ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCES
DEPARTMENT OF EMERGENCY MEDICINE

PATTERN OF ORTHOPEDIC INJURIES RELATED TO ROAD TRAFFIC ACCIDENT AMONG PATIENTS MANAGED AT EMERGENCY DEPARTMENT OF TIKUR ANBESSA SPECIALIZED HOSPITAL IN ADDIS ABABA, ETHIOPIA, 2021 E.C.

BY - YETNAYET BEZABIH

A THESIS SUBMITTED TO ADDIS ABEBA UNIVERSITY COLLEGE OF HEALTH SCIENCES DEPARTMENT OF EMERGENCY MEDICINE AND CRITICAL CARE, FOR PARTIAL FULFILLMENT OF THE REQUIREMENTS OF DEGREE OF MASTER'S IN EMERGENCY MEDICINE AND CRITICAL CARE NURSING.

Addis Ababa, Ethiopia

January2021

ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

DEPARTMENT OF EMERGENCY MEDICINE

Name of Investigator	**Yetnayet Bezabih**
Name of Advisors	**Principal; Birhanu Tesfaye (MD)** **Co-advisor; Ins. Birhanu Melaku (MSC)**
Title of the study	**Pattern of orthopedic injuries related to RTA among patients managed at emergency department of TASH, Addis Ababa Ethiopia, 2021.**
Study Area	**Tikur Anbessa Specialized Hospital in Addis Ababa, Ethiopia**
Study period and budget	**From November till June 2021** **24,309 ETB**
Address of Investigator	**Email-yetnayet77@gmail.com** **Phone-0926175524**

APPROVAL SHEET

ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCE

DEPARTMENT OF EMERGENCY MEDICINE

Thesis title

PATTERN OF ORTHOPEDIC INJURIES RELATED TO RTA AMONG PATIENTS MANAGED AT EMERGENCY DEPARTMENT OF TASH ADDIS ABABA, ETHIOPIA, 2021.

By: Yetnayet Bezabih

Approved by examining board.

Chairman dept. graduate committee	**signature**	**date**
_____	_____	_____

Advisors

_____	_____	_____
_____	_____	_____

Examiners

_____	_____	_____
_____	_____	_____

ACKNOWLEDGMENT

First, I would like to thank almighty GOD for keeping me healthy, giving strength & courage to do this research. Then, I would like to forward my great gratitude to my advisors, Ins. Birhanu Melaku & Dr Birhanu Tesfaye for their outstanding guidance & input starting from topic selection & throughout the thesis development process. Thirdly, I would like to express my heartfelt gratitude to Addis Ababa University for financial support & also Department of Emergency Medicine for allowing me to do this research. Finally, I would like to extend my appreciation to St. Peter specialized hospital for sponsoring me to continue my education.

TABLE OF CONTENTS

List of Table

List of Figure

ACRONYMS AND ABBREVIATIONS

ATLS= Advanced Trauma Life Support

BSC=Bachelor of Science

ED=Emergency Department

EMCCN=Emergency Medicine and Critical Care Nursing

ETB=Ethiopian Birr

GNP=Growth National Product

HUCSH=Hawassa University Comprehensive Specialized Hospital

ICU=Intensive Care Unit

MSC=Master of Science

MSH=Menelik II Specialized Hospital

RTA=Road Traffic Accident

RTI=Road Traffic Injury

STI=Soft Tissue Injury

TASH=Tikur Anbesa Specialized Hospital

WHO=World Health Organization

UK=United Kingdome

ABSTRACT

Background: Road Traffic Accident (RTA) is an accident which occurs on a way or street open to public traffic; resulted in one or more people is being killed or injured, and at least one moving vehicle involved. Most of orthopedic injuries are caused by RTA. Orthopedic injury is any injury to the musculoskeletal system. Often, relating to the bones and joints as a result of an accident or trauma to the body. Each year approximately 1.3 million people lose their lives on the road and as many as 50 million others are injured and because of injury every year 12 million people disabled and from them 6 million people develop permanent disability. Most of those disabilities are caused by orthopedic injuries.

Objective: The aim of this study is to assess pattern of orthopedic injuries related to road traffic accident among patients managed at the emergency department of TASH in Addis Ababa Ethiopia, 2021.

Method: Institutional based retrospective cross-sectional study was conducted from March till June 2021 G.C. A total of 354 patients' chart was selected by using systematic random sampling technique. Data was entered into Epi data version 4.2 & analyzed by SPSS version 26.0 software.

Result: A total of 354 RTA victims with orthopedic injury were included in the study. The study reveals that male were mostly injured person (71.7%) with age group of 13-24. Taxi accounts for 36.3% of cause of injury followed by motorbike (27.4%) & lower limb were the commonest anatomic site of injury (47.9). From all injury type fracture is the commonest one with 71.1% especially lower limb fracture (42.1%). More than half victim (59.5%) had open wound. 51.8% experience RTA while they are crossing or walking around road.

Conclusion: Reproductive age groups are most vulnerable age groups to RTA. According to my finding the major cause of RTA was minibus and pedestrian were the most injured victims.

Key words

Orthopedic injury, pattern, road traffic accident

1. INTRODUCTION

1.1 Background

Injuries are categorized as unintentional and intentional. Unintentional injuries contain most of the traffic injuries, fires, falls, poisonings and drowning(1).

Road traffic injuries (RTI) occurs due to road traffic accident. Road Traffic Accident (RTA) is an accident which happens on a way or street open to public traffic; caused one or more person is being killed or injured, and at least one moving vehicle involved. These accidents, include collisions between vehicles, between vehicles and pedestrians and between vehicles and animals or fixed objects, and that of An Orthopedic injury is any injury to the musculoskeletal system. Often, relating to the bones and joints as a consequence of an accident or trauma to the body(2,3).

Globally from all injuries Road traffic injuries encounters (17.5%), falls (12.2%), interpersonal violence (10.1%), and self-inflicted injuries (9.7%) are the main injury-related cause(4).

Half of the world's road traffic life losses happen among motorcyclists (23 %), pedestrians (22 %) and cyclists. Motor vehicle accidents are the top cause of death in adolescents and young adults globally(5). And it expected that by 2030 it will be the fifth top cause of death in all age group(5,6)

RTI are one of the top causes of injuries in Africa. Life losses from RTI in the African region are 40% greater than in all other low- and middle-income countries and 50% greater than the world average. In developing countries these injuries are an important and mostly ignored health problem (1).

Each year Because of injuries12 million people disabled, and from this almost 6 million are forever disabled. Orthopedic injuries are the most common type of injuries that cause disability(7,8).

A study in Ghana showed that 0.83% had an injury-related disability. The vast majority (78%) of such disabilities were because of extremity injuries. Hence; extremity injury-related disability is an alerting issue in developing countries(4).

A study conducted in Addis Ababa, Ethiopia on adult limb fractures at TASH caused by road traffic injuries showed that road traffic injuries causes almost half of the musculoskeletal injuries(5). And it causes 62% of orthopedic admission in Black Lion.

Even though Orthopedic injuries related to RTA in Ethiopia is high, as far as my knowledge concerned, little is known on a pattern of orthopedic injuries related to RTA in Ethiopia so that the

aim of this study is to assess the pattern of orthopedic injuries related with RTA in the emergency department of TASH, Addis Ababa, Ethiopia.

1.2 Statement of the problem

Injury continues to be major cause of mortality and morbidity both in the developed and developing countries. Around the world, 5.8 million people loss their life every year, and every day 16000 people die from injuries(4).

Road traffic injuries are the 8th top Cause of death in the world and the first top cause of death for young people aged 15–29. Each year around 1.3 million people lose their lives on the road. Globally 17 road fatalities per 100,000 population per year are reported. In Africa 25 road fatality per 100,000 population and In Ethiopia the prevalence of road traffic fatality is 25.3 per 100,000 population and the rate is among the top in the world(9,10).

Every year 20 to 50 million people are disabled by road traffic injuries. Nearly 16% of the people who are injured become disabled for life. Orthopedic injuries are the most common type of injuries and top cause of disability and from Orthopedic injuries musculoskeletal injuries are Main cause for disability specially femoral fractures and open tibia fractures(8,11).

RTA's were frequently documented as the main reason of most fractures, especially in developing countries(12).

In UK injured people secondary to RTA occupied almost 50% of orthopedic beds. In developing countries 30% to 70 % of Orthopedic beds are occupied by injured patients due to RTA(1,13)

When we see the economic Impact annually RTA cost estimated about US$ 518 billion. The average yearly cost of road crashes was about 1% of GNP in developing countries, 1.5% in developed countries. In Ethiopia RTI costs 56 million US dollar each year(14).

After physical injury treated 50% survivors from RTI develop psychological distress for more than decades, so it can affect quality of life(15)

Even though there is significant Orthopedic injury due to RTA in Ethiopia and number of vehicle in Addis Ababa is getting high(from the entire number of cars found in Ethiopia 62% of them found in Addis Abeba)(16), as far as my knowledge concerned, there is limited amount of study conducted in pattern of orthopedic injury related to RTA. Therefore, the objective of this study is to fill this gap by studying the injury type and magnitude of orthopedic injuries due to RTA in Addis Abeba, TASH.

1.3 Significance of the study

The result of this study determines the magnitude of problem and pattern of injuries which were measured by assessing the cause, type & site of injury. It also gives insight about most frequently injured age group. Therefore, this study helps the health care providers and hospital administrators & also transport minister for planning and intervention. It also used for local and national policy makers to revise health policy.

It provide some additional information about patterns of orthopedic injury (such as mostly injured anatomic site, progress of patient & injury type) related to road traffic accident visiting the emergency department of TASH. The finding also serves as a baseline information for researchers who has interest on this issue & want to do further research on topic related to pattern of orthopedic injury related to RTA.

2. LITERATURE REVIEW

Now RTA become a rising public health issue. It cost low and middle-income countries between 1% and 2% of their GNP. Even though RTA is preventable, each year 1.35 million people loss their life(14).

A study done in Nepal on civil service hospital showed that from all Orthopedic injured patients (2823) RTA is the second most common (34.6%) cause. Fracture is the most common injury it accounts 33.7% then sprain and strain 26.0%, laceration 19.2%, dislocation 9.1%.The most common anatomic site of injury is extremity injury (85.1%).From the fracture type simple fracture was the most common(94.5%) (17).

The study conducted in Taiwan showed that males were mostly injured (59.4) than females (40.5).when we see the injury pattern the most common ones were the fracture of the skull, intracranial injury (17.93%), then fracture of upper limb (12.22%), followed by the fracture of lower limb (11.07%), fracture of spine and trunk (6.10%), open wound of lower limb (4.79%), certain traumatic complications and unspecified injuries (3.73%), and open wound of upper limb (2.42%) (18).

A study conducted in south India revealed that, 83% of the victims are male and the rest 17% are females and mostly injured age groups were 20-29 (31.3%), most of the victims were under 40 years and average age of the victims were 31.5. The commonest cause of injury was Motor bicycle(24.4%).The most common injury was fracture and the commonest site was lower limb(43.4%) followed by upper limb 19% then facial bone 10.9%,ribs,clavicle and pelvis accounts 7.7%,6.8%,3.6% respectively. (19).

The study done in Uganda shows that males (83%) were more injured than females (17%) and passengers are more injured than others, from them the most common cause is motorcycle (69%). The most common type of injury is fracture it accounts 76% specially extremities fracture (48.5%), from them 36.3% had open wound fracture, closed fracture seen on 15.9% of victims and dislocation occur on 7.6% of victims. Open wound injury occur around 40.2% of victims(20).

The study done in Tanzania shows that from all injuries Road traffic injuries were the most common mechanism of injury, representing 43.9% of injuries. From the injured patients 72.7% are males and 26.2% are females and the most common aged group were 15-44. The most common

type of injury was fracture specially extremities fracture (44.1%)and 77.2% develop closed fracture and the most common site were extremities fracture it accounts 44.1% (21).

The study done on Wolaita stated that RTAs were the leading cause of injury, accounts for 62.5% of all trauma victims followed by falling accident (20.8%) and personal violence (9.6%). Male gender (77.6%) was mostly injured than female. The most injured age groups were 20-29(35.42%) followed by 10-19(26.04%) years age. The most common cause of injury was motorcycle crashes it accounts (31.2%) then the second common cause is Isuzu (21.7%) followed by Bajaj (14.2%). From RTA victims' majorities was passengers (45.8%) followed by pedestrian (33.8%) and drivers (18.8%). From all victims 81.5% improved,12.5% disabled,6% died(22).

A study conducted in Arbaminch Hospital showed that males (68.1%) were more injured than females and most injured age groups were 20-29. The mean age was 25.5. From all injury RTA were the main cause of injury it accounts 47.0% and from this the most common cause was motorcycle crash (40%) followed by Bajaj (33%) then public bus (11.6%). From RTA victims(41%%) were passengers, (30%) were Drivers and (25%) were pedestrians. (16).

The study done in Hawassa showed that from all RTA victims' majority were male (59.9%) than female.70% of victims were between 20–49 years of age. Major cause of injury was motor bicycle crush it accounts 49% followed by public transport 16.8%. From the injured patient (18.8%) was pedestrian and (6.9%) accident happened around the street. Head injury is the most common type of injury it accounts(38.5%) followed by lower extremity(27.9%) then upper extremity(18.8%)(23).

The study was done on Menelik Specialized hospital (MSH) hospital showed most common cause of injury is RTA. The male gender was mostly injured (73.5%). Majority of the victim was pedestrian, and the most common cause was motor vehicle crash it accounts (56.7%). Most patients lived in Addis Ababa (73.2%). When we see their outcomes (61.8%) managed at the emergency and discharged, 30.7% were admitted to ward, 5% transferred to other hospital for subspeciality management,1.5% died,1.1%% left against medical advice(24).

A study done at TASH on injury characteristic and outcome of road traffic accident showed that majority of victims were males (71.8%) than females (28.3%) and majority of the victims were pedestrian (36.1%). Minibus was the most common cause of RTA. Head injury (50.4%) was the most common injury followed by extremities injury (47%). Majority of the victim got open wound (56.5%).out of all 78% had got fracture, from this the most common one was lower limb fracture

accounts 36.2% and the least one is pelvic fracture which accounts 5.1%. Majority of the accidents occurred in Addis Ababa city (60.4 %) while (39.6 %) occurred out of the city. From study subjects 77.5% improved, 6.1% disabled, 10.8% referred to other Hospitals, 7.4% died and 5.6% were on follow up and another study done on this area on adult limb fracture due to RTA revealed that road traffic injury is the most common one it accounts 47.9% and male gender were mostly injured (74.8%). Mostly injured age groups were 15-25 years (35.1%). Lower limb was mostly injured body part (57.4%) than upper limb (41.1%). Majority of the victim had closed fracture (82.2%). From the fractures femoral fracture is the highest(15.8%) then tibio fibular fracture(14.4%) followed by humors(12.9%), pelvic fracture occur around 3%of patients(5,25).

3. OBJECTIVE OF THE STUDY

3.1 General objective

To assess pattern of orthopedic injuries related to road traffic accident among patients managed at the emergency department of Tikur Anbessa Specialized Hospital, in Addis Ababa Ethiopia, 2021.

3.2 Specific objectives

- To examine the pattern of orthopedic injuries related to RTA among patients managed at ED of TASH.
- To identify orthopedic injuries related to RTA by type & site among patients managed at ED of TASH.

4. METHODS AND MATERIALS

4.1 Study area

Tikur Anbessa Specialized Hospital (TASH): One of the largest specialized and teaching hospitals, located in Addis Ababa city. It gives service for more than 700,000 patients per year. It has more than 700 beds and it serves as a training center for undergraduate and post graduate students. Orthopedic department is one of the main departments in the black lion hospital. It was established on September 25, 1987, as premier orthopedic center in the country. It gives full orthopedic clinical service, offers specialty and subspeciality training and conducts research. The department receives referred patients with trauma weather emergency or cold case and all regular musculoskeletal conditions from all over the nation (Data obtained from their websites).

4.2 Study period

The study was conducted from Jan 1st, 2019, up to Jan 1st 2021 G.C.

4.3 Study design

An institutional-based retrospective cross-sectional study was employed.

4.4 Source and study population

4.4.1 Source population

All orthopedic injured patients who had visited TASH due to RTA.

4.4.2 Study Population

All orthopedic injured patients related to RTA, who visited the emergency department of TASH from Jan 1st, 2019, up to Jan 2021 G.C

4.4.3 Study unit

The selected orthopedic injured patients by systematic random sampling.

4.5 Eligibility criteria

4.5.1 Inclusion Criteria:

Patients who sustained orthopedic injuries due to RTA and managed at the Emergency Department of TASH from January 1st, 2019, up to January 1st, 2021, G.C.

4.5.2 Exclusion Criteria

RTA patient chart without orthopedic injury

4.6 Study Variable

4.6.1 Dependent Variable

Pattern Orthopedic Injuries due to RTA

4.6.2 Independent Variables

Age

Sex

Address

4.7 Sample Size Determination and Sampling Technique

4.7.1 Sample Size Determination

Single proportion formula was used to determine the sample size:

$n = Z^2pq/ d^2$

Where n= the desired sample size

z = the standard normal deviate at a 95% confidence level (=1.96).

P = the proportion of pattern of orthopedic injury related to RTA. Which is not known; Hence, p=50% (0.5) is used.

$$q = 1-P=1-0.5=0.5$$

d =level of precision (set at 5 % or 0.05)

Substituting these figures in the above formula: n = 384

But the target population is less than 10,000 so the sample size was adjust using the following formula.

$$nf =n/1+n/N=384/1+384/2000=322$$

Then add 10% for missing charts.

Finally, nf=354

Where nf = the desired sample size (where the population is less than 10,000)

4.7.2 Sampling Technique

A Systematic sampling technique were used to select 354 patients' chart with orthopedics injury related to RTA who fulfill the inclusion criteria. Therefore, the first patient chart was selected randomly and then every K^{th} patient chart was selected that is K=N/n =2000/354=5.6~6.

4.8 Operational definition

Injury: Physical damage on the body intentionally or unintentionally

The pattern of injury: Characteristics of the object causing the injury, Numerical representation of orthopedic injury due to road traffic accident it is maybe bones, joints, muscles, ligaments, tendons, nerves, skin, and musculoskeletal system.

Pedestrian: A person walking rather than traveling in a vehicle

Passenger: A person traveling/transport/ by vehicle

Vehicles: A device for carrying or transporting individuals or objects.

Chart with any missing information: any chart who misses the valuable information about the Patient condition example diagnosis, which skeletal part was injured and their treatment outcome.

Multiple fracture: fracture at two or more places in a bone.

4.8.1 Data collection tool and procedure

A standardized structured checklist composed of closed-ended questions was used to collect the data. It was adapted from injury surveillance guideline of WHO with some modification(26). The data was collected by four nurses using a checklist and was taken directly from the patient chart.

4.8.2 Data processing and analysis

The collected data was checked for its clarity completeness and consistency. Then the response was coded and entered the computer using Epi data version 4.2 statistical package. Then the data exported to windows of Statistical Package for Social Science (SPSS) version 26 for data analysis. During the process of analysis, descriptive statistics (frequency, percentage, mean and standard deviation) was used to provide an overall and coherent presentation and description of the data using tables and figures.

4.8.3 Data quality management

To assure the data quality, training was given for data collectors for one day on a method of extracting the needed information, how to fill the information on a checklist and aim of the study and contents of the instruments. Therefore, data collectors were familiar with each content of checklist. 5% pretest was done prior to actual data collection to check the fitness of checklist.

There was an ongoing supervision throughout data collection. The filled checklist was checked visually for its completeness, missed values, and unlikely responses; those incomplete check list was tried to be filled with data collector as much as possible otherwise it was omitted from the analysis. The principal investigator made spot-checking and reviewing the completeness and consistency of the information that was collected; before the actual data possessing entry of 5% of the data to EPI data software package is made to maintain the data quality.

4.9 Ethical consideration

Ethical clearance was obtained from Addis Ababa University, College of Health Sciences, department of emergency medicine. An official letter was submitted to TASH and permission was taken from the concerned bodies. All collected data confidentiality were kept and the names/or other personal information was not notified in any report.

4.10 Dissemination and Utilization of Results

Primarily it will used for partial fulfillment in the requirements of the degree of master's in emergency medicine and Critical Care Nursing; it will be submitted and presented to the department of EMCCN, Addis Ababa University. Afterward, it will be presented to different scientific conferences. Finally, it will be submitted for possible publication in a reputable national or international journal to make it accessible to the scientific community.

5. RESULT

5.1 Demographic characteristics

Table 5-1 Demographic characteristics of study populations for assessing the pattern of orthopedic injury and their outcome among RTA victims visited TASH in Addis Ababa, Ethiopia from January 1st 2019 – January 1st 2021.

Variables		frequency	percent
Age	1-12	46	13.7
	13-24	107	31.8
	25-36	98	29.2
	37-49	39	11.6
	>49	46	13.7
Sex	Male	241	71.7
	female	95	28.3

Most of the study subjects are males 241 (71.7%). The mean age of study population was 29.1. From all age group, 13-24 age group are the most frequent victim ages 107(31.8%) and both the above and lower age group was the least frequently injured age group. Among study subject, 217(64.6%) live in Addis Ababa whereas the rest 119(35.4) live out of Addis Ababa.

5.2 pattern of injury

5.2.1. Distribution of the study population based on Anatomic site of injury.

Table 5-2 Pattern of study population based on Anatomic site of injury for assessing pattern of orthopedic injury and their outcome among RTA victims visited TASH in Addis Ababa, Ethiopia from January 1st 2019 – January 1st 2021.

S.No	which region of the body were injured	frequency	percent
1	upper limb	56	16.7
2	lower limb	161	47.9
3	Pelvic area	25	7.4
4	chest area	10	3.0
5	head injury	26	7.7
6	multiple injury	58	17.3

The common injured anatomic site is lower limb alone 161(47.9%) then multiple injury 58(17.3%) and the least one is chest area injury such as rib & clavicular fracture.

5.2.3. Distribution of study subject based on Nature of injury in the body.

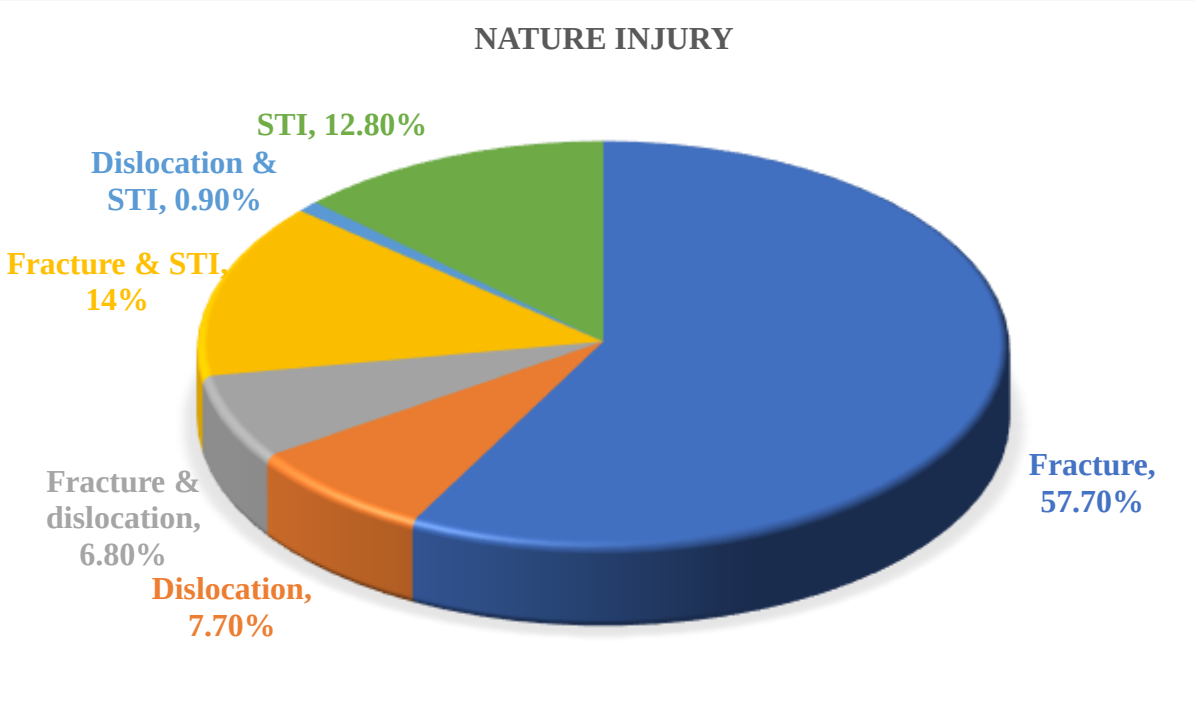

Figure 5-1 pattern of study population based on nature of injury in the body for assessing pattern of orthopedic injury and their outcome among RTA victims visited TASH in Addis Ababa, Ethiopia from January 1st 2019 – January 1st 2021.

Fractures are the most common type of injury 241 (71.7%) followed by STI 43(12.8%) then dislocation 29(8.6%).

5.2.4. Distribution of study subjects based on anatomic site of fracture.

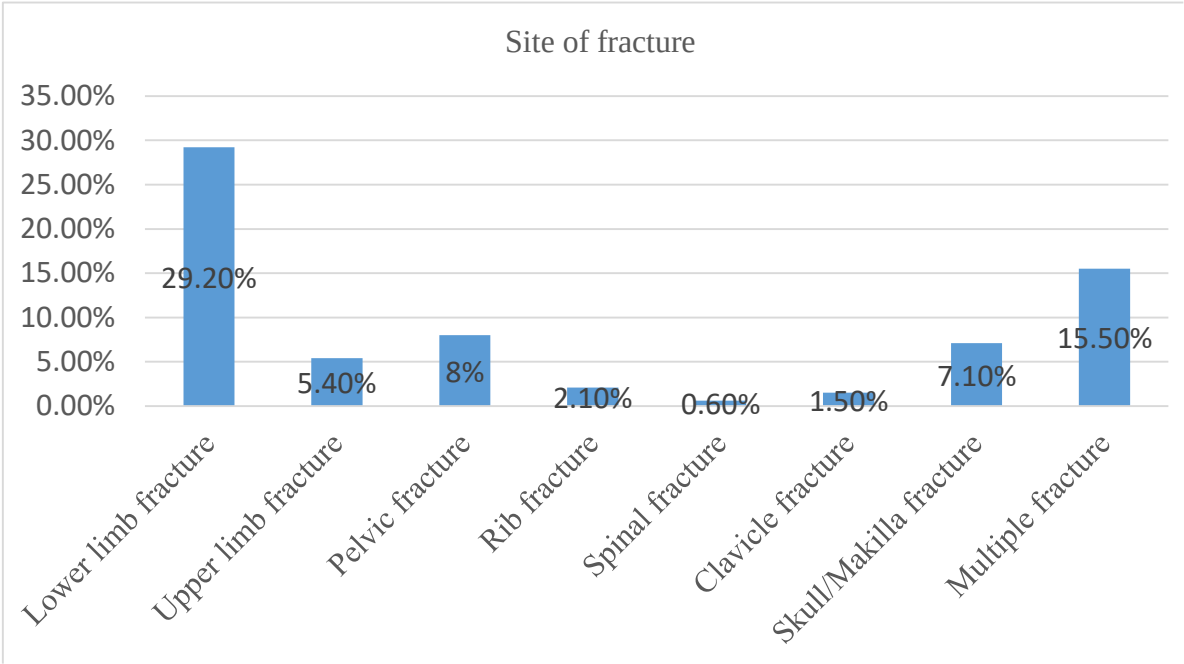

Figure 5-2 pattern of study population based on anatomic Site of fracture for assessing pattern of orthopedic injury and their outcome among RTA victims visited TASH in Addis Ababa, Ethiopia from January 1st 2019 – January 1st 2021.

The most common site of fracture is lower limb fracture 98(42.1%) & Multiple fracture 52(22.3%). The least one is spinal bone fracture which accounts 2(0.9%).

5.2.5 Distribution of study population based on type of fracture.

Table 5-3 pattern of study population based on type of fracture for assessing pattern of orthopedic injury and their outcome among RTA victims visited TASH in Addis Ababa, Ethiopia from January 1st 2019 – January 1st 2021.

Compound fracture is the most common type of fracture followed by simple fracture.

Type of fracture	frequency	Percent
simple	111	47.6
compound	122	52.4

5.2.6. Distribution of study population based on anatomic site of dislocation.

Table 5-4 Pattern of study population based on anatomic site of dislocation for assessing pattern of orthopedic injury and their outcome among RTA victims visited TASH in Addis Ababa, Ethiopia from January 1st 2019 – January 1st 2021.

S.No	Site of dislocation	frequency	percent
1	Shoulder	19	5.7
2	Elbow	14	4.2

3	Hip	12	3.6
4	knee	8	2.4

The common site of dislocation is shoulder 19(5.7%) whereas knee dislocation encounters the least 8(2.4%).

5.2.7. Distribution of study subjects based on skin integrity.

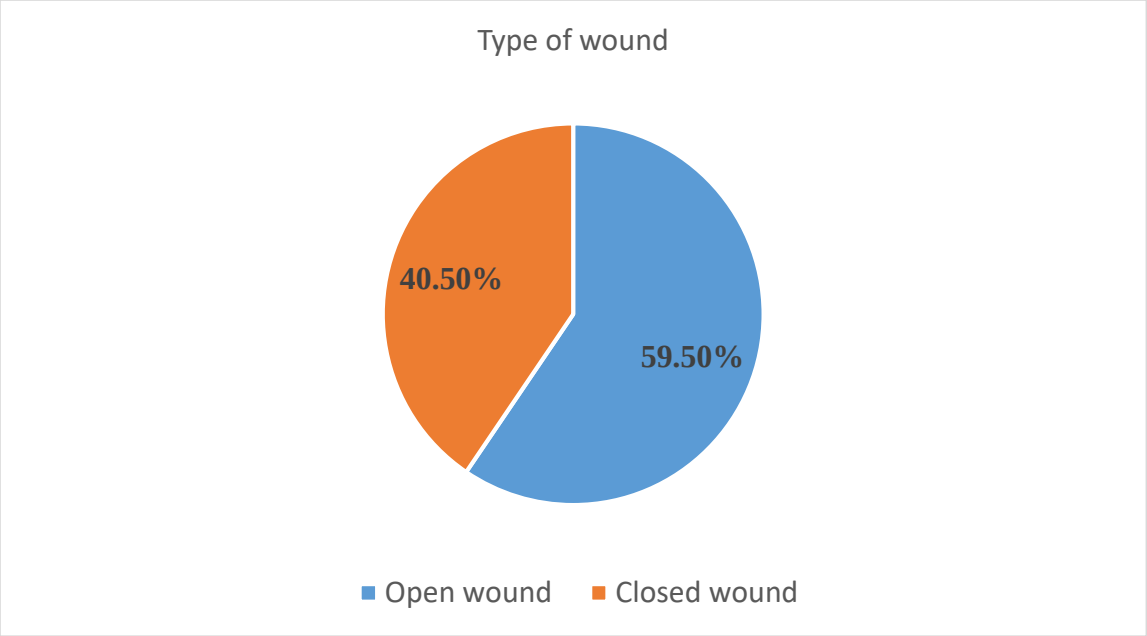

Figure 5-3 pattern of study population based on skin integrity for assessing pattern of orthopedic injury and their outcome among RTA victims visited TASH in Addis Ababa, Ethiopia from January 1st 2019 – January 1st 2021.

Among study subject's majority of them had open wound 200(59.5%).

5.2.8. Distribution of study population based on cause of injury.

Table 5-5 pattern of study population based on vehicle type that cause the injury for assessing pattern of orthopedic injury and their outcome among RTA victims visited TASH in Addis Ababa, Ethiopia from January 1st 2019 – January 1st 2021.

S.No	which vehicle type cause the injury	frequency	percent
1	Taxi	122	36.3
2	Motorcycle	92	27.4
3	Bicycle	28	8.3
4	Bus	18	5.4
4	pickup trucks	24	7.1
5	Others	52	15.5

From all study subject, the most common cause of injury was taxi 122(36.3%) and followed by motorcycle 92(27.4%). whereas pickup trucks were the least common cause of injury 24(7.1%).

5.2.9 Distribution of study population according to their situation during accident

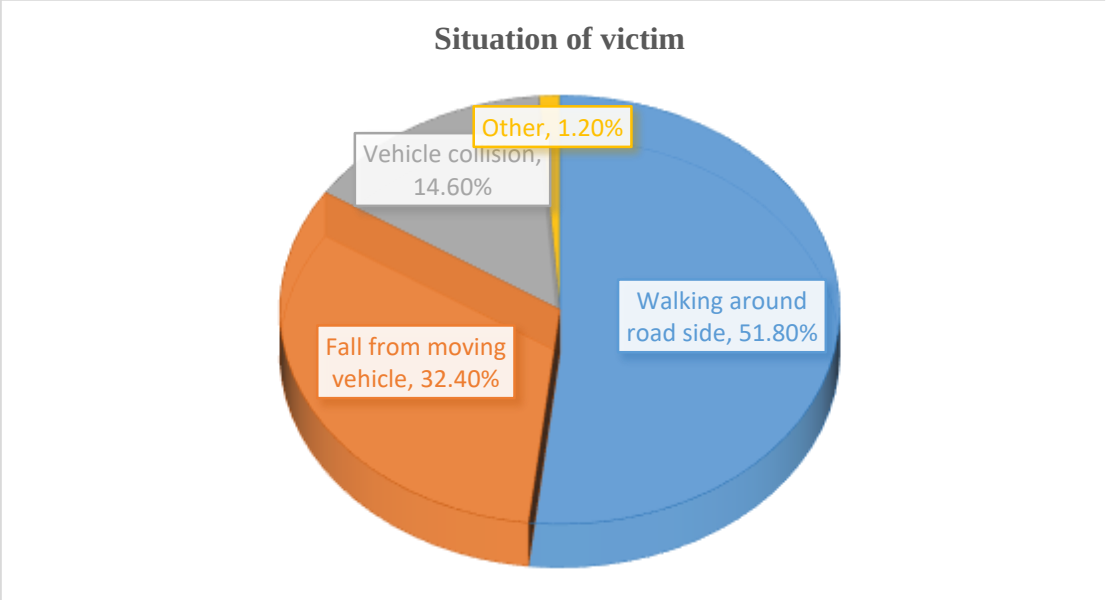

Figure 5-4 situation of the study population during injury for assessing pattern of orthopedic injury and their outcome among RTA victims visited TASH in Addis Ababa, Ethiopia from January 1st 2019 – January 1st 2021.

Around half of study subjects are injured while walking on the roadside or crossing the road 174(51.8%), followed by falling from moving vehicle 109(32.4%), vehicle collusion 49(14.6%) and the rest 4(1.2%) injured when the parking car moves while they were under it or/and between tires.

5.3 Distribution of study subjects based on patient condition when they came to TASH ED

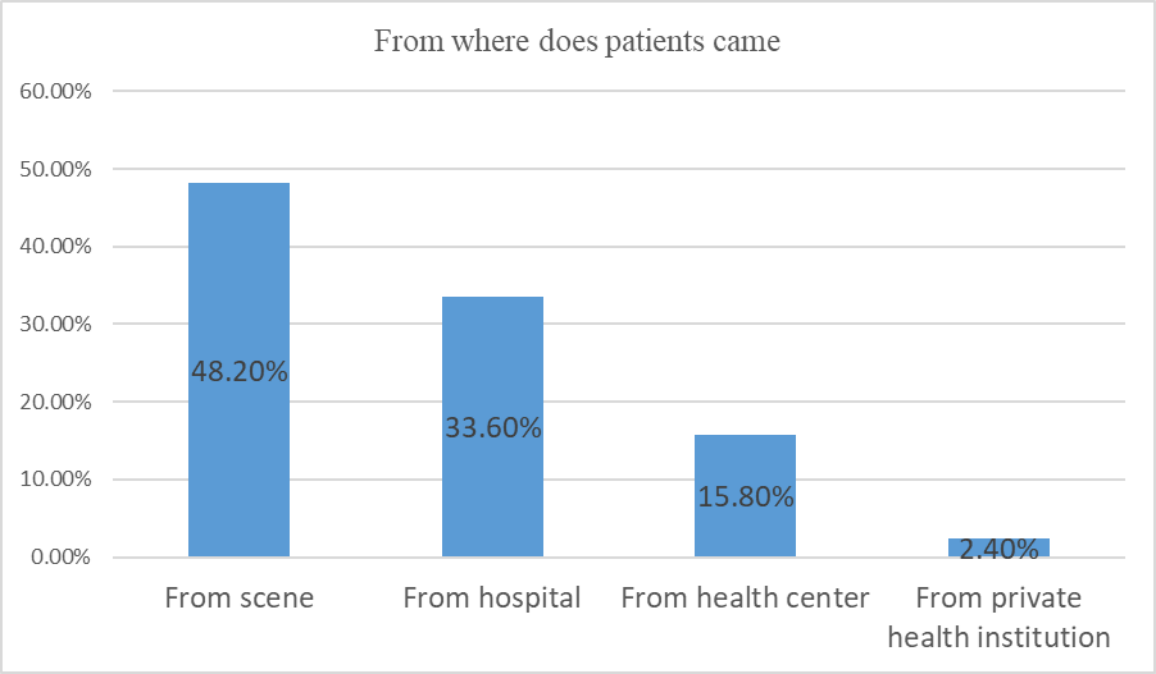

Figure 5-5 referral of the study population for assessing pattern of orthopedic injury and their outcome among RTA victims visited TASH in Addis Ababa, Ethiopia from January 1st 2019 – January 1st 2021.

The majority study subjects came with referral from health institution 174(51.8%). Of all, most patients 69.6% are stable while arrived at ED. from arrived patients 165(49.1%) did not get any medical support before arrival whereas 153 (45.5%) got some management such as first aid and resuscitation.

Table 5-6 treatment and their condition before ED of study population for assessing pattern of orthopedic injury and their outcome among RTA victims visited TASH in Addis Ababa, Ethiopia from January 1st 2019 – January 1st 2021.

Patient condition and stabilization		frequency	percent
Was treatment given Before arriving to ED TASH?	Yes	153	45.5
	No	165	49.1
	unknown	18	5.4
Which type of treatment was given?	first aid	17	5.1
	resuscitation	21	6.3
	medication	44	13.1
	All	69	20.5
	Other	6	1.8
	Stable	234	69.6

Condition of the patient at arrival of the emergency department	unstable	98	29.2
	died body on arrival	4	1.2

6. DISCUSSION

Among all orthopedics patients who attend TASH ED, almost half of them (49.7%) are due to RTA (27). Based on HMIS report of TASH there were a total 3397 RTA cases from January 1st, 2019, up to January 1st, 2021, and from this 2000 were orthopedic injury.

According to the finding, majority of the victim's age group were 13-24 with mean age of 29. As WHO report on 2018 RTA were the first top cause of death for young people aged 15–29 (14). A study conducted in TASH on 2007, the most affected age group with RTA was between 15-25yrs (35.1%) (25) which are consistent with my result. Even if there is a gap on study period, the victims are still adolescents & young adults. This might be due to high number of drivers in this age groups and it is the starting point of time for individual to expose them sieves to external environment independently.

This study shows that males (71.7%) were more injured. A study conducted in Taiwan(59.4%) & India(83%) found out that males are majorly injured person(18,19). Similarly, A research done in Uganda (83%) & Tanzania (72.7%) support this finding (20,21). Another study done on Menelik Specialized hospital shows that males (73.5%) are the most injured (24). The result of mentioned study is coincided with my finding. The reason behind why males account higher proportion of RTI might be due to working nature of male such as most drivers are males & are more exposed to external environment. And personal habit of male expose them more frequently. This could be the reason behind high number of male victims.

In this study the most common orthopedic injury was fracture especially lower limb fracture (29.2%). A study conducted in Nepal, Taiwan, Tanzania, and Uganda coincide the finding of common orthopedic injury which is fracture. When comparing findings of common anatomic site of fracture with study conducted on Taiwan skull bone & upper limb fracture was the commonest (17.9% & 12.2% respectively)(18), On India lower limb fracture was the common one followed by upper limb fracture (43.4 % & 19% respectively)(19), and on Tanzania(44.1%)(21) & Uganda(48.5%)(20) Both extremities are the commonest. Also, on another study done in Ethiopia HUCSH shows that both extremities fracture accounts for 27.9% and study on TASH in 2013 shows fracture accounts for 78% from which lower limb fracture is the commonest (36.2%). According to my finding extremity fracture was 48.8% (lower limb 42.1% and upper limb 7.7%). This all studies imply extremities fractures were the commonest fracture even if in Taiwan skull

bone fracture was the common, but my finding is high as compared to study conducted in HUCSH. The reason behind this could be the cause of injury which was different in the two-study area (in HUCSH Motor bicycle was the commonest cause of RTA accounts 49% of all cause unlike my finding which is taxi (36.3%)

This study showed that majority of the study subjects had open wound (59.5%). A study on Uganda showed that open wound injury account around 40.2%(20). Another study done in TASH on 2010, shown that open wound injury accounts for 56.5%(25). This is almost consistent with my finding. This is due to most study subjects are pedestrian and according to my finding common cause of injury was taxi unlike Uganda and TASH studies which was MVA.

The finding of this study reveal that most victims were pedestrian (51.8%). Another study on Hawassa showed that pedestrians victims accounts only 18.8% (22). The wide difference between the two findings might be due to high road crowdedness & high flow of pedestrian around the road in Addis Ababa.

According to my finding, most common vehicle that cause injury was taxi (36.3%) followed by motorcycle (27.4%). A study done in India on pattern of injury from RTA stated that most of RTA is caused by motor vehicle(73.5%)(28). another study done in Arbaminch, Wolaita and Hawassa shown that the most common cause of injury was motorcycle crashes it accounts 40%, 31.2% and 49% respectively(16,22,23). The discrepancy on the cause of injury might be majority of people who live in Addis use car(Taxi) as a means of transportation as compared to people live in Arbaminch and Wolaita that use motor bicycle as a means of transportation and also 62% of national cars found in Addis Ababa(29).

7. CHAPTER SEVEN: CONCLUSION

Road traffic accident takes the life of many individuals. Reproductive age groups especially among males are the most vulnerable groups to RTA. According to my finding the most common cause of RTA was Taxi (minibus) and pedestrian were the most injured victims. The major type of injury was fracture especially lower limb fracture. Significant number of victims had got open wound. Most of the victims didn't get any medical support before arrival.

8. CHAPTER EIGHT

8.1 Limitation of the study

The study did not incorporate victims those directly gone to outpatient department of TASH. It is limited to those victims who attend TASH including referred cases from different health institution and it does not incorporate those who did not attend health institution & those experience only traditional healing practice. Since secondary data are used, precision could not be measured.

8.2 Recommendations

Based on the findings I recommend the following points to mentioned responsible body

To Federal ministry of health

To give ATLS training for health care professional & also first aid training for drivers & traffic polices.

To transport ministry

I recommend transport minister that since pedestrian are the most vulnerable for RTIs, transport ministry is expected to work on creating awareness among the society about proper use of road, health consequence of RTA by using different reachable methods like poster & media.

To researcher

I recommend researchers to conduct further research on the topic on community-based study to see real magnitude of orthopedic injury related to RTA.

To society

Everyone in the society should consider themselves as responsible person in minimizing & preventing RTA related orthopedic injury.

To TASH

The hospital should communicate with road traffic authority to develop linkage with the hospital to improve the health care system on trauma.

9. CHAPTER NINE: REFERENCES

1. Wolde A, Abdella K, Ahmed E, Tsegaye F, Babaniyi OA, Kobusingye O, et al. Pattern of injuries in Addis Ababa, Ethiopia: A one-year descriptive study. East Cent Afr J Surg [Internet]. 2008 [cited 2021 Mar 8];13(2):14–22. Available from: https://www.ajol.info/index.php/ecajs/article/view/136639

2. Orthopedics | Common Orthopedic Injuries | Beaumont Health [Internet]. [cited 2021 Mar 8]. Available from: https://www.beaumont.org/conditions/common-orthopedic-injuries

3. Gebresenbet RF, Aliyu AD. Injury severity level and associated factors among road traffic accident victims attending emergency department of Tirunesh Beijing Hospital, Addis Ababa, Ethiopia: A cross sectional hospital-based study. PLOS ONE [Internet]. 2019 Sep 26 [cited 2020 Oct 12];14(9): e0222793. Available from: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0222793

4. Seyoum G. CLINICAL PROFILE AND PATTERNS OF EXTREMITIY FRACTURES AMONG PATIENTS VISITING ORTHOPEDICS DEPARTMENT IN TIKUR ANBESSA SPECIALIZED HOSPITAL, ETHIOPIA. Ethiop Med J [Internet]. 2020 Mar 25 [cited 2020 Oct 27];58(02). Available from: https://emjema.org/index.php/EMJ/article/view/1259

5. 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 [Internet]. 2015 May 20 [cited 2020 Oct 27];15(1):10. Available from: https://doi.org/10.1186/s12873-015-0035-4

6. Aloudah AA, Almesned FA, Alkanan AA, Alharbi T. Pattern of Fractures Among Road Traffic Accident Victims Requiring Hospitalization: Single-institution Experience in Saudi Arabia. Cureus [Internet]. [cited 2020 Oct 12];12(1). Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6996471/

7. Alonso JE, Lee J, Burgess AR, Browner BD. THE MANAGEMENT OF COMPLEX ORTHOPEDIC INJURIES. Surg Clin North Am [Internet]. 1996 Aug 1 [cited 2021 Mar 8];76(4):879–903. Available from: https://www.sciencedirect.com/science/article/pii/S0039610905704862

8. Ahmadi M, Mohammadi A, Chraghbaigi R, Fathi T, Shojaee Baghini M. Developing a Minimum Data Set of the Information Management System for Orthopedic Injuries in Iran. Iran Red Crescent Med J [Internet]. 2014 Jul [cited 2021 Mar 8];16(7). Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4166095/

9. Nickenig Vissoci JR, Shogilev D, Krebs E, Andrade L, Vieira I, Toomey N, et al. Road Traffic Injury in Sub-Saharan African Countries: A Systematic Review and Summary of Observational Studies. Traffic Inj Prev. 2017 Apr 27; 18:00–00.

10. Nantulya VM, Reich MR. The neglected epidemic: road traffic injuries in developing countries. BMJ [Internet]. 2002 May 11 [cited 2021 Jan 2];324(7346):1139–41. Available from: https://www.bmj.com/content/324/7346/1139

11. Conway DJ, Coughlin R, Caldwell A, Shearer D. The Institute for Global Orthopedics and Traumatology: A Model for Academic Collaboration in Orthopedic Surgery. Front Public Health [Internet]. 2017 [cited 2021 Mar 9];5. Available from: https://www.frontiersin.org/articles/10.3389/fpubh.2017.00146/full

12. Mahdian M, Fazel MR, Sehat M, Khosravi G, Mohammadzadeh M. Epidemiological Profile of Extremity Fractures and Dislocations in Road Traffic Accidents in Kashan, Iran: a Glance at the Related Disabilities. Arch Bone Jt Surg [Internet]. 2017 May [cited 2021 Mar 9];5(3):186. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5466864/

13. Mohan D. Road safety in less-motorized environments: future concerns. Int J Epidemiol. 2002;31(3):527–32.

14. Peden MM, World Health Organization, editors. World report on road traffic injury prevention. Geneva: World Health Organization; 2004. 217 p.

15. Vincent HK, Horodyski M, Vincent KR, Brisbane ST, Sadasivan KK. Psychological Distress After Orthopedic Trauma: Prevalence in Patients and Implications for Rehabilitation. PM&R [Internet]. 2015 Sep 1 [cited 2021 Mar 9];7(9):978–89. Available from: https://www.sciencedirect.com/science/article/pii/S1934148215001380

16. Hailemichael F, Suleiman M, Pauolos W. Magnitude and outcomes of road traffic accidents at Hospitals in Wolaita Zone, SNNPR, Ethiopia. BMC Res Notes [Internet]. 2015 Apr 9 [cited 2021 Jan 2];8(1):135. Available from: https://doi.org/10.1186/s13104-015-1094-z

17. Pant R, Lamsal DK, Thakali K, K.c KM. A study of pattern of orthopedic injuries among patients attending an emergency department of Civil Service Hospital, Kathmandu Nepal. J Gen Pract Emerg Med Nepal [Internet]. 2018 Dec 22 [cited 2021 Jan 2];5(7):9–14. Available from: http://jgpeman.com/index.php/jgpeman/article/view/94

18. Pan R-H, Chang N-T, Chu D, Hsu K-F, Hsu Y-N, Hsu J-C, et al. Epidemiology of Orthopedic Fractures and Other Injuries among Inpatients Admitted due to Traffic Accidents: A 10-Year Nationwide Survey in Taiwan [Internet]. Vol. 2014, The Scientific World Journal. Hindawi; 2014 [cited 2020 Oct 12]. p. e637872. Available from: https://www.hindawi.com/journals/tswj/2014/637872/

19. Jha N, Srinivasa D, Roy G, Jagdish S. Injury Pattern among Road Traffic Accident Cases : A Study from South India. Indian J Community Med. 2003 Jan 1;28.

20. Mutooro SM, Mutakooha E, Kyamanywa P. A Comparison of Kampala Trauma Score II with the New Injury Severity Score in Mbarara University Teaching Hospital in Uganda. East Cent Afr J Surg [Internet]. 2010 [cited 2020 Dec 12];15(1):62–71. Available from: https://www.ajol.info/index.php/ecajs/article/view/136538

21. Casey ER, Muro F, Thielman NM, Maya E, Ossmann EW, Hocker MB, et al. Analysis of traumatic injuries presenting to a referral hospital emergency department in Moshi, Tanzania. Int J Emerg Med. 2012 Jun 8;5(1):28.

22. Misker D, Tunje A, Mengistu A, Abera F, Yalelet M, Gebrie M, et al. Magnitude and Factors Associated with Road Traffic Accident among Traumatized Patients in Arba Minch General hospital, 2017. Int J Public Health Saf [Internet]. 2017 [cited 2020 Dec 6];2(3):1–5. Available from: https://www.hilarispublisher.com/abstract/magnitude-and-factors-associated-with-road-traffic-accident-among-traumatized-patients-in-arba-minch-general-hospital-20-32352.html

23. Duko B, Tadesse F, Oltaye Z. Patterns of road traffic injury and potential consequences among patients visiting Hawassa University Comprehensive Specialized Hospital, Hawassa, Ethiopia. BMC Res Notes [Internet]. 2019 Mar 29 [cited 2020 Oct 27];12. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6439992/

24. Laytin AD, Seyoum N, Kassa S, Juillard CJ, Dicker RA. Patterns of injury at an Ethiopian referral hospital: Using an institutional trauma registry to inform injury prevention and systems strengthening. Afr J Emerg Med [Internet]. 2020 Jun 1 [cited 2020 Oct 27];10(2):58–63. Available from: http://www.sciencedirect.com/science/article/pii/S2211419X20300021

25. Admassie D, Yirga T, Lamisho B. Adult limb fractures in Tikur Anbessa Hospital caused by road traffic injuries: Half year plain radiographic pattern. Ethiop J Health Dev [Internet]. 2010 [cited 2021 Feb 3];24(1). Available from: https://www.ejhd.org/index.php/ejhd/article/view/379

26. Holder Y, Peden M, Krug E et al (Eds). Injury surveillance guidelines. Geneva, world Health Organization, 2001.pdf.

27. Ahmed E, Chaka T. The pattern of orthopedic admissions in Tikur Anbessa University Hospital, Addis Ababa. Ethiop Med J. 2005 May 1; 43:85–91.

28. Shamim M. Pattern of Injuries from Road Traffic Accidents Presented at a Rural Teaching Institution of Karachi. Indian J Surg. 2017 Mar 1;79.

29. Tiruneh BT, Dachew BA, Bifftu BB. Incidence of Road Traffic Injury and Associated Factors among Patients Visiting the Emergency Department of Tikur Anbessa Specialized Teaching Hospital, Addis Ababa, Ethiopia [Internet]. Vol. 2014, Emergency Medicine International. Hindawi; 2014 [cited 2020 Oct 12]. p. e439818. Available from: https://www.hindawi.com/journals/emi/2014/439818/

10. CHAPTER TEN: APPENDIX

Questionnaire

Serial number

Possible response (make a circle for answers)

Serial number	**PART I- SOCIODEMOGRAPHIC DATA**	**Possible response**
1	Age	_____in number
2	Gender	A. Male B. Female
4	Residence	A. In A.A B. Out of A.A
	Part II Effects of injury on the body	
5	Situation of the victim during the injury	A. Walking on the roadside, crossing the road B. Fall from a moving vehicle C. vehicle collision D. Others….
6	Which vehicle type cause the injury	A. Taxi B. Motorcycle C. Bicycle D. Bus E. Pickup trucks F. Others…..
7	Which region of the body were injured? (Anatomic location)	A. upper limb B. lower limb

		C. Pelvic area D. chest area E. skull fracture F. multiple fracture
8	Characteristics / nature of injury in the body	A. Fracture B. Dislocation C. fracture and Dislocation D. Fracture and STI E. Dislocation and STI F.STI G. others…….
9	site of Dislocation	A. Shoulder B. Elbow C. Hib D. knee
10	Site of fracture	A. lower limb fracture B. upper limb fracture C. pelvic fracture D. rib fracture E. spinal fracture F. clavicle fracture G. skull/maxilla facial fracture H. multiple fracture
11	Type of fracture	A. Simple B. Compound
11	Types of wound/skin break or not	A. open wound B. closed wound
12	From where the patient comes to the emergency department?	A. From the scene B. From hospital C. From health center D. From private health institution.
13	Was treatment given Before arriving to ED?	A. Yes B. No C. unknown
14	If yes Q13 which type of treatment was given?	A. First aid (basic) B. resuscitation C. medication D. all E. Others_____
15	How was the condition of the patient at arrival of the emergency department? (Based on vital sign)	A. Stable B. Unstable C. died body on arrival

16	What was the care given in the emergency department?	A. resuscitation B. medication C. both D. other_____.