from December 31st, 2018 to January 1st, 2021. among these 93(73.8%) were males and 33(26.2%) were females. Concerning the age, category 37(29.4%) were age range between 20-29 years old, 26(20.6%) were 30-39 years old, and 21(16.7%) were 60-69 years. 33(30%) and 93(32.29%) RTA victims were died from TASH and AaBET respectively (fig 3&4).

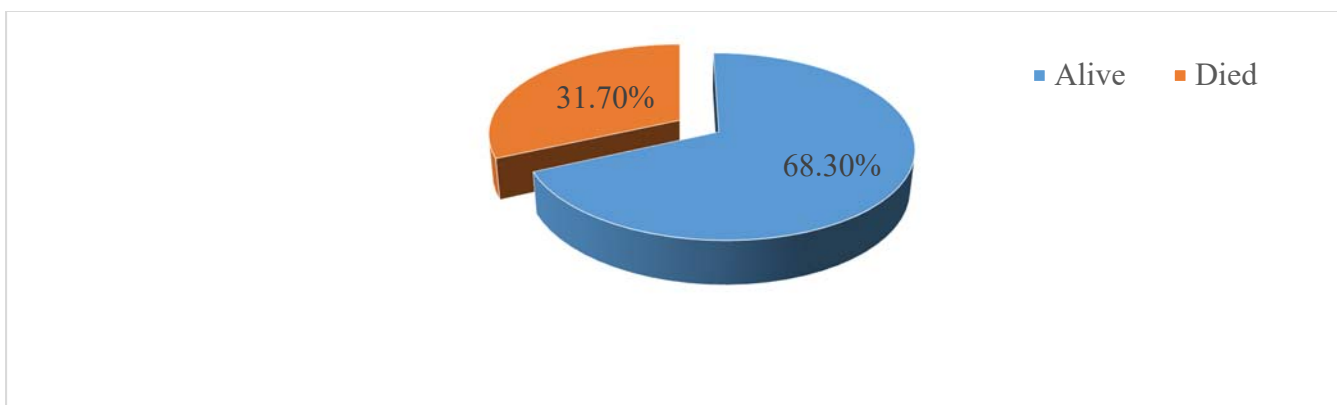


Figure 3: prevalence of hospital fatality from RTA victims at AaBET and TASH in Addis Ababa, Ethiopia from Dec 31st 2018 to January 1st, 2021.

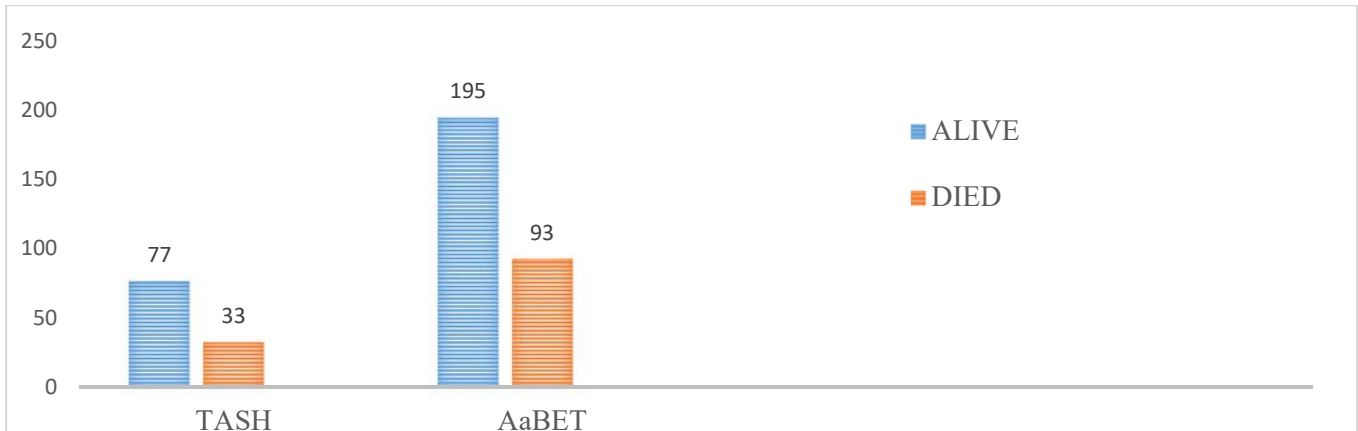


Fig 4. prevalence of hospital mortality from RTA victims with specific hospitals in Addis Ababa, Ethiopia from Dec 31st 2018 to January 1st, 2021.

Pre-hospital transport/mod of arrival.

Regarding pre-hospital transport or mode of arrival to the hospital, among the deceased victims, the majority were transported by Ambulance 99(78.6%) and the rest of police car 16(12.7%) see table 3. 48(38.1%) have arrived at ED with the first hours 52(41.3%) arrived in ED within 1-6hrs after the accident happened (see fig 4).

Table 3. mode of arrival to the emergency room of RTA Victims at AaBET and TASH in Addis Ababa, Ethiopia, from Dec 31st 2018 and January 1st, 2021.

Mode of arrival to ED			Ambulance	Police car	Private automobile	Taxi	Walking	Total	
Outcome of accident	Alive	Count	192	21	22	25	12	272	
		%	70.6	7.7	8.1	9.2	4.4	100	
	Died	Count	99	16	6	5	0	126	
		%	78.6	12.7	4.8	4.0	0.0	100	

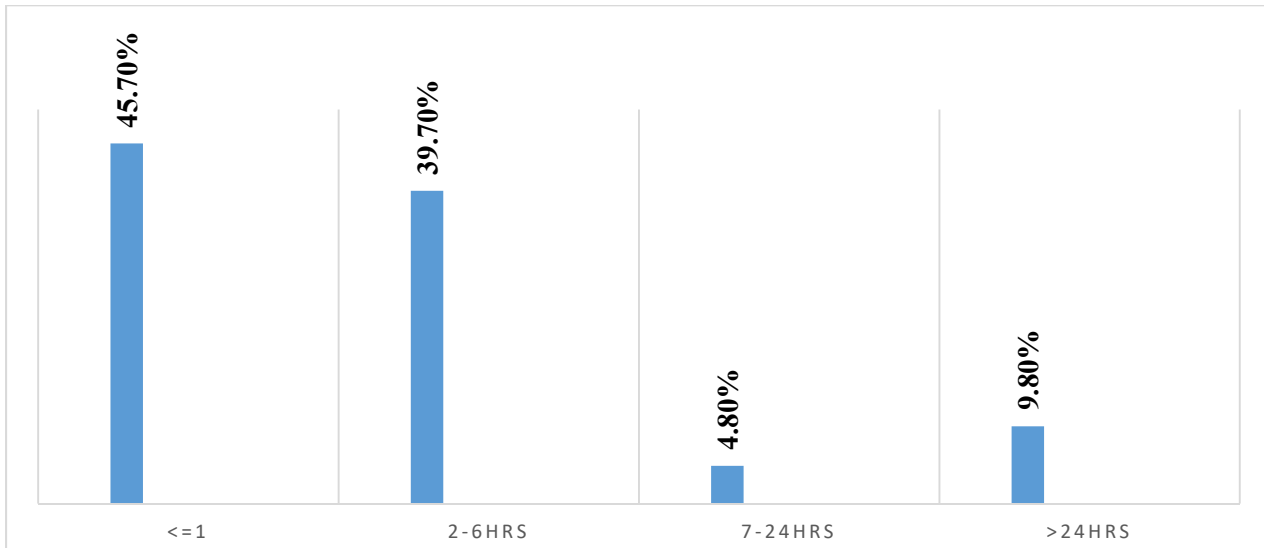


Figure 5: Total duration of time from accident to ER arrival among RTA victims at AaBET and TASH from Dec 31st 2018 to January 1st 2021.

Physiological parameter

A pattern of vital signs on initial arrival into the ED the majority of RTA victim's systolic BP were 188(47.2%) within the category of 120-129 mmHg, diastolic BP was 269(67.6%) within the category 60-100 mmHg, respiratory rate 273(68.6%) with the category of 12-25 bpm, and level of consciousness 102(25.6%) within the category of severe, 82(20.6%) within the category of moderate, and 80(20.1%) within the category of mild.

Type of road user and type of vehicle involved

From total causality more than half 220(55.3%) were pedestrians, 120(30.2%) were passengers, 38(9.5%) were divers, and 20(5%) were motorcyclists. Regarding types of vehicles, most 165(41.5%) was a car, 51(12.8%) was a motorcycle, 43(10.8%) was a taxi, 42(10.6%) was a minibus, and the rest Isuzu, Bajaj, bus, heavy vehicle, and private automobile which account <10% (see fig 5).

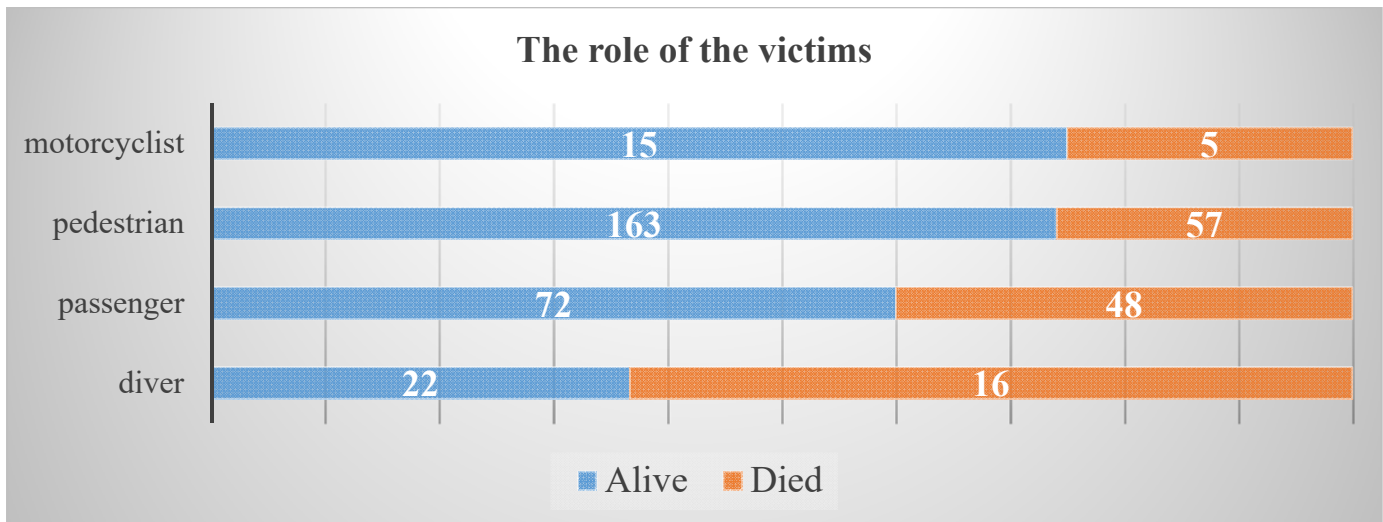


Figure 6: role of victims during accident of RTA Victims at AaBET and TASH in Addis Ababa, Ethiopia, from Dec 31st 20 to January 1st. 2021.

Mechanism of injury

Regarding types of collision or mechanism of collision 186(46.7%) were occurring between a motor vehicle with a pedestrian, 112(28.1%) were occurring between a motor vehicle with each other, 38(9.5%) were occur between motor vehicle/cycle with Bajaj (see table 4).

Table 4. Mechanism of injury of RTA Victims at AaBET and TASH in Addis Ababa, Ethiopia, from Dec 31st 2018 to and January 1st. 2021.

Mechanism of injury	Frequency	Percent (%)
Motor vehicle with each other	112	28.1
Motor vehicle with motorcycle	20	5.0
Motorcycle with each other	2	0.5
Motor vehicle with pedestrian	186	46.7
Motor vehicle with Bajaj	38	9.5
Falling from moving motor vehicle	11	2.8
Falling from moving motorcycle	12	3.0
Rollover	17	4.3
Total	398	100

Body region involved and Injury description

The commonest sites of body injured were the head neck and face 246, extremity 63, chest and thorax 54, abdomen including pelvic, and back including spinal cord were 47 and 31 respectively. Regarding injury description 154 were contusion, 114 were hematoma, 98 were laceration, 72 were abrasion, 26 and 24 were crash and avulsion respectively. However, a single victim had more than one body region involved and injury description (see table 5).

Table 5. Body region involved of RTA Victims at AaBET and TASH in Addis Ababa, Ethiopia, from Dec 31st 2018 to and Jan 1st. 2021.

Variables	Category	Frequency	Percent (%)
Body region involved			
Head neck & face	Yes	246	61.1
	No	152	38.2
	Total	398	100
Chest & thorax	Yes	54	13.6
	No	344	86.4
	Total	398	100
Abdomen(including pelvic organs)	Yes	47	11.8
	No	351	88.2
	Total	398	100
Extremities	Yes	63	15.8
	No	335	84.2
	Total	398	100
Back including spinal cord	Yes	31	7.8
	No	367	92.2
	Total	398	100
Injury description			
Hematoma	Yes	114	28.6
	No	284	71.4
	Total	398	100
Laceration	Yes	98	24.6
	No	300	75.4
	Total	398	100
Contusion	Yes	153	38.4
	No	245	61.6
	Total	398	100
Abrasion	Yes	72	18.1

	No	326	81.9
	Total	398	100
Avulsion	Yes	24	
	No	374	
	Total	398	100
Crash	Yes	26	6.5
	No	372	93.5
	Total	398	100

Regarding the primary diagnosis of the victims, 242(60.8) had TBI (head neck and face), 66(16.6%) had Polly trauma, 46(11.6%) had a chest injury, 37(9.3%) had hemopneumothorax, 25(6.3%) had spinal cord injury, and 23(5.8%), 20(5.0%), & 19(4.8%) had an abdominal injury, pelvic injury, and pneumothorax respectively. However, a single victim may have multiple diagnoses.

In this study, the commonest types of bone fracture were ribs fracture it was accounting for 28(18.4%), basal skull fracture 19(12.5%), femoral fracture 15(9.9%), linear skull fracture 11(7.2%), and others types of fracture 20(13.2%).

Table 6. Types of fracture of RTA Victims at the AaBET and TASH in Addis Ababa, Ethiopia, from Dec 31st 2018 to January 1st. 2021.

Types of associated bone fracture	Frequency	Percent %
Linear skull #	11	7.2
Depressed skull #	7	4.6
Basal skull #	19	12.5
Mandibular/maxillofacial #	9	5.9
Clavicular #	6	3.9
Rib #	28	18.4
Humeral #	6	3.9
Radial/radio-ulnar #	9	5.9
Pelvic #	12	7.9
Femoral #	15	9.9
Tibia/tibio-fibular #	10	6.6
Others	20	13.2
Total	152	100

Regarding the outcome of head injury 68(66.7%) victims died due to severe head injury, 13(15.9%) victims died who had a moderate head injury, and 7(8.8%) victims died due to mild head injury.

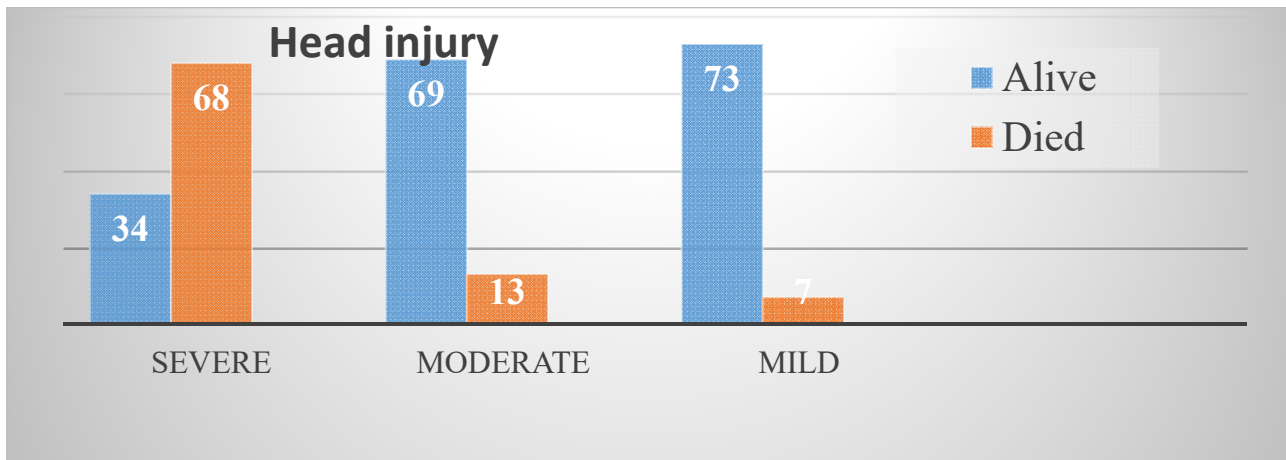


Figure 7: Head injury state severity of RTA Victims at AaBET and TASH in Addis Ababa, Ethiopia, from Dec 31st 2018 to January 1st 2021.

Regarding the type of treatment or intervention most 375(94.2%) have got general non-operative management only, 44(11.1%) had needle decompression, 41(10.3%) require laceration repair, 40(10.1%), and 7(1.8%) victims had chest tube drainage and splint/dislocation reduction respectively. Among the deceased victims, 68(66.7%) victims were intubated however, a single victim may have taken more than one intervention.

5.3. Factor associated with hospital fatality from RTA in bivariate and multivariate logistic regression.

5.3.1. Bivariate and Multivariate logistic regression.

Factor associated with hospital fatality from RTA victims in this study include: the total time before emergency room, initial systolic blood pressure, level of consciousness abdomino-pelvic injury, head injury state, and endotracheal intubation.

To avoid excessive number variables P- value less than 0.2 in bivariate analysis were taken into the multivariate analysis. The multivariate logistic regression analysis identified that, head injury state of severity, endotracheal intubation status, and length of hospital stay.

Among RTA victims who had severe head injury more than 30 times (AOR=30.79,95%CL:6.62,143.25) likely to happen hospital mortality as compared to those who had mild head injury among victims admitted at AaBET and TASH from Dec 31st, 2018 to January 1st, 2021.

The hospital fatality from RTA victims admitted for less or equal to 1 day more than 24 times(AOR= 24.88,95%CI:5.13, 114.37) likely to die as compared to those who had a length of hospital stay more than 3days among victims admitted at AaBET and TASH from Dec 31st, 2018 to January 1st , 2021.

RTA victims who had intubated are sixteen times (AOR=16.65, 95% CI: 1.23, 222.12) likely to have hospital mortality as compared to not intubated among victims admitted at AaBET and TASH from Dec 31st 2018 to January 1st 2021.

Table 8. Factors associated with hospital fatality of RTA Victims at AaBET and TASH in Addis Ababa, Ethiopia, from Dec 31st, 2018 to January 1st, 2021.

Variable	Categories	Outcome of accident		COR 95% CI	AOR 95% CI	P –value
		Died	Alive			
Sex of victims	Male	93	202	.923(0.604, 1.580)		
	Female	33	70			
Total time before ED	≤1hrs	48	134	.464(.227,.946)**		
	2-6hrs	52	106	0.635(.311,1.297)		
	7-24hrs	9	10	1.165(.387,3.501)		
	>24hrs	17	22			
Systolic BP	≤90	38	20	1.555(.553,4.372)		
	91-119	66	122	.443(.553,4.372)		
	120-129	7	95	.06(.019,.194)**		
	130-139	4	26	.126(.032,.497)**		
	≥140	11	9			
Level of consciousness	≤7	67	3	692.333(178,2681.504)**		
	8-12	51	21	75.286(31.595,179.393)**		
	13-15	8	248			
Types of vehicle involved	Car/four wheelers	35	130	.090(.017,0.464)**		
	Isuzu	19	19	.333(.060,1.865)		
	Minibus	19	23	.275(.050,1.525)		
	Bus	9	8	.375(.058,2.414)		
	Taxi	15	28	.179(.032,.996)**		0.049
	Bajaj	8	18	.148(.024,.900)**		0.038
	Motorcycle	12	39	.103(.018,.576)**		0.010
	Heavy vehicle	3	5	.200(.023,1.712)		
Private automobile	6	2				
Abdominal and pelvic	Yes	23	24	2.307(1.246,4.274)**	2.09(0.32, 13.613)	0.44
	No	248	103			
Contusion	Yes	54	99	1.311(.852,2.016)		
	No	72	173			

Laceration	Yes	20	78	.469(.272,.810)**	0.42(0.13,1.45)	0.17
	No	106	194			
TB/head neck &face	Yes	62	180	.495(.322,.761)**		0.001
	No	64	92			
Hemopneumothorax	Yes	20	17	2.830(1.427, 5.614)		0.003
	No	106	255			
Polly trauma	Yes	21	45	1.009(.572,1.779)		
	No	105	227			
If head injury state.	Severe	68	34	20.857(8.669,50.184)**	30.79(6.62, 143.25)**	0.001
	Moderate	13	69	1.965(.740,5.214)		
	Mild	7	73			
Endotracheal intubation status	Intubated	71	9	5.871(2.558,13.475)*	49.16(8.89, 271.82)**	0.001
	Not intubated	12	231	0.039(.018,.081)**		0.001
	Unknown	43	32			
Length of hospital stay	<1day	49	64	1.861(1.150,13,013)	24.88(5.42, 114.37)**	0.001
	2-3days	19	67	0.689(0.381,1.249)		
	>3days	58	141			

6. Discussion

This study shows that the prevalence of hospital fatality from road traffic accident from Dec 31st, 2018 to January 1st, 2021 was found to be 31.7% in AaBET and TASH in Addis Ababa, Ethiopia. This result is higher compared to a previous study conducted in Southern Iran 12%, Finota Selam town 23.3%, and Oromia regional state (Burayu) 25% (28,37,39). These may be due to differences in methodology, time, and the setting is a referral hospital, and trauma centers most trauma patients who are relatively critical victims referred to these hospitals.

In the current study, most victims who died from RTA were male (73.8%) with a male to female ratio of 2.8:1. Similarly high prevalence of RTA fatality in males has been reported in a study conducted in Tikur Anbessa specialized hospital Addis Ababa, Ethiopia (40).

Regarding age, the highest numbers of RTA (32.9%) were observed in the 20-29 age group. This age group presents the most industrious and generative and therefore economically and socially active these finding was in line with the previous study done in Addis Ababa(41). Fatality by age group was

distributed 62.5% 50% and 33.3% died within the age group 70-79, 80-89, and 10-19 respectively, and this is due to study focus on RTA victims who had admitted to the hospital.

The result in this study shows that 45.7% of RTA victims were arrived ≤ 1 hr after the accident, 39.7% of RTA victims arrived 1-6hrs. These indicate that most of the victims arrived at the emergency room with golden hour, whereas none of the victims received pre-hospital care. This finding is in line with road traffic injury in Lagos. This may be due to both settings are university teaching hospitals (42).

On physiological parameters of dead RTA victims upon presentation in the emergency room in these study systolic blood pressure 47.2%,25.6%, and 14.6% of victims were within category 91-120mmhg, 120-129mmhg, and, ≤ 90 mmhg respectively. Dystolic blood pressure around 70% within normal range 60-80mmhg, level of consciousness Glasgow coma scale ≤ 7 were account around 56%. this finding in line with the study of emergency room mortality which was done in Addis Ababa(12).

This study found that the majority 55.3% RTA victims were pedestrian and 30.3% of RTA victims were passenger, and regarding the type of vehicle involved in a road traffic accident four wheeler`s (car) were the most frequent vehicle's type constituted 41.5% of injury. This finding in line with the study which was done in Lagos, Nigeria 42.0% were the passenger and followed by pedestrian 34.0%, and four-wheelers were the most frequent vehicle type constituted 54.%. Regarding the types of road users, there was a small discrepancy may due to differences in the study area to mean that the current study was in hospitals whereas the study done in Lagos, Nigeria was in pre-hospital setup. (42, 43).

The pattern of injury by body regions in this study shows that the most common body sites affected from the injury were the head neck and face 246(61.8%) which was followed by extremities 63(15.8%) and abdomino-pelvic injury 47(11.8%). This finding is in line with the study done in Addis Ababa and Lagos (12,42).

From the total of RTA Victims, 152 had a fracture in their different parts of the body. Most of skeletal injuries were rib # 18.4%, basal skull # 12.5%, femoral # 9.9% pelvic # 7.9%, linear skull # 7.2%, tibial/tibiofibular # 6.6%, radial/radio-ulnar # 5.9%, mandibular/maxillofacial # 5.9%, depressed skull # 4.6%, clavicular # 3.9%, and humeral # 3.9% the current finding was bit lower than the finding in common type and patterns of bone fractures and it prevalence in RTAs Addis Ababa .It may be due to study population difference (43).

Of the 126 dead road traffic accidents, most 88 had a head injury from these, 77.2% had a severe head injury, 14.77% were moderate head injury and 7.9% were mild head injury. Fact that the head is the controlling part of our body system, so road traffic accidents on this part of the body may end up with death. The same is true about their level of consciousness.

This study found a statistically significant association between the total time taken before emergency room arrival, initial systolic blood pressure, abdomen-pelvic injury, laceration, TBI, endotracheal intubation, and length of hospital stay. After adjusting for potential confounders, head injury severity, endotracheal intubation status, and length of hospital stay had a strong association with hospital mortality of RTAs in both hospitals. This finding in line with the study done at bureau town(37).

This study identified that severe head injury, level consciousness, and length of hospital stay have an association with hospital fatality of road traffic accidents. Road traffic accident victims who had a severe head injury 30 times [(AOR=30.79, 95%CL: 6.62, 143.25)] likely to occur hospital mortality as compared to those who had a mild head injury. Road traffic accident victims who had intubated 16 times (AOR=16.65, 95% CI: 1.23, 222.12) likely to occur hospital mortality as compared to those who had not intubated. This may be due to a head injury severity increase the probability of dying also increase in RTA victims, and the same is true for the level of consciousness. I couldn't find a study the supports or contradict this finding.

Strength and limitation of the study

Strength of study: data quality was assured under the close supervision of the principal investigators, and this study exclusively concentrated in hospitals, so it may show the same aspect of quality of care for hospital fatality of road traffic accidents.

Limitation of the study: since the data was secondary data there was difficulty in the collection of the data, and a lack of a similar registration format in hospitals and with the department of the hospital. In general poor documentation and handling of patient's charts were another major challenge.

Conclusion

In conclusion, more than 15 thousand individuals have sustained road traffic accidents within 3 years. Male and young age groups were predominantly affected by RTA. Pedestrians and passengers were vulnerable to RTA than others victims. The majority of the accident was happened by car (four-wheeler vehicle). This research clearly illustrates that the prevalence of hospital mortality of RTA in the last 3 yrs was found to be high.

The study revealed that head injury severity, endotracheal intubation status, and length of hospital stay were significantly associated with the prevalence of hospital mortality from a road traffic accident.

7. Recommendation

Based on this conclusion the prevalence of hospital fatality of road traffic accidents is high. Federal Minister of Health (FMOH), Minister of transport, Police commission, media, and NGOs should play a great role in reducing road traffic fatality and injuries by awarding pedestrian about road traffic signs and how to follow the road safety rules and improving high quality in pre-hospital and facility-based emergency care for road traffic victims as immediate as possible.

To better understand the implication of these results future studies are advisable.

8.

References

1. Traffic collision. In: Wikipedia [Internet]. 2020 [cited 2020 Nov 28]. Available from: https://en.wikipedia.org/w/index.php?title=Traffic_collision&oldid=991079942
2. Road traffic injuries [Internet]. [cited 2020 Nov 28]. Available from: <https://www.who.int/news-room/fact-sheets/detail/road-traffic-injuries>
3. Abagaz T, Gebremedhin S. Magnitude of road traffic accident-related injuries and fatalities in Ethiopia [Internet]. *Epidemiology*; 2018 Aug [cited 2020 Nov 28]. Available from: <http://biorxiv.org/lookup/doi/10.1101/382333>
4. WHO | The burden of road traffic crashes, injuries, and deaths in Africa: a systematic review and meta-analysis [Internet]. WHO. World Health Organization; [cited 2020 Nov 28]. Available from: <http://www.who.int/bulletin/volumes/94/7/15-163121/en/>
5. WHO | Global status report on road safety 2013 [Internet]. WHO. World Health Organization; [cited 2020 Nov 28]. Available from: http://www.who.int/violence_injury_prevention/road_safety_status/2013/en/
6. Kazeem Y. Death rates from traffic accidents are higher in Africa than anywhere else [Internet]. *Quartz Africa*. [cited 2020 Nov 28]. Available from: <https://qz.com/africa/1489613/death-rates-from-road-traffic-accidents-are-highest-in-africa/>
7. Road Traffic Accidents in Ethiopia [Internet]. *World Life Expectancy*. [cited 2020 Nov 28]. Available from: <https://www.worldlifeexpectancy.com/ethiopia-road-traffic-accidents>
8. Peden MM, World Health Organization, editors. *World report on road traffic injury prevention*. Geneva: World Health Organization; 2004. 217 p.
9. Gopaul CD, Singh-Gopaul A, Sutherland JM, Rostant L, Ebi KL. The Epidemiology of Fatal road traffic Collisions in Trinidad and Tobago, West Indies (2000–2011). *Glob Health Action*. 2016 Dec 1;9(1):32518.
10. Amdeslasie F, Kidanu M, Lerebo W, Ali D. PATTERNS OF TRAUMA INPATIENT SEEN AT THE EMERGENCY CLINICS OF PUBLIC HOSPITALS IN MEKELLE, NORTHERN ETHIOPIA. *Ethiop Med J*. 2016 Apr;54(2):63–8.
11. WHO | Global status report on road safety 2015 [Internet]. WHO. World Health Organization; [cited 2020 Nov 29]. Available from: http://www.who.int/violence_injury_prevention/road_safety_status/2015/en/
12. Mehadi A. EMERGENCY ROOM MORTALITY PATTERNS AND ASSOCIATED FACTORS AMONG ROAD TRAFFIC CRASH VICTIMS AT ADULT EMERGENCY DEPARTMENT OF TERTIARY LEVEL TRAUMA CENTERS IN ADDIS ABABA ETHIOPIA FROM JANUARY 1st 2016 TO DECEMBER 31st 2017. :52.

13. Road safety [Internet]. [cited 2020 Dec 10]. Available from: <https://www.who.int/westernpacific/health-topics/road-safety>
14. Cardona AMS, Arango DC, Fernández DYB, Martínez AA. Mortality in traffic accidents with older adults in Colombia. *Rev Saúde Pública* [Internet]. 2017 [cited 2020 Dec 11];51. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5344075/>
15. Reported road casualties in Great Britain 2018 annual report. :47.
16. BORMANS Y. Road safety: Europe's roads are getting safer but progress remains too slow [Internet]. Mobility and Transport - European Commission. 2020 [cited 2020 Dec 10]. Available from: https://ec.europa.eu/transport/media/news/2020-06-11-road-safety-statistics-2019_en
17. Zhang X, Yao H, Hu G, Cui M, Gu Y, Xiang H. Basic Characteristics of Road Traffic Deaths in China. 2013;42:9.
18. Sadeghi-Bazargani H, Samadirad B, Shahedifar N, Golestani M. Epidemiology of Road Traffic Injury Fatalities among Car Users; A Study Based on Forensic Medicine Data in East Azerbaijan of Iran. *Bull Emerg Trauma*. 2018 Apr 1;6(2):146–54.
19. Bazargan-Hejazi S, Ahmadi A, Shirazi A, Ainy E, Djalalinia S, Fereshtehnejad S-M, et al. The Burden of Road Traffic Injuries in Iran and 15 Surrounding Countries: 1990–2016. *Arch Iran Med*. 2018;21(12):10.
20. Lotfi MH, Lashkardoost H, Hamed A. Fatal road traffic accidents in Yazd province, Iran during 2011-2015. *J Emerg Pract Trauma*. 2019 May 1;5(2):51–5.
21. Mahdian M, Sehat M, Fazel MR, Akbari H, Rahimi H, Mohammadzadeh M. Road traffic deaths in Kashan region, Iran: An eight-year study (2006–2013). *Chin J Traumatol*. 2018 Feb;21(1):54–7.
22. [http://www.who.int/entity/violence_injury_prevention/publications/road_traffic/UN_GA_resolution-54-255-en.ROAD SAFETY IN THE WHO AFRICAN REGION.pdf](http://www.who.int/entity/violence_injury_prevention/publications/road_traffic/UN_GA_resolution-54-255-en.ROAD_SAFETY_IN_THE_WHO_AFRICAN_REGION.pdf).
23. Adeloje D, Thompson JY, Akanbi MA, Azuh D, Samuel V, Omoregbe N, et al. The burden of road traffic crashes, injuries and deaths in Africa: a systematic review and meta-analysis. *Bull World Health Organ*. 2016 Jul 1;94(7):510-521A.
24. Mamady K, Zou B, Mafoule S, Qin J, Hawa K, Lamine KF, et al. Fatality from Road Traffic Accident in Guinea: A Retrospective Descriptive Analysis. *Open J Prev Med*. 2014;04(11):809–21.
25. Walugembe F, Levira F, Ganesh B, Lwetoijera DW. A retrospective study on the epidemiology and trends of road traffic accidents, fatalities, and injuries in three Municipalities of Dar es Salaam Region, Tanzania between 2014-2018. *Pan Afr Med J* [Internet]. 2020 May 20 [cited 2020 Dec 12];36. Available from: <http://www.panafrican-med-journal.com/content/article/36/24/full/>
26. Abegaz T, Gebremedhin S. Magnitude of road traffic accident-related injuries and fatalities in Ethiopia. Useche SA, editor. *PLOS ONE*. 2019 Jan 29;14(1):e0202240.

27. Abagaz T, Gebremedhin S. Magnitude of road traffic accident-related injuries and fatalities in Ethiopia [Internet]. *Epidemiology*; 2018 Aug [cited 2020 Dec 12]. Available from: <http://biorxiv.org/lookup/doi/10.1101/382333>
28. Tadege M. Determinants of fatal car accident risk in Finote Selam town, Northwest Ethiopia. *BMC Public Health*. 2020 Dec;20(1):624.
29. Alessandro, Belchior , Rodriguas, Motorcycle Accidents Morbidity and Associated Factors in a city of the northeast of Brazil. *Tanzania journal of health research*, October 2013.
30. Mohammadraza Mehmand, Hamid Soori Mosa Amiri, Risk Factors for Fatal and Nonfatal Road Crashes in Iran. *Iran Red crescent Med.J*. July 15, 2014.
31. Gentiana, Qirjako, Genc Burazeria, Burazeria Hysa. Factors Associated with Fatal Traffic Accidents in Tirana, Albania Cross-sectional Study. January 28, 2008.
32. Zhang X, Yao H, Hu G, Cui M, Gu Y, Xiang H. Basic Characteristics of Road Traffic Deaths in China. 2013;42:9.
33. Abegaz T, Gebremedhin S. Magnitude of road traffic accident-related injuries and fatalities in Ethiopia. Useche SA, editor. *PLOS ONE*. 2019 Jan 29;14(1):e0202240.
34. Woldu AB, Desta AA, Woldearegay TW. Magnitude and determinants of road traffic accidents in Northern Ethiopia: a cross-sectional study. *BMJ Open*. 2020 Feb;10(2):e034133.
35. Tadesse F, Mekonnen S, T/Selassie W, Kediro G, Gobena N, Bedaso A, et al. Prevalence and associated factors of motorcycle accident injuries in public Hospitals of Southern Ethiopia. [Internet]. In Review; 2019 Sep [cited 2020 Dec 12]. Available from: <https://www.researchsquare.com/article/rs-5954/v1>
36. Misker D. Magnitude and Factors Associated with Road Traffic Accident among Traumatized Patients in Arba Minch General hospital, 2017. 2017;2(3):5.
37. Hordofa GG, Assegid S, Girma A, Weldemariam TD. Prevalence of fatality and associated factors of road traffic accidents among victims reported to Burayu town police stations, between 2010 and 2015, Ethiopia. *J Transp Health*. 2018 Sep;10:186–93.
38. Yomi Kazeem. Death rates from traffic accidents are higher in Africa than anywhere else. 12 feb 2019.
39. Jafar Hasanzadeh, Mehdi Moradinazar, Trends of Mortality of Road Traffic Accidents in Fars Province, 15 July 2014.
40. Seid M, Azazh A, Enquselassie F, Yisma E. Injury characteristics and outcome of road traffic accident among victims at Adult Emergency Department of Tikur Anbessa specialized hospital, Addis Ababa, Ethiopia: a prospective hospital-based study. *BMC Emerg Med*. 2015 Dec;15(1):10.

41. Baru A, Azazh A, Beza L. Injury severity levels and associated factors among road traffic collision victims referred to emergency departments of selected public hospitals in Addis Ababa, Ethiopia: the study based on the Haddon matrix. BMC Emerg Med. 2019 Dec;19(1):2.
42. Narsiru A. Ibrahim, FMCS, FWACS, Abdul wahab O. Ajufem E, Idown , FWACS,Road Traffic Injury in Lagos, Nigeria Assessing Prehospital Care. June, 22, 2016.
43. Adisu Asefa, Common Types and Patterns of Bone Fractures and Their Prevalence in Road. December, 2017.

Annex I: Checklist for data collection

Data collector Name:

Code:

Signature

Supervisor's Name:

Code:

Signature

Date

Annex II: Data retrieving form

Tool for extraction of data for assessing the prevalence of hospital fatality and associated factors of a road traffic accident in the AaBET and TASH hospitals in Addis Ababa

1. Hospital. 1. TASH 3. AaBET
2. Age

3. Sex 1. Male 2. Female

4. The place of Accident :

- a. Addis Ababa
- b. Oromia
- c. Amhara
- d. SNNP
- e. Others (specify)
- f. Unknown

5. Mode of arrival to ED/ Prehospital transport by ;

- a. Ambulance
- b. Police car
- c. Private automobile
- d. Taxi
- e. Carried
- f. walking
- g. referred from other health facilities
- h. other (specify)
- i. unknown

6. Duration of Accident/Total time before ED Arrival _____/minutes/hrs/days

7. A pattern of Vital Signs on Arrival in the ED:

- a. Syst BP _____
- b. PR/HR _____
- C. RR _____
- D. GCS _____

8. Type of road users/Role of the victim during the Accident.

- a. Driver
- b. Passenger
- c. Pedestrian
- d. Motorcyclist
- e. Pedal Cyclists
- f. Pillion rider
- g. Other (Specify) _____
- h. Unknown

9. Type of vehicle involved/caused the accident:

- a. Car
- b. Isuzu
- c. Minibus
- d. Bus
- e. Taxi
- f. Bajaj
- g. Motorcycle
- h. Truck/Heavy Vehicle
- i. Private Automobile

10. Type of collision (Mechanism of injury)

- a. MV-MV
- b. MV-MC
- h. MC-Bicycle
- i. MV-Bicycle

- c. MC-MC
- d. MV–Bajaj
- e. MC–Pedestrian
- f. Single MC (falling from)
- g. Falling from MV
- j. Roll Over
- k. MV–Pedestrian
- l. Other (Specify) _____
- m. Unknown

11. Body region affected/involved:

- a. Head Neck & Face
- b. Chest & Thorax.
- c. Abdomen (including Pelvic organs)
- d. Extremities (including Pelvis)
- e. Back including Spinal Cord
- f. Other (Specify) _____
- g. Unknown

12. Injury description:

- a. Hematoma
- b. Laceration
- c. Contusion
- d. Abrasion
- e. Avulsion
- f. Crash
- g. Other(specify) _____
- h. Unknown

13. Primary Dx.

- a. HI/Head, Neck & Face
- b. Pelvic #
- c. SCI
- d. Chest injury
- e. Hemopneumothorax
- f. Pneumothorax
- g. Abdominal injuries Crush injuries Polly Trauma/Multiple injuries
- h. Other(specify) _____

14. If a fracture what type?

- a. Depressed skull #
- b. Basal Skull #
- c. Mandibular/Maxillofacial #
- d. Clavicular #
- e. Rib #
- g. Radial/Radio-Ulnar #
- h. pelvic#
- i. humeral#
- j. Tibial/ Tibio-fibular #
- k. Other(specify) _____

f. Humeral #

15. If head injury state severity: 1. Severe 2. Moderate 3. Mild

16. If he/she had comorbidity: 1. Yes, 2. No

17. Types of Treatment/ED intervention given:

1. General non-operative mgt only

2. General+Laceration repair

3. General+Splint/slab, #/dislocation reduction

4. General+Tracheostomy

5. General+Chest tube drainage

6. General+Needle Decompression

7. Other (Specify) _____

18. Endotracheal Tube/Intubation status: 1. Intubated 2. Not intubated 3. Unknown

19. Length of stay _____ Minutes/hours/day

20. Immediate cause of death: 1.

a. MOF

h. Hemorrhagic Shock

b. Respiratory Arrest

i. Septic shock

c. Cardiorespiratory Arrest

j. Severe TBI

d. Arrhythmias

k. Crash injury

e. Fat Embolism.

L. Brain Herniation

f. DVT/PE

m. Other (specify) _____

g. Cardiac Arrest

n. Unknown

Data Collectors and supervisors

Check List 1. Data collector's Name: _____

Cossasssde: _____ Signature: _____

2. Supervisor's Name: _____ Cod: _____

Signature: _____ Date: _____ Code: _____

Annex III: Information Sheet

Title of the Research Project: assess hospital fatality and associated factors of RTA among victims admitted in the AaBET and TASH hospitals in AA, Ethiopia 2021.

Name of Principal Investigator: Abraham Samuel.

Introduction: Greetings! My name is Abraham Samuel. I am a student at Addis Ababa University's department of Emergency medicine and critical care in the Masters of Science in emergency medicine and critical care (MSC). As part of this degree, I am undertaking a research project on the hospital fatality and associated factors from RTAs among victims admitted in the AaBET and TASH hospitals in A A, Ethiopia 2021.

Purpose of the Research Project: This study aims to assess hospital fatality and associated factors of RTA among victims admitted in the AaBET and TASH hospitals in AA, Ethiopia. The information gained from this research will be used to make recommendations to reduce road traffic deaths and disability.

Procedure: The data collection was conducted from the AaBET and TASH hospitals in AA (TASH, & AABET). All necessary information was extracted by using a data extracting tool adapted from a previous study that was done in Addis Ababa.

Risk and /or Discomfort: the data was extracted from medical records, so it did not impose any harm on patients.

Confidentiality: During data extraction, the patients' names were not taken, instead they were identified by their card number in the registration book. All extraction forms collected were kept confidential. The information extracted was used only for research purposes.

Right to Refusal or Withdraw: Approval of the manager of the hospital was required to start data abstraction.

Person to contact: If you have any further questions or would like to receive further information about the project, please contact:

Phone: +251(0)912768864

Email: abrahamsamu133@gmail.com

