ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCE, DEPARTMENT OF EMERGENCY MEDICINE

PATTERN AND OUTCOME OFANTERIOR ABDOMENAL INJURY PATIENTS ADMITTED IN AaBET HOSITAL, ADDIS ABABA, ETHIOPIA, 2020/2021

BY: MATEBE MUCHE (BSC)

ADVISORS:

1) DR.SOFIA KEBEDE (MD, EMCC SPECIALIST)

2) MEBRAT MICHAEL (BSC, MSC IN EMCCN)

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

June, 2021

ADDIS ABABA, ETHIOPIA

PATTERN AND OUTCOME OF ANTERIOR ABDOMENAL INJURY PATIENTS ADMITTED IN AaBET HOSITAL, ADDIS ABABA, ETHIOPIA, 2020/2021

BY: MATEBE MUCHE (BSC)

ADVISORS:

1) DR.SOFIA KEBEDE (MD, EMCC SPECIALIST)

2) MEBRAT MICHAEL (BSC, MSC IN EMCCN)

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

June, 2021

ADDIS ABABA, ETHIOPIA

ASSURANCE OF PRINCIPAL INVESTIGATOR

The undersigned agrees to accept responsibility for the scientific ethical and technical conduct of the research project and for the provision of required progress reports as per terms and conditions of the Research Publication Office, Addis Ababa University.

Name of the Student: Matebe Muche (BSC)

Date_____

Signature_____

Approval of the Advisers

Name of the advisers:

1st ----------

Date _____

Signature_____

2nd ----------

Date _____

Signature_____

APPROVAL BY THE BOARD OF EXAMINATION

This thesis by Matebe Muche is accepted in its present form by the board of examiners as satisfying thesis requirement for the degree of masters in emergency medicine and critical care nursing.

INTERNAL EXAMINER _____ _____ _____ _____

NAME RANK SIGNATURE DATE

EXTERNAL EXAMINER _____ _____ _____ _____

DEPARTMENT HEAD _____ _____ _____ _____

NAME RANK SIGNATURE DATE

ACKNOLEDGMENT

I would like to thank Addis Ababa University, college of health science to give me this chance and it is also my pleasure to acknowledge everyone who has contributed to the successful completion of this thesis.

I would like to thank St. Peter specialized hospital for giving me sponsorship letter for MSC program.

I would like to acknowledge AaBET hospital staff members for providing necessary information and facilitating my data collection process.

My special thanks go to my advisors Dr. Sofia Kebede and Mebrat Michael for their valuable and constructive comments throughout the development of my thesis work.

ABBRIVATIONS AND ACCRONYMES

AA	Addis Ababa
AaBET	Addis Ababa Burn Emergency and Trauma
ASE	Abdominal Surgical Emergency
FAST	Focused Abdominal Sonography for Trauma
FMOH	Federal Ministry of Health
GBD	Global Burdon of Disease
GIT	Gastro Intestinal Tract
ICU	Intensive Care Unit
MVA	Manual Vacuum Aspiration
PAI	penetrating abdominal injury
RTA	Road Traffic Accident
SPHMMC	Saint Paul Hospital Millennium Medical College
USA	United States of America
WHO	World Health Organization

TABLE OF CONTENTS

Table of Contents

List of tables

List of figure

ABSTRCT

Background: Abdominal trauma is a major public health problem for all nations and all socioeconomic strata and associated with high morbidity and mortality in the world. Abdominal injury is classified as blunt and penetrating trauma. Road traffic accident is the most common cause of abdominal trauma in the world. Most abdominal injuries are preventable. The main problems for inadequate treatment outcome are misdiagnosis, delayed arrival of patients to health institutions.

Objective: The aim of this study was to assess the pattern and outcome of abdominal trauma in AaBET hospital, Addis Ababa, Ethiopia from March 2021 to April 2021.

Method: Institutional based retrospective cross-sectional study was conducted among abdominal trauma patients admitted in AaBET Hospital emergency department from January 2018 to January 2021. Data was collected using a pre-tested structured checklist from patient`s chart review. The data was checked for its' completeness and entered into Epi data version 3.1 then exported to SPSS version 25 software for analysis. Descriptive statistics (graph, table, proportion, median and IQR) were used to describe frequency distribution of the data. The Associations between independent variables and dependent variables were analyzed by using logistic regression models.

RSULT: Out of 124 patients 83.1% were males. The age of respondents was ranged from 5-89 with median (IQR) age of 32 years. Penetrating abdominal injury 58.9% was the greatest proportion of mechanism of abdominal injury. Stab injury 40(55.56%) was the major cause of penetrating injury. Road traffic accident 24(47.1%) was the commonest cause of blunt abdominal trauma. Bowel 41(62.1%) was the highly injured hollow viscous organ in penetrating abdominal trauma and liver 7(38.9%) was the commonest injured solid organ in blunt abdominal trauma. Eighty four (67.7%) of patients were treated by operative management and the commonest reason of intra operative management was hemodynamic instability. Hemodynamic and respiratory complications were high in number after operational procedure.

Conclusion: Abdominal injury is male disease. Among 124 abdominally injured patient 10(8.1%) died. GCS<9, post-operative hemodynamic complication, past medical history of illness and bowel evisceration were significantly associated with mortality.

Key Words: Abdominal trauma, patterns, outcome, AaBET Hospital, Ethiopia

Chapter-one

1. INTRODUCTION

1.1 Background

Trauma or injury is defined as damage to the body caused by an exchange with environmental energy that is beyond the body's resistance. It remains the most common cause of death for all individuals particularly productive age group(1).

The abdomen is partially enclosed by the lower thorax. The anterior abdomen is defined as the area between the costal margins superiorly, the inguinal ligaments and symphysis pubis inferiorly, and the anterior axillary lines laterally. The majority of the hollow viscera may be involved when there is an injury to the anterior abdomen(2). Abdominal injury is relatively common in both civilian and military casualties and remains a major source of morbidity and mortality. The mechanism of injury may be blunt or penetrating(3) or abdominal injury can also be intentional or unintentional (accidental)(4). Abdominal visceral injuries were defined as injuries to the spleen, liver, stomach, intestine, mesentery, pancreas, or kidney(5).

Blunt abdominal trauma is a direct blow, such as contact with the lower rim of a steering wheel or an intruded door in a motor vehicle crash, can cause compression and crushing injuries to abdominal viscera. Such forces deform solid and hollow organs and can cause rupture, with secondary hemorrhage, contamination by visceral contents, and associated peritonitis and head, spinal, thorax, genitourinary and musculoskeletal injuries. Penetrating abdominal trauma includes stab wounds and low-velocity gunshot wounds cause tissue damage by lacerating and cutting. High-velocity gunshot wounds transfer more kinetic energy to abdominal viscera(2, 6).

The incidence of abdominal trauma in North Africa has been approximated to 9%(7, 8). In South Africa penetrating abdominal injury accounts 90.2% and blunt abdominal injury 9.8%(9), in Uganda, blunt abdominal injury is the commonest mechanism of injury which accounts 85.7%(4) and males are predominantly affected than females 92.5% and 7.5% respectively(10).

The study in Dilchora Hospital, Eastern Ethiopia showed that out of 382 trauma victims 3.14%s had abdominal injuries(11),in Arbaminch, Gamogofa zone15.4%(12),in Dilla,Gedeo zone out of 376 victim from 2016-2019 the abdominal trauma covered 11.44%(13),in Tikur Anbesa ,Addis Ababa from 328 reviewed patients for Abdominal surgical emergency(ASE)12.5% had penetrating abdominal injuries and 9.4% had blunt abdominal injuries(14) and the study done at SPHMMC from the abdominal trauma required laparotomy 62%s were penetrating and 38%%s were blunt abdominal trauma(15).

In the management of abdominal trauma some of the patients are managed by operative management and some of them are managed by conservative managements (non-operative).

Non-operative management of hemoperitoneum is safe for hemodaynamically stable(3, 4). Abdominal traumas are common and are frequently associated with other injuries. Tenderness, guarding, and rigidity are the best physical signs, but there may at first be no clues whatever to the presence of intra-abdominal injury. Sudden profound collapse occurring immediately after resuscitation may be the first indication of severe intra-abdominal bleeding(4).

1.2 Statement of the problem

Trauma including abdominal trauma is a big challenge. Abdominal injuries are responsible for 10% of the mortalities due to trauma. Delays in early diagnosis or misdiagnoses are two major reasons for the mortality and morbidity associated with abdominal trauma(16).

Trauma is the second largest cause of disease accounting for 10% of global burden(17). Trauma is also associated with high morbidity and mortality and continues to be a public health problem worldwide especially in low and middle income countries. Injury accounts for 10% of all global deaths, according to world health organization (WHO) study on global burden of disease(GBD) 1990-202(18, 19).

Approximately one-third of all trauma patients have abdominal trauma worldwide. Abdominal injury related death accounts about 10% in USA and approximately 671 billion dollars were spent on trauma victims in the USA in 2013, and the costs associated with fatal injuries are 214 billion dollars including abdominal injuries(12).

In Africa the situation is similar except worse with limited investigation and human power as well as health intuitions incapability of treating trauma victims. In sub-Saharan Africa, abdominal trauma causes major problems with one study reporting 55% of individual were discharged with sequels (30 splenectomy,8 nepheroctomy,4 cholecystectomy and 2 distal pancreatectomies(12, 20).

In Ethiopia, abdominal trauma is a common emergency accounting for 15.4% of admissions due to injury. Delayed arrival of patients to the hospital, inadequate pre hospital treatment and wound site infection are the major problems that affect the outcome of abdominal trauma and majority of them are hemodaynamically unstable so need surgical interventions (12).Abdominal trauma is the third most common cause of emergency laparotomy which increases the burden of surgeons. From all emergency laparotomy abdominal injury accounts about 11.7% with mortality rate of 14.8% and is second major causes of laparotomy related death following intestinal obstruction(21).

Abdominal injuries cause complications unless treated early, like acute respiratory distress syndrome, pneumonia, thromboembolism, shock, GIT bleeding, peptic ulcer, constipation, diarrhea, vomiting, distention, acute kidney injury, urinary tract infection, wound dehiscence and wound infection are the most common complications and associated death is higher in older age of >60 year(14, 22).

Inability to recognize occult abdominal hemorrhage and failure to successful control of bleeding from intra-abdominal organs are the major cause of significant morbidity and such injuries account for 10% of traumatic deaths that occur annually in the USA. Even though current advancement of trauma systems, failure to manage abdominal injuries continually accounts for significant morbidity(23).

Every trauma victim requires a fast, correct and systematic assessment and trans-professional and multi-displinary approach to immediately identify and treat life threatening injuries. Legislations and effective police on road safety are needed to prevent road traffic accident and prevention is a hallmark(22, 24)

1.3 Significance of the study

This study will give information on patterns and outcomes of abdominally injured patients who visited and treated in AaBET hospital. It will stimulate efforts in preventing traumatic abdominal injury. The study will show abdominal injury characteristics. It is significant in that, it provides the public valuable information on the seriousness of the injury and to be part of preventive action. It will aware of emergency health professionals and other health professionals to strengthen early referrals system and early surgical intervention. Findings can be used by FMOH department of emergency directorate and AaBET Hospital to design and develop locally appropriate plan and implementation strategy to improve health care to the patient. Finally this study can be used as further initiation for researchers who have interest to study on trauma related topics

Chapter-two

2. Literature Review

A literature search was conducted through databases Google, Google Scholar, Hinari, Medline, PMC, and Pub-Med, ERIS, EBSCO using keywords that are related to the topic in a study (pattern, outcome, abdomen, and trauma)

2.1 Socio-demographic factors of victims

Retrospective cross sectional study conducted in Saudi Arabia and India showed that abdominal trauma was common among young males than females, specially the third decade of life. In India 80 (55%) patients were occupied as either laborer or farmer, 22(14.4%) were from urban area and 131(85.6%) were from rural area (5, 18, 25).

Another research conducted in Mauritania and West Africa from 2012-2016 showed out of 100 cases, 92% were males with the mean age of 22.78 years which ranges 5 - 70 years (18).

The prospective studies done in North Africa (Nigeria and Egypt) showed that abdominal traumas were more common in males. Majority of their ages were third decades of life and 87.1% with the mean age of 10.85. Students were highly affected by abdominal trauma from the study conducted in Egypt(3, 6). Similar study done in South Africa revealed that the abdominal trauma affected 92% of males, but the majority of their ages were 12-70 years who had mean age of 29.2_+10.7. In Tanzania it accounted 84.6% of males, majority of age ranges from 21-40(49.3%) with the mean age of 31.48(3, 6).

Retrospective study in Kenya and Uganda revealed that abdominal traumas were 92.5% and 83.2% among males respectively. The prevalence of abdominal traumas were 46(39%) peasants 27(23%) students,19(16%) labourers,10(8%) drivers, 9(8%) soldiers and 7(6%) others in Uganda(4, 10).

Retrospective studies conducted in Arbaminch and Dilla, Ethiopia showed that abdominal trauma was more common among males 77.4% with majority their age ranges 20-40(52.5%) and 71% with the mean age of 29.7 respectively. Young people have been found to be affected more as they are mobile population who move from one place to other place in order to cater for their family needs. These ideas are supported by many studies done. According to the research conducted in Dilla identified occupational exposures obtained were students(34.2%),farmers(30.24%),unemployee(21.3%),drivers(5.8%),civilservants(6.7%),others(3.8%).Gamo ethnicities were highly affected with abdominal trauma (52.3%) followed by Wolaita56(21.1%),Konso40(15%),Amhara11(4.1%) and others 29(10.9%) from the retrospective research conducted in Arbaminch hospital(5, 12, 18).

2.2 Injury pattern

Traumatic injuries are a significant threat to public health worldwide. Nowadays trauma has become the greatest reason of death particularly in the developing countries(6).

Regarding the pattern of injury the study conducted in North America on incidence, patterns, and factors predicting mortality of abdominal injuries in trauma patients found that the most frequent type of abdominal trauma was blunt trauma172(69.4%) out of 248 abdominal trauma. The most common cause of blunt abdominal trauma was motor vehicle accident accounted (62.8%).Penetrating abdominal trauma was 76(29.6%) and the most common causes were stabbing which accounted 47.4%, blast injuries 36.8%, and 15.8% were gunshot wounds (6)**.**

The study done in India on the patterns of injury, clinical presentation, organ involvement and associated injury revealed that blunt abdominal trauma accounted 37(74%) is out of 50 case of abdominal trauma and 13(26%) penetrating abdominal trauma. The commonest causes of abdominal trauma were road traffic accident (48%), fall (32%), assault/stab injury (18%) and railway accident (2%).The patients presented with abdominal pain 90%,abdominal distension 17.6%, vomiting 32.7%, hematuria 7.2% or retention of urine, bleeding per rectum, sign of shock or hypotension 43 out of 153 patients, breathlessness or chest pain(1, 5).

The cross-sectional study in Pakistan on visceral injuries in patients with blunt and penetrating abdominal trauma found that out of 140 abdominal traumas, Penetrating trauma (51.5%) was more common than blunt trauma (48.5%). Intestines are the most commonly affected hollow viscous organ by penetrating injuries 70.1% and the liver is the most commonly affected solid organ 42.85% in blunt trauma, followed by the spleen (28.5%).Patients presented with abdominal pain, tenderness on physical examination due to road traffic accident and fall(16).

The research conducted in South India and India showed that penetrating abdominal trauma was more common than blunt abdominal trauma 68% and 32% out of 100 abdominal trauma patients respectively. Stab injuries were the most frequent causes, followed by road traffic accident 12 (12%), fall from height 6 (6.3%), domestic accidents 4 (4%) and sports or leisure accidents 4 (4%). On arrival to the emergency room 10 (10%) patients were hemodaynamically unstable with shock and had been transfused. Clinically peritoneal syndrome with tenderness was also present in 20(20%) cases (5).

Trauma poses a major public health challenge in Africa(4). The study done in Egypt and North Western Tanzania stated that the majority of abdominal trauma patients presented had blunt abdominal trauma77.5% and 77.8%respectively. Motor vehicle accident was the most common cause of trauma affecting 38(47.5%) and 64.9% of all studied patients respectively and also represented 61.29% of blunt abdominal trauma patients. Stab wounds the most common cause of penetrating abdominal trauma affecting 66.6% followed by gunshot affecting 33.33%.Pain, tachycardia, hemoperitoneum, and hypotension were the most common warning signs in the studied populations. The spleen was the most frequently affected solid organ, and the most

frequently affected hallow viscous organ was the small intestine whereas pancreas and kidney were the least injured organ(7, 20).

In Nigeria the prospective study done on abdominal injuries in university of Port Harcourt teaching hospital, stated that penetrating abdominal injuries were more common than blunt abdominal injuries 73.3% and 26.7% respectively out of forty-five patients seen over four years of study period. Gunshot to the abdomen was the most common predisposing factor in those with penetrating injury 21(63.6%), while RTA was the most common in patients with blunt abdominal injury, seen in seven (58.3%) patients. Small bowel was the most commonly injured organ following penetrating injury, seen in 14 patients (42.4%) while spleen was the most common in blunt injuries, seen in five patients (41.7%) (3).

The study conducted in Uganda Blunt abdominal injury was the commonest type of injury (85.7%) and penetrating accounted 14.3%.Most injuries were a result of road traffic crushes (47.1%) and 15% of the injuries were sustained at home among those assault accounted 50%, fall 22.2%.Spleen was the most commonly injured organ among the patients that had exploratory laparotomy while the liver was the least injured solid organ(4).

In Ethiopia it is difficult to get enough literature related to the pattern and outcome of abdominal trauma. But similar study done in Arbaminch on the prevalence of abdominal trauma and associated factors in Arbaminch general hospital Gamogofa zone, South Western Ethiopia by Wogderes Tsegaye, from 266 enrolled trauma patient`s document reviewed the abdominal injury was 15.4%.Of those who had abdominal injury, blunt injury was 23(56.1%),while penetrating injury was 18(43.9%).Regarding the cause of blunt injury falls were 9(39.1%), kicks6(26.1%), MVA(21.7%),thrown stone(8.7%) and from penetrating abdominal injury 9(50%) were bullet injuries 8(44.4%) were knife and one person(5.6%) had spear injury(12).

The study conducted in Tikur Anbessa teaching hospital on abdominal surgical emergency by Nebyu Seyuom et al, from 328 abdominal surgical emergencies who undergone emergency laparotomy 65(19.8%) were abdominal trauma of which 42(64.6%) were penetrating abdominal trauma and 23(35.4%)were blunt abdominal trauma(1).

Similarly the study at St. Paul's Hospital Millennium Medical College was conducted from January 2014 to December 2016 by Kirubel Abebe et al showed that penetrating abdominal injury was the leading indication for trauma laparotomy 80(62%) and blunt was 49(38%). Overall, the leading cause of abdominal injury was stab (35.7%). RTA was the major 27 (55.1%) cause of blunt abdominal injuries(15).

2.3 Diagnosis and treatment outcome

The treatment outcome of abdominal trauma depends on type of abdominal trauma, presence of chronic diseases, delay in early transport from the site of trauma to the emergency department,

and age of patient(20). Laboratory and radiographic investigations were used for diagnosis of abdominal trauma(6). Abdominal trauma related death in Saudi Arabia and Pakistan accounted 20% and 13% respectively(16, 18).

The research done in India and South India showed that majority of the patients were managed conservatively 65.4% and 34.6%s were managed by surgical intervention. Among the study population 5 patients expired leading to approximate mortality of 3.3%. FAST was the quick and reliable diagnostic method for abdominal trauma patients (1, 5).

The study in National Center Hospital, Nouakchott, Mauritania, Uganda and Tanzania revealed that majority of hemodaynamically unstable patients were managed by emergency operation, including negative laparotomies. Selective non operative management was realized for hemodaynamically stable patents. The mortality rate was 2% and majority of deaths were related to road traffic accident (4, 7, 9).

Prospective study conducted in Durban, South Africa revealed that 440 (90%) of the patients underwent laparotomy and 48(10%) patients were managed no operatively. Some patients developed complications132(28%), and 52 (11%) died from 488 enrolled patients .In Egypt most of the patients were discharged with permanent sequel and 6 deaths were recorded from observational descriptive study of abdominal trauma. (9, 20).In Tanzania the research done on the pattern and outcome of abdominal trauma patients stated that 42 patients were managed by non-operative interventions from 210 patients seen during the study period and 10 patients died before surgery was done(7)

According to the institutional based cross sectional research conducted in Arbaminch, Ethiopia, majority of patient arrived to the hospital within less than 4 hours after the occurrence of injury and admitted for 4-6days (46%). Operative management was done for 52% of hemodaynamically unstable patients. Patients transfused blood and developed infection were 39%. Looking in to patient outcome, one patient dead while 27(10.2%) patient referred. Among the ultra sound findings 21(51.2%) of them had positive for hemopertonieum and 9(22%) negative for hemopertonieum and 11(26.8) patients had no ultrasound imaging(12).

2.4 Other factors affecting treatment outcome

Abdominal injuries are commonly associated with other injuries and these may complicate the management and affect the treatment outcome(12).

The research done in North America stated that the most common associated injuries were injuries of extremities 51.2%,chest injuries 34.1%,head and neck injuries 14.6%. If only a single abdominal organ was injured, it was infrequently the cause of death. Isolated abdominal injuries rarely less than 5% resulted in death, even though abdominal injuries accounted for 41% of all deaths with multiple injuries. Few of them had chronic illness among those hypertension was the common illness 50% and PAI is the commonest cause of mortality (57.9%). Research done in Charity hospital, New Orleans in Virginia reported as 40% of the abdominal trauma patients

developed complication and patients requiring multiple procedures for abdominal injury cause death in 27% of cases(1, 6).

Retrospective study done in Brazil revealed that the lungs were the most affected extra-abdominal organs in all death mechanisms and observed more injuries to the head and heart of the victims of penetrating trauma. Fracture of lower limbs, especially of the femur 15.6% and tibia/fibula 12.4% and 10.6%, respectively were the blunt abdominal trauma associated traumas(1).

Descriptive cross sectional study done in India found that the commonest associated body region involved were chest 44 (28.8%) followed by extremities 35 (22.9%), pelvic 24 (15.7%) and head 17 (11.1%) respectively and poly trauma patients have poor prognosis relative to isolated abdominal trauma (5).

According to the research conducted South India commonest postoperative complications was surgical site infection 12 (7.8%) followed by burst abdomen 6 (3.9%) and anastomotic leak 3 (2%). In this study shortest duration of hospital stay was one day and longest duration was 60 days and the mean duration of hospital stay is 12.8 days. Ninety one(59.5%) patients were discharged within 10 days.(5).The time interval between injury and emergency care has risk factor for fatality, 80% of blunt cases died with delayed of 60-90 minutes and many blunt cases survived (73.6%) waited less than 60 minutes and also 81.8% fatality penetration cases waited 60-90 minutes, but 75% of survived penetration cases waited less than 60 minutes and PAI has high risk of mortality(6).

The research done in Nigeria, Egypt and North Western Tanzania explained that PAI, late presentation to the hospital and complications were significant cause of mortality. The length of hospital stay ranged from 0-7 days in 44 (55%) cases and 8–15 days in 36 (45%) cases. Postoperative wound site infection was the most common complication (8.9% and others were wound dehiscence in two patients was seen (4.4%) and intra-abdominal abscesses in one patient 2.2% (3, 7, 20).

Another researches done in South Africa and in West Africa explained that intra-abdominal and extra abdominal injuries and the presence of complications like, shock, sepsis and hemoglobinemia had significantly higher mortality rate than isolated abdominal injuries and no complicated cases(9, 18).

In Ethiopia the research done in Arbaminch on the prevalence and associated factor of abdominal trauma found that 38.9% of abdominal trauma patients were transfused blood and 39% of them had infection. Majority of abdominal trauma patients (46%) admitted in the hospital for 4-6days.About 59% of abdominal trauma patients didn`t receive pre-hospital treatment(12).

Retrospective research conducted in St. Poul by Kirubel A. et al explained that the average duration of time from injury to presentation was16.7 hours and around 48.8%s out of 129

patients presented within 6 hours after injury. Less than half 41% of rural residents patients came within 6 hours of injury. Chest injury was the commonest associated injury accounted 72% followed by fracture and head injury accounted 20% and 7% respectively. Vital sign derangement was seen in 77.5% patients at presentation and 24(18.6%) of them were hypotensive and tachycardic and enhanced the chance of death by 33.3%(15).

Conceptual Framework

The following conceptual framework shows that the association between independent and dependent variables which is adapted from reviewing different literatures ((7, 12, 18, 22).

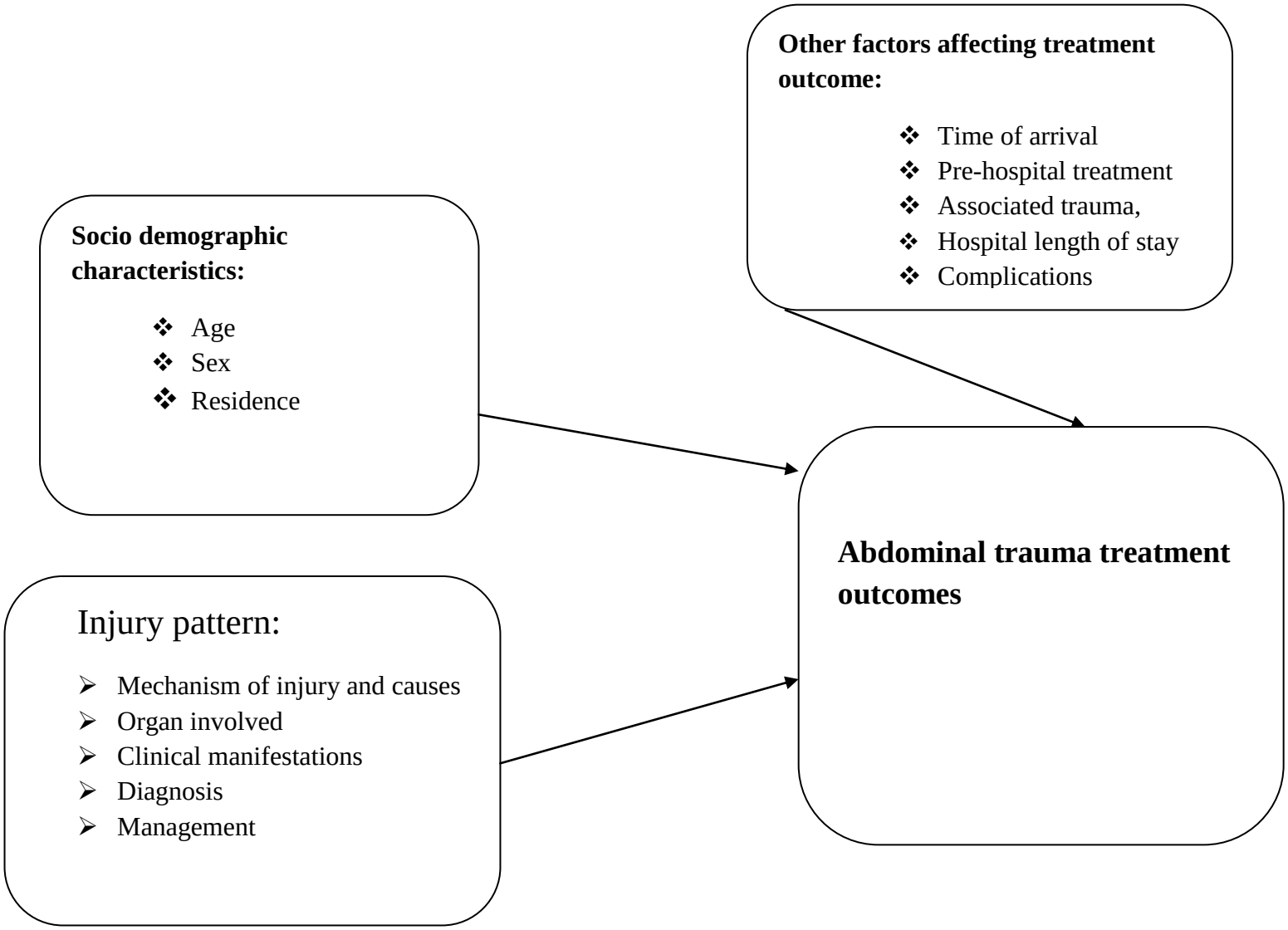

Figure 1: Conceptual framework of pattern and outcome of abdominal trauma at AaBET hospital, Addis Ababa, Ethiopia 2021

Chapter-three

3. Objectives of the study

3.1 General Objective

To assess the pattern and outcome of abdominal injury patients in AaBET Hospital, Addis Ababa, Ethiopia, March 2021 to April 2021

3.2 Specific Objective

- ✓ To assess pattern of abdominal injury.
- ✓ To assess the outcome of abdominal injury
- ✓ To identify associated factors affecting treatment outcome of abdominal trauma

Chapter-four

4. Methods and materials

4.1 Study Area and Period

This study was conducted in AaBET Hospital from March 2021 to Aprils 2021G.C in Addis Ababa. AaBET hospital is the biggest trauma facility found in Addis Ababa and that is an affiliate of SPHMMC established on 15, July, 2015 G.C. It is inclusive of four major departments; Emergency Medicine and Critical care, Plastic Reconstructive and Hand Surgery, Orthopedic & Traumatology and Neurosurgery. AaBET hospital is a progressive and successfully managed upper level teaching hospital as well as centers for traumatology, physiotherapy, and spinal disorders. AaBET hospital is one of the largest government-based traumas & emergency center in the country managed by FMOH and it is providing majority of health services of Oromiya region catchment areas and Addis Ababa residency. The hospital has a total of 158 beds and 34 emergency beds and 106 emergency staff nurses, 11emergency medicine and critical care specialists, 3general surgeon, 6neurosurgeon, 8orthopecians, 5plasastic and reconstructive surgeons, 15anesthetists in the emergency department. This hospital is currently working to improve emergency, critical care service, training, and research. It is recognized as one of the largest government trauma centers in the country reaching over 12 million people(26).

4.2 Study Design

Quantitative type of institution based retrospective cross sectional with chart review of three years data study was used (from January2018-January 2021).

4.3 Population

4.3.1 Source Population

All abdominally injured patients admitted in AaBET hospital from January 2018 to January 2021

4.3.2 Study Population

All systematically selected abdominal injured patients admitted in AaBET hospital from January 2018 to January 2021.

4.4 Eligibility Criteria

4.4.1 Inclusion Criteria

All emergency patients having record of abdominal injury at AaBET hospital from January 2018 to January 2021 were included.

4.4.2 Exclusion Criteria

All cases with death observed before or upon arrival at the emergency department and those who have no full documentation were excluded.

4.5.1 Sample Size Determination

The sample size was calculated by using 15.4% proportion (P) of abdominal injury, a confidence level of 95% (1.96), and 5% margin of error (d) based on the study conducted on assessment of prevalence of abdominal trauma and associated factors in Arbaminch general hospital, Arbaminch, Gamo Gofa zone, Southwestern Ethiopia. Based on this assumption the sample size was calculated by using a single population proportion formula:

$n= [(Z\alpha/2)^2 * P (1-P)] / d^2$ Where;

n = estimated sample size

$Z\alpha/2$ = is a standard normal value which corresponds 95% of confidence level = 1.96

p= estimated prevalence of abdominal injuries is (0.154).

d= tolerable sampling error = 0.05.

After substitution the estimated sample size yields 200.I used correction formula because of the source population was less than 10,000 which was 260 for three years of data.

$200\times \frac{260}{460} = 113$, then I used 10% of nonresponse rate for missed and incomplete charts and added to 113.

113x10% +113=11.3+113=**<u>124</u>**

4.5.2 Sampling Procedure

Patients` cards were sorted out from HMIS and then systematic random sampling technique was applied. Based on HMIS documentation of AaBET hospital from January 2018 to January 2021 reported that total Patients with abdominal trauma were 260.This data was taken from HMIS register of AaBET hospital. The selection of patient cards was carried out every k value, which is sampling fraction calculated from source population and sample size.

K=source population/sample size

K=260/124=2.1

The selection of patients` card was carried out every 2 cards from 260 of them. From 260 cards I used the lottery method to select the first card from the first 2 orderly arranged patient`s document and then I took the card every 2 interval of patient cards.

4.6 Variables of the Study

4.6.1 Dependent Variable

Treatment outcome: discharged with alive or died

4.6.2 Independent Variable

Socio demographic factor: age, sex, residence

Injury pattern: mechanism of injury, GCS, organ involved, clinical manifestations and diagnosis, operative or conservative management.

Other factors affecting treatment outcome: Time of arrival, pre-hospital treatment, associated extra abdominal trauma, complication and length of hospital stay

4.7 Operational Definition

Patterns: Refers to characteristics of abdominal trauma regarding type, mechanism, abdominal organs affected, associated extra- abdominal injuries and management of abdominal trauma patients included in the study(22).

Intent of injury: the mechanism by which the injury occurs either intentional or unintentional(27).

Mechanism of injury: refers to the way damage to skin, muscles, organs and bones happen(28).

Penetrating Abdominal Trauma : occurs when a foreign object pierces the skin and the object remains in the tissue or passes through the tissues and creating a wound (29).

Blunt Abdominal Trauma: Injuries resulting from an impact with a dull, firm surface or object(30).

Patient's outcomes: patient condition at discharge either dies or still alive(22).

4.8 Data Collection Procedure and Tool

Data was collected by using structured checklist prepared for secondary data assessment. The tool contains socio- demographic characteristics, pattern of abdominal injury and status of the patient at discharge. The supervisors and data collectors were selected. The supervisors followed the data collection technique and all the data collectors and supervisor had regular meeting with the principal investigator at the end of each day of data collection period and the Principal investigator and the supervisor closely monitored the data collection process.

4.9 Data Quality Assurance

The data quality was maintained through careful design of checklists. Pretesting was done at 5% of sample size at Black Lion hospital for relevant amendments. The data collectors and supervisors were provided the necessary introduction and instruction to checklists. The checklists were checked for the completeness immediately after data collection. The Principal investigator and the supervisor closely monitored the data collection process.

4.10 Data Analysis Technique

The collected data were coded and entered into Epi Data Version 3.1 and cleaned. The cleaned data set were exported to SPSS Version 25 software for analysis. Socio demographic factor,

injury pattern and other independent variables those affect the patient outcome presented using relevant descriptive statistics (frequency and percentage for categorical variables and median and IQR for continuous variables) were calculated. Logistic regression was performed to see the association between the dependent variable and independent variables. Bivariate analysis was done at 25% level of significance to screen out potentially significant independent variables. For multivariate logistic regression, 95% confidence interval was used and variables with p-value ≤ 0.05 were considered as statistically significant with the outcome variable. Tables and graphs were generated to present data.

4.11 Ethical Considerations

The ethical clearance was obtained from Addis Ababa University, Emergency Medicine and Critical Care department. Official letter was written along with the ethical clearance and submitted to AaBET hospital office by principal investigator. This study didn`t have any risk consequence for study participants. The confidentiality of participant's related data was maintained by avoiding possible identifiers such as name of study participants only identification number was used as a reference.

4.11 Result Disseminations

The result of the study is disseminated to Addis Ababa University, college of health science department of emergency medicine and critical care nursing, AaBET Hospital administrative office, Addis Ababa health bureau and peer review for publication is considered

Chapter-five

5. Result

5.1 Socio demographic characteristics

A total of 124 patients` documents were seen during the study period with the response rate of 98.4%. From those 103(83.1%) were males. The peak incidence of injury was at the age of 30-39 years, 40 patients (32.3%). Greater proportion of the victims 47.6% and 41.1 % were from Oromiya and Addis Ababa residency respectively.

Table 1: Socio demographic character of abdominal trauma patients admitted at AaBET hospital, Addis Ababa, Ethiopia 2021

Sex:	**Frequency**	**Percentage (%)**
Male	103	83.1
Female	21	16.9
Age:		
<20	13	10.5
20-29	37	29.8
30-39	40	32.3
40-49	19	15.3
50-59	6	4.8
≥60	9	7.3
Address:		
Addis Ababa	51	41.1
Oromiya	59	47.6
Amhara	7	5.6
SNNP	4	3.2
Others	3	2.4

5.2 Pattern of abdominal injury

The most common mechanism of abdominal trauma was PAT 73(58.9%) and commonly caused by stab injury 40(55.56%) and bullet (gunshot) injury 28(38.89%). RTA and accidental fall were the predominant cause of BAT accounted 24(47.1%) and 16(31.4%) respectively. Three-quarter of the patients (75%) were brought to the hospital by ambulance. More than half 64(51.6%) of patients were admitted to the hospital during day time and 60(48.4%) at night time. Seventy two (58.1%) of the patients had GCS of 13-15 followed by 36(29%) 9-12 and 16(12.9%) <9. Road 52(41.9%), home 26(21%) and village 24(19.4%) were the places where abdominal traumas frequently occurred. The greatest proportion of abdominal injuries were occurred intentionally 79(63.7%). Patients who took alcohol during injury were small in number 15(12.1%). Almost all patients 117(94.4%) had abdominal pain. Only 12.1% patients had history of past illness.

Table 2: pattern of abdominal trauma patients AaBET hospital, Addis Ababa, Ethiopia 2021

Variables	Frequency N	Percentage (%)
Mode of arrival**:**		
Ambulance	93	75
Foot	3	2.4
Private car	16	12.9
Carried	6	4.8
Public taxi	5	4
Other	1	0.8
GCS**:**		
Mild(13-15)	72	58.1
Moderate(9-12)	36	29
Sever(<9)	16	12.9
Place of injury:		
Work place	19	15.3
Road	52	41.9
Home	26	21
Village	24	19.4
Farm	3	2.4
If RTA**:**		
Passenger	9	7.3
Pedestrian	10	8.1
Driver, motorcyclist, cyclist, others	5	4
Intent of injury:		
Intentional	79	63.7
Unintentional	45	36.3
Mechanism of abdominal injury:		
PAT	73	58.9
BAT	51	41.1
Clinical presentation**:**		
Abdominal pain	117	94.4
Abdominal distention	21	16.9
Hypotension(BP<90)	44	35.5
Tachycardia(HR>100)	60	48.4
Hematuria	6	4.8
Bowel evisceration	32	25.8
Vomiting	6	4.8
Bleeding at the wound site	20	16.1
Other signs and symptoms	14	11.3

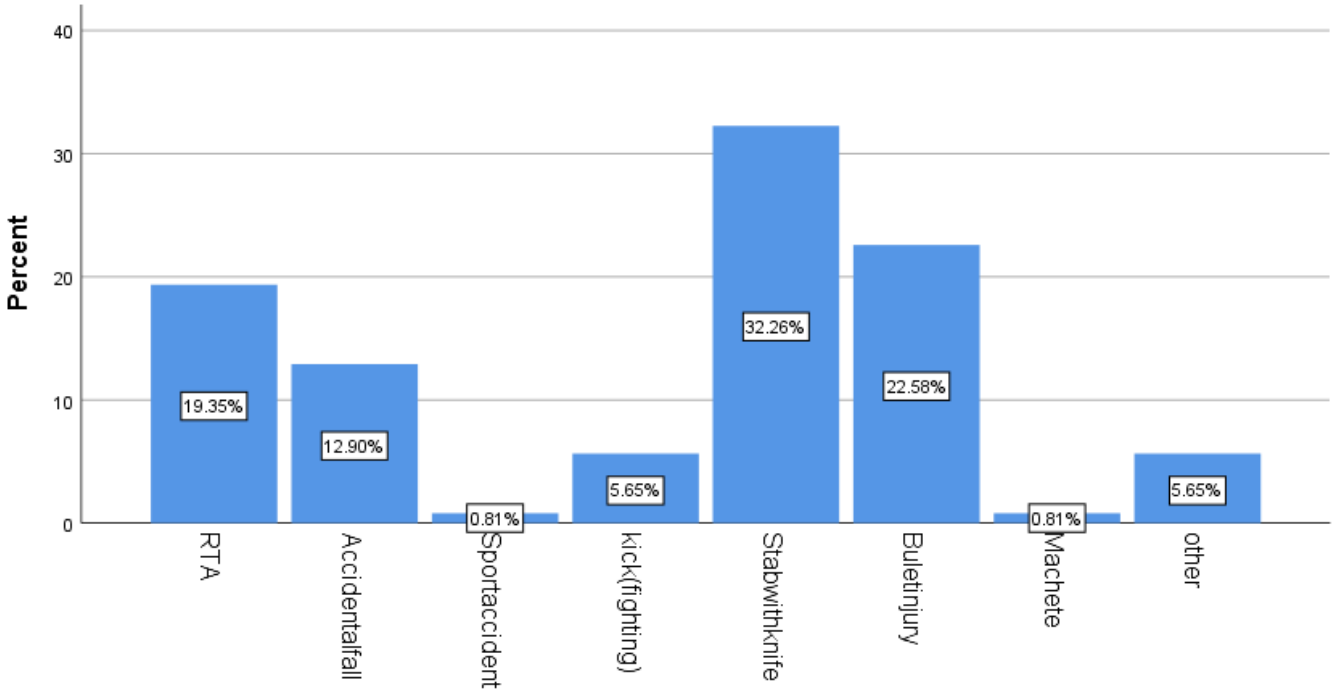

Figure 2: Cause of abdominal injury at AaBET hospital, Addis Ababa, Ethiopia 2021

5.3 Diagnosis and treatment outcome of abdominal trauma

Out of 124 abdominal trauma patients 121(97.6%) had FAST examination and from those 72(58.1%) were positive for hemoperitomeum. Half of the patients 62(50%) had pre-hospital treatment. Majority of the patients 84(67.7%) were managed by operative method and the commonest reason of operative management was hemodynamic instability 28(33.3%). Liver injury 7(38.9%) was the most common intraoperative finding of blunt abdominal trauma and bowel injury 41(62.1%) was the most common intra operative finding of penetrating abdominal injury. Of the intraoperative procedure bowel repair 42(50%) and liver laceration repair 13(15.48%) were greater in number. From a total of admitted patients 114(91.9%) were discharged with alive and 10(8.1%) of the patients died.

Table 3: Diagnosis and treatment outcome of abdominal trauma patients at AaBET hospital Addis Ababa, Ethiopia 2021

Variables	Frequency	Percentage (%)
FAST:		
Positive	72	58.1
Negative	49	39.5
Not done	3	2.4
Pre-hospital treatment:		
Yes	62	50
No	62	50
Management type:		
Conservative	40	32.3
Operative	84	67.7
Patient outcome:		
Discharged with alive	114	91.9
Died	10	8.1

Table4: Reason of intraoperative management of abdominal injury patients at AaBET hospital Addis Ababa, Ethiopia 2021

Variables	**Frequency**	**Percentage (%)**
Hemodynamic instability	28	33.3
Peritonitis	16	19.0
Peritoneal breaching local wound exploration	8	9.5
Evisceration	7	5.6
Failed conservative management	16	8.3
Other	9	10.7

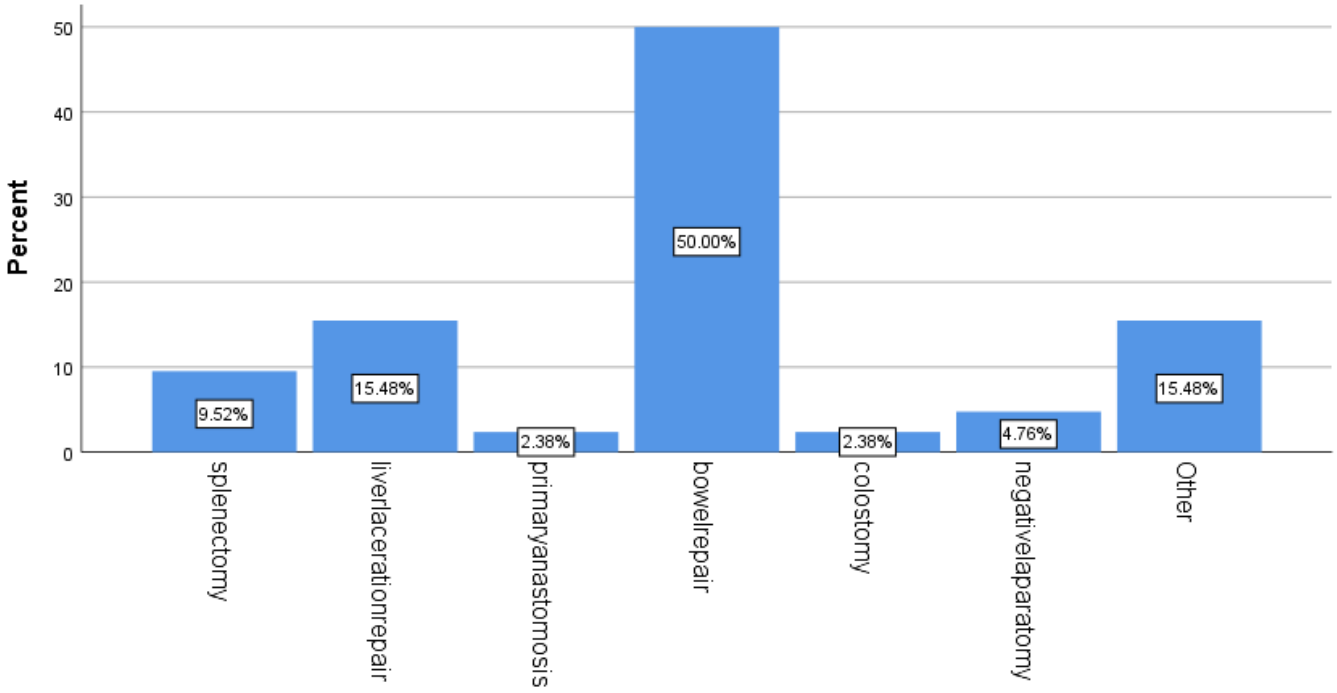

Figure 3: Intraoperative procedure of abdominal trauma patients at AaBET hospital Addis Ababa, Ethiopia 2021

5.4 Other factors affecting treatment outcome of abdominal trauma

Fifty eight (46.8%) of the patients had associated extra abdominal injury. Head was the commonest region 31(53.4%) of extra abdominal injury followed by thoracic region 24(41.4%). Out of 124 patients 49 (39.5%) of them presented to the hospital within 7 hours after injury. From 84(67.7%) operatively managed patients 53(42.7%) of patients developed post-operative complications. Hemodynamic 23(43.4%) and respiratory 22(41.5%) complications were the most common postoperative complications. Almost three quarter of the patients (73.39%) stayed at the hospital for ≥7days.

Table 4: Associated extra abdominal injuries of abdominal trauma patients at AaBET hospital Addis Ababa, Ethiopia 2021

Variable:	Frequency	Percentage (%)
Extremity injury	12	20.7
Head injury	31	53.4
Thoracic injury	24	41.4
Genitourinary	13	22.4
Spinal injury	4	6.9
Pelvis injury	8	13.8
Maxillofacial injury	3	5.2
Other extra abdominal injury	1	1.7
Total		

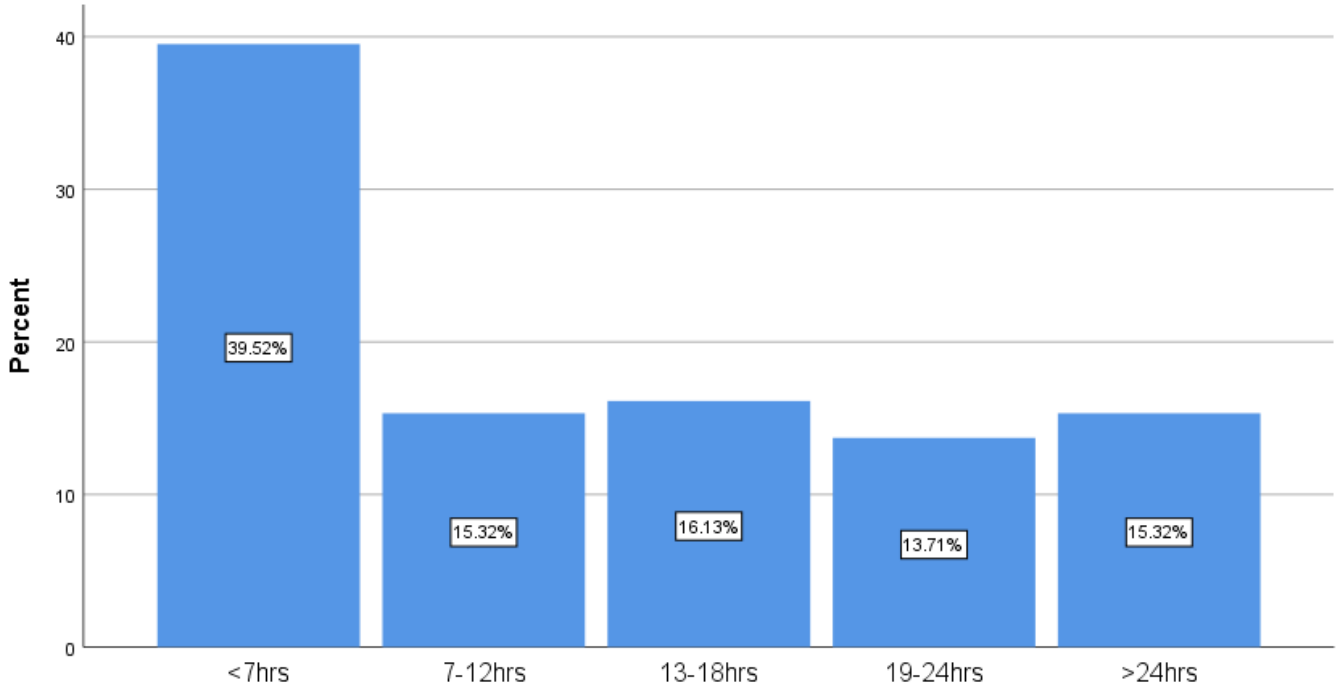

Figure 4: Duration of time from abdominal injury to presentation to AaBET hospital Addis Ababa, Ethiopia 2021

Table 5: Postoperative complications of abdominal trauma patients at AaBET hospital Addis Ababa, Ethiopia 2021

Variables:	Frequency	Percentage (%)
Surgical site infection	19	35.8
Intra-abdominal collection	6	11.3
Peritonitis	17	32.1
Paralytic ileus	5	9.4
Respiratory complication	22	41.5
Hemodynamic complication	23	43.4
Other postoperative complication	1	1.9

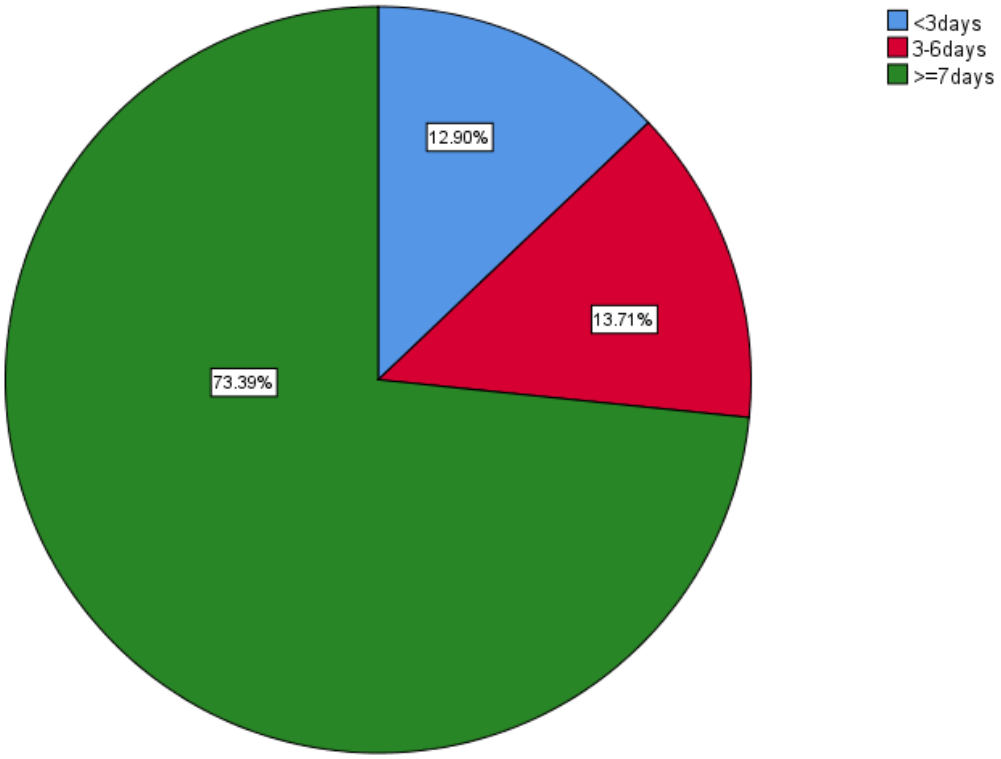

Figure 5: Length of hospital stay of abdominal trauma patients at AaBET hospital Addis Ababa, Ethiopia 2021

5.5 Factors associated to outcome of abdominal trauma

This study included 124 patients, 114(91.9%) were discharged with alive and 10(8.1% died. In this study the constants were coded for 1 as protective effect for GCS, time of admission and duration of time from injury to presentation to the hospital and for 2 as protective effect for past

medical illness, postoperative complication, hemodynamic complication and bowel evisceration variables. At bivariate analysis such as time of admission, GCS<9, bowel evisceration, past medical history of illness, postoperative complication, hemodynamic complications, and duration of time from injury to presentation to the hospital for 19-24 hours had p-value of 0.25 and included to multivariate analysis. In multivariate analysis variables such as GCS<9 is 14 times more likely to cause death, AOR: 13.6(95%CI: 3.68, 24.45), bowel evisceration was 17 times more likely to cause death, AOR: 16.66(95%CI: 1.53,18.18), past history of medical illness was 22 times more likely to cause death, AOR: 22.02(95%CI: 1.24, 39.58), hemodynamic complication 17 times more likely to cause death, AOR: 17.11(95%CI: 1.93,31.34). The above four variables were significantly associated with treatment outcome of abdominal trauma at the p-value of $\leq$0.05 with 95% CI (table 7)

Table 6: Bi-variable and multivariable analysis of factors associated with treatment outcome of abdominal trauma at AaBET hospital, Addis Ababa, Ethiopia 2021(n=124).

Variables	Categories	Pattern and outcome of abdominal trauma		COR with 95% CI	AOR with 95% CI	P-value
		Alive	Died			
Time of admission	Day	57	7	1		
	Night	57	3	0.43(0.106,1.740)	1.45(0.16,13.45)	0.742
GCS	Mild	71	1	1		
	Moderate	33	3	6.46(0.65,64.41)	21.7(0.84,56.53)	0.064
	Sever	10	6	14.6(4.64,19.49)	**13.62(3.68,24.43)**	**0.008**∗
Bowel evisceration	Yes	25	7	8.31(2,34.48)	**16.66(1.53,18.18)**	**0.021**∗
	No	89	3	1		
Past medical illness	Yes	10	5	10.4(2.57,42.14)	**22.02(1.24,39.6)**	**0.035**∗
	No	104	5	1		
Postoperative complication	Yes	46	7	3.45(0.85,14.03)	0.64(0.06,7.37)	0.718
	No	68	3			
Hemodynamic complication	Yes	26	7	7.9(1.91,32.72)	**17.11(1.93,31.34)**	**0.050**∗
	No	88	3	1		
Duration of time from injury to presentation to hospital	<7hrs	47	2	1		
	7-12hrs	18	1	0.36(0.05,2.77)	0.25(0.009,6.99)	0.413
	13-18hrs	18	2	0.47(0.04,5.7)	0.62(0.03,14.68)	0.769
	19-24hrs	14	3	0.94(0.12,7.48)	0.58(0.02,17.49)	0.755
	>24hrs	17	2	1.82(0.27,12.47)	0.39(0.02,10.16)	0.752

∗=p-value≤0.05

Chapter-Six

6. Discussion

Abdominal trauma is continuous to pose a significant public challenge. This study has shown the pattern and outcome of abdominal trauma patients admitted to AaBET hospital emergency department. In this study the majority of the patients were young people age ranged from 30-39 years with the median age (IQR) of 32 years. Males were more dominantly affected than females with male to female ratio of 5:1. This study is supported by similar study done in Tanzania states that abdominal trauma is common in productive male age groups with the median age(IQR) of 31.5 and male to female ratio of 5.5:1(7). These results may be due to males at this ages are economically active in outdoor activities, mobile and food earner of the family and males are highly prone for fighting.

In this study stab 55.56% was the commonest cause of penetrating abdominal trauma and RTA 47.1% for blunt abdominal trauma. This result in lined with the study done, in Ethiopia (St. Paul Millennium Medical College) showed that stab injury and RTA accounted 57.5% and 55% respectively, in North America stab injury was 48.1% and in India RTA was 48% (1, 5, 15). Similarity of RTA and stab injury between my study result and study done at St. Paul may be due to similar setting and unlicensed drivers and driving after taking alcohol and similar with research result of North America and India may be due to interpersonal violence, homicidal activities and driving after drinking alcohols.

The commonest clinical manifestations of this study were abdominal pain 117(94.4), hypotension44 (35.5%) and abdominal distension 21(16.9%). It is similar with research conducted in South India which reveals that commonest clinical manifestations are abdominal pain 92.1%,hypotension 28.1% and abdominal distension 17.6%(5). The possible scientific reasons may be associated nerve injury can cause pain; hemorrhage or bleeding from visceral solid and hollow organs can lead to hypotension and abdominal distension may be secondary to peritonitis or accumulation of blood in peritoneal cavity.

The result of this research revealed that bowel 41(62.1%) was the commonest hollow organ injured by PAI and liver 7(38.9%) was the commonest solid organs injured by blunt abdominal trauma. While comparing this result with the research done in South India, Uganda and Tanzania the percentage of bowel injury is less than the result of the present study(18%,22.9% and 56%) secondary to PAI and on the contrary the commonest solid organs injured following blunt abdominal trauma was spleen(27.5%) (4, 5, 7). This difference may be due to sample size variation and diagnostic methods used. Liver is highly prone for injury relative to other organs due to its large size and anatomical location.

Commonest associated extra abdominal injuries in this study were injury to the Head 31(53.4%), chest(thoracic) 24(41.4%) and extremities 12(20.7%), almost similar to the findings of the

research conducted in Saudi Arabia 58% had associated head injury and in Tanzania chest 34% and extremity 27% were commonest associated extra abdominal injuries (7, 25).The reason behind this may be associated extra abdominal trauma has high chance of occurrence as polly trauma like in RTA associated injury or patients may be fallen down and injured extra abdominal area after primary abdominal attack by stab, bullet and others even though associated extra abdominal injuries are common in blunt injury.

According to this study result half of the patients were given pre-hospital care. Majority 72(58.1%) of the patients had positive U/S for hemoperitonium. Hemodynamic instability 28 (33.3%) was the major reason of operative management. Bowel repair and liver laceration were the major intraoperative procedure. Other similar study conducted in Arba Minch showed that majority of U/S findings were positive U/S 21(51.2%) and hemodynamic instability 8(36.4%) was the most common reason of operative management. Bowel repair and liver laceration repair were the major intra operative procedure, but majority of the patients(59%) did not receive pre-hospital care unlike to my result(12). The occurrence of unlike results may be in case of the recent result pre-hospital care delivered for half of them as they were given from other health institutions before admission to my study area. Other possible reasons for the above similar results may be driven from availability of FAST for diagnosis, bleeding into peritoneal cavity, shock or hypotension, anatomic location and large size of those visceral organs may cause prone for injury.

Eighty four (67.7%) of the patients were treated by operative management. Similar to this study the research conducted in Tanzania among 210 patients 141(67.14%) were managed operatively(7). The reason can be raised from hemodynamic deteriorations and unresponsiveness to conservative management (clinical deterioration during observation) and surgical intervention may be necessary to remove foreign body like bullet injury from body cavity, sign of peritonitis or hemoperitonium finding after FAST.

Hemodynamic complication 23(43.4%) and respiratory complication 22(41.5%) were predominant among post-operative complications. The possible reasons for these complications can be inadequate administration of fluid to maintain blood volume, postoperative re-bleeding, prolonged bed confinement and development of DVT and lack of health education about cough exercise after surgery and also anesthesia drug may reduce lung function. This finding is unlike to the finding of the research done in Arba Minch, which stated that surgical site infection was the commonest post-operative complication 39%(12).

From this study majority (39%) of the patients were presented to the hospital within <7hours after occurrence of abdominal trauma. This might be as majority of patients have access of health institutions` ambulance as a mode of transportation to hospital and presence of clear catchment allocation, unlike to the research conducted in Uganda reported that majority of patients were presented to the hospital more than 6 hours after injury(4).

From the present study majority 91(73.4%) of the patients stayed in the hospital for ≥7days. Delayed arrival of patients to hospital or arrival of patients after development of complications, inadequate of quality of intra-facility care, development of hospital acquired infection or post-operative complications may prolong hospital stay. The above finding is in disagreement with the research conducted in South India which stated that majority 59.5% of the patients were discharged within 10 days(5).

According to the recent study almost three quarter of the patients (91.9%) were discharged with alive and 10(8.1%) patients died, similar to the study done in Egypt,90% of the patients were discharged with alive and 10 of the patients died, in Nigeria 92.48% of the patients discharged with alive and 7.52% were died(8, 22). The possible reason of majorities' improvement may be hospital level of being trauma center, inter-displinary health professional based care for patients, and early disposal of patients to respected ward based of severity of injury.

In other way the present study`s mortality rate is 8.1% higher than the mortality rate of reported from the research conducted in Arba Minch,Ethiopia,2.4%,in Mauritania,2%,Nigeria Port Harcourt teaching hospital 4.4%(3, 12, 18).This difference may also be due to seriously injured patients referred from remote area, arrival of patients after development of complication and delayed initiation of treatment because of late arrival to hospital, post-operative complications, the duration, the type and the method of research conducted as well as sample size difference.

From this study abdominal trauma patients with GCS<9 were more likely to die than that of patients with GCS of 13-15 and 9-12. The possible reasons might be brain insult and it causes diagnostic and therapeutic challenges for health professionals. But the research done in Egypt has shown that regarding Glasgow coma scale, there was highly statistical significant difference between admission and discharge rather than showing association between GCS and treatment outcome of abdominal injury patients(22).

Hemodynamic complications were 17 times more likely to cause abdominal related death than patients without hemodynamic complication. The possible scientific rationales can be inadequate nutritional and oxygen supply to the tissue secondary to shock or hypotension causes tissue cells to switch to anaerobic respiration, anemia, DVT, re-bleeding or reperfusion injury and organ ischemia of patients. Likewise the research in South Africa showed that from hemodynamic instability, hypovolemic shock and low hemoglobin levels were statically significant for abdominal trauma patients mortality(9).

Regarding the past medical illness, this study revealed that abdominal trauma patients with history of past medical illness were 22 times more likely to die than those who had no history past medical illness. The scientific explanation for this associated could be past medical illness causes weakening of immunity, some of the comorbidities may cause contra indication for medications that are necessary for the treatment of abdominal trauma or comorbidities and medications used for comorbidities may enhance mortality like anti-hypertensive medications

can cause shock and blood thinners can cause profuse bleeding and shock and finally profound state of shock may end up patient death. In the finding of this study, small number of patients had past medical illness which is supported by the research done in Egypt. However the past medical illness couldn`t have statically significant effect on (have no association with)mortality of patients with abdominal trauma as finding showed in study conducted in Egypt (22).

Abdominal trauma patients with bowel evisceration 17 times to die than patients without bowel evisceration. Possible justifications may be contamination (development of infections) due to touching and replacement of protruded visceral organ in to abdominal cavity with bare hands and also failure of sterile, moist, occlusive (water proof) dressing. The other possible reason for death following bowel evisceration may be shock secondary to hemorrhage from protruded organ. Although similar study conducted in Sudan reported that abdominal Evisceration through the stab wound was noted in 30 (35.3%) of the patients, abdominal evisceration had no association with mortality of the patients(31).

6.1 Limitation of the study

- Small sample size with short years of data and single study area
- Retro respective cross sectional study
- Some charts were incomplete or poor documentation
- Missed patient chart and incompatibility of HMIS patient file and chart patient file.

Chapter-Seven

7. Conclusion

This study tried to assess different factors like socio demographic characteristics, injury pattern, diagnosis and treatment outcome and factors affecting treatment outcome. Death of abdominal trauma patient was 10(8.1%). GCS<9, past medical illness, bowel evisceration and hemodynamic complications were identified as associated factors for abdominal trauma related death.

Chapter-Eight

8. Recommendation

Based on the study findings the following recommendations are forwarded:

- The hospital should improve chart keeping.
- There should be separated trauma registration log book from other non-trauma cases.
- Future similar studies should be carried on a large sample size in different trauma center hospitals to reveal patterns of abdominal trauma.
- Developing strategies that necessitate training the health professionals on how to use abdominal trauma scoring systems for frequent assessment of patients' health status from first day of admission to prevent further complications.
- Writing feedbacks to the referring health institutions to refer early as needed and to give proper first aid care.
- Writing feedbacks to government agencies like police to prevent at least intentional injuries.
- Abdominal trauma patients should be treated for both trauma and other comorbid illness if they have.
- Emphasis should be given to close monitoring of comatose patients as they are highly dependent of health professionals and prone for infection, early identification and treatment of comorbidities, close monitoring of vital signs, resuscitation, hemodynamic monitoring, sterile, and moist dressing and training for health professional about post-operative patient care to prevent post- operative complication related death and other first aids needed to reduce abdominal related mortality.

References

1. Hemang A. Panchal AMR. The study of abdominal trauma: patterns of injury, clinical presentation, organ involvement and associated injury. International Surgery Journal. 2016;3(3).
2. Trauma ACo. Advanced Trauma Life Support. American College of Surgeons.ninth edition.
3. Amabra Dodiyi‐Manuel NJJ, Patrick Okechukwu Igwe. Abdominal Injuries in University of Port Harcourt Teaching Hospital. Nigerian Journal of Surgery. 2011;21(1).
4. G. Ruhinda PK, D. Kitya,F. Bajunirwe. Abdominal Injury at Mbarara Regional Referral Hospital, Uganda East and Central African Journal of Surgery 2008;13(2).
5. Rajiv Kundlas RG, Joseph Alexis,Sadasivan Jagadish,Elamurugan TP. Clinico – Epidemiological Profile, Pattern and Outcome of Abdominal Trauma in A Level 1 Trauma Centre in South India. International Journal of Contemporary Medical Research 7(5).
6. Mohammad A Gad AS, and Goda M Ellabban. Incidence, Patterns, and Factors Predicting Mortality of Abdominal Injuries in Trauma Patients. North American Journal of Medical Scineces. 2012(4).
7. Shilanaiman Hilary Ntundu, AMH, Alfred Kishe, Heri Babu, Ola F. Jahanpour,David Msuya, Samuel G. Chugulu, and Kondo Chilonga,. Patterns and outcomes of patients with abdominal trauma on operative management from northern Tanzania: a prospective single centre observational study. 2019.
8. S PAgbo MO, S Ismail. pattern of surgical abdominal emergencies in Sokoto, Nigeria. Jos journal of Medicine. 2008;6(1).
9. M.N.Mnguni;D.J.J.Muckart;T.E.Madiba. Abdominal trauma in Durban,South Africa:Factors influencing outcome iInternational surgery. 2012;97(2).
10. P. MUSAU PGJaFAO. pattern and outcome of abdominal injuries at Kenyatta National Hospital, Nairobi. East African Medical Journa. 2006;83(1).
11. Lemma Negesa Bulto& YD, Biftu Geda. Magnitude, causes and characteristics of trauma victims visiting Emergency and Surgical Units of Dilchora Hospital, Eastern Ethiopia. Pan African Medical Journal. 2018.
12. Tsegaye W. assessment of prevalence of abdominal trauma and associated factors in arbaminch general hospital Arbaminch Gamo Gofa Zone South Western Ethiopia. 2018.
13. Semagn Abate BJA, Hailemariam Mulugeta Kassim,Bivash Basu. Epidemiology and outcomes of injuries among trauma patients in Ethiopia: A 5 -years retrospective Analysis. Critical Care and emergency medicine 2015-2019.
14. L. Hanks CPL, G. Tefera,N. Seyoum. Abdominal Surgical Emergencies at Tikur Anbessa Specialized Hospital in Ethiopia; A Shifting Paradigm. East Cent Afr J surg. 2013;19(1).
15. Kirubel Abebe1 MB, Ayelign Tsehaye,Befekadu Lemmu,Engida Abebe. Laparotomy for Abdominal Injury Indication & Outcome of patients at a Teaching Hospital in Addis Ababa, Ethiopia. Ethiop J Health Sci. 2019;29(4):503.

16. Bushira kiran Naeem SP, Ndia Naeem,Tanweer Ahmed,Iqbal Khan,Imran khan,Muhammad Tahir,Mazhar Iqbal. Visceral Injuries in Patients with Blunt and Penetrating Abdominal Trauma Presenting to a Tertiary Care Facility in Karachi,Pakistan. 2018;10(11).
17. Nikhil Mehta SB, Kumar Venugopal. An experience with blunt abdominal trauma: evaluation,management and outcome. Clinics and Practice 2013;4:599:35.
18. A. Moulaye Idriss, YT, J. S. Baba, S. M. Boukhary, B. Hamad, M. Abdllatif, T. A. Kane, M. Abdllahi, BM, B. Taleb. Abdominal Trauma: Five Years Experience in National Centre Hospital, Mauritania. 2018.

19. Christopher.J.L.Murray ADL. A comprehensive assessment of mortality and disability from diseases, injuries, and risk factors in 1990 and projected to 2020. The Global Burden of Disease. 1996;2.
20. Abd-El-Aal A. Saleem OAAR, Hassan A. Abdallah, Mohamed Yousef A. Epidemiological evaluation and outcome of pure abdominal trauma victims who underwent surgical exploratory laparotomy. Al Azhar Assiut Medical Journal. 2015;14(24-8):1687-93.
21. Tegegn G.Surgical treatment outcome and associated factors of abdominal surgical emergencies among patients operated in hiwotfana specialized university hospital harar Ethiopia april 2015.
22. Seham H.Mohamed MAA-A, Mogedda M.Mehany, Naglaa G.AbdElhafez & Ahmed T.Ahmed. Patterns and Outcomes of Abdominal Trauma Patients Admitted to Trauma Intensive Care Unit. Assiut Scientific Nursing Journal. 2020;8(21).
23. Cuschieri SA SR, Moosa AR. Trauma specific injuries In: Edward Arnold Essential surgical practice. 2002;1:1-41.
24. Maurice Asuquo VN, Mark Umoh,Gabriel Ugare,Cyril Agbor,Emmanuel Japhet,Anthonia Ikpeme. Blunt Abdominal Trauma in a Teaching Hospital,Calabar, Nigeria. International Journal of Clinical Medicine. 2012(3): 693-6.
25. Ali Albshabshe FASAJ, Jubran Safar Mater Al Shahrani , Salah Saeed al Jathnan Al Qahtani, Saeed Mohammed Saeed Alghamdi, Ali Ahmad Saeed Alsaleem,Mohammed Saeed Abdullah Alqahtani. Pattern and frequencies of patients with abdominal trauma admitted to ICU of tertiary care center (southern region, Saudi Arabia). The Egyptian Journal of Hospital Medicine. 2018;73 (4):2836-.
26. Tadesse A. Assessment of trauma care in tertiary center EC emergency medicine and critical care 2020(4):01-8.

27. Jill Daugherty P, corresponding author Dana Waltzman, PhD, Kelly Sarmiento, MPH, and Likang Xu, MD. Traumatic Brain Injury–Related Deaths by Race/Ethnicity, Sex, Intent, and Mechanism of Injury — United States, 2000–2017. MMWR Morb Mortal Wkly Rep. 2019;65(64(33)).
28. Michelle Despres P, CEAS II VP. Mechanism of Injury. 2018.
29. Burns SLB. Penetrating Abdominal Trauma 2020(01).

30. Eric L Legome M. Blunt Abdominal Trauma. 2019(02).

31. Maha Yassin Omer AAH, Mohammed Toum Musa. Penetrating Abdominal Injuries: Pattern and Outcome of Management in Khartoum. International Journal of Clinical Medicine. 2013;5:18-22.

APPENDEX

Information Sheet

A cross sectional study checklist to assess the pattern and outcome of abdominal injuries at AaBET Hospital, Addis Ababa, Ethiopia 2021 G.C.

My name is……. I am collecting data behalf of Mr. Matebe Muche. He is final year Master`s degree in Emergency Medicine and Critical Care Nursing student at Addis Ababa University. He is currently conducting a research as partial fulfillment for the requirement of course completion of research methodology on the topic of "pattern and outcome of abdominal injuries at AaBET Hospital, Addis Ababa, Ethiopia.". He uses patient document to revise his essentials of information from the document

Consent Form

If you have any questions you may ask me now or later, even after the study has started.

If you wish to ask questions later, you may contact any of the following individuals:

1. Matebe Muche

Cell phone: 0929451123

Email: matebemuche@gmail.com

You can ask me any more questions about any part of the research study, if you wish.

To be filled by data collectors and supervisors

Data collectors & supervisors Name Signature

Data collector name

Supervisor name

Data collection date

Annex 1

Addis Ababa University College of Medicine and Health Science Department of Emergency Medicine and Critical Care, checklist used for data collection on pattern and outcomes of abdominal injuries in AaBET Hospital.

Name & signature of data collector _____Date____/____/____Code no_____ Pts. MRN _____

Part I. Data on socio demographic characteristics

1. Ag in year ….……..

2. Gender……..?

   A) Male
   B) Female

3. Time of admission in day/night……..?

4. Residency……..?

   A) Addis Ababa
   B) Oromiya
   C) Amhara
   D) Tigre
   E) Sidama
   F) SNNP
   G) Others

5. Glasgow coma scale

   A) Mild (13-15)
   B) Moderate (9-12)
   C) Sever (<9)

Part II. Data on Pattern of Abdominal Injury

6. Cause of injury……?

   A) RTA
   B) Accidental fall
   C) Sports accident
   D) Kicks
   E) Stab with knife
   F) Bullet injury
   G) Machete injury
   H) Other

7. Place of injury……?

   A) Work place
   B) Road
   C) Home
   D) Village

E) Farm
F) Other

8. If RTA……..?

A) Driver
B) Passenger
C) Pedestrian
D) Motorcyclist
E) Bicyclists
F) Other

9. Intent of the injury……..?

A) Intentional
B) Unintentional
C) Undetermined intent

10. Mechanism of abdominal injury……?

A) Blunt
B) Penetrating

11. If blunt, cause of injury……..?

A) Motor vehicle trauma
B) Falls from heights
C) Kicks
D) Sports accident
E) Thrown stone
F) Other

12. If penetrating, object used……..?

A) Knife
B) Bullet
C) Machete
D) Spear
E) Other

13. Is Pre-hospital treatment given…….?

A) Yes
B) No
C) Unknown

14. Duration of time from injury to presentation to the hospital in hour……..

15. Mode of arrival to hospital on/by…….

A) ambulance
B) foot
C) private car
D) carried
E) private car
F) other
a.

16. At the time of injury any alcohol intake……?

A) Yes
B) No

17. Initial clinical presentation…….?

A) Abdominal pain
B) Abdominal distention
C) Hypotension (BP<90)
D) Tachycardia (PR>100)
E) Hematuria
F) Bowel evisceration
G) Other……..

18. Past medical history of illness……?

A. yes
B. No

19. If associated extra abdominal injury, which one is……?

A) Extremity injury
B) Head injury
C) Thoracic injury
D) Genitourinary injury
E) Spinal injury
F) Pelvis injury

20. FAST finding…….?

A) Positive for hemoperitoneum
B) Negative for hemoperitoneum
C) Not done

21. Management type……..?

A) Conservative
B) Operative

22. If operated, reason for operative management…….?

A) Hemodynamic instability
B) Peritonitis
C) Peritoneal breach in local wound exploration
D) Evisceration
E) Failed conservative management
F) Other

23. Intraoperative finding of blunt injury…….?

A) Splenic injury
B) Liver injury
C) Bowel injury
D) No organ injury
E) Other

24. Intraoperative finding of penetrating injury……..?

A) Bowel injury
B) Splenic injury
C) Renal injury
D) No organ injury
E) Other

25. Intraoperative procedure…….?

A) Splenectomy
B) Liver laceration repair
C) Primary anastomosis
D) Bowel repair
E) Colostomy
F) Ileostomy
G) Negative laparotomy

Part IV= Data on Outcome of injury

26. Is there complication…….?

A) Yes
B) No

27. Postoperative complications…….?

A) Surgical site infection
B) Intra-abdominal collections
C) Peritonitis
D) Paralytic ileus
E) No complication
F) Other

28. Length of hospital stay in day……?

29. Patient outcome……?

A) Discharged with alive
B) Died