ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCE

DEPARTMENT OF EMERGENCY MEDICINE

ASSESSEMENT OF EMERGENCY CARE CAPACITY OF DILLA UNIVERISITY REFERAL TEACHING ZONAL HOSPITAL EMERGENCY DEPARTMENT, DILLA UNIVERSITY REFERRAL TEACHING HOSPITAL, SNNPR,ETHIOPIA,2017.

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A THESIS SUBMITTED TO THE DEPARTMENT OF MERGENCYMEDICINE COLLEGE OF HEALTH SCIENCES, ADDIS ABABA UNIVERSITY AS PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF EMERGENCY MEDICINE.

June, 2017G.C

Addis Ababa, Ethiopia

ACKNOWLEDGEMENT

I express my heart-full thanks to Addis Ababa University, Emergency department to give this chance and I am grateful to express my heart-felt appreciation and thanks to my advisor Dr Aklili Azazh for his constructive comment and unreserved advice.

I also acknowledge to Dilla hospital staffs and management for their cooperative response and support for information gathering.

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ABBREVIATION

FMOH: Federal Ministry of Health

ECCN: Emergency & Critical Care Nurse

BSC: Bachelor of Science

SNNPR: South Nation Nationalities People Region

FDRE: Federal Democratic Republic of Ethiopia

WHO: World Health Organization

EM: Emergency Medicine

MSC: Masters of Science

UGEM: Undergraduate Emergency Medicine

EMT**:** Emergency Medicine Technician

EMCC**:** Emergency Medicine and Critical Care

HSDP**:** Health Sector Development Program

AAU**:** Addis Ababa University

TASH**:** Tikur Anibesa Specialized Hospital

ECCS**:** Emergency Care Capacity Score

DURTH**:** Dilla University Referral Teaching Hospital

ETSRAT: Emergency and Trauma Services Resources Assessment

ESRAT: Emergency Services Resources Assessment Tool

ACEP**:** American College of Emergency Physician

EDs**:** Emergency Departments

RTA: Road Traffic Accident

ICP: Intracranial pressure

ETAT: Emergency Triage and Treatment

EHTG: Ethiopian Hospitals Transformation Guideline

ATLS: Advanced Trauma Life Support

ALSO: Advanced Life Support in Obstetric

FAST: Focused Abdominal Sonography for Trauma

ABSTRACT

Background; Ethiopian Federal ministry of health has published hospital transformation guidelines which contains lists of essential emergency equipment, supplies, drugs and Human resources (Clinical & non-clinical) necessary to provide service in emergency care area. Also Good opportunity made from FMOH to improve access to health service provision by expanding or constructing new facilities buildings to deliver quality care for communities. Additionally FMOH examining challenges and providing chance to local level to address the gap in the whole parts of Ethiopia.

Objective; The objective of the study was to assess Emergency care capacity of Dilla University Referral teaching hospital, Gedeo zone ,SNNPR, Ethiopia.

Methods: Descriptive Institution based cross-sectional study design was conducted from January 09 to June 07, 2017. This study was conducted at DURTH using Emergency and Trauma Services Resources Assessment Tool for Ethiopia. This assessment tool was modified from the general (ESRAT) to (ETSRAT-Ethiopia) by Emergency and critical care directorate in FMOH. Data was entered in excel, results of the study was organized and presented using tables, and; the following statistical analysis was considered .Such as Frequency, percentage.

Results : The study demonstrated that emergency care capacity findings were ; nearly 67?% of emergency care personnel, and 70% of emergency medicine were available in the hospital, but only 43% emergency drugs were available in emergency care area. 36% over all emergency equipment indicator, 21% of emergency care supply, 75% of emergency care area laboratory indicator & 88% of system (routine) indicator were available in emergency unit of DURTH.

Conclusion & Recommendation; The findings reveal extreme deficiency of essential emergency equipment, supplies & drugs. Additionally there were shortage of emergency care health personnel & lack of job specific training. Therefore Dilla Hospital stakeholders should take measure to fill the above listed gaps. In Addition, FMOH & appropriate stakeholders should assist to fulfill the gaps.

CHAPTER ONE

1. INTRODUCTION

1.1. BACKGROUND OF THE STUDY

Emergency care capacity is determined by human resources and structural resources. Human resource s means the number and mix of health care professional include nurses and physicians and their level of formal training. Structural resources means material resources which used to provide optimal emergency care includes space, supplies items like essential medications and equipment. Availability of adequate numbers and well trained staff, essential medications and equipped emergency department is a necessary components to provide urgent care service in health institution of any country.

According to WHO toolkit on monitoring health systems strengthening, Availability refers to the physical access or reachable of services that meet a minimum standard. Which requires specific elements of health service delivery resources such as basic equipment and drugs, trained adequate health work force, and guidelines for treatment. This obtained by facility visits, using set of standardized data collection instruments. Data on the population distribution are required to estimate physical access. **[1].**

To talk about emergency care resources first we should know about burdens of disease or overwhelming factors. Emergency department visit was increasing due to steady growing global burden of communicable and chronic non-communicable medical, Surgical and trauma emergency condition. Non-communicable diseases comprise 80% of deaths in low- and middle-income countries, while 90% of mortality due to unintentional injury in these settings **[2, 3, and 4].**

According to World Health Organization Fact, traumatic injury kills about 5.8 million people each year accounting for 10% of the world death and 32% more than the number of fatalities than from HIV/AIDS, malaria and tuberculosis combined **[5]**.

There is still a high burden of preventable morbidity and mortality in resource limited low- and middle-income metropolitan cities such as Addis Ababa, Ethiopia. These globally growing burden of emergency conditions, especially in low-and middle income countries and resource available for emergency care in emergency department of health institutions are disproportion,

due to lack of human and material resources to care for injured or acutely ill patients, lack of specially trained emergency medical personnel, lack of basic infrastructure to deliver emergency care, lack of essential equipment and drug supply for emergency care **[6, 7].**

In Ethiopia Emergency care at emergency room was first started in Menelik II hospital. This was the first public hospital started to provide emergency care in ED after Ethio-Italian war because of causalities. The second public Hospital was Black Lion Hospital which begin Emergency service Unit with 20 observation and 3 resuscitation beds on August in 2009. In third St. Paul's Hospital established emergency room with 14 observation beds and next private Hospitals like Korean Hospital and other private hospitals also have EM care organized. After establishment of emergency care unit in parts of Ethiopia, Addis Ababa University established emergency medicine personnel Training program by creating partnership with other international universities and others to fill gap of Human resource for emergency care. EM personnel training established on October 2010 with programs EM Residency & MSC for Nurses, UG EM medical students, and on job short course raining was given to different professionals. **[8].**

According to the study done In Gedeo Zone in 2015, the impacts of road traffic accidents threaten severely the securities of peoples. In this zone most of the victims of accidents were adult and youth which account 71% are productive parts of the communities. As the result of injury adult &youth become permanently disabled, result in loss of the contribution of these energetic section of the zone. Findings from this area road traffic accidents are neglected causes of morbidity and mortality which leads a lot of people to death and permanent impairment **[9].**

1.2. STATEMENT OF PROBLEM

Because of increment of global burden of surgical, medical and traumatic emergency conditions, resulted in growing of local and international commitment to improve emergency care in low-and middle income country, including those in sub-Saharan Africa such as Ethiopia **[10, 11].**

Sub-Saharan African countries were struggling to identify obstacle for provision of emergency care and finding solution in common. Emergency care capacity Consensus conference was done in sub-Saharan Africa. The meeting points of the conference were; Emergency care referral systems (pre- and out-of-hospital emergency care), Healthcare facility based emergency care Emergency medicine specialist training and the role and importance of emergency nurses. The overall consensus points of recognition were all people should have equal access to acute care. According to consensus, access should not be limited by the inability to afford, the lack of health care providers or facilities. Maintaining the quality of services requires well-trained acute care practitioners working within an environment that provides adequate human and physical resources, and ongoing training .Acute care providers should perform regular reflection on their practice, building on strengths and correcting weakness in the acute care system on a regular basis, increasing interest of governments, academic institutions, non-governmental organizations, donors and other stakeholders create an unprecedented opportunity for advancing acute care in Africa. During results of consensus conference, researchers noticed challenges to the integration of delivering acute care were; under-documentation of the burden of acute disease, most healthcare facilities in the region lack an integrated approach to triage, resuscitation, and stabilization of acutely ill patients, limited resources for health care including critical shortage of trained healthcare personnel, essential equipment and drugs, lack of standardized regionally-appropriate clinical guidelines for acute care at the sub-district and community level, and there is no current advocacy plan for placing acute care on the global health agenda**. [12].**

According to 2011 report of hospitals in six sub-Saharan countries, none of the surveyed Hospitals had adequate infrastructure to meet the World Health Organization's minimum Standards of practice essential for the provision of emergency and surgical care, and fewer than 50% had 24-hour services **[13].**

In Ethiopia traumatic injuries are one of the common cause of morbidity and mortality. The largest proportion of serious injuries in Ethiopia comes from road traffic accidents; they have become one of the major national health burdens. The health sector recognizes that injuries

have multiple causes that necessitate a multi-sectorial approach towards effective prevention and rapid responses when they occur, including efforts to strengthen the quality and availability of emergency medical services. The target under HSDP III was to improve the proportion of people seeking formal health care in the case of serious illness or injury from 41% to55% **[14].**

. In Ethiopia Insufficient availability of human and material resource, essential equipment, drug supply, and infrastructure was cited as major barriers in providing basic emergency care **[7, 11]**.

To assist in resource allocation and planning, the World Health Organization (WHO) published lists of supplies considered as essential supply items for provision of minimum of basic emergency care **[15, 16].**

The Ethiopian Federal Ministry of Health recognized the gap between the need for emergency care services and the lack of resources available to deliver quality care and identified strengthening human resource capacity as a critical step to create an emergency medical system **[17, 18].**

Ethiopia is developing a comprehensive national health system giving priority, to building human capacity and developing infrastructure for training and education. This call to action by the Federal Ministry of Health to increase the number of trained health professionals in emergency medical care guided the development of a global health collaboration to strengthen existing emergency care at Addis Ababa University's Tikur Anbessa Specialized Hospital. This article describes the development of a twinning partnership between AAU, the University of Wisconsin-Madison, and the non-profit, diaspora organization People to People to strengthen emergency care and develop emergency medicine training as a specialty at TASH in Addis Ababa, Ethiopia. **[11]**.

There has been too few data on compliance with WHO's essential supplies for delivery of emergency care in Ethiopia. Then study was developed and to address this gap, it was interested to assess the emergency care capacity at adult and pediatric emergency department DURTH, SNNPR, Ethiopia. By doing this, the findings might identify gap in the essential components of Adult and pediatric emergency care items in Dilla university referral teaching hospital that would allow development of targeted intervention and strategies to improve emergency care**.**

1.3. SIGNIFICANCE OF THE STUDY

This study will have great significance concerning identifying the role and the way to enhance health service development

- It will identify the most unavailable material resource for emergency care to identify the gap & recommend for responsible body of the institution.

-It will provide information about Human resource and staff training capacity of emergency care & to fill the gap by planning for future improvement.

- It will identify Triage system to improve the system.

-It will initiate researcher to do in-depth study on the areas.

CHAPTER TWO

2. LITERATURE REVIEW

2.1. Human Resources, staff Training and continuing medical education, Essential Supplies, Equipment and Drugs, Infrastructure, Triage &Payment system.

To negotiate barrier to provide quality emergency care worldwide we have to search the problems, we must work together across disciplines and across boundaries in order to negotiate change and reduce the global burden of medical, surgical and traumatic emergency condition. Trauma and emergency care system have continued to mature over the past five decades in the U.S. and other highly developed nations, in contrast it is too low-and middle income countries such organization and infrastructure is virtually non-existent.

According to systematic review articles of emergency medicine in developed countries like the United States, UK and Australia shows that decade's years history in developing and advancing emergency medicine into an independent medical specialty. It is popular as other medical and surgical specialists as well. There was a realization of advanced emergency care to provide timely care and other consulting specialty that does not take patients from other physicians, enabling other specialties to practice more efficiently by eliminating disruptions to their office and hospital rounds schedules. In US, Sub-specialties of emergency medicine in the U.S .include toxicology, pediatric emergency medicine, emergencies and disasters, critical care, hyperbaric medicine, administration/practice management and research. In U.S emergency care was delivered in different emergency care team so that Emergency physicians do not work alone. Other members of the team include specialized emergency nurses, emergency technicians, paramedics, and physician extenders such as physician assistants and certified nurse practitioners. To provide quality emergency medical care in developed world like U.S was fielding extensive emergency medicine workforce and accomplishing the goals of the World Health Assembly in Resolution60.22 passed unanimously in 2007 that urges members:"...to ensure that a core set of trauma and emergency care services are available to all people who need them"**[19].**

Globally time-sensitive illnesses like RTAs, communicable and non-communicable diseases burden is increasing, and unfortunately the burden is high also in low-and middle income

countries. Due to unmet need of care and burdens of diseases, the quality of care were poor in resource limited settings in sub-Saharan Africa. Limited communication system, infrastructure, supplies and properly trained human resources all negatively impact the ability to deliver quality emergency and urgent healthcare. The improvement of emergency care in low-and middle income countries is also increasing importance.

The study in western Kenya , a total of 6o five level health facilities in Kisumu and Siaya counties in western Kenya .30 Out of 60 health facilities were level 4 and 5 other were lower levels. According to the study results of level 4 & 5 health facilities are; in a review of basic trauma supplies in level 4 and 5 facilities, 97% had gloves, 93% had suture and wound care materials, and 83% had oxygen. All five of the level 5 facilities 100% had chest tubes and X-ray capability .Three (12%) of the 25 level 4 facilities had chest tubes and 48% had X-ray capability. 64% level 4 facilities, and 100% of the level 5 facilities had blood available for transfusion. Level five facilities capacity of Functioning supplies and equipment were; 80% Monitored beds, 80% Central line kits, 80% Suction,100% Blood pressure cuffs, 60% Defibrillator, 100% Chest tube trays,100% Ultrasound,100% X-ray,100% Glucometer, Medications were; 40% Nitroglycerine, 100%Antibiotics,100% Opiates, 100% Insulin, 100%Pressors, 100% General and regional anesthesia, Airway/breathing were ; 100% Oxygen,20% CPAP/BPAP machine,100% Ambubag,100% Intubation supplies**[20] .**

Another study also done on emergency care capacity in Freetown of Sierra Leone, in seven secondary care facilities of two private and five public hospitals, using emergency care capacity score.(The private hospitals stocked all 23 indicator drugs and all 34 equipment indicators. The public facilities had an average of 16 of the 21 drug indicators and 21 of the 34 equipment indicators. ECCS of hospitals with each indicator and overall score showed that ECCS of 46% infrastructure,75% diagnostic, 50% Guideline,55%system,76%equipment,82%drugs,67%of training and 79% human resource availability were scored. The overall ECCS was 66%. As in Study showed that, deficiencies in capacity were most prominent in infrastructure and guidelines, while capacity was higher in terms of drug and equipment availability **[21].**

According to the study done in Tanzania in ten hospitals of four were district hospitals (secondary care), three were regional hospitals (tertiary care), two were national referral hospitals (quaternary care) and one was a privately owned mission. According to the study showed results Infrastructure; 30% Triage area for adults, 60% Emergency/Resus Room or

Area for adults, 30% Triage area for children, 50% Emergency Room/Area for children, over all calculated Infrastructure capacity score mean of 42.5%. Human resources capacity score of;100% Nurse always in the ER Clinician, 100% always in the ER or on-call for ER, Over all human resource capacity score of mean 100%.Staff training capacity of ; 20% Any staff trained in adult triage, 40% Any staff formally trained in Emergency care of adults, 40% Any staff trained in pediatric triage, 60% any staff formally trained in Emergency care of children ,Over all trained staff capacity score mean of 40%. The rest all emergency care capacity indicators were almost similar with ICU. Over all capacity score of median 100% Drugs , 90% equipment,42.2% Routine, 17.1% Guidelines,100% support service, Over all emergency care capacity indicators adult and pediatric emergency department of all hospitals calculated mean of 66.5% and ECCS of median 71.1% **[22].**

Study done in Kenya, in one district and one provincial hospital found that hospitals had a large volume of trauma, but due to the lack of intensive care units, specialized trauma units, and reported that absence of specialist senior like orthopedics and neurosurgery, faced to challenge to provide definitive care for severely injured patients the researcher reported that institutional capabilities were poor to train trauma-specific training, Formal trauma-specific training was absent in both hospitals. Advanced Trauma Life Support (ATLS) courses, was not available primarily due to the costs of such courses. And lack of quality improvement program. Due limitation of capacity, the researcher called for national and global intervention **[23]**.

The Study done in Rwanda district hospitals some limitation like non-functional triage system & lack of job aids for triage across all district hospitals surveyed. For management of asthma/Broncho-spasm, 25% of district hospitals lacked both nebulizer and MDI and, therefore efforts should be deployed to have at least one of these items. strong side of the district hospitals were readily availability of most of drugs necessary for resuscitation or emergency care were in all surveyed hospitals. From the findings researcher suggest that many of the physical resources judged necessary to provide emergency care to very sick children in a typical district hospital in Rwanda were available **[24]**

The survey done in Ghana second- level police hospital showed that there was critical shortage in availability of equipment &supply such as ; Absent of life saving advanced airway management equipment & supplies Thoracotomy set, Tracheostomy set Endo-tracheal tube, laryngeal mask airway: utility for physiological support of seriously injured patients like Transport ventilators, mechanical ventilator were not present: essential equipment & supplies

necessary for cardiovascular management like Electronic cardiac monitoring, Defibrillator, Central venous catheter& low-cost supply Urinary catheter were completely absent **[25].**

The study done in our country shows that the cause of dissatisfaction of emergency unit nurses were recommended that lack of medical equipment and supplies **[26].**

The study done in 32 public hospitals in Ethiopia was faced shortage of basic equipment and supplies in the emergency rooms of several hospitals. reported even in some hospitals there was a complete absence of these equipment and supplies A number of hospitals don't provide emergency and essential surgeries like tracheostomy 12(37%) 9 (19%) appendectomies 9 (28%). The major reasons were lack of skilled personnel, lack of equipment and lack of supplies. Twelve (37.5%) of the hospitals did not have designated emergency room and some hospitals shortage of x- ray facilities and basic laboratory services **[27]**

CHAPTER THREE

3. OBJECTIVE

3.1. General objective

The general objective of the study is to assess Emergency care capacity of DURTH, SNNPR, and Ethiopia.

3.2. Specific objectives

To assess the human resource mix and training for emergency care at adult and pediatric emergency department of DURTH.

To describe physical infrastructure for emergency care at adult and pediatric emergency department of DURTH.

To assess availability of essential equipment and Supplies for emergency care at adult and pediatric emergency department of DURTH.

To assess availability of essential emergency Medicines at adult and pediatric emergency department of DURTH.

To identify Laboratory service in emergency care area at adult and pediatric emergency center of DURTH.

To describe Triage system at adult and pediatric emergency department of DURTH

CHAPTER FOUR

4. METHODS AND MATERIAL

4.1. Study area and period

The study was conducted from January 09 to June 07, 2017 at Dilla (DURTH), SNNPRS, and Ethiopia. Dilla town is the administrative city of Gedeo zone, bordered on east, south and west by Oromia region, and on the north by Sidama zone .According to 2007E.C census, the total number of Dilla town population was 59,150. It is located360km from Addis Ababa and 90 km from Hawassa (the capital city of SNNPR). The hospital in this town established in 1976E.C namely Dilla university referral hospital (Former Dilla zonal hospital). DURTH is the only one Zonal referral teaching hospital, it provides curative and rehabilitative services for about 2 million populations living in SNNPR & Oromia Regional state. More than 10 health institutions were refering patients for further & better care from inside and outside of the catchment area. This hospital staffed by different specialist disciplines like surgery, obstetrics & gynecology, pediatrics, internal medicine, dermatology and other types health professional in different level of qualities. This hospital has total of 186 inpatient beds. Emergency care area provide services 24 hours a day, 7 days a week. The hospital is tertiary level teaching hospital giving medical education for varies category of health professionals.

4.2. Study design

Descriptive institution based cross-sectional design was conducted at adult and pediatric Emergency rooms of DURTH.

4.3. Population

4.3.1. Source Population

All hospitals which are found in Gedeo zone, SNNPR

4.3.2. Study Population

Emergency rooms in hospitals of Gedeo zone

4.3.3. Study Unit

Adult and Pediatric Emergency rooms at DURTH.

4.4. Inclusion and Exclusion criteria

4.4.1. Inclusion criteria

Emergency units of DURTH which have functional adult and pediatric emergency centers.

4.4.2. Exclusion criteria

Emergency care areas of Dilla hospital which are not provide surgical & medical emergency care service for adult and pediatric patients.

4.5. Sample size and Sampling technique

In Dilla town there is only one hospital which fulfill the criteria of adult & pediatric emergency unit. Therefore Adult and pediatric emergency rooms of Dilla hospital was selected purposively.

4.6. Data collection instrument

The data was collected by using a structured set of standards developed by Emergency & critical care directorate in FMOH to evaluate the Emergency and Trauma Capacity of primary, general and tertiary hospitals in Ethiopia. It was modified as Emergency and Trauma Services Resources Assessment Tool for Ethiopia This tool was revised to meet the Ethiopian context with clinicians and policy makers of Ethiopia. The core area of capacity evaluation are ,Services provision and Operating hours, human resources, staff training and continuing medical education, Essential drug, supplies & equipment availability, Triage systems, infrastructure, and laboratory service for emergency and trauma care. To meet the objective of the study area some modification of the tool were done. This Study would weigh too greatly towards the availability of adult and pediatric emergency care resources items in DURTH.

4.7. Study Variables

4.7.1 Dependent/outcome variable

Physical Infrastructure, Equipment, Supplies, Drugs, Training, availability of Human resource, Triage System & Laboratory service.

4.7.1 Independent/Explanatory variable

Capacity of Adequate provision of Emergency care; in terms of adequate provision of drugs, equipment and supplies, provision of conducive environment, Adequate Trained personnel, Appropriate triaging of patients to the right zone for medical attention,

4.8. Data collection Procedure

The data was collected by interviewer administered questionnaires and the presence & functionality of supplies including medications and equipment was assessed through direct observation using standards check lists. A structured interview was conduct face-to-face with head of all each unit areas of the hospital involved in emergency and trauma care service such as vice-president/ Chief executive, Medical director, Head of human resources medical director, nurse Matron, emergency case team head Physician, emergency units nurse coordinator and. Practicing emergency care area staff.

4.9. Data processing and analysis

Data was entered into Microsoft Excel. The results of the study was organized and presented using tables and statistical analysis was considered using Microsoft excel .Such as Frequency & percentage were employed.

4.10. Data quality Control

To assure the quality of data, structured data collection was used. The first two visits was done to schedule free day for interview & submit ethical clearance letter. During the data collection procedures, all the collected data was reviewed and checked daily for its completeness. Principal investigator was collected, organized and summarized data properly. The questionnaire was pretested before the actual data collection was conducted.

4.11. Ethical consideration

Formal permission written letter was obtained from department of emergency medicine. This ethical clearance letter was submitted and the purpose of the study was clearly communicated with vice-president/Chief Executive hospital. Finally, permission obtained from Chief Executive of the hospital. Emergency care area health personnel, medical director & emergency room staff in charge were asked their willingness to respond questionnaire before interviewing questionnaires and finally verbal consent was obtained from respondents.

4.12. Dissemination and communication of the results

Findings of the study will be disseminated to submission of the report to AAU, Department Of Emergency Medicine, DURTH and FMOH. I will try to publish the result of findings on scientific journals.

4.13. Operational definition

Training - The minimum requirement for training was defined as having attended an educational course organized within a government hospital/organization like BLS, ATL, and ETAT.

Physical infrastructure – refers designed emergency care area, access to regular power supply/generator, water supply and storage.

Triage system -refers to a system by which trained health personnel are able to sort out emergency cases or patients through categorization for treatment.

Essential emergency drugs - refers to drugs used for emergency care which are recommended as essential emergency medicine by WHO/EHTG.

Essential emergency equipment – refers to Non-consumables capital emergency equipment and durable items that last for several years like mechanical ventilator, AED/Defibrillator, blood pressure cuff…etc.

Essential Emergency Supplies – refers to consumable emergency care items that need to be replaced on a routine bases including disposable, single use items e.g. Disposable syringes & needle ; items that are used within a short time like blood glucose monitor strips, reagents, urine collection bags; and reusable items like cervical collar, suction tubing .

Emergency Care Area - refers to a parts OPD where critically or severely ill patients receive care

CHAPTER FIVE

5. RESULTS

5.1. General characteristics

A total of 20 out of 22 emergency care area health personnel in this rotation and medical staff in charge (head) were participated in the assessment. The participants were 14(70%) clinical staff (11 nurses, 2 pharmacist, 1 lab technician), 2 practicing medical staff (General practitioner) & 4 are Coordinators of emergency units in charge, Matron & chief executive of the hospital (Emergency unit case team head, emergency room nurse coordinator, Matron & vice-president (executive)).

5.2. Human resource

N.B. According to Ethiopian Hospital Transformation Guideline recommendation From lists of 21 minimum requirement of human resources for emergency case team, some of the personnel (such as Specialists, Social Worker) may also be part of the Inpatient Case Team, however they should be readily available to provide support/consultation to the Emergency Case Team whenever required. So if they provide support/consultation to the emergency case team, they taken as 'available' in emergency care area.

The finding of our study show that, a total of 14(67%) out of 21 emergency units human resources indicator were available in emergency care area. 5 (24%) were not available in the hospital & the remaining 2 (9%) available in the hospital, but not available in the emergency care area. Clinical and non-clinical emergency care area staffs such as General practitioner, Professional nurse(BSC) , Clinical nurses(Diploma), Pharmacist/Druggist, Lab technologist/technician, Runner/patient assistant, Cleaner and Security all were available in emergency care area 24hours a day. Auxiliary specialist staffs in different disciplines which included in EHTG recommendation such as Internist, Pediatrician, Surgeon and Obstetrician & gynecologist were readily available to provide support/consultation according to EHTG recommendation. Specialist staff of different disciplines needed for emergency care area like Emergency physician specialist, Orthopedics, Neurosurgeon & Psychiatrist not available in this hospital. In the same way Critical care nurse not available in the institution. The other health personnel such as Health officers, EM & CC nurse practitioner and imaging personnel available in the hospital, but not in emergency care area..

5.3. Staff Training indicator

Table 1. Staff Training status of emergency room General practitioner physicians & nurses in DURTH

	Emergency Staff training indicator	Yes	No
1.	Training of Pediatric ETAT	11(79%)	3(21%)
2.	Training of Advanced Life Support in Obstetric	0	14(100%)
3.	Training of basic life support	2	12(86%)
4.	Training of Advanced trauma life support	4	10(71%)
5.	Formal Training of airway management	1	13(93%)
6.	Formal training in how to intubate	0	14(100)
7.	Training of Focused Abdominal Sonography for Trauma	0	14(100%)

finding show that regarding staff training ; from the respondents who take pediatric ETAT training were 11(79%), those who take training of basic life support were 2 (14%) out of 14 & those who take training of advanced trauma life support was only 1 out of 14. None of the emergency care area staff who took Training on ATLS, ALSO, AAM & BAM.

5.3. Infrastructure indicator

Table 2. Available Facility infrastructure in Emergency center at DURTH

	Infrastructure indicator	Yes	No
1	Specific Designed Emergency care area		
2	pediatric emergency triage room	X	
3	pediatric Resuscitation room	X	
4	Medical-surgical emergency Triage room	X	
5	Medical-surgical Resuscitation room	X	
6	Emergency care area Isolation room		X
7	Is electricity continuously available?	X	
8	Is there a Back-up power supply in the case of power interruption (Generator)	X	
9	Is running water continuously available		X
10	is there another source if water supply interrupt		X
11	Is there functioning Refrigerator	X	

The above table show that, total of 8 (73%) out of 11 infrastructure indicators were available in the emergency care area. In DURTH both adult and pediatric emergency units have specific-designed triage and resuscitation areas. The units has continuous electricity power supply, if supply interrupt there is standby back-up generator. Also there is functioning refrigerator to store medication which require refrigeration. Emergency care area have no isolation room, continuous sources of local water supply and also there is no another water provision sources.

5.5. Essential Emergency Medicine Indicator

Table 3. Availability of Essential emergency medication at the Emergency unit in DURTH

	Available in Dilla hospital emergency care area		**Available in Dilla hospital the pharmacy/dispensary**		**Not available in Dilla hospital**
1	50% Dextrose (40% D)	1	Aspirin	1	Nor-adrenaline
2	Adrenaline/Epinephrine	2	Group O negative whole blood	2	Dextran/Voluven
3	Anti-venom (snake)serum	3	IV Calcium gluconate	3	Etomidate
4	Atropine -	4	IV Kcl/Potassium solution	4	Fresh frozen plasma
5	Tetanus anti-toxin serum	5	IV Vitamin K	5	Gelofusin
6	Diazepam	6	Magnesium sulphate	6	Heparin
7	Dobutamine	7	Naloxone	7	Glucagon, IM
8	Hydralazine	8	Nitroglycerine	8	IV Dopamine
9	Hydrocortisone	9	Propofol	9	10% Xylocaine spray
10	Insulin	10	Suxamethonium	10	Mannitol
11	IV Fluid- all type			11	Midazolam
12	IV Frusemide			12	Pethidine/Narcotic analgesia
13	Labetalol			13	Phenylephrine
14	Lidocaine			14	Sodium bicarbonate
15	Morphine/Narcotic anesthesia				
16	Oral Rehydration salt(ORS)				
17	Oxygen supply				
18	Salbutamol				

The above all emergency medication were recommended by WHO/EHTG.

From the above table, Almost 28(68%) out of total 41 essential items) emergency drugs listed in WHO/EHTG were available in the hospital, but only 18(44%) out of 41 essential items) were in stock of emergency care area, the remaining 10(24%) out of 41 items were available other than emergency unit, this misplaced crucial items like Aspirin, magnesium sulfate, IV calcium, gluconate, IV kcl were, either in dispensary or other pharmacy stock. Several essential items pointed in WHO/EHTG such as; like Fresh frozen plasma, Heparin, mannitol, Nor-epinephrine, dopamine, midazolam, sodium bicarbonate were not available in the hospital.

5.4. Essential emergency Equipment Indicator

Table 4. Availability of essential emergency equipment in DURTH

	Basic emergency Equipment indicator	WHO/EHTG Recommendation	Dilla hospital/ DURTH
1	**Airways/Breathing**		
1.1	Bag valve mask	E	2
1.2	Elastic gum bougies	ETHIO	0
1.3	Laryngoscope various sizes of blades	E	0
1.4	McGill forceps	E	2
1.5	Nasal prongs	E	2
1.6	Nebulizers	ETHIO	2
1.7	Oxygen cylinder with flow meter	E	2
1.8	Suction machines & tubes	E	1
1.9	Thoracotomy set	E	0
1.1	Tracheostomy set	E	0
1.11	Transport ventilators	ETHIO	0
1.12	Ventilator (ICU)	D	0
1.13	Venture mask/poly mask	E	0
1.14	Yankeur suction	E	0
2	**Circulation/haemodynamics**		
2.1	12 Lead ECG machine	ETHIO	0
2.2	Blood & fluid warmer	D	0
2.3	Cut-down set	ETHIO	0
2.4	Defibrillation/AED	ETHIO	0
2.5	Infusion pumps	ETHIO	0
2.6	Syringe pumps	ETHIO	0
3	**Splints**		
3.1	Cervical collar- Soft/hard	E	0
3.2	Spine board	E	0
3.3	Splints (specify the type needed)	E	0
3.4	Trac 3 traction (trade name)	E	0

WHO/EHTG – World Health Organization Ethiopian Hospital Transformation Guidelines, **E** – Item taken as Essential for emergency care at second-level hospitals by WHO, **D** – Item taken as Desirable for emergency care at second-level hospitals by WHO, **ETHIO** – Taken as essential item needed for effective emergency care by EHTG; For emergency Equipment by level category of **: 2**- Available & functional in emergency care are : **1**- Available in emergency care area, but not functional **: 0**- Not available in emergency care area.

From our study emergency equipment findings show that, only 5(36%) out of 14 Airway/Breathing essential equipments indicator were available & functional in emergency care area. Equipments that are needed for management of airway/breathing like bag valve mask, McGill forces, Oxygen cylinder with flow meter, nasal prongs& nebulizer were available and functional. Suction machines were available in emergency care area, but not functional. There is No lifesaving advanced airway surgical & non-surgical management equipments such as Thoracotomy set, Tracheostomy set, Laryngoscope various sizes of blades & Elastic gum bougies were not available in emergency care area. In addition equipments like mechanical ventilator & Transport ventilators were not available in the hospital.

Emergency care equipments which are necessary for managements of circulation including 12 Lead ECG machine, Blood & fluid warmer, Cut-down set, Defibrillation/AED, Infusion pumps and Syringe pumps all were not available in the emergency care area.

.Essential splints equipments needed for management of -trauma like Cervical collar, spine back board, splints & traction were not available in the hospital.

Monitoring devices & Diagnostic equipments needed for provision of emergency service such as Pulse oximeter, Glucometer, thermometer, stethoscope, Lumber puncture set and minor surgical set were available & functional in the emergency care area. The remaining equipments and devices like Blood gas electrolyte analyzer, Spirometer/peak flow meter, Mobile X-ray machine, Diagnostic peritoneal lavage set, Hand held Doppler machine and Supra-pubic catheter set were not available.

The overall 12(32%) out of 38 equipments indicator items which were available & functional during our survey.

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5.5. Essential emergency Supply Indicator

Table 5. Availability of essential emergency supply in DURTH.

	Basic emergency supply indicator	WHO/EHTG Recommendation	Dilla hospital/ DURTH
1	Airways/Breathing		
1.1	chest tube/underwater seal drainage	E	0
1.2	Combitube	ETHIO	0
1.3	Endo-tracheal tube	E	0
1.4	laryngeal mask airway	ETHIO	0
1.5	Nasopharyngeal airway	E	0
1.6	Oro-pharyngeal airway	E	0
1.7	Tongue depressor	ETHIO	1
2	Circulation/haemodynamics		
2.1	central venous catheters	E	0
2.2	Foleys catheter	E	1
2.3	High capacity catheters	E	0
2.4	Intra-osseous needles	E	0
2.5	IV Cannula 14, 16, 18, 20 &	E	0
3	Splints		
3.1	bandages	E	1
3.2	POP	E	1

WHO/EHTG – World Health Organization Ethiopian Hospital Transformation Guidelines, **E** – Item taken as Essential for emergency care at second-level hospitals by WHO, **D** – Item taken as Desirable for emergency care at second-level hospitals by WHO, **ETHIO** – Taken as essential item needed for effective emergency care by EHTG; by category of: **1**- Yes (available in emergency care area): **0**- NO (Not available in emergency care area)

The above table show that over all essential emergency Supply indicator according to WHO/EHTG recommendation was 3(21%) out of total 14.The only available essential emergency supply were Foleys catheter, bandages & POP. Airway/breathing, circulation and trauma emergency management supplies such as Endo-tracheal tube, laryngeal mask airway chest tube/underwater seal drainage, Combitube, airway adjuncts, central venous catheters, High capacity catheters and Intra-osseous needles were not available in emergency units.

5.6. Laboratory (Diagnostic) service indicator

This study finding demonstrate that, a total of 6 out of 8 needed emergency laboratory tests, namely Hemoglobin/Hematocrit, Blood film for malaria, Blood group & cross match, Urinalysis or urine dipstick, Stool examination and Pregnancy test were always available in the emergency care area. The remaining complete blood cell count & Random blood sugar were sometimes available in emergency care area.

According to EHTG recommendation out of the minimum requirement of laboratory services 75% were always available in the emergency care area.

5.7. Triage system & Payment system/financial barriers to care

Table 6. Available triage & payment system in emergency care area at DURTH

	Triage & payment system indicator	Yes	No
1	Does hospital have any triage protocol to distinguish urgent patients from those who wait?	X	
2	Is triage protocol used in the emergency care area	X	
3	is there different triage categories in any way (Color coding system?	X	
4	are All nurses who work in emergency care area trained in the use of triage protocol?	X	
5	are All physicians who work in emergency care area train in the use of triage protocol?		X

The above table show, all emergency care area nurses were trained in the use of triage protocol to sort out patients & they use color coded triage categories posted on wall at in-front of triage desk in triage room. The Over- all triage indicator score approximately 4(80%) out of 5.

6. DISCUSSION

This study demonstrates widespread deficiencies in emergency care capacity in Dilla university referral teaching hospital, Most of emergency care items were below 70% expected availability based on WHO recommendation it may have negative impact emergency care provision. The result of the study show that, Capacity was severely weak in job-specific training and continuing education among emergency room staff member, availability of essential Emergency equipments & supplies, shortage of senior specialist human resources capacity , and scores high in capacity on triage and payment system indicator, laboratory services & infrastructure indicator.

Study found there was no senior specialist staff like Emergency physician Specialist Orthopedics, Neurosurgeon & Psychiatrist not available in our hospital. This is similar with the findings on Shortage of human resources with that of other African countries. Study done in Kenya showed that there was lack of orthopedics and neurosurgery as the result the hospitals had a limited capacity to provide definitive care for severely injured patients **[23]**.

Previous study done in Developed countries like the united states, UK and Australia shows that emergency medicine were advanced into an independent specialty as other medical and surgical specialists. They were realized advanced emergency care to provide timely care and other consulting specialty that does not take patients from other physicians. In the U.S probably more than 50% current worldwide output emergency medicine personnel practicing. In U.S Sub-specialties of emergency medicine were like toxicology, pediatric emergency medicine, emergencies and disasters, critical care and hyperbaric medicine were practicing. In addition other members include specialized emergency nurses, emergency technicians, paramedics, and certified nurse practitioners were reported **[19].**

The above U.S study showed us that, there was the widest gap in emergency care provision between developed & developing LMIC countries including Ethiopia. In Ethiopia improving level of training both in physician and nursing specialty is the vital issues. Ethiopia was struggling to increase emergency care personnel Creating a twinning Partnership to Strengthen Emergency medicine at Addis Ababa University/Tikur Anbessa Specialized Hospital **[11].**
Our study result demonstrated absent of job-specific training in DURTH, except nurses trained ETAT. This finding were similar to the unavailability of job-specific training seen in other low and middle income countries. A Similar case study in hospitals of Kenya reported that

Formal job-specific trauma training like Advanced Trauma Life Support (ATLS) training courses was not available. [23]. additionally Also in Sierra Leone reported at the time of carrying out the evaluation there was no formal postgraduate training for clinicians in critical or emergency care [21]..

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The survey found shortage of essential drugs in emergency care area , from the study unavailability of items are due to stock out and it was stocked in other than emergency unit i.e. either in central pharmacy or dispensary. In contrast to our study district hospitals in Rwanda showed that there were readily available most of drugs necessary for resuscitation or emergency care were available in all surveyed hospitals [24]. This study findings on emergency drugs capacity were higher than our study area.

The survey done in Ghana second- level police hospital showed that there was critical shortage in availability of equipments &supply such as ; Absent of life saving advanced airway management equipments & supplies Thoracotomy set, Tracheostomy set Endo-tracheal tube, laryngeal mask airway: utility for physiological support of seriously injured patients like Transport ventilators, mechanical ventilator were not present: essential equipments & supplies necessary for cardiovascular management like Electronic cardiac monitoring, Defibrillator, Central venous catheter& low-cost supply Urinary catheter were completely absent [25]. This study findings gap in equipments and supplies were similar with our study.

In previous year, the study done in our country shows that the cause of dissatisfaction of emergency unit nurses were reported as lack of medical equipment and supplies [26]. Additionally the study done in 32 public hospitals in Ethiopia was faced shortage of basic equipment and supplies in the emergency rooms of several hospitals. Reported even in some hospitals there was a complete absence of these equipment and supplies [27]. A number of deficiencies in essential equipment and non-consumable supplies were not uniquely happen to Dilla hospital, it was also happen in the same country /and other African countries. The causes of such deficit were reported as budget constraint, lack of responsible specialized staff who enforce to avail equipments &supplies to practice his knowledge and skill. Therefore effortful commitment was needed to assure availability of items.

In contrast with the Tanzanian study, our study found higher capacity score of emergency infrastructure and routines/system reported**. [22].**

Even Our study demonstrated high capacity in Triage system, the opposed result was reported from district hospitals of Rwanda was found non-functional triage system & lack of job specific training for triage across all surveyed district hospitals **[24]**.

Strategic assessment study done in Ghana demonstrated that Factors contributing to non-availability of essential emergency items including emergency equipment, supplies & drugs. item absence (having never been present), insufficient supply or stock-outs or lack of training .Insufficient operating budgets, Technology item like Blood pressure cuffs non-availability were due to breakage , The author recommended that , Item availability could be improved, both affordably and reliably, by better organization and planning, such as: regular assessment of demand using established disease surveillance mechanisms; real-time bed-side inventory and feedback to procurement agencies to avoid stock-outs; and improving financing. In addition, for broken technology items developing local service and technical support capability **[28].** Similar action performing at this hospital may be able identify causes of deficiencies & taking measure on organization & planning may improve availability.

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7. CONCLUSION

This study identified barriers for provision of emergency care in Dilla university referral teaching hospital. The weakest parts were extreme shortage of capital emergency equipment, non-consumable supplies and drugs. In addition there was shortage of specialized emergency care personnel. Even at that existed deficit, several strong sides were seen, for example laboratory Service capacity, for all emergency staff nurses' in-service ETAT training was given. From the result of our study showed as, strong commitments were needed from the studied institution & responsible higher body stack-holders of the country.

8. RECOMMENDATION

Recommendation Based our Findings:

1. There was gap in job-specific training opportunity & specialist staff needed for emergency care, So the health institution must facilitate short term trainings & provide opportunities to continues education to increase knowledge, skill and improve quality of emergency
2. Findings of study demonstrated shortage of essential emergency drugs, so the. Health institution should fill the emergency care area stock to increase capacity & delivery of quality care.
3. There was extreme deficit of essential capital equipment & supplies, therefore the institution should fill according to his capacity level, unless must propose to higher ministry of health.

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ANNEXES

1. Questionnaire

BY: ASRESU FELEKE

ADVISOR: Dr AKLILU AZAZH (MD, EM PHYSICIAN, ASSOCIATE PROFESSOR)

Emergency care capacity assessment data collection tool

Interviewer Name _____ Date (did/mm/my): ___ / ___ / ___

Hospital Name: _____

Region: _____

[] General [] Primary [] Tertiary

1. Basic hospital information

Survey administrator instructions: The following information may be asked of the Medical Director or another administrator who collects this data. Please ask the administrator to provide a number, and then code the appropriate category that this number falls into.

A. Basic Total Hospital Information

1. How many people live in the catchment area that the district hospital serves?	Less than 100, 000	0
	100,000- 1.5 Million	1
	1.5 Million- 5 Million	2
	Greater than 5 Million	3
	Don't know	888

2. How many health institutions both inside and outside of the catchment area refer patients to your hospital?	Less than 10	0
	11-20	1
	21-30	2
	Greater than 30	3
	Don't know	888

3. How many total inpatient beds are there in the hospital?	Less than 50	0
	50-100	1
	101-150	2
	151-200	3
	200-250	4
	251-300	5
	Greater than 300	6
	Don't know	888

. What's the exact number of total inpatient _____beds

B. Basic Emergency room information

. How many patient beds are there in the Emergency Care Area? _____ Beds

3. Service Provision and Operating Hours of various departments for Emergency care

Survey administrator instructions: The next questions ask about the services that this hospital provides and the operating hours of various departments. These questions should be

directed to the Emergency Care Area physician or nurse in charge.

Are the following services staffed and available to emergency patients 24 hours a day, 7 days a week? For a department to be considered open, the staff must be physically present in the department, not coming from home.	**Open 24 hours a day**	**Open part of the day or week**	**N/A (none in hospital)**	**Don't know**
a. the outpatient department	1	0	999	888
b. the operating theatre	1	0	999	888
c. the pharmacy	1	0	999	888
d. the laboratory	1	0	999	888
e. blood storage in hospital	1	0	999	888
f. the imaging department	1	0	999	888
g. Liaison office	1	0	999	888
h. ED Card office	1	0	999	888
I. ED Cashier office	1	0	999	888

2. Human resources in emergency care area (Numbers of practicing staff And Training status)

A) Emergency Care Area Staff (i.e. the Permanent Staff in the Emergency Care Area)

A2. Member Staff s who covers 24 hours a day at Emergency care area

Emergency care area Human resource Indicator	Yes	No	N/A
1 Emergency physician Specialist	1	0	999
2 Internist			
3 Pediatrician			
4 Surgeon			

5	Obstetrician & gynecologist			
6	Orthopedics			
7	Neurosurgeon			
8	Psychiatrist			
9	General practitioner			
10	Health officers			
11	EM & CC nurse practitioner(MSc)			
12	Critical care nurse			
13	Professional nurse			
14	Clinical nurse			
15	Pharmacist/Druggist			
16	Lab technologist/technician			
17	Imaging personnel			
18	Runner/patient assistant			
19	Cleaner			
20	Security			
21	Social worker			

B) Staff Training

	Emergency Staff training indicator	Yes	No
1	Training of Pediatric ETAT	1	0
2	Training of adult ETAT		
3	Training of Advanced Life Support in Obstetric		
4	Training of basic life support		
5	Training of Advanced trauma life support		
6	Formal Training of airway management		
7	Formal training in how to intubate		
8	Training of Focused Abdominal Sonography for Trauma		

3. Physical Resources in Emergency care area

3.1 Infrastructures

A1. Where are the following emergency services delivered? (If these services are not available in the hospital please mark N/A). In this question, the term "Emergency Care Area" refers to a free-standing emergency care area or a single area where any crucially ill patient is resuscitated

	Infrastructure indicator	Yes	No
1	Specific Designed Emergency care area	1	0
2	pediatric emergency triage room		
3	pediatric Resuscitation room		
4	Medical-surgical Triage room		
5	Medical-surgical Resuscitation room		
6	Emergency care area Isolation room		
7	Is electricity continuously available?		
8	Is there a Back-up power supply in the case of power interruption (Generator)		
9	Is running water continuously available		
10	is there another source if water supply interrupt		
11	Is there functioning Refrigerator		

3.3. Essential emergency medicines

Survey administrator instructions: This section refers to the medication stock in the Emergency Care Area. If the medications are not in the Emergency Care Area, check the pharmacy or dispensary. All medications must be seen in order to mark that they are currently available. If the medication is available in the Emergency Care Area, you do not need to find it in the pharmacy or dispensary.

	Emergency medicine Indicator	Available in the emergency care area	Available in the pharmacy/ dispensary	Not available in emergency care area or pharmacy dispensary
1	50% Dextrose (40% D)	2	1	0
2	Adrenaline/Epinephrine			
3	Nor-adrenaline			
4	Anti-venom (snake) serum			
5	Aspirin			
6	Atropine			

6	Tetanus anti-toxin serum			
7	Dextran/Voluven			
8	Diazepam			
9	Dobutamine			
10	Etomidate			
11	Fresh frozen plasma			
12	Gelofusin			
13	Group O negative whole blood			
14	Heparin			
15	Hydralazine			
16	Hydrocortisone			
17	Glucagon, IM			
18	Insulin			
19	IV Calcium gluconate			
20	IV Dopamine			
21	IV Fluid- all type			
22	IV Frusemide			
23	IV Kcl/Potassium solution			
24	IV Vitamin K			
25	Labetalol			
26	Lidocaine/Local anesthesia			
27	10% Xylocaine spray/Local anesthesia			
28	Magnesium sulphate			
29	Mannitol			
30	Midazolam			
31	Morphine/Narcotic anesthesia			
32	Naloxone			
33	Nitroglycerine			
34	Oral Rehydration salt (ORS)			
35	Oxygen supply			
36	Pethidine/Narcotic analgesia			
37	Phenylephrine			
38	Propofol			
39	Salbutamol			
40	Sodium bicarbonate			
41	Suxamethonium			

3.4. Essential emergency equipment (Non-consumables)

Survey administrator instructions: This section refers to equipment that is used in the Emergency Care Area. All equipment must be functional in order to be counted—it should be turned on and checked to make sure its power source is working.

	Basic emergency **Equipment indicator**	Available & **functional in the emergency area**	Available in the **emergency area, but not functional**	Equipment present but not able to assess due to power outage
1	**Airways/Breathing**			
1.1	Bag valve mask	2	1	0
1.2	elastic gum bouges			
1.3	Laryngoscope various sizes of blades			
1.4	McGill forceps			
1.5	Nasal prongs			
1.6	Nebulizers			
1.7	Oxygen cylinder with flow meter			
1.8	Suction machines & tubes			
1.9	Thoracotomy set			
1.1	Tracheostomy set			
1.11	Transport ventilators			
1.12	Ventilator (ICU)			
1.13	Venture mask/poly mask			
1.14	Yankeur suction			
2	**Circulation/haemodynamics**			
2.1	12 Lead ECG machine			
2.2	Blood & fluid warmer			

2.3	Cut-down set			
2.4	Defibrillation/AED			
2.5	Infusion pumps			
2.6	Syringe pumps			
3	**Splints**			
3.1	Cervical collar- Soft/hard			
3.2	Spine board			
3.3	Splints (specify the type needed)			
3.4	Trac 3 traction (trade name)			
4	**Monitoring devices**			
4.1	Pulse oximeter			
4.2	Patient monitors (invasive & non-invasive)			
4.3	Glucometer			
4.4	Blood gas electrolyte analyzer			
4.5	Spirometer/peak flow meter			
4.6	Thermometer			
4.7	Stethoscope			
4.8	Sphygmomanometer (digital & aneroid)			
5	**Diagnostic equipment**			
5.1	Mobile X-ray machine			
5.2	Diagnostic peritoneal lavage set			
5.3	Lumber puncture set			
5.4	minor surgical set			
5.5	Hand held Doppler machine			
5.6	Suprapubic catheter set			

3.4. Essential Emergency Supplies (consumables)

Survey administrator instructions: Refer to equipment photo guide if any equipment is unfamiliar

Table 6. Availability of essential emergency supply in DURTH.

	Basic emergency supply indicator	Yes	No
1	Airways/Breathing		

1.1	chest tube/underwater seal drainage	1	0
1.2	Combitube		
1.3	Endo-tracheal tube		
1.4	laryngeal mask airway		
1.5	Nasopharyngeal airway		
1.6	Oro-pharyngeal airway		
1.7	Tongue depressor		
2	Circulation/haemodynamics		
2.1	central venous catheters		
2.2	Foleys catheter		
2.3	High capacity catheters		
2.4	Intra-osseous needles		
2.5	IV Cannula 14, 16, 18, 20 &		
3	Splints		
3.1	bandages		
3.2	POP		

3.5. Laboratory service

Survey administrator instructions: Please confirm with lab supervisor; seeing reagents and machinery is NOT necessary.

	Laboratory service indicators	Always available	Sometimes available	Not available
1	Hemoglobin/Hematocrit	2	1	0
2	Blood floom for malaria			
3	Blood group & cross match			
4	complete blood cell count			
5	Random blood sugar			
6	Urinalysis or urine dipstick			
7	Stool examination			
8	Pregnancy test			

4. Routine/System indicator

Triage system

Survey administrator instructions: Confirm the following response of question **A1** with the actual presence of triage organization present in the Emergency Care Area. If the answer to question in this section is No, please answer N/A in all of the following questions in this section.

	Triage & payment system indicator	Yes	No
1	Does hospital have any triage protocol for distinguish Urgent patients from those who wait?	1	0
2	Is triage protocol used in the emergency care area		
3	is there different triage categories in any way (Color coding system?		
4	are All nurses who work in emergency care area Train in the use of triage protocol?		
5	are All physicians who work in emergency care Area train in the use of triage protocol?		

Thank you for your corporation!

Asresu Feleke

2. Declaration

I, the undersigned, declared that this is my own work and all the source of materials used for this thesis have fully acknowledged.

Name: Asresu Feleke

Signature: _____

Date of Submission: _____

Place: AAU

This paper has been submitted for examination with my approval as a university advisors.

Advisor:

Dr AKLILU AZAZH (MD, EM PHYSICIAN, ASSOCIATE PROFESSOR)

Signature: _____

Date: _____

External Examiner:

Name: Dr. Assefu W/tsadik (MD, ER Physician)

Signature: _____

Date: _____