

**PATTERN OF TRAUMA ADMISSIONS AND OUTCOME IN PATIENTS PRESENTED TO
JIMMA UNIVERSITY SPECIALIZED HOSPITAL, AUGUST 2015 – NOVEMBER 2015.**

BY BADHAASAA BEYENE (MD)

**A RESEARCH PAPER SUBMITTED TO JIMMA UNIVERSITY COLLEGE OF PUBLIC HEALTH
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December, 2015

Jimma, Ethiopia

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BY BADHAAS AA BEYENE (MD)

ADVISORS: SEIFU ALEMU (MD, Assistant professor of Surgery)

ABDULHALIK WORKICHO (Epidemiologist, PhD Fellow)

**December 2015,
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Abstract

Background

Trauma is a neglected disease of the modern society regardless of socioeconomic factor of the society because much is not done especially for its prevention. Once it occur third of patients will die at the scene showing the severity of the problem even not allowing intervention. This condition gets worsened in developing countries like Ethiopia where there is no trauma registry data base and triage as well as universal treatment protocol was not developed.

Objective: To identify the pattern of trauma associated hospital admission and Outcome of patients treated in JUSH.

Method: A prospective descriptive study was conducted in Jimma University Specialized Hospital, which is located in South Western Ethiopia from August 2015 – November 2015. The source population was all emergency surgical admissions of which the trauma patients were included as a study population. Consecutive sampling method was used with the calculated sample size of 210. Depending on inclusion and exclusion criteria 211 trauma patients were included in the study. The data was collected by pre tested structured questionnaire with trained surgical residents. The collected data get cleared, coded and analyzed by computer program spss version 20.0

Result

A total of 211 admitted trauma patients were studied with male to female ration of 3.14. One hundred seventy eight (84.4%) of patients were found in the age range of 11 - 40 years. The leading cause of trauma admission was Road Traffic Accident (RTA) 39.8% and the least being bullet injury which was 2.8%. Majority of RTA happened on pedestrians followed by drivers of motor bicycle themselves. Admitted Patients were given different management according to their diagnosis and 80.1% of them discharged improved and hospital fatality rate was 7.6% with male predominance 93.3%. The outcome of patients significantly associated with mechanism of trauma (P - value 0.001). Patients in the age range of 21-40 years accounted 68.75% of hospital deaths resulting from trauma.

Conclusion

As trauma is preventable cause of death worldwide this study also showed similar finding which was more common in young productive force of a country. Unlike other developed and developing countries pedestrians and motor cyclists were the major victims of the accident which can be improved by teaching pedestrians as well as drivers about road traffic safety precautions. Additionally, improving better road facility and other infrastructures has paramount advantage.

Acknowledgement

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Acronyms

RTA	Road traffic accident
MVI	Motor Vehicle Injury
ISS	Injury severity scale
TRISS	Trauma and injury severity score
ASCOT	A severity characterization of Trauma
DALYs	Disability adjusted Life years
ORIF	Open reduction and internal fixation
PACU	Post anesthetic care unit

CHAPTER ONE BACKGROUND

1.1 INTRODUCTION

Trauma is a leading cause of death and disability worldwide, contributing significantly to the global burden of disease but with no much due attention. It is termed as “*neglected disease of Modern society*.”

The World Health Organization (WHO) estimates that injury is responsible for more than 5 million deaths annually, more than the mortality caused by human immunodeficiency virus, malaria, and tuberculosis combined. It is the most frequent cause of death in the first four decades of life, and it remains a major public health problem in every country, regardless of the level of socioeconomic development. [1, 2] More than 90% of injury occurs in low- and middle-income countries, where formal trauma systems and methods for data tracking have not yet been widely implemented.

Injury have traditionally been defined as physical damage to a person caused by an acute transfer of energy (mechanical, thermal, electrical, chemical, or radiation energy) or by the sudden absence of heat or oxygen. This definition has been broadened to include damage that results in psychological harm, mal-development, or deprivation. Injuries are most commonly categorized with reference to the presumed underlying intent: injuries considered to be unintentional include those caused by road traffic incidents, falls, drowning, burns, and poisonings, and injuries considered to be intentional include those caused by self-harm, interpersonal violence, and war and conflict. [3]

Pattern of Injury By mechanisms and severity

The distribution of injury by mechanisms varies for death, hospitalizations, and emergency department visits. The two leading causes of trauma related death are related to motor vehicles and firearms, accounting for 29% and 18% respectively, of all injury related deaths in 2003. In contrast falls, the leading causes of nonfatal injury accounts about one third of hospitalizations and emergency department visits (15% and 18% respectively). Leading causes of death among the fatal injuries are injuries sustained to the central nervous systems for 40%-50% of the total and the second one is hemorrhage, accounting for 30%-35% [4]

There are triphasic occurrences of death in trauma patients in which one third of them occur at the scene of the injury and is therefore inevitable death. Early phase of trauma related death occurs when patient reach hospital and cannot be salvaged without emergent intervention. But patient who get advanced trauma management thought to be salvaged at this phase. The late trauma related death is associated with infections and malnutrition. [5]

Therefore all this deaths can be prevented with appropriate prevention efforts before it occurs and providing prompt intervention once it happen.

Public health interventions are traditionally characterized in terms of three levels of prevention: These three levels of prevention are defined by their temporal aspect – whether prevention takes place before violence occurs, immediately afterwards or over the longer term. [6]

Injury severity scoring and outcome

This is to predict outcome following trauma. The outcome interest can be of survival, hospital or ICU stay or performance or procedure delivery which takes in account the anatomic Injury score, physiologic derangement score and comorbidity scores. The Trauma and injury severity score (TRISS) incorporates all the above components. Similarly an outcome predictor developed in 1965 in Uganda, the Kampala Trauma Score which combines different parameters. [4, 7] Mainly the use of this severity scoring systems predicts the possible outcome of trauma patients but cannot exactly tell what is going to happen and helps for triage and patient transfer to the base care.

Outcomes are the result of care from the perspective of the patient, Provider, Payer and society. It also includes length of stay, cost, quality of life, patient satisfaction and compliance with the guidelines. [4]

1.2. STATEMENT OF THE PROBLEM

Trauma is the major cause of mortalities and morbidities worldwide despite the socioeconomic background of the societies. The only difference is mechanism of injury and level of care. Whatever the cause, in one third of the victims, it costs their life and disables the rest. In developed countries there is a systematic approach to this trauma patients starting from the incident of trauma to the level of tertiary hospital care with different management protocols. Despite this effort one third of trauma patient die at the scene of injury which makes its management challenging. [4]

Therefore different prevention methods for different mechanisms of trauma has been devised and yet needs more modifications and efforts to stop like interpersonal violence, suicides, and other homicidal acts worldwide. For instances , safety driving precaution ,improving infrastructure conditions like road and establishing better transportation facilities in developing countries , tight criminal laws, etc. can lessen the ever increasing prevalence of injury associated morbidities and mortalities.[6,8,9]

WHO estimates that 16 000 people die every day from trauma injuries, and for every person who dies, several thousands more are injured, many of them with permanent disability. Injury accounts for 16% of the global burden of disease. According to WHO, **road traffic injury** is ranked ninth among the leading causes of loss of disability adjusted life years (DALYs) worldwide, and is anticipated to rise to become the third leading cause by 2020 [4, 10] but In sub-Saharan Africa, already it ranks third as a major cause of death and permanent disability among the adult population after tuberculosis and HIV/AIDS. [11]

CHAPTER TWO LITERATURE REVIEW

2.1 LITERATURES

According to research done in central India, Annual incidence of trauma was 22.78%. RTA was the commonest cause of injury (46.85%). Most common age group affected was 11-40 year age group (64.06%), with predominance of Male (79.4%) and rural population (72%) [1] On the other hand study conducted in Canada showed that Elderly patients age > 65 years make up only 30% of total admissions but accounts for more than 50% of the deaths that result from trauma. Falls were the most frequent injuries and accounted for 64% of all trauma admissions in this age group. RTAs were the next most common and accounted for 27% of admissions. [12] Similarly, research done in district of Doha/ Qatar shows, the sex proportions were 80% males and 20% females. Concerning the mechanisms of trauma, Road traffic collisions were the most frequent causes of injuries and constituted 56.25% of all cases and predominant among the 11-40 age group. Falls were the second most common cause of injuries; they were responsible for 15.61% of all cases followed by fall from a height representing 15.52% of all cases. [13]

The research done by Kirya F. M. in Mulago Hospital, Uganda shows Road traffic injuries accounted for 75% of the cases and these were followed by assaults in 21% of the cases. [14]

In road traffic injury cases, frontal impact was the commonest mode (51.47%) most cases were unintentional injury (68%) and Alcohol intoxication was present in 11.07% of cases. [15]

Study by Ogendi J OK. from western Kenya showed RTA was leading cause of hospitalization, and accounted for most injury- associated in- hospital stay and deaths, and majority of these RTA (39.1%) involved public transport occupants. [11]

Study conducted in Tikur Anbessa Hospital for one month, RTA fatality rate was 2.6 % and admission to the facility was 3.8% while 17.6% patients transferred to other hospitals for admission. Another study from Addis Ababa Hospitals showed emergency trauma patients who visited OPD account 26.7% with admission rate of 4.5%. [2, 16]

As community based research in Jimma zone showed, the three most common causes of injury were, sharp instruments cut 122(33.5%) ,falling accident 76(20.9%) and violence 64(17.6%). [17] And another study done In Jimma university specialized Hospital by Kifle and Negalign showed trauma accounts 1102(8.2%) of surgical outpatient department. The commonest mechanism of injury was blunt assault, 341(30.9%), followed by road traffic accident, 334(30.3). Fracture was the leading

outcome of injury, 454(41.2%), followed by bruise or skin laceration, 404(36.7%). [18]

As to the site of trauma, the musculoskeletal system is most commonly affected (31.4%) followed by the cranial (21.8%), intra- abdominal including genitor- urinary (12.5%) and cardiothoracic (12.5%) systems respectively. Multisystem injuries were representing only 21.8% from the whole number of cases involved in this study. [13] Review of Road Traffic Accident Admissions in a Nigerian Tertiary Hospital by O.V. Akinpelu, showed Head injuries occurred in 132 (37.3%) patients, femoral fractures in 47 (14.1%), Spinal injuries in 33 (9.3%), leg fractures in 33 (9.3%). Isolated injuries occurred in 79.4% while 20.6% had multiple injuries. (32.6%) of all cases involved motorcycles, pedestrian accidents occurred in 84 (23.7%). [19]

In the year 1998/1999, there were 3.8 million acute admissions in hospitals throughout the United Kingdom and acute admissions for orthopedics and trauma patients constituted 8%. A study from Irrau, Nigeria showed, the total orthopedics and trauma admission was 2129 patients. Adult admissions were 1822 (85.58%) patients while pediatric admissions were 307 (14.42%). Of the 1446 (67.92%) male admissions, 201 were in the pediatric age group whereas of the 683 (32.08%) female admissions, 106 were in the pediatric age group. The male to female ratio was 2.1:1. [20]

Trauma causes a global mortality rate of 10% and left many in life long disability as research done in Saudi Arabia by Emad Hokkam et al depicted. [21]

Research done by Nik Hisamuddin Nik Ab Rahman et al from Malaysia showed that, Time has always been a crucial factor in determining the outcome of patients after trauma. 58.7% of deaths occurred within 48 hours of presentation; of the remaining 22.7% patients died within 3-7 days, 18.7% later than 7 days. [10]

Similarly research done by Kirya F. M. in Mulago Hospital, Uganda There were 39 deaths (26% mortality rate), 25 (64.1%) of which were unexpected using the TRISS methodology. The leading causes of death were intracranial hematoma (46%) and hemorrhagic shock (41%).

Twenty-three (59%) of the deaths were occurred on the first day of injury. Missed injuries contributed 13 (54%) of the preventable deaths. [14] Also Trauma review In Ethiopia showed the rates of death from MVIs and homicide are generally higher with an average weighted pool percentage of 37.5% and 24.1% respectively [3]

There was significant delay between the time of the crash and arrival at hospital (average of 9.2 hours, range 1 - 17hours) in developing country like South Africa which has impact on the outcome.

[22] On the contrary the average time for transfer in Saudi Arabia is 45 min. [21] and the duration of hospital stay varied from 1 to 308 days with a mean duration of 29 days. [19] The average number of total ICU admissions was about 350 patients per year and about 20% of them were trauma patients. [11]

According to Trauma systematic Review on 36 articles done in Ethiopia by A. Azaj et al, Hospital admission rate among those presented with injury at the OPD was assessed by seven articles. The admission rate range between 5.2% and 37.7% and those admitted patients have stayed for an average of 10-14 days (range 1- 283 days).[3]

Assessment of the utility of specialized services among the admitted cases showed that nearly three quarters (72%) required X-rays/imaging services, 43.3% required the use of theatre for surgical procedures, 20.0% required blood transfusion, while 1.0% was admitted to the Intensive Care Unit (ICU). Of the 10 patients admitted to ICU, 7(70%) were due to RTC. [11]

2.2 SIGNIFICANCE OF THE STUDY

This study will point out the incidence of trauma admission in J USH which is not known by formal study before and also the outcome of patients offered different treatment options according to the scientific recommendations with minimal available resources. Specifically it will also identify the commonest causes of trauma and trauma associated deaths which will alert concerned body like policy makers to design prevention methods. Also this research will compare the obtained result with others countries result providing recommendations for better care.

CHAPTER THREE OBJECTIVE

3.1 GENERAL OBJECTIVE

- ❖ To identify the pattern of trauma admissions and treatment outcome in JUSH.

3.2 SPECIFIC OBJECTIVE

- To describe characteristics of admitted patients in JUSH.
- To determine the pattern of trauma admissions in JUSH.
- To identify treatment given in accordance to guidelines.
- To assess the association between different mechanisms of trauma and their outcome

CHAPTER FOUR METHODS AND MATERIALS

4.1 STUDY AREA

The study was conducted in Jimma University Specialized Hospital which is located in Oromiya region, south western Ethiopia about 341km from the capital city. The study area, J USH gives service for catchment areas from three regions namely SNNP, Gambela and Oromiya Region with the total population of around 15 million. Majority of the patients come from the later region mainly Jimma zone as a whole, Illu Ababor zone and parts Wollega Zone.

4.2 STUDY PERIOD

The study was conducted from august 1, 2015 to November 30, 2015.

4.3 STUDY DESIGN

Prospective descriptive study was used.

4.4 SOURCE POPULATION

The source population was Patients admitted as emergency to surgical wards during the study period.

4.5 STUDY POPULATION

All trauma patients who admitted to wards or ICU during the study period were incorporated in the study.

4.6 SAMPLING METHOD AND SAMPLE SIZE

Consecutive sampling method was used to incorporate all study population of interest during the study period.

To determine acceptable minimum sample size with the formula

$n = Z^2 (P) (1-P) / e^2$ where $Z= 1.96$ at 95% C.I., $p=proportions$ in general population $e=margin$ of error

Taking the values for

$p=38\%$, which is the prevalence of trauma/admission. [23, 24]

$e = \pm 0.05$,

$n = 1.96^2 p (1-p) / e^2$

$n = 1.96^2 \times 0.38 \times 0.62 / 0.05^2 = 362$. Considering small population size reduction/correction can be done with formula

$n_1 = n / (1 + (n - 1) / N)$ where N = the number of study population expected. Let be $N = 500$,

$$n_1 = 362 / 1 + (362 - 1 / 500) = 362 / 1.722 = \mathbf{210}$$

4.7 DATA COLLECTION PROCEDURES

Data was collected with pre tested structured questionnaires which has both open and closed ended questions by trained surgical residents from secondary source which is the patients card while they were in the facility and any incomplete information was collected from the patients themselves

4.7.1 Measurements

Instruments

The data was filled with trained residents on to structured questionnaires

Inclusion criteria-

- ✓ all trauma admissions to surgical wards /ICU of Jimma University Specialized Hospital

Exclusion criteria-

- Patients who sustain burn and poisoned
- Patients who will not consent
- Patients who will come unconscious and the trauma condition is unknown

4.7.2 Variables

Independent Variables

- Age,
- Sex
- Address

Dependent Variables

- o Trauma severity
- o Vital signs of patient
- o Outcome of patient
- o Primary survey
- o Secondary survey

- o Duration of hospital stay

4.8 DATA ANALYSIS AND INTERPRETATION

Data was cleared, coded, checked for completeness and entered into SPSS version 20 and analysis was made. The result was reported in sentences, shown in tables, graphs and discussed with the literatures from different similar researches.

4.9 ETHICAL CLEARANCE

Formal letter was written from the IRB of Jimma University. The importance of the study was properly explained to the patients or attendants and Consent was taken. The Result of the study was only disclosed to concerned bodies and researchers who want to do further research in related areas.

4.10 OPERATIONAL DEFINITIONS

Primary survey - A Clinical approach to a patient when initially present to emergency department with fast assessment, diagnosis and management in the first thirty minute of stay. [5]

Secondary survey - Further diagnosis and management given to the patient following primary survey. [5]

Disability - Loss of functionality of specific organ or system as a result of trauma. [6]

Road traffic accident – injury associated with motor vehicle accident. [6,]

Intentional injury – injury caused due to the conscious act of the assailant or self- e.g. Interpersonal violence, suicide and homicides. [6, 9]

Polytrauma – when a patient sustained trauma to two or more than two systems. [25]

Primary prevention – approaches that aim to prevent violence before it occurs. [5]

Secondary prevention – approaches that focus on the more immediate responses to violence, such as pre-hospital care, emergency services or treatment for sexually transmitted diseases following a rape. [5]

Tertiary prevention – approaches that focus on long-term care in the wake of violence, such as rehabilitation and reintegration, and attempts to lessen trauma or reduce the long-term disability associated with violence. [5].

Extra seat occupant- is/are passenger who was/were overloaded beyond the capacity of the seat of a given vehicle.

4.11 DISSEMINATION PLAN

The result of the research was submitted to Jimma University, College of Public Health and Medical Sciences, Department of Surgery; There it can be made open access for the one who will find it important for health planning through the permission of college of public health and medical sciences, Jimma University and also for further researchers as a reference in accordance with the terms and regulations of Jimma University.

CHAPTER FIVE RESULT

A total of 211 admitted trauma patients to surgical wards and ICU were included during the study period with the proportion of 160(75.8%) males and 51(24.2%) females. The age distribution shows majority of the patients, 67(31.8%) were in the age range of 21- 30 years old, 53(25.1%) were in the age range of 31 -40 years, 33(15.6%) in their first decade of life. One hundred forty seven (69.7%) of patients come from Jimma zone followed by from Southern nations nationalities and people (SNNP) which accounts 30(14.2%), 18(8.5%) from Illubabor Zone, 6(2.8%) from Gambela region and 10(4.7%) from different areas other than stated above.

Table 1 Age and Sex distribution of Trauma admissions to Jimma University Specialized Hospital from August 2015 – November 2015.

Age	Sex		
	Male	Female	Total
0-10	20(60.6%)	13(39.4%)	33(100%)
11-20	41(77.4%)	12(22.6%)	53(100%)
21-30	56(83.6%)	11(16.4%)	67(100%)
31-40	18(72.0%)	7(28.0%)	25(100%)
41-50	14(87.5%)	2(12.5%)	16(100%)
51-60	6(60.0%)	4(40.0%)	10(100%)
61-70	5(71.4%)	2(28.6%)	7(100%)
Total	160(75.8%)	51(24.2%)	211(100%)

Concerning the mechanism of trauma; 84(39.8%) from road traffic accidents (RTA), 39(14.7%) from falling accidents, 26(12.3%) sustained stick injury, 23 (10.9%) sustained stab injury and 6 patients sustained bullet injury.(see table 2) When these mechanisms of trauma differentiated to specific age groups RTA caused 29.8%in the age range of 11-20 years, 26.2 %in 21-30 years, 17.9%in those aged below ten years; Majority of the stab injuries, 56.5%happened in the age range of 21-30 years old; falling accident more common in children and adolescents age below 20 years accounting 51.3%. (See table 3)

Table2. Mechanism of trauma according to gender difference in admitted trauma patients to J USH from August – November 2015

Mechanism of Injury	Sex		Total
	Male	Female	
RTA	61	23	84(39.8%)
Stab	21	2	23(10.9%)
Bullet	5	1	6(2.8%)
Fall	28	11	39(18.5%)
Stick	20	6	26(12.3%)
Others	25	8	33(15.6%)
Total	160	51	211(100%)

Table3 Mechanism of trauma in different age group of admitted trauma patients to J USH from August – November 2015

Age	Mechanism of trauma					Total
	RTA	Stab	Fall	Stick	Others	
0-10	15(17.9%)	2(8.7%)	6(15.4%)	3(11.5%)	7(17.9%)	33(15.6%)
11-20	25(29.8%)	4(17.4%)	14(35.9%)	3(11.5%)	7(17.9%)	53(25.1%)
21-30	22(26.2%)	13(56.5%)	4(10.3%)	12(46.2%)	16(41.0%)	67(31.8%)
31-40	11(13.1%)	2(8.7%)	5(12.8%)	3(11.5%)	4(10.3%)	25(11.8%)
41-50	4(4.8%)	1(4.3%)	4(10.3%)	5(19.2%)	2(5.1%)	16(7.6%)
51-60	4(4.8%)	1(4.3%)	4(10.3%)	0(0%)	1(2.6%)	10(4.7%)
61-70	3(3.6%)	0(0%)	2(5.1%)	0(0%)	2(5.1%)	7(3.3%)
Total	84(100%)	23(100%)	39(100%)	26(100%)	39(100%)	211(100%)

According to system involved in the trauma; 111(52.6%) were musculoskeletal injuries, 32 (15.2%) head injury, 17 (8.1%) abdominal injury, 14(6.6%) chest injury and 37 (17.5%) of patients had polytrauma. From scene of injury to hospital arrival it took 86(40.8%) of patients about 4 hours, 51(24.2%) of them 4- 12 hours, 31(14.7%) 12- 24 hours, 18(8.5%) arrived within 1- 3 days of injury and 25 (12.3%) of them come after 4 days of trauma.

Majority of the traumas, 159(75.4%), were happened unintentionally. whereas 47(22.3%) of them were intentional and five were unknown. From the intentional injuries, 32(68.1%) were interpersonal violence and 15(31.9%) were homicidal act.

Similarly the whole Road Traffic Accidents were caused unintentionally and the type of the motor vehicle which caused the trauma were as follows; minibus 38(45.2%), motor bicycle 30(35.5%) and 10(11.9%) caused by Bajaj accident. More than half; 45(53.6%) of patients were pedestrian, 18(21.4%) of them were drivers and 6 (7.1%) were extra seat occupants. Of the pedestrian victims 15(33.3%) were under the age of 10 years followed by 12(20.6%) of them in the age range of 11- 20 years.

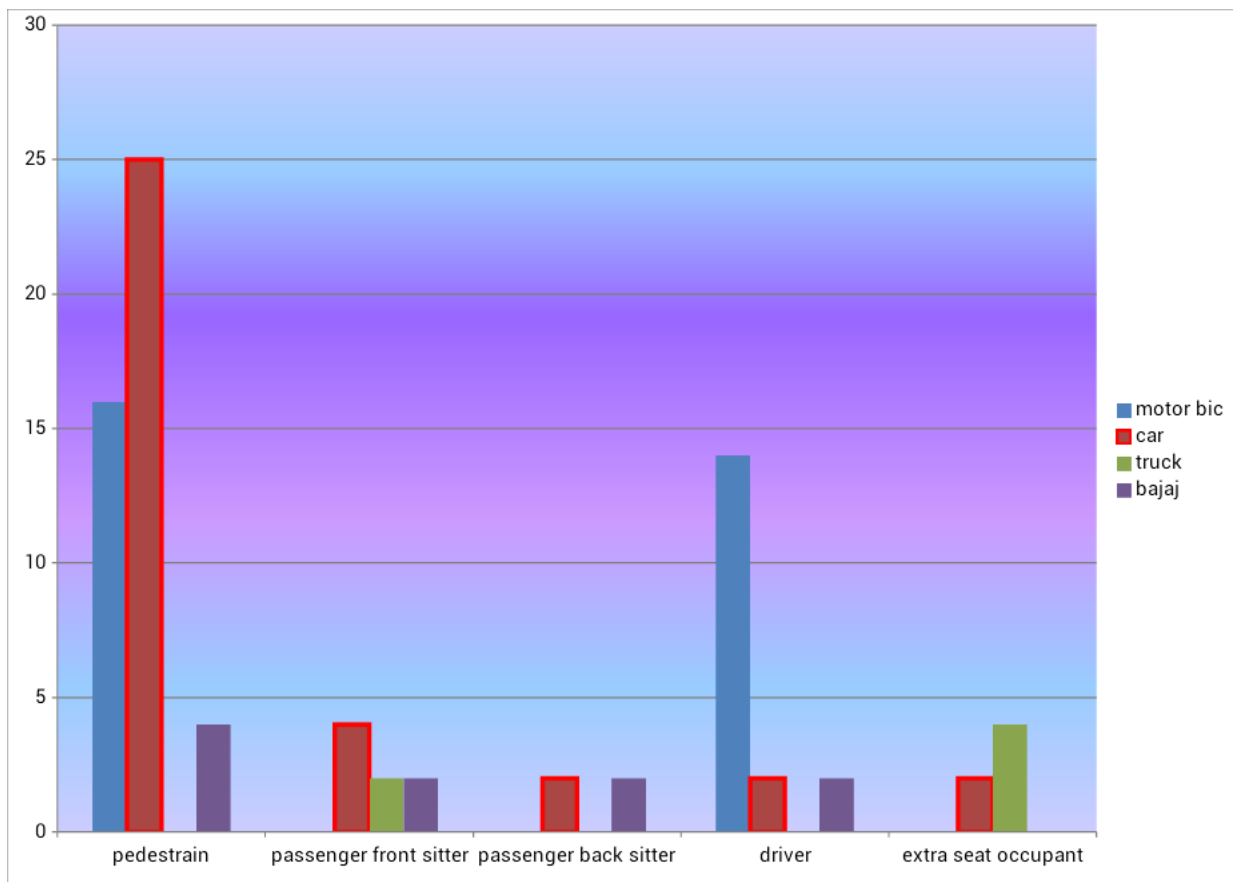


Figure1. Graph showing the type of motor vehicle and the position of the patient during the trauma in patients admitted to J USH from August 20115 – November 2015.

From the radiographic investigations done for patients after their presentations x ray of different bones accounts 103(58.9%), skull x ray 33(18.9%), chest x ray 18(10.3%) , more than two types of x ray 20(11.4%) and only one patient(0.6%) had CT scan of the brain outside the facility.

Concerning the treatment given on arrival to emergency department, all admitted patients given IV fluids, and IV antibiotics given for 149 indicated patients; 73(49.0%) of them given ampicillin and chloramphenicol, 36(24.2%) given ceftriaxone and 27(12.8%) of them given combination of ceftriaxone and metronidazole. From the definitive management opted, 133(63.0%) undergone emergency operations, 47(22.3%) given supportive care and planned for elective surgery all of them were orthopedic patients those who need ORIF for different fractures while 31(14.7%) managed conservatively of which 19(61.3%) were successfully managed and the rest converted to operative management; seven of them on Elective surgery basis and 5 as an emergency procedure.

Out of the emergency operations done 34(24.6%) of them had external fixation for compound fractures/ multiple fractures, 20 (14.6%) laparotomies for both blunt and penetrating abdominal injuries, 15(10.9%) had tube thoracostomy, 23(16.8%) operated for Traumatic brain Injury (TBI) and depressed skull fractures with elevation and burr hole. Nine patients had both laparotomy and chest tube insertion simultaneously. From the 29 laparotomies 7 (24.1%) has no intra- abdominal injuries, 10(34.5%) had viscus perforations, 5(17.2%) had combination of hollow organ and solid organ injury, Two had isolated solid organs injury, Another 2 patients had intra peritoneal bladder injury and Three had diaphragmatic injury.

Table4. Emergency operations done for trauma patients in patients presented to J USH from august 2005- November 2015.

Type of operation done	Frequency	Percent (%)
Laparotomy	20	14.5%
Tube thoracotomy	15	10.9%
Ex-Fix	34	24.6%
Repair	9	6.5%
Debridement	17	12.3%
EDSF and/ or Burr hole	23	16.7%
Both Laparotomy and chest tube	9	6.5%
Others	11	7.9%
Total	138	100%

Following surgery, during immediate postoperative periods in both emergency and elective trauma patients, 157(88.2%) of them transferred safely to surgical wards, 16(9%) admitted to ICU and 5(2.8%) died on the operation table or in the PACU.

The outcome of admitted trauma patients during the study period was assessed and found to be, 81% discharged improved, 14(6.6%) of them discharged the same without improvement, 9(4.3%) of them get complicated and 16(7.6%) of patients died in the facility. Nine of the dead patients arrived hospital within 4 hours of trauma and given possible available treatments though they couldn't get salvaged. Males account 15 (93.75%) of the deaths and majority of them were in the age range of 21 -40 years 11(68.75%). The mechanism of trauma has significant association with the outcome of the patient with a p- value of 0.001.

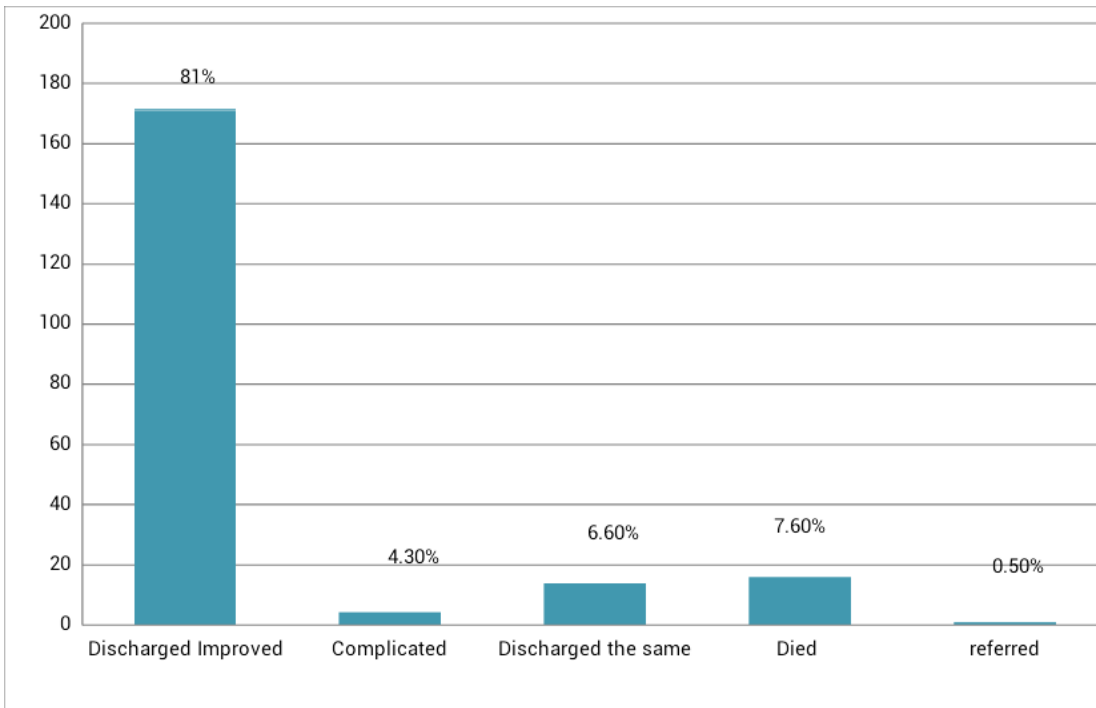


Figure2. Treatment outcome in patients presented to J USH from August – November 2015.

As to the length of hospital stay after presentation including the time they were kept at OPD was assessed and found to be 73(34.6%) stayed 7- 14 days, 68(32.2%) of them stayed 1 - 7days, 38(18%) stayed 15- 21 days, 15 (7.1%) stayed more than 4 weeks, 9(4.3%) stayed less than 24 hours in the hospital and 8 (3.8%) stayed 22- 28 days.

Table 5 Length of hospital stay in trauma patients admitted to J USH, surgical wards and ICU from August – November 2015.

Length of stay	Frequency	Percentage (%)
Less than 24 hours	9	4.3%
1- 7 days	68	32.2%
7- 14 days	73	34.6%
14- 21 days	38	18%
21- 28 days	8	3.8%
More than 4 weeks	15	7.1%
Total	211	100%

The facility mortality with respect to the length of hospital stay was analyzed and showed, nine patients died in less than 24hrs after trauma and hospital admission, 5 of them during the first week of injury and two patients died after a week of presentation.

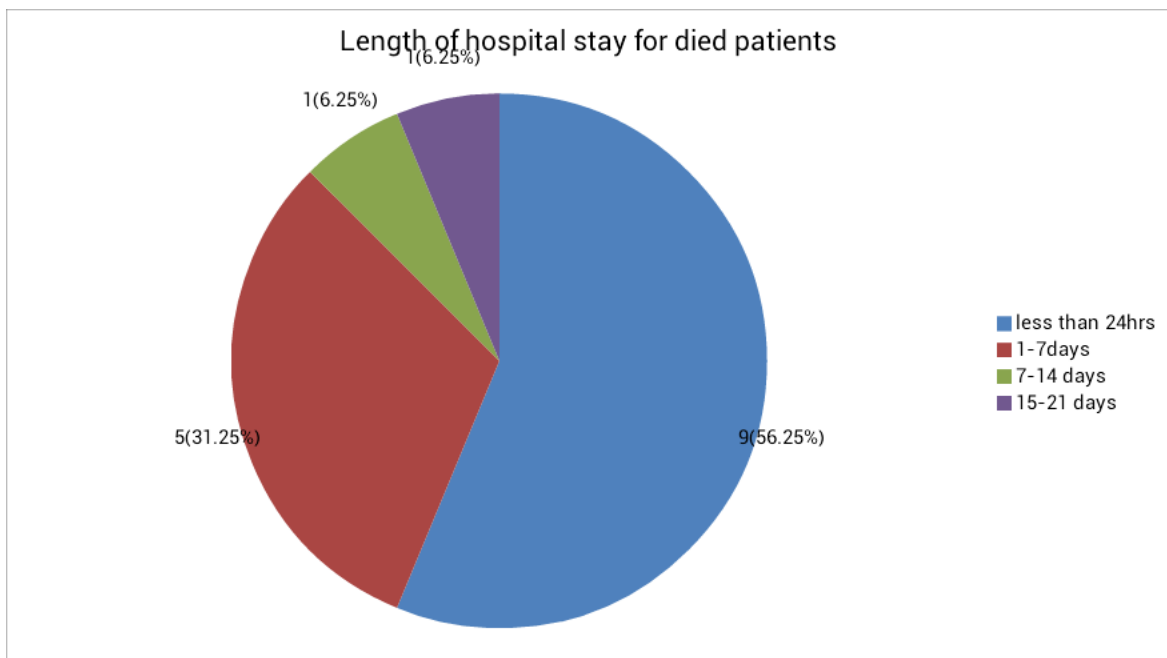


Figure3. Length of hospital stay for died trauma patients in J USH from August 2015- november 2015.

CHAPTER SIX DISCUSSION

From Demographic study of trauma worldwide, it commonly occurs in young productive force with more prevalence in males than females. This study also shows similar finding with male to female ratio of 3.14:1 this result is similar to the research done in other developing countries. [1, 10, 13] in which more than three fourth are in the age range of 11-40 years old.

Probably this could be due to the majority of outdoor activities performed by adults and children in developing countries like Ethiopia. [10] And as we consider gender, males are more affected with traumas. Interpersonal violence and specific accidents that happen, for example drivers were entirely males in which they themselves get injured. On another hand males are prone to rage and accidents than females of the same age range. [3]

The pattern of Injury RTA was the leading cause of trauma admissions nearly the same with the result of the research [26] done Tikur Anbessa Hospital. Also research done by [14] shows RTA was the leading cause of trauma admissions accounted 75% followed by assaults in 21%. The result was higher than this study's which can be attributed to the geographic difference i.e. the study which was conducted in Uganda's capital, teaching Hospital and Jimma town which is a semi urban area unlike Kampala and Addis Ababa which are highly populated cities; for instance 77% of the Ethiopia's registered vehicles concentrated in Addis Ababa.[2]

Road traffic accident is an ever growing problem worldwide and it was forecasted as 3rd common cause of disability adjusted life year DALYs by 2020. [10, 14] According to this study RTA is a leading cause of trauma associated hospital admission and also trauma related death accounting 56.25%. Therefore giving due consideration to this global pandemic problem a concerned body has to plan to reduce it. As the result of this study showed majority of the victims of death were pedestrians and drivers of motor cycle which can be reduced by teaching pedestrians about road traffic safety precautions and also for the drivers especially Minibus drivers. Great emphasis has to be given to motor cycle drivers as it caused 72% of RTA happened to drivers and 35.7% of general RTA following accidents caused by Minibus with a great disparity compared to the research done by [2] in which motor bicycle caused only 2.9% of the RTAs. This study can give clue about the magnitude of trauma admissions and its impact on the service as well it points to the possible solutions for the preventable causes.

As to the system injured concerned the study showed, musculoskeletal system was affected in 111(52.6%), in a similar way study [2] showed 113(53.8%). The study from district of Doha/ Qatar showed relatively lower findings with musculoskeletal injuries 31.4%, followed by 21.8% head injury, 12.5% intra-abdominal injuries and cardiothoracic injuries each, 21.8% had multi-systemic injuries. [13]

The pattern of systemic injury was similar with the mechanism of injury, as pedestrians get hit by the moving car or most of the time they cause trauma to the extremities unlike in case of stab injuries which occur around the torso. So this result showed that the burden of orthopedic admission was higher with relatively longer hospital stay in these patients.

When the trauma triage and transfer concerned, this study's result was almost similar with research [2] but better than the time of hospital arrival of [22]. On the contrary the average time for transfer in Saudi Arabia is 45 minute. [21]

The researcher [2] identified that victims were brought within 4hours which was acceptable for developing countries with non-existent triage and accident response system but demands a stronger effort to make these durations as short as 15 -20 minutes to save lives and reduce lots of disabilities. This time is the second peak of mortality at which severely injured patients die, so making as short as 15-30 minutes may save the life of this patients before they go in to irreversible stage.

The study revealed in hospital mortality rate during the study period of 7.6% In the same way it was stated in the study done in Saudi Arabia by Emad Hokkam et al. Trauma causes a global mortality rate of 10% [21] The current result was lower than the global which could be attributed to the short period of study and possibly improving health care system. Research done by Nik His amuddin, showed that 58.7% of deaths occurred within 48hours and 18.7% later than 7 days. And another research by Kirya F., Mulago hospital, Uganda showed 59% of the deaths happened during the first day of hospital admissions. [10]

This can be improved by improvement in triage system and increasing hospital facility as well as quality of staffs in hospital setting. At the same time up-to-date investigation modalities like CT scan which was none at this time can improve the outcome of head injury patients specifically with early diagnosis and intervention.

CHAPTER SEVEN CONCLUSION AND RECOMMENDATIONS

This study found out that significant number of young people involved in the trauma with male predominance and also the death rate was also by far greater in male patients. Road traffic accident was the leading cause of mortality and morbidity. Orthopedic admissions from different musculoskeletal injuries account more than half. Majority of the victims of RTA were pedestrian hit by minibus followed by Motor bicycle accidents in which the drivers themselves get injured and the age of the motorcycle driver patients was 11-20 years. Pedestrians were the major victims of RTA and one third of them were under the age of 10 years.

This research in general showed the magnitude of trauma in Jimma University Specialized Hospital which was none done before. It also identified the pattern of trauma admission, age groups which were prone for trauma and trauma associated deaths. Over all, it showed the delayed presentation to Hospital for different reasons. Either the knowledge of pedestrians about road traffic safety or drivers ability has to be assessed by further research. Till then, the care of families especially for children has to get much emphasis.

The other limitations of this research might be; a short study period and in one part of the county which might not be generalized for the national status but can be taken as a good start for further study.

It will be better if a concerned body has to work on infrastructures like roads and transportation facilities, road traffic safety educations for the general population and particularly young school children as they were the major victims from the population strata in this research. And the hospital itself has to have up-to-date investigation facilities and treatment. There has to be strong control over motor bicycle transportation and licensing.

Lastly, as trauma is an ever evolving problem the Government has to establish trauma centers and in particular JUSH has to work on this preventable neglected global epidemic.

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ANNEX

Questionnaires for Trauma Admissions to Ward/ICU

You are kindly requested to fill accordingly! Better if you fill at the time of discharge from care.

SOCIO DEMOGRAPHY

Name..... Card no..... Age..... sex----- address.....

Date and time of presentation.....

PATIENT CLINICAL CONDITION, HISTORY

2.1. Patient C/C..... 2.2. Duration of trauma.....

2.3. Mechanism of trauma

RTA Stab Bullet falling from Ht or falling down accident crush injury stick sharp instruments
 Other, Specify and write the circumstance of the trauma-----

2.4 Intent of the injury. Unintentional intentional undetermined

2.4.1 If intentional specify. Suicide interpersonal violence homicide

2.5 If RTA, Type of motor vehicle, motor bicycle Car/minibus Lorry/truck Tractor/Grader Bus
 others

2.6. If RTA, where was the patient during the accident?

Pedestrian Driver back seat occupant front seat occupant middle seat occupant extra seat occupant

2.6.1 Was the patient intoxicated? Yes No

2.7. If bullet specify type of the gun pistol AK-47. Other heavy fire arm Blast effect

2.7.1 If pistol, **Distance of the shot**, < 3 m 3- 7 m >7 m

2.8. If falling from height accident, write the approximate Ht.....

2.9 Any chronic medical problem /surgical problem? Yes no. If yes specify-----

-

III PHYSICAL EXAMINATION

3.1 Was primary survey used? Yes no.

3.2 Use the **primary survey protocol** (if indicated otherwise go to secondary survey)

A Airway-----

B Breathing RR-----

Chest examination-----

C Circulation

External bleeding-----

CVS BP----- PR-----

Abdomen (positive finding)

Pelvic bones stability and long bones exam.

D Disability and neurologic exam. AVPU/GCS-----

E exposure and temperature control. Write down what you observed-----

3.3 Secondary survey (if patient improves with management proceed with secondary survey.)

General condition

A. ASL B. Acute On CSL C. in CRD. D. Comatose E. well looking

V/S BP----- PR----- RR----- T-----

HEENT-----

CHEST-----

CVS -----

Abdomen.....

Gus

MS and Integumentary system

NS (neurologic exam)

IV. INVESTIGATION DONE

4.1 laboratory Investigations

Hct/Hb..... blood gr and Rh WBC..... N%..... L%..... PLT.....

RBS

4.2 Imaging type and its findings

.....
.....

4.3 FAST

Findings.....

4.4 DPL

Result.....

4.5 U/A

RESULT.....
....

4.6 U/S

4.8 Other investigations, if any.....

V. Tentative Dx. (Asst.)

VI. Treatment Given

6.1 General Management

IV fluids Blood transfusion (.....unit) O2 collar applied

Antibiotics (write)

Analgesics (write)

Other medications

For fractures, Splinted not splinted put on skin traction elevated

6.2 Management opted. A. Conservative B. Emergency Surgery Elective surgery planned

6.2.1. If managed conservatively successful failed

6.2.2 If conservative mx failed after how many hours or days?

6.2.3 Then what was done?

6.3 If emergency surgery planned, after how many hours from presentation to OPD?

6.3.1 What was the procedure done? Laparotomy tube thoracotomy open thoracotomy burr hole and evacuation of hematoma EDSF Craniotomy Ex- fix wiring/pinning debridement repair

ORIF other (write).....

6.3.1a. If laparotomy done what were the injured/ ruptured organ/s? Liver spleen Pancreas

Kidney (Rt/Lt) SB LB Diaphragm (Rt/Lt) side Duodenum Major blood vessels Bladder

Nothing was injured

6.3.1b. what was done for the above findings? Please write

6.3.2 If any other procedures done please specify

-

6.4. Final Outcome in conservatively managed pt. improved remain in same condition died

6.5. For orthopedic patients, if elective surgery planned write the type of surgery.....

VII. Final Assessment -----

VIII. POST PROCEDURE COURSE

8.1 Immediate post-operative Transferred to ward admitted to ICU died intra operatively or just in PACU

Transferred to OPD

8.2 After admission to ward or ICU stayed smooth course and discharged improved Complicated. Please specify the complication and what was done? -----

On how many post procedure day it happened? -----

Remain with the same condition

Died please write possible cause of death -----

Transferred to other unit -----

8.3 Date of discharge

Collected by Checked by.....

Kampala Trauma Score (KTS)

Value Coded

Age

<5 1

6-55 2

>55 1 a. _____

Number of Serious Injuries

None 3

One 2

Two or more 1 b. _____

Systolic Blood Pressure (mmHg)

>89 4

50-89 3

1-49 2

Undetectable 1 c. _____

Respiratory Rate (breaths/min)

10-29 3

>30 2

<9 1 d. _____

Neurological Status

Alert 4

Responds to Verbal Stimuli 3

Responds to Painful Stimuli 2

Unresponsive 1 e. _____

KTS TOTAL: a + b + c + d + e = _____

Possible range is 5-16.

5 - Most severe

16 - Least severe is a perfect score on all variables.