



ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
SCHOOL OF COMMERCE
PROJECT MANAGEMENT MASTER'S PROGRAM
DISASTER RISKS AND PREPAREDNESS STATUS OF PUBLIC
HOSPITALS IN ADDIS ABABA, ETHIOPIA

BY: ANDUALEM WUBETIE

ADVISORS: - Dr WASIHUN M. (PHD)

THIS THESIS IS TO BE SUBMITTED TO SCHOOL OF COMMERCE
DEPARTMENT OF BAIS FOR PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE IN MASTERS OF ART IN
PROJECT MANAGEMENT

JUNE, 2024
ADDIS ABABA, ETHIOPIA.

ADDIS ABABA UNIVERSITY

GRADUATE STUDIES PROGRAM

MASTER OF ARTS DEGREE IN PROJECT MANAGEMENT

**DISASTER RISKS AND PREPAREDNESS STATUS OF PUBLIC
HOSPITALS IN ADDIS ABABA, ETHIOPIA**

BY

Andualem Wubetie

Approved by Board of Examiners

Advisor _ Dr Wasihun M____Signature _____Date_____

Internal Examiner - Dr Adane _____Signature_____Date_____

External Examiner - Dr Zelalem_____Signature_____Date_____

DEPARTMENT HEAD

Name ----- Signature ----- Date -----

Declaration

I hereby declare that the study which is being presented in this thesis entitled “**Disaster risks and preparedness status of public hospitals in Addis Ababa, Ethiopia**” is an original work of my own. It had not been presented for any educational qualification at this university or any other and in any projects by any means, and all the resources and materials used for this thesis had been accordingly acknowledged.

Andualem Wubetie

Declaration

I hereby declare that the study which is being presented in this thesis entitled “**Disaster risks and preparedness status of public hospitals in Addis Ababa, Ethiopia**”. It is conducted by Andualem Wubetie for the partial fulfillment of the requirements of a master’s degree in Project Management. To the best of my knowledge, it is original work carried by him, it had not been presented for any educational qualification at any institution or not published work at any journal.

Advisor(Dr Wassihun M, PHD, Assistant professor)

Date

AKNOWLEDGMENT

I want to express my thanks to Addis Ababa University school of Commerce for providing me the chance to participate in this program. I would like to extend my deepest appreciation to my advisor Dr. Wasihun M(PHD) for his valuable support and guidance during my research work. His expertise and advice have significantly influenced the direction of my study and improved the quality of my work. My thank is also to Hospital managers and disaster management focal persons for their cooperation and participation during my data collection.

Finally, I would like to thank my beloved family for their continuous support.

ABBREVIATIONS AND ACRONYMS

AAU-	Addis Ababa University
AHM-	All Hazard Measure
ED –	Emergency Department
HDRME-	Hospital Disaster Risk Management Evaluation
ICG -	Incident command group
MCI -	Mass Casualty Incidents
NGO -	Non Governmental Organization
PMBOK -	Project management body of knowledge
PMI -	Project Management Institute
RBM -	Result-based management
SSA-	sub-Saharan Africa
SWOT -	Strength, weakness, opportunities and threats
WBS -	work breakdown structure
WHO -	World Health Organization

Table of content

Contents

AKNOWLEDGMENT	IV
ABBREVIATIONS AND ACRONYMS	V
Table of content	VI
Abstract	IX
Chapter 1: Introduction	1
Background	1
Statement of the problem	2
Research questions	5
Objective	5
General objective:	5
Specific objectives:	5
Significance of the Study	6
Scope of the Study	6
Limitations of the study	7
Organization of the Study	7
CHAPTER TWO- Literature Review	8
Types of Disaster:	10
Phases of disaster and emergency management	11
Hospital emergency response	12
2.3. Project Management Concepts in disaster readiness and response	14
CHAPTER THREE- RESEARCH METHODOLOGY	20
Introduction	20
Study Setting and Period	20
Research Design	20
Research Approach	20
Data Source	21
Population	21
Data collection tools and process	21
Data processing and analysis	22
Ethical Consideration	23

CHAPTER -FOUR - DATA PRESENTATION, ANALYSIS AND INTERPRETATION.....	24
Characteristics of public hospitals	24
leadership and management	25
Level of hospital emergency and disaster preparedness	27
Summary of Hospital Preparedness Level	31
Disaster Risk Perception of Hospital Focal persons/managers.....	32
DISCUSSION.....	33
CHAPTER- 5 - CONCLUSIONS AND RECOMMENDATIONS.....	35
5.1. CONCLUSION.....	35
5.2. RECOMMENDATIONS.....	35
5.3. Suggestions for Further Study.....	37
References	37
ANNEX – I	42

List of tables

Table 1: Characteristics of public hospitals	24
Table 2: Level of hospital managers' commitment	26
Table 3 : Description of emergency and disaster preparedness status.....	30
Table 4: Disaster management preparedness level	31
Table 5: Hospital disaster focal persons'/managers' perceptions for Disaster Risks	32

List of figures

Figure 1: Disaster management cycle	12
Figure 2 Conceptual framework	19
Figure 3: Level of hospital managers' commitment.....	27
Figure 4: Hospital disaster response preparedness level.....	32

Abstract

A disaster is an event that suddenly disturbs the functioning of a community or organization, resulting in human, economic, material, or environmental losses and crises. Disaster response is the actions taken directly before, during, or immediately after a disaster. Hospitals have a vital function and role in the provision of essential medical care for communities during any type of emergency/disaster. Project Management plays a vital role in disaster relief efforts. Disaster management is used to plan and utilize key project management principles and practices.

The objective of this study was to assess the disaster risks and preparedness status of public hospitals in Addis Ababa, Ethiopia. The study was conducted from March to April 2024 in Addis Ababa city public hospitals. About 82% of hospitals have a low level of disaster preparedness. The majority (73% of hospitals) were not updated and tested their disaster management plan at least annually. Most hospitals have faced real disasters and the most common was road traffic accidents. Common challenges were a shortage of supplies and resources, coordination problems, space and security problems. From the total seven parameters to assess the disaster preparedness of public hospitals, five parameters were scored as low level. Most of the focal persons for disaster management did not have management training experience. Most (91%) of hospital managers have a low level of support, commitment, and participation in disaster management. The perceived disaster risk of most tertiary-level hospitals is high level.

Key words: *Hospital disaster preparedness, project management, public hospitals, Addis Ababa*

Chapter 1: Introduction

Background

Disasters are serious disruptions to the functioning of a community or organization that exceed its capacity to cope using its own resources. It can be caused by natural or man-made hazards. Disasters have resulted in substantial devastation and loss of lives throughout human history (IFRC, 2024) . According to World Health Organization definition, it is defines as “a sudden ecologic phenomenon of sufficient magnitude to require external assistance”(WHO, 2011). Disasters can lead to severe disruptions of the functioning of a community or society, causing devastation for individuals, economic, material and environmental losses. All communities are at risk for different types of disasters and emergencies including those related to natural disasters, infectious disease outbreaks, conflicts, technology and others(WHO, 2019).

Globally, disasters are increased in number and frequency, and Sub-Saharan Africa(SSA) is one of the affected regions for its prone to major natural forces and man-made events(Farah et al., 2023). In the last 10 years, it affected more than 35 million people in SSA, resulted in an impact on economic and social activities. Furthermore, people in different parts of Africa are facing different challenges of natural hazards, like droughts, flood, volcanic eruptions, and earthquakes, compared with other continents in the world (Farah, 2023)

These events cause thousands of deaths, and injuries, and incur economic loss in billions of dollars annually. Global statistics showed that there is a higher frequency of impact on developing nations compared to industrialized countries (Goosman, 2019).

Disaster management is essential for organizing resources strategically to minimize the impact due to disasters. It is a process of effectively preparing for and responding to disasters. It involves a systematic approach to managing the responsibilities of disaster prevention, preparedness, response, and recovery. Disaster management is about organizing and directing resources to cope with a disaster(Tulane, 2021).

It is stated that emergency managers are project managers as the phases of emergency management largely follow the project management framework. Therefore, a deeper understanding of project management for best practices is essential for emergency managers in the health care setting.

According to the Project Management Institute (PMI), a project is defined as “a temporary effort to create value through a unique product, service or result,” and project management is “the use of specific knowledge, skills, tools, and techniques to deliver something of value to people.” Based on these definitions, a project in disaster or emergency management includes different actions like incident action plan development, technical team establishment, response framework creation, design and execution of a training exercise, and other activities (Tager, 2022).

Project management knowledge, that is generated through well-designed, effectively executed study findings is crucial to organizational future capacity for better achievement of goals for effective preparation and response focused on preventing injury, disability, and death, and also to support recovery (Lurie et al., 2013).

The frequent and continuous occurrence of public health emergencies was challenging for government agencies and healthcare organizations for effective preparedness and response capacities. Natural hazards combined with social, economic, and environmental weaknesses resulted in disasters with devastating consequences in our country. Hospitals are vital to provide essential medical care for communities during any type of disaster response. Disasters may result a rapid increase in service demand that can overwhelm the functional capacity and safety of hospitals and the healthcare system (WHO, 2011).

Hospital disaster management provides the opportunity to plan, prepare and respond in case of disasters which can prevent confusion and inefficiency during response(Heavenna, 2018).

Statement of the problem

Disasters are events that exceed the capacity of society or organization to cope with them using its own resources. It can be caused by natural or manmade.(Zibulewsky, 2001).

Disaster response is the actions taken directly before, during or immediately after a disaster. The objective is to save lives, to ensure health and safety and to meet the essential needs of the affected people. Disaster response activities are warning/evacuation, providing immediate care, continuing assistance and the immediate restoration of infrastructures. Emergency response aims to provide immediate assistance to maintain life, improve health and support the morale of the affected population.

Project managers can work in such difficult situations with skills that are needed in that particular situation. A holistic approach, including proactive and reactive strategies, can be applied in managing the impact of crises and supporting affected communities or organizations. The project manager must be able to transfer his theoretical knowledge into practice(Mahesh, 2024).

Project management in emergency conditions attracts the most attention and resources and it needs application of knowledge, skills, tools, and techniques to the emergency response activities to meet the immediate needs of affected people. Proper project management practice is critical for the success of emergency response. (Kesto & Diribsa, 2022)

In a standard project management approach, a project manager needs to rethink and adopt more collaborative and innovative approaches to implement the disaster plans when the disaster has occurred. A project manager should know detailed information about the affected organization and the communities and interact with the local authorities to conduct a rough situation analysis. After an initial analysis, the project manager can conduct a detailed situation analysis and prepare a report with all the information collected, similar to a project business case. If a project manager starts the project without having gathered information first, then the project will be delayed or it will fail which may not achieve the desired goal. In unexpected, uncertain and uncontrollable events, especially in unstable environments, would require either quick project intervention or complex project adjustments. The aim of urgent emergency project management in disaster response is to properly conduct actions in unstable and uncertain crisis-driven / unfavorable disastrous environments(Pells, 2023).

Disaster management includes tasks, measures and procedures like prevention and mitigation of hazards, coordination and capacity building, preparation, assessment, and prompt reaction to disasters, and effective evacuation, relief, reconstruction and rehabilitation activities. Organizations have their own disaster response administration framework. After studying a probable number and magnitude of natural and man-made disasters, the destruction and losses it caused and the relief efforts made, it is analyzed whether disaster management organizations are doing their maximum in their capacity or some issues need addressing for effective management (Siddique, 2017)

In developing countries, there are more disaster occurrences with a huge magnitude of mortality and morbidity. According to a WHO report in 2023, from 25 disasters occurring in developing countries, there was a 44% fatality rate. This high number of fatalities was related to the limited capacity of preparedness and non-effective response mechanisms. Preparedness for disaster response requires both financial capacity and appropriate planning. In addition to having all the required capacity, effective response needs coordination and management effectiveness for effective and rapid response to the disaster.(Farah et al., 2023).

Ethiopia including Addis Ababa has faced different manmade and natural disasters. The country is vulnerable to climate change-induced disasters including drought, epidemics, flood, conflict, earthquake, pests, wildfires, landslides, etc. These different hazards occur with varying frequency and severity. Over 760,000 people were affected in Ethiopia in the year 2023 due to heavy rains, floods and landslides and 43 were killed(OCHA, 2024). Political instability, civil and armed war and other conflicts resulted in millions of displacement and death(global conflict tracor, 2023). Addis Ababa city has also faced different manmade and natural disasters and is prone to it. Climate change and rapid urbanization are the major causes of flooding in Addis Ababa. About 67% of the population in Addis Ababa city live in flood-prone area(Yimere, 2023). Ethiopia is one of the highest road crash rate countries in the world and more than 60% occur in its capital city Addis Ababa. It resulted in a 13.4% fatality rate and a 19-million-dollar cost of property damage. Fire and other accidents are also common in Addis Ababa.

Hospitals are crucial for disaster response and to manage crises effectively by involving proactive measures to mitigate the impact of natural or manmade disasters. Hospital disaster preparedness requires a comprehensive approach that involves strategies, training, and community involvement. It involves proactive measures such as efficient strategies, trained staff, and appropriate tools to ensure patient safety and manage resources during emergencies.

Even if hospitals have a vital role in disaster management, most public hospitals in Ethiopia including Addis Ababa have low levels of preparedness status. Even if there are limited studies, in Addis Ababa and the country, the previous research findings showed that hospitals' response level for disaster response is not satisfactory and most of them have low levels of readiness for disaster response. (Firissa *et al.*, 2023, Woyessa *et al.*, 2020, Ayenew, 2022).

This study was aimed to assess the disaster risks and preparedness status of public hospitals in Addis Ababa, Ethiopia. The study findings will help to recommend hospital managers and stakeholders to have the required capacity for a hospital disaster preparedness plan. The recommendations are necessary actions and corrective measures to strengthen emergency and disaster preparedness. The study findings can be used to provide direction on how to optimize the available resources. It will assist hospital managers and staffs, as well as health system managers and decision-makers.

Research questions

What are the disaster risks in Addis Ababa public hospitals

What are the levels of disaster response preparedness status of Addis Ababa Public Hospitals?

What are leadership and management-related factors

What is the planning status of coordination for emergency and disaster management?

What are hospital emergency and disaster response and recovery planning status?

What is the communication and information management status for disaster response?

What are the human resources, logistics, and finance planning status for disaster response?

What are patient care and support services planning status?

Objective

General objective:

To assess disaster risks and preparedness status of public hospitals in Addis Ababa, Ethiopia 2024.

Specific objectives:

To assess disaster risk levels

To evaluate the hospitals' disaster response readiness level

To assess leadership and management related factors

To assess coordination of emergency and disaster management

To evaluate hospital emergency and disaster response and recovery planning

To assess communication and information management status of the hospital for disaster response

To assess human resources for disaster response

To evaluate logistics and finance planning for disaster response

To assess Patient care and support services plan during the disaster

Significance of the Study

Many hospitals in the country including Addis Ababa have frequently faced challenges in responding to disasters which is mainly due to lack of preparedness to respond properly and achieve their goals. This study's finding can be used as a baseline to show the gaps and factors related to preparedness status which is important in put to recommend responsible stakeholders and persons to respond and solve problems related to it.

The finding is important for several stakeholders including the management of the hospitals, hospital staff, health burros, and federal ministry of health and other related sectors to take it as input for possible solution of a problem and take corrective measures to develop standards, guidelines, protocols, and policies.

The findings of this study is important for hospital staffs and stakeholders to understand hospital disaster preparedness status and factors affecting it and necessary for corrective strategy. It will inform their future planning and strategic development as far as they are concerned. Furthermore, the study can serve as a baseline for researchers and scholars in the area related to hospital disasters and the factors that contributed to them.

Scope of the Study

The scope of this study was focused on disaster risks and preparedness status of public hospitals in Addis Ababa, Ethiopia. It was limited to public hospitals public in Addis Ababa, Ethiopia and did not include other hospitals or health institutions. The study was conducted from March to April 2024 in the selected hospitals to assess disaster risk levels and preparedness for disaster response using mixed methods (quantitative and qualitative) of study design.

Limitations of the study

It may be difficult to reach appropriate conclusions based on explanatory research findings for its impact of a wide range of factors and variables in relation to clarity of information and prediction. The study was conducted in Addis Ababa public hospitals which are relatively more organized and structured. This may not be representative for other regional and private hospitals. The study finding is variable depending on the study setting and may not be representative for others.

Organization of the Study

This study is organized into five chapters. Chapter one includes the introduction and general background of the study. Chapter two is a literature review that discusses works of literature related to the study. Chapter three is the research methodology explaining the methods of the study for this research. The fourth chapter is data presentation, analysis and interpretation, and the fifth chapter is the conclusion and recommendation.

CHAPTER TWO- Literature Review

2.1. Introduction to Literature Review

This chapter explains different literature conducted related to this study. The literature review provides the study with an explanation of the theoretical rationale of the problem being studied as well as what research has already been done and how the findings are related to the problem of this study. Different kinds of literature were reviewed and focused on study objectives obtained from different international journals using Google Scholar, PubMed and others. The works of literature provide an overview of major information that has been done related to this study topic. The chapter covered the studies and analysis for the theoretical literature review and identified gaps.

2.2. Theoretical Review of the Literature

2.2.1. Disaster readiness and response

Disaster is a serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, which leads to an impact on human, material, economic and environmental.(Disaster | UNDRR, 2007)

Every year, about 400 natural disasters and 30–40 armed conflicts occur worldwide. Both natural and man-made disaster and other emergencies imperil the health of hundreds of millions of people and substantially increase levels of morbidity and mortality. Natural events and human-made emergencies like armed conflict, climate change, flooding and earthquakes frequently occur in relatively remote area which is difficult-to-reach locations, often in the poorer countries of the world that are least able to cope(CDC, 2019).

The commonest hazardous events in the world are transportation crashes, floods, cyclones/ windstorms, outbreaks, industrial accidents, and earthquakes. About 190 million people are affected annually by emergencies due to natural and manmade disasters, with over 77 000 deaths. Approximately 172 million are affected by conflict. More than 1200 outbreaks in 168 countries with in the last five years. These natural and manmade disasters cost an average US\$ 300 billion annually and the cost of armed conflicts can reach up to trillions(WHO, 2019).

Reducing the disaster risks and their consequences is vital to local and national health security and to building the resilience of communities, countries, and health systems. Countries are expected to have strengthened their capacities to reduce disaster health risks and consequences through the implementation of a multi-hazard disaster risk management framework approach. Fragmented approaches to different types of hazards, including over-emphasis on reacting to, instead of preventing events and preparing properly to be ready for response, and gaps in coordination across the entire health system, and between health and other sectors, have hindered the ability of organizations and societies to achieve optimal outcomes (WHO, 2019).

Outbreaks and Emergencies in the African Region report of, 2023 showed that there are 155 ongoing and 134 outbreaks. The frequency of both natural and man-made disasters in Africa is escalating. The impact of these events has overstretched and overwhelmed the health care system which is least prepared to handle and cope with the surge capacity. It is needed for every hospital to have a disaster management committee with a flexible disaster management plan to respond to these emergencies. It is also needed to expand training in disaster management (Aliyu, 2015).

Making hospitals, health facilities and related infrastructure safe and secure, prepared for emergencies, and energy efficient will protect the lives of their occupants, enable effective health response and recovery, support sustainability and reduce the impact of health care on climate and the environment. (WHO, 2019) .

Ethiopia is one of the developing countries most vulnerable to natural and man-made disasters. Drought-induced famine, landslides, floods, crop pests and wars are the major emergency events over the past many years. These are major causes of suffering to communities and millions of dollars worth of property destruction (Abebe, 2009).

Conflict is the major event that has caused human suffering and economic destruction in recent years in Ethiopia. It causes more than 20 million people in need of aid due to the conflict. The conflict has left many injured and has had a severe impact on families' lives and livelihoods in the country. Disease outbreaks, including malaria, measles, acute respiratory tract infections and other vaccine-preventable diseases, cholera resulted in significant impact. Over 2.8 million people have been displaced and are living in crowded settings with limited access to food, nutrition, health, water and sanitation infrastructure (WHO, 2023). Ethiopia becomes the third

largest refugee hosting country in Africa which have more than 930,000 refugees and asylum seekers. Refugees are mainly from South Sudan, Somalia, and Eritrea. The internal conflict resulted in the death of thousands and millions of internal displacement in Ethiopia (UNHCR, 2023). Road traffic accidents is also the major cause of mortality and morbidity in Ethiopia making the country among the list of the most affected countries in the world (Alemayehu et al., 2023).

These situations have led to the effective collapse of healthcare capacities in the country and affected areas. The majority of healthcare facilities were unable to meet the health needs of the affected people. Health workers were running out of supplies. WHO coordinated with different partners and provided emergency health support and strengthened capacities regarding prevention, preparedness, and response to disease outbreaks.

The damage caused by disasters is immeasurable and variable based on its geographical location, type, and degree of vulnerability. It has an impact on the mental, socio-economic, cultural, and political state of the affected community (Zibulewsky, 2001).

Types of Disaster:

Disasters are divided into 2 basic groups namely natural and manmade.

Natural disasters include meteorological disasters like floods, tsunamis, cyclones, hurricane, typhoons, and Snow storms. Topographical disasters include earthquakes, volcanic eruptions, and landslides. Environmental disasters can be global warming, ozone depletion, and UV Radiation.

Man, made disaster: it can be technological (transport failure, Public place failure, Fire), industrial (chemical spills, radioactive spills), or Warfare (war, terrorism, internal conflicts, civil unrest).

There are three activation levels of disaster, level I, level II and level III due to the incident's severity, size, location, and actual or potential impact on public health, welfare, and infrastructure (UNHCR, 2023). Level I – If the community or organization can contain the event and respond effectively using its own resources. Level II – If the disaster requires external assistance, but these can be obtained from nearby agencies. Level III – if the disaster magnitude

exceeds the capacity of the local community or origin and requires assistance from state-level, national or global assets.

Phases of disaster and emergency management

There are four phases of disaster management. These are prevention and mitigation, preparedness, responses and recovery (Akita, 2023). Understanding these four phases empowers organizations to prepare for and respond to crises in a good and better way. Making the correct decisions during a disaster response gives for the organization the to have the best chance for survival and recovery after a disaster event. A systematic process of using administrative decisions, organizations, and operational capacities to implement policies, strategies, and coping capacities to lessen the impacts of hazards. The ultimate goal of the management is to minimize its impact by appropriate preparedness, response, recovery, and mitigation(UCF, 2024).

Prevention & Mitigation: The best way to address a disaster is by being proactive. It is identifying potential hazards and devising safeguards to mitigate their impact. Prevention & mitigation is vulnerability reduction and mitigation through programs such as socio-economic activities and addressing root causes. The aim of mitigation is to minimize the loss of human life resulting from a disaster. Regulatory and physical measures are needed to prevent disasters from occurring or to mitigate their effects. To plan effectively for disaster prevention, it is needed to have community assessment information including knowledge of community resources like, emergency services, hospitals and clinics, and community health personnel including physicians, nurses, pharmacists, emergency medical teams and others.

Disaster Preparedness: The fundamental objective of disaster preparedness is to minimize the loss of life, livelihood and sufferings. It is to decrease emergency response time and ensure that necessary resources (personnel and equipment) are available and on-site after a disaster. Preparedness includes professional, equipment& drug preparedness. Issues to consider include – weather patterns, geographic location, expectations related to public events and gatherings, in close proximity to the hospital.

Response: It is the actual implementation phase of the disaster plan. It is an action taken immediately after the impact of a disaster to minimize its effects and to provide immediate rescue, relief and support to the community. The best response plans use an incident command

system, are relatively simple, routinely practiced, and are modified when improvements are needed. Types of information during response include geographical at risk or affected, presence of continuing hazards, injuries and deaths, status of health care infrastructure, total number of injured persons, number of seriously injured victims who needs critical care and others.

Recovery: it begins when the disaster is stopped and serves the community, establishing long-term medical care for the affected in a disaster, rebuilding, and working to minimize the future chance of similar disasters occurrence. Recovery activities should be connected with prevention and mitigation.



Figure 1: Disaster management cycle

Hospital emergency response

Hospitals play a vital role in the healthcare system during disasters by providing essential medical care to the communities. Any incident that causes loss of infrastructure or patient surge often requires a multifunctional response and recovery effort, including health care provision. Without appropriate emergency planning and preparedness, local health systems can easily become overwhelmed to provide care during a disaster event. Resource shortage, a surge in demand for medical services, and the disruption of communication and supply lines create a major barrier to the provision of health care. To enhance the readiness of health facilities to cope

with the challenges of a disaster, hospitals need to be prepared to initiate fundamental priority action(WHO, 2011). Hospitals should be prepared to implement each action promptly and a functioning command-and-control system is essential for effective emergency management operations. A hospital incident command group (ICG) is crucial for developing and managing hospital-based systems and procedures for effective emergency response. Organizing a hospital incident command group considers representatives from hospital administration, communications, security, nursing administration, human resources, pharmacy, infection control, respiratory therapy, engineering and maintenance, laboratory, nutrition, laundry, cleaning, and waste management. It also includes external emergency services such as emergency medical services, police service, military services, and fire/rescue services. ICG is responsible for generating the hospital emergency operation plan. The groups meet regularly to assess hazards and develop or update short- and long-term plans, conduct exercises and training, and redesign the disaster plan based on evaluations of exercises & real events.

The second step after ICG formation is to conduct a hazard risk assessment: A detailed analysis of hazards and vulnerabilities internal and external to the hospital is needed to determine the scope and priorities for planning. This hazard risk assessment should continue throughout the planning process and be constantly monitored and evaluated for any changes. The emergency plan is developed based on facility and community-based risk assessments which assist a hospital in anticipating and addressing facility, staff, patient, and community needs and support(MPS, 2019).

The third step is to set planning objectives: Based on the results of the risk analysis, identify the disaster management strategies agreed upon by the ICG.

Fourth step is to determine responsibilities: It is sorting of the responsibilities of hospital departments, personnel and other health agencies in the community (State, Private and NGO's). Tasks should be allocated to people and organizations who are capable of carrying them out effectively and efficiently.

The fifth step is the analysis of resources: It is to identify what a facility will require. if gaps exist, the planning committee must identify sources of personnel and equipment that can be called upon speedily and efficiently. Mutual aid agreements with other health care facilities within the immediate area and/or region should be implemented.

The sixth step is to develop systems and procedures: It is to identify its strategies for prevention and mitigation, preparedness, response and recovery from mass casualty incidents and disasters. communication systems, public information education, relations, and resource management systems should be established.

Step seven is to write the plan: The document should be distributed to all who use it for internal and external role players in disaster responses. It should be simple to use and understand.

Step eight is training personnel who participate in the disaster. This is an essential part for emergency preparedness and response activities. It is to prepare personnel to function outside of normal day-to-day activities and to carried out within a highly stressful environment. Hospital staffs should be trained and tested regularly in their emergency management tasks.

Step nine is to test plans, personnel and procedures: Plans should be tested, reviewed and updated on a regular basis at least annually for its effectiveness. “A plan which has not been tested and reviewed may be worse than no plan at all - it can build a false sense of security in the healthcare facility about its level of preparedness (MPS, 2019)”. The final stage is reviewing and amendment of the plan. For each time of the plan or part of the plan is activated for an exercise or an actual event, it needs to identify improvements and updates of the plan using strength, weakness, opportunities, and threats(SWOT) analysis. Planning is a dynamic that never stops its process. The written plan is simply one outcome of the planning process, but it's not an end point. The written plan is a living document that must be constantly tested, reviewed, and updated.

2.3. Project Management Concepts in disaster readiness and response.

project management concepts are used within many fields to achieve organizational goals and successful outcomes. Studies and Project Management Body of Knowledge support these concepts with the inclusive of project fundamentals, techniques, processes and various knowledge areas. The project management knowledge areas provide an extensive management guide on scope, time, cost, quality, human resources, communications, integrations, risks and procurement. Even if there are many other systems that support project management best practices, the fundamental principles are essentially similar(PMBOK, 2017).

Project management is achieving project goals with available resources. Projects have scheduled beginning and completion times with a given responsibility. This is why leadership is becoming quite important within project management settings. Leaders are quite significant in terms of being initiators, coordinators, encouragers, energizers and harmonizers which are useful capabilities during disaster response time(Baroudi & Rapp, 2012). Project management approaches can solve problems and provide successful outcomes using organized structured methodologies in disaster.

Knowledge, skills and tools of project management is used in disaster response. In any project management process, the initial step is to define the scope and objectives of the project. During disaster response, important activities are identifying the needs and priorities of the affected population, available resources and capacities, the expected outcomes and indicators, and the time frame and required budget. Realistic and clear scope and objective is helpful to align disaster project with the overall goals and strategies of the disaster response. Once we have defined the scope and objectives of our project, we need to develop a project plan that outlines how we will achieve them. Planning includes work breakdown structure, schedule, budget, risk management plan, and a communication plan. After planning, the next step is to implement the project plan according to the agreed scope, schedule, budget, and quality standards. In disaster response, it is mobilizing and managing human, material, and financial resources, as well as collaborating and coordinating with other actors and agencies involved in the response. Implementing the project plan will require using our leadership, communication, and problem-solving skills, as well as technical and operational expertise. Monitoring and evaluation of the project outcomes and impacts including process and methods is the final step in project management. For disaster response, it is collecting and analyzing data and evidence on the results and effects of our project activities, as well as the efficiency and effectiveness of our project management. It includes soliciting and incorporating feedback and lessons learned from stakeholders and team members to improve our project strengths and weaknesses.(Emergency Management, 2024)

Disaster management is about organizing and directing resources to cope with a disaster and coordinating the roles and responsibilities of responders, organizations, public sector agencies, volunteers, donations, etc. The ultimate goal of the disaster-management leader is to minimize

the event's impact, something that involves preparedness, response, recovery and mitigation(UCF, 2024).

To effectively coordinate the disaster management, the leaders must develop a number of critical skills during disaster prevention, mitigation, preparedness, response and recovery.

Prevention: During the prevention stage, strong analytical skills help leaders to identify potential threats, hazards and high-risk areas. Problem-solving abilities are also invaluable in identifying the best ways to avoid or diminish the likelihood of disaster events.

Mitigation: leaders in disaster management need to have planning skill during the mitigation stage to develop strategies and structural changes which can help to mediate potential threats. Mitigation is central because, if done properly, it can reduce the impact of emergency or disaster(Yeo et al., 2018).

Preparedness: During the preparedness stage, it's important to be skilled in training people to respond to disasters. An organized way of readiness is important for response. Communication skills in written and oral form is needed to prepare people and emergency-response personnel for an action in worst-case scenarios.

Response: The ability to quickly make decisions is crucial here, as the response stage is time-sensitive. Another way of skill is delegating essential tasks to other emergency responders.

Recovery: Disaster managers help their organizations and communities to recover with the essential skills of empathy, understanding and relationship building. Without earning the trust of the community, any recovery efforts are likely to come up short(UCF, 2024)

Project Management plays a vital role in disaster relief efforts. Many countries have Disaster Management Plans that utilize key project management principles and practices. These national systems are connected and aligned with regional and organizational plans that are coordinated and implemented by the established disaster and emergency management system(Karlene, 2017).

Leadership during a disaster should be effective and ethical with essential skills. Project management practice in a resource-limited setting is to utilize and deploy those resources most

effectively. Specifically, Communication, Time Management, Procurement Management and Human Resource Management have a very important role to play in disaster management.

Communication: Project manager spent about 90% of his time on communication. It is critical that accurate and timely information should be communicated to all responsible persons and stakeholders. On-scene Commanders and disaster management focal persons/Coordinators are key players to ensure that the established communication protocols are adhered to as far as is practical, and also correct and appropriate information is reported to all stakeholders and the media. Disruption of telecommunications is common and backup systems like satellite radios are needed. This will assist greatly with frequent reportings from rescue teams to the Command Centre (Linda, 2024, Karlene, 2017).

Time Management: Scheduling of all activities is very critical. The initial priority for any disaster is to mitigate human suffering. Therefore, it should focus on protection of life. Re-establishing telecommunications, transport facilities and also maintaining adequate security. Most disaster response plans will include timelines for completing specific tasks. But, the realities on the ground for these timelines may be impractical.. Many of the priority tasks should be done in parallel.

Procurement: during disaster time, supplies will be depleted quickly requiring external human and technical resources to assist with relief efforts. There is usually an urgency to get the goods and supplies to the needy recipients. Procurement procedures in routine way may not result in the timely provision of services and goods, therefore, alternate procurement mechanisms to acquire goods and services should be implemented without compromising good ethics and guiding principles for procurement. It is considering the quality of the goods procured because there is a risk of poor quality goods being received and distributed. Specifications should be clearly outlined on purchase orders, and suppliers should also clearly state in delivery documents the specifications of goods supplied.

Human Resource Management: With limited resources, good leadership is key during this time of chaos and disruption. During the disaster relief and recovery efforts, the management of human resources is very important. This will be challenging, since many of the available human resources will be volunteers and aid workers who may be untrained and also from diverse

cultural backgrounds. Project Leaders will therefore have to be creative and flexible to the constant change and to make good use of the available manpower. It is needed to employ project management tools and techniques towards ensuring a more efficient and effective disaster response.

Planning and implementation effectiveness: planning should be based on disaster response projects. It is based on the dynamicity of the environmental and situational analysis. He should plan according to the local availability of commodities. A project manager should consider and use different project management concepts like defining the project objectives, describing results and activities, risks and assumptions, indicators and means of verification, introduce logical frameworks and write the project documents. Planning is needed for funding, action, and communication. It should be according to a result-based management (RBM) for better results.

Budget and cash flow management plan effective use: The financial source may be from different sources for disaster response projects. So the project managers have to use it effectively in a better way with other supporters and stakeholder. This is by clearly allocating resources based on need and close communication with all stakeholders participating in the project. Project managers should prepare cash flow management to achieve projects within budget. It should be implemented based on work breakdown structure (WBS). Items that are most important and urgent must be implemented urgently. A step-by-step plan with all integrated tools is needed to use the budget as planned.

Leader and a teacher: Important skills of project managers during disaster management are to be a leader, a good listener, and a teacher. He should interact with local people and understand challenges to achieve objectives. Also, a project manager must work with local stakeholders.

Resource identification and effective utilization: effective use of resources and the identification of resources according to the prepared plan is an important skill for project managers. Using its own materials and manpower during a disaster is the most difficult task. The project manager should use locally available staff. To be dependent on external resources is not necessary which it may take a prolonged time to provide.

Think of the minimum requirements during execution: The project managers should think the actual requirements of the resource and meet the requirement instead of wasting the budget.

The project manager should also think about further disasters that may be prone to it. We can minimize the impact for the future if any disaster happens. Preparation for emergency plan is should be done for the next major disaster - prevention is better than cure(Mahesh, 2024).

Conceptual framework

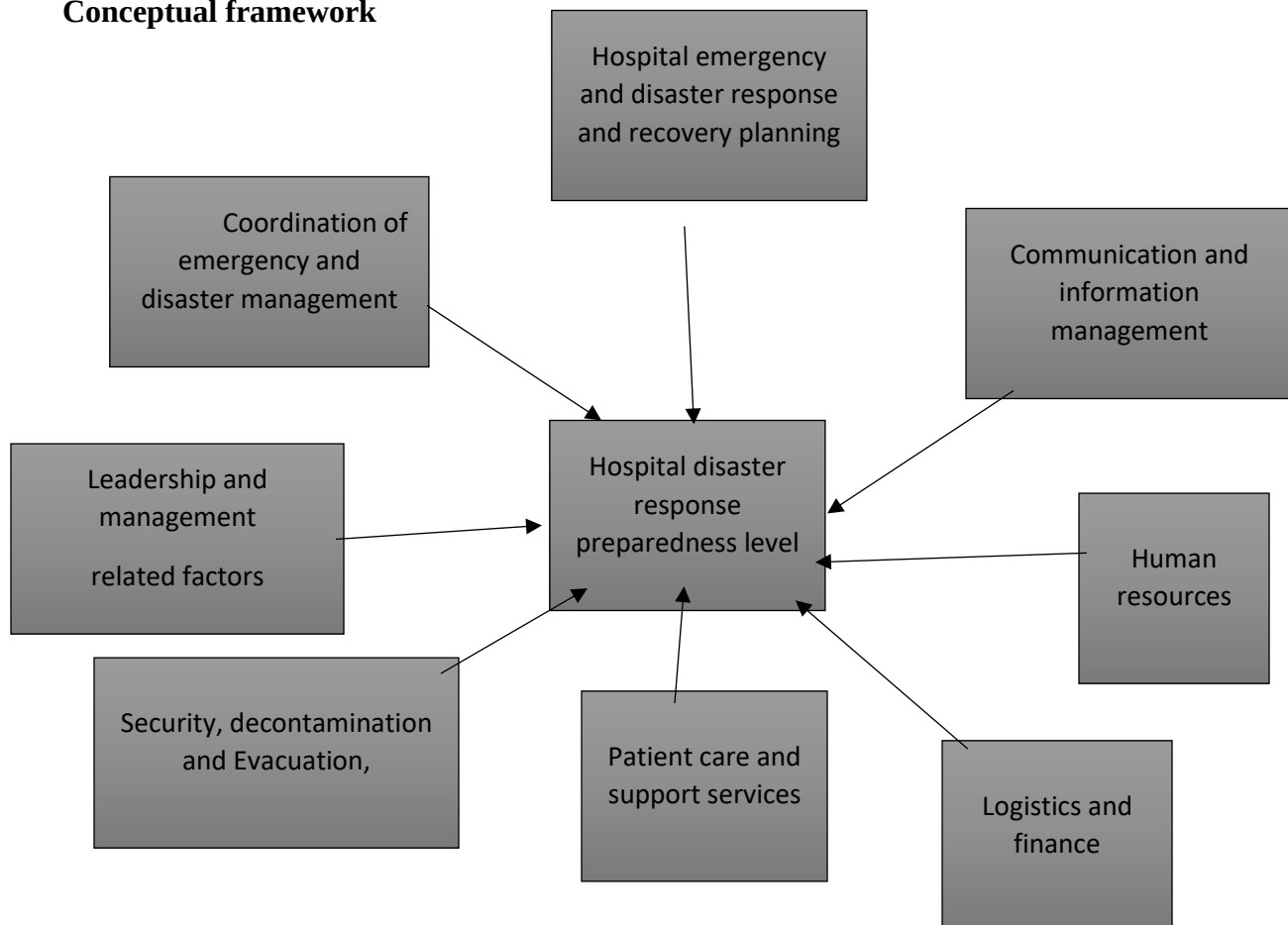


Figure 2 Conceptual framework of hospital disaster risk management evaluation model adopted from WHO hospital safety index assessment tool and Hospital Disaster Risk Management Evaluation model

CHAPTER THREE- RESEARCH METHODOLOGY

Introduction

This chapter describes the method which were used to study research aimed to achieve the seat general and specific objectives. It describes the methods of study design, study area, and subject, instrument, data collection procedures, analysis, and interpretation methods.

Study Setting and Period

This study was conducted from March to April 2024 in Addis Ababa city public hospitals. Addis Ababa is the capital city of Ethiopia, with an estimated number of 5,704,000 populations in 2024 (WPR, 2024). Addis Ababa is also the capital city of Africa as it is the home of the African Union, and serves as the economic, political, and cultural hub. There are 41 hospitals in Addis Ababa (13 public and 28 private), 98 health centers, and 382 private clinics. Out of 13 public hospitals in the city, 11 were included in the study. One hospital was excluded because it is exclusively for maternal and child care. The other one refused to participate in this study. These study hospitals are six general hospitals, four tertiary-level hospitals, and one trauma center. All hospitals have organized emergency and critical care services in addition to other specialty services.

Research Design

Research design is an arrangement of conditions for data collection and analysis in a manner that aims to mix the relevance to the research purpose with economy in procedure (Jeremiah, 2021). The research design was explanatory research with quantitative and qualitative research approaches. Because this research design is used to describe and explain these research approaches which is the appropriate methodology to achieve the aims of this study (Hunter, 2019) and this study is a mixed-method of study. It was cross cross-sectional timeline to assess the disaster risks and preparedness status of hospitals in Addis Ababa, Ethiopia.

Research Approach

A mixed research approach was used to assess disaster risks and preparedness status of hospitals using quantitative and qualitative techniques. Utilization of a mixed method approach has more

advantageous outcomes by reducing the limitations of each individual approach and to gain more complete picture than quantitative or qualitative study which strengthen their value in a synergistic way(George, 2023). Mixed methods is the incorporation or integration of qualitative and quantitative research approaches which yields a more comprehensive and balanced data.

Data Source

The data source was both primary and secondary data. It was collected using structured questionnaire from focal persons of hospital disaster management, direct observation, and records. The secondary data sources were disaster response protocols, guidelines, response reports, registered documents for disaster-related activities like resources, plans, operations, responses, participants for preparedness and resources, and stakeholders' participation and involvement. The primary data sources are from interviews of focal persons, direct observation of resources, and setups for the readiness of disaster response and it was checked from secondary data for a verification to the primary data and to triangulate the results.

Population

The study was conducted in Addis Ababa city public hospitals in Addis Ababa, Ethiopia. Out of 13 referral public hospitals in Addis Ababa city, 11 were included in the study. One hospital was excluded because it is exclusively for maternal and child care. This hospital has no human and material resources to respond to any type of disaster which can't manage illness or injury other than maternal and child care. The other hospital was refused for the study. The study hospitals are six general hospitals, four tertiary-level hospitals, and one trauma center. All hospitals have organized emergency and critical care services in addition to other specialty services. Focal persons for disaster response from each hospital were purposively selected for interviews to get verifiable data. Those who have no disaster focal persons, hospital directors, and emergency directors were interviewed.

Data collection tools and process

The questionnaire includes both quantitative and qualitative questions. The tool was adopted from WHO hospital safety index assessment tool(WHO, 2015) and designed using the conceptual framework of Hospital Disaster Risk Management Evaluation (HDRME) model

which defines and operationalizes disaster preparedness and response (Abbasabadi Arab et al., 2019). Eight key components of the framework were constructed focusing on hospital disaster preparedness and response level. These components are management and leadership, coordination of emergency and disaster management, hospital emergency and disaster response and recovery planning, communication and information management, human resources, logistics and finance, patient care and support services, security, decontamination and evacuation. It has three level Likert scale (1- low level, 2- average level and 3- high level of disaster response preparedness status). In addition to the framework, perceived disaster risks events were assessed. Hospital disaster focal persons perceived the disaster risk level based on the hospital's geographical location. The perceived assessment event was scored as low risk(1), moderate risk(2) and high risk(3).

Data processing and analysis

The collected data was checked for its completeness, cleared and coded. Then it was entered to Epi data version 4.2 and exported to SPSS version 26 for analysis. Descriptive statistical analysis like frequency percentage and proportion was done. The result was presented using appropriate tables & graphs. Both qualitative and quantitative data were used. The quantitative data includes hospital-related data, management and leadership support information, hospital disaster preparedness status-related data, and managers' perception of hospital disaster risks.

Management and leadership-related information was assessed using 7 questions to check hospital disaster management and support status. Each question was computed out of 3 points and 1 representing low level, 2 – average, and 3 high level of support for disaster management.

A total of 40 questions for hospital disaster preparedness and responses status were used and analyzed computing a mean score percentage gained for hospitals. Each question was computed out of 3 points with 3 representing a high level of preparedness and 1 indicating a low level of preparedness. The level of preparedness was categorized as low if the mean score or average score was 33.3% to 66.6% and good if the percentage score was from 66.7–100%. Qualitative data obtained from the observation evaluation checklist were categorized into seven themes. The findings of qualitative data were described and summarized under each theme and presented in the form of text. The risk perception of hospital disaster focal persons were analyzed and done using the weighting system of All-Hazards Measure (AHM) of 5 multiplication factors for three categories of disaster namely natural disaster, technological disaster, and social disaster. The

responses ranged from 15–45, with 15–25-low risk, 26–35 moderate risk, and 36–45- high-risk perception for disaster. Finally based on the findings data were presented using figures, tables, and charts. Based on the study finding Conclusion and recommendations were employed.

Ethical Consideration.

Ethical approval letter was obtained from the institutional review board of Addis Ababa University, School of Commerce. A letter of permission was obtained from the hospital manager of the study hospital before the actual data collection period. Information was given to study participants about the purpose and procedure of the study. Informed consent was obtained before actual data collection. Confidentiality and privacy were ensured during data processing and analysis. Any identifier of the hospital was not presented in the study.

CHAPTER -FOUR - DATA PRESENTATION, ANALYSIS AND INTERPRETATION

Introduction

This chapter includes all analyses done from the data collected for each studied hospitals. Descriptive statistics was carried out to provide the analysis results by addressing study objectives. The analysis was conducted using the SPS version 26. The chapter will focus on data analysis, interpretation and presentation of the collected information from each hospital. The aim of this study was to assess the disaster risks and preparedness status of public hospitals in Addis Ababa. A total of 11 hospitals were included in the study and hospital disaster focal persons were interviewed. Data were collected using a structured questionnaire to assess hospital disaster risks and preparedness status. The study results were presented using tables, graphs and charts.

Characteristics of public hospitals

A total of 11 hospitals were included in the study with a response rate of 92% from the total 12 hospitals. The level of hospitals are six general hospitals four tertiary-level hospitals and one trauma center (table 1).

Table 1: Characteristics of public hospitals in Addis Ababa, Ethiopia 2024.

s.no	Hospital code	Level of hospital	Total emergency bed	Total hospital bed	Annual ED visit
1.	01	Tertiary	42	950	12652
2.	02	General	16	300	5329
3.	03	General	15	333	10500
4.	04	General	25	482	9300
5.	05	Tertiary	20	373	12000
6.	06	General	31	171	11500
7.	07	Tertiary	40	530	17000
8.	08	General	11	200	14000
9.	09	Trauma center	43	153	9601
10	10	Tertiary	16	350	9909
11	11	General hospital	31	160	7200

Of the total 11 hospitals, 9(80%) have disaster focal persons and the majority of them are Emergency Department (ED) directors. They are emergency physician or emergency nurses. Most of 9(82%) focal persons have training experience related to emergency/disaster

management. Their disaster management experience ranges from 6 months to 10 years. However only 2 focal persons have management/leadership training experience.

All hospitals have disaster response plans, but the majority of them 8(73%) are not updated at least annually. All of the hospitals have no regular meetings for the disaster committee and the common reasons mentioned were; *‘the meeting is conducted when there is an event like mass gathering, epidemic disease happen, and other suspected events expected to be happen’*. Other reasons mentioned also include the absence of focal persons to organize the committee and conduct the meeting, low awareness of disaster, and the absence of an organized hospital disaster management system. Even if the hospitals have disaster response plan, most of them have not tested it, and only 3 (27%) hospitals have conducted disaster drills. Of the total hospitals, only one hospital has identified and prioritized disaster risks. All of the hospital plans have all-hazard response plan and none of them have hazard specific plan.

Almost all hospitals (10 from 11) have faced real disaster in the last two years and some of the hospitals have faced up to 6 disasters. The most common disaster was road traffic accidents and others include conflict, mass gathering, cholera, relapsing fever, and building collapse. The challenges during disaster response were a shortage of supplies, equipment, human resources, space, lack of coordination, no appropriate activation mechanism, delayed activation of disaster, transportation problems, disorganization, resource utilization problems, overflow of attendants, and security issues. Concerning disaster management training, the majority of hospital staffs 7(64%) didn’t get training. The common reasons include management-related issues like not organizing for training, lack of awareness for disaster management, lack of trainers and training material, new leadership to facilitate training, no access and information for the training and providing training only for focal persons.

Six (55%) of hospitals use sirens as activation mechanisms to respond the disasters and all of them use cell phones. They also use social media like Telegram group, WhatsApp.

leadership and management

Hospital managers are vital for disaster management in organizing and directing resources to cope with a disaster and coordinating the roles and responsibilities of responders, organizations, public sector agencies, volunteers, and other activities. Their ultimate goal is to minimize the

event's impact for their effective work and involvement in preparedness, response, recovery and mitigation. Hospital leadership and management part has 7 questions intended to assess the resource allocation to implement the planning, developing community involvement programs for disaster management success, managers' attention for the prevention of disaster risk, developing guidelines and standards for the safety of patients and staffs, the presence of well-established structure for the disaster risk management, the presence of good external relationship with community relief organizations and presence of developed protocols to use their resources and technical assistance for disaster situation management. The result finding showed that overall managers' involvement, commitment, support, and participation in disaster risk management is low. The majority of managers for the disaster management activities are average to low level. Even if the majority of hospitals have an established structure for disaster risk management, most managerial activities are low to the average level (table 2). The majority (91%) of hospital managers have a low level of commitment, support, and participation in disaster risk management (fig 1).

Table 2: Level of hospital managers' commitment, support, and participation in disaster risk management in Addis Ababa public hospitals, 2024.

S.no	Variable(score range 1-3)	Mean $\pm$ SD	Level		
			Low	Average	High
1.	Allocating resources to implement plans	1.9 $\pm$ 0.7	3(27.3%)	6(54.5)	2(18.2%)
2.	Developing community involvement programs for the success of the disaster risk management	1.6 $\pm$ 0.67	5(45.5%)	5 (45.5%)	1(9%)
3.	Managers' attention to the prevention stage of disaster risk management and enhance the safety of the hospital environment.	1.4 $\pm$ 0.52	6(54.5%)	5(45.5%)	0
4.	Developing guidelines and standards to create a safe and sustainable environment for patients and staffs	2.0 $\pm$ 0.45	1(9%)	9(82%)	1(%)
5.	There is a well-established structure for the disaster risk management	2.6 $\pm$ 0.52	0	5(45.5%)	6(54.5%)
6.	There is a good external relationship established with community relief organizations.	2.0 $\pm$ 0.45	1(9%)	9(82%)	1(9%)
7.	Hospital managers developed protocols to use their resources and technical assistance for disaster situation management	1.4 $\pm$ 0.68	7(63.7%)	3(27.3%)	1(9%)
	Total	13 $\pm$ 1.7	13(61.9%) – low		

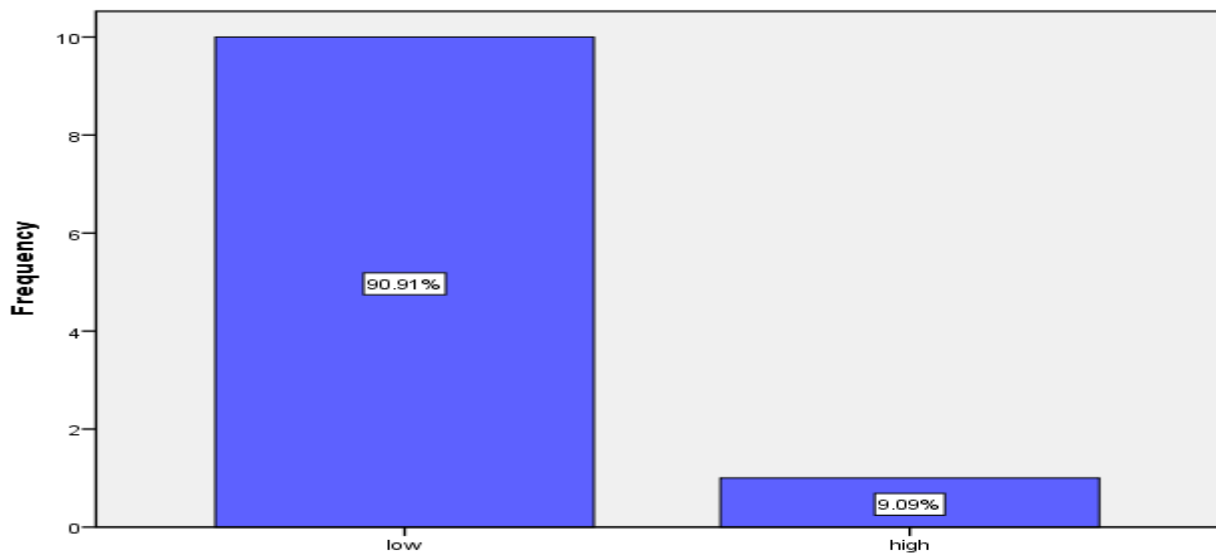


Figure 3: Level of hospital managers' commitment, support, and participation in disaster risk management.

Level of hospital emergency and disaster preparedness

The level of hospital emergency and disaster preparedness was assessed using a checklist comprising seven categories. The checklist has a total of 40 assessment questions with 1-3 Likert scale for each them. Each them is described in the following subheadings.

Coordination of emergency and disaster management activities

For effective emergency and disaster response, hospitals need to have coordinated management activities. One of this study aim was to evaluate the presence of integrated and coordinated emergency and disaster activities in their healthcare service management system. The study findings showed that the majority of hospitals have trained emergency/disaster committees but are not fulfilled their functions effectively. The majority of hospitals have designated emergency and disaster management coordinator representatives from each department but they are not fulfilling their role to implement the hospital preparedness program. The Preparedness program to strengthen the emergency and disaster response and recovery plan of the hospital is not adequate. Most of hospitals have no Emergency Operation Center (EOC). Coordination

mechanisms and cooperative arrangements with local disaster management agencies and healthcare networks are also low for the majority of hospitals.

Hospital emergency and disaster response and recovery planning

The presence of a hospital emergency and disaster response and recovery plan is a major tool for effective disaster management. All hospitals have the plan but the majority of them are not updated at least annually. The type of plan is an all-hazard plan and only one hospital has hazard specific plan. The majority of hospitals have not tested and evaluated the plan for corrective actions.

Communication and information management

During disaster management, communication and information management is one of the major components for effective coordination and response. The study findings indicated that the majority of hospitals have good communication and information management systems. There is internal and external communication during emergencies and procedures to communicate with the public and media. However, there is a lack of an external stakeholder directory for the majority of hospitals.

Human resources

Human resource management is also a major critical component during disaster management. Even if the majority of hospitals have staff contact lists, they were not updated and availability is average to low level. There is a procedure for mobilization and recruitment of personnel during an emergency or disaster but the majority of staffs are not trained for disaster response. Most hospitals have low levels of hospital personnel well-being during an emergency or disaster response and there are assigned duties and responsibilities.

Logistics and finance

Logistics and finance preparedness is one major factor for the effective response of hospital emergency/disaster response. It is a major challenge for hospitals to respond the emergencies/disasters effectively. Almost all hospitals have faced logistic challenges during their actual disaster response. Major logistics and financial requirements during an emergency or disaster response are supplies, transportation, food and drinking water, and financial resources.

During this observational study, even if the majority of hospitals have stores for emergency supplies, there was not enough quantity for 72 hours of disaster response. Most of hospitals have no agreements with local suppliers and vendors for emergencies and disasters.

There is a transportation mechanism for victims and staff during an emergency for the majority of hospitals including different ambulances and other vehicles.

Patient care and support services

The ultimate goal of preparedness is to provide optimum care of patients during emergencies and disasters. The status of patient care and support service for each hospital was assessed and their findings indicated that the overall assessment result was good. The majority of hospitals have a procedure, resources, and trained persons for the continuity of emergency and critical care services and essential clinical support services during disasters. They have also designated triage locations and trained persons to triage major emergencies and disasters, a system for referral, transfer, and reception of patients, good infection surveillance, prevention and control procedures.

The common problem for most of hospitals was the expansion of space for mass casualty incident management. Psychosocial services, triage tags and other logistical supplies for mass casualty incidents were also identified problems.

Evacuation, decontamination, and security

During an emergency and disaster response, infection prevention and security is a major issue which needs a good preparation. There is personal protective equipment for the majority of hospitals and isolation rooms for infectious diseases and epidemics. However, it is not an adequate amount for decontamination of chemicals and radiological hazards. In this study finding, most of hospitals have no evacuation plan, and the majority of staffs are not trained for its procedure. Hospitals did not have computer system network security plans and no trained persons for it (table 3).

Table 3 : Description of emergency and disaster preparedness status of public hospitals in Addis Ababa, Ethiopia 2024.

Variables (Score Range = 1-3)	Mean± SD
Coordination of emergency and disaster management activities	
Hospital Emergency/Disaster Committee	2.2 ± 0.6
Committee member responsibilities assigned and training given	2.2 ± 0.75
Designated emergency and disaster management coordinator	2.4 ± 0.67
Preparedness program for strengthening emergency and disaster response and recovery	1.8 ± 0.6
Hospital incident management system	2.3 ± 0.65
Emergency Operations Centre (EOC)	1.5 ± 0.52
Coordination mechanisms and cooperative arrangements with local emergency/disaster management agencies	1.7 ± 0.65
Coordination mechanisms and cooperative arrangements with the health-care network	1.7± 0.47
Total	2.0 ± 0.63
Hospital emergency and disaster response and recovery planning	
Hospital emergency or disaster response plan	2.6 ± 0.5
Hospital hazard-specific subplans	1.1 ± 0.3
Procedures to activate and deactivate plans	1.7±0.47
Hospital emergency and disaster response plan exercises, evaluation and corrective actions	1.8±0.75
Hospital recovery plan	1.2±0.4
Total	1.7±0.48
Communication and information management	
Emergency internal and external communication	2.4 ±0.505
External stakeholder directory	1.3 ± 0.47
Procedures for communicating with the public and media	2.4 ± 0.67
Management of patient information	2.0 ± 0.45
Total	2.0± 0.52
Human resources	
Staff contact list	1.7±0 .647
Staff availability	1.6±0.5
Mobilization and recruitment of personnel during an emergency or disaster	1.9±0.54
Duties assigned to personnel for emergency or disaster response and recovery	1.9±0.54
Well-being of hospital personnel during an emergency or disaster	1.6±0.67
Total	1.7± 0.58
Logistics and finance	
Agreements with local suppliers and vendors for emergencies and disasters	1.2 ±0.4
Transportation during an emergency	2.4±0.67
Food and drinking-water during an emergency	1.8±0.6
Financial resources for emergencies and disasters	1.6±0.5
Total	1.7±0.5
Patient care and support services	
Continuity of emergency and critical care services	2.5±.52
Continuity of essential clinical support services	2.4±0.52
Expansion of usable space for mass casualty incidents	1.6±0.67
Triage for major emergencies and disasters	2.1±0.3
Triage tags and other logistical supplies for mass casualty incidents	1.7±0.78
System for referral, transfer and reception of patients	2.2±0.4
Infection surveillance, prevention and control procedures	2.00±0.63

Psychosocial services	1.7±0.65
Post-mortem procedures in a mass fatality incident	1.8±0.6
Total	2±0.56
Evacuation, decontamination and security	
Evacuation plan	1.5±0.8
Decontamination for chemical and radiological hazards	1.4±0.82
Personal protection equipment and isolation for infectious diseases and epidemics	1.5±0.7
Emergency security procedures	2.8±0.6
Computer system network security	1.2±0.4
Total	1.7±0.66
Total preparedness mean value	1.8±0.48

Summary of Hospital Preparedness Level

Most hospitals (81.8%) have a low level of readiness for disaster response. Based on the assessment checklist which is categorized into seven parameters, hospitals have good levels only by 2 parameters scored average and above value (table 4 and fig 2).

Table 4: Disaster management preparedness level of public hospitals in Addis Ababa, Ethiopia 2024.

s.no	Parameters	No of questions	Score range	Score obtained		Level of preparedness
				Score	Percent	
1.	Coordination of emergency and disaster management activities	8	8-24	15	62.5	Low
2.	Hospital emergency and disaster response and recovery planning	5	5-15	8	53.3	Low
3.	Communication and information management	4	4-12	8	67	Good
4.	Human resources	5	5-15	9	60	Low
5.	Logistics and finance	4	4-12	7	58	Low
6.	Patient care and support services	9	9-27	18	67	Good
7.	Evacuation, decontamination and security	5	5-15	8	53.3	Low
8.	Total	40	40-120	74	61.7	Low

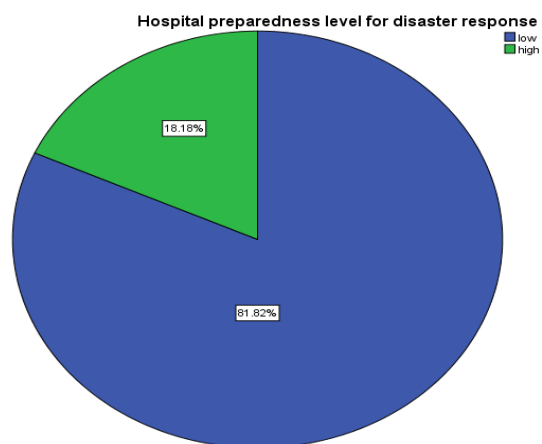


Figure 4: Hospital disaster response preparedness level

Disaster Risk Perception of Hospital Focal persons/managers

Hospital disaster focal persons and managers were interviewed for their risk perception of major disaster types. These are natural disasters, technological disasters, and social disasters. Their perception range was found to be variable from low to high based on hospital geographical location, hospital level and type of services. Most tertiary level hospitals have a high risk of disaster perception (**table 5**).

Table 5: Hospital disaster focal persons'/managers' perceptions for Disaster Risks of public hospitals in Addis Ababa, Ethiopia 2024.

Hospitals	Scores of disaster perceived risks			AHM	Range	Category of perceived risks
	Natural disaster	Technological Disaster	Social disaster			
Hospital 1 (Tertiary hospital)	5(2)	5(3)	5(3)	40	36-45	High risk
Hospital 2 (General hospital)	5(2)	5(2)	5(2)	30	26-35	Moderate risk
Hospital 3 (General hospital)	5(2)	5(2)	5(3)	35	26-35	Moderate risk
Hospital 4 (General hospital)	5(2)	5(2.3)	5(3)	36.5	36-45	High risk
Hospital 5 (Tertiary hospital)	5(2)	5(2)	5(1.3)	26.5	26-35	Moderate risk
Hospital 6 (General hospital)	5(2)	5(2.3)	5(1)	26.5	26-35	Moderate risk
Hospital 7 (Tertiary hospital)	5(3)	5(3)	5(1.5)	37.5	36-45	High risk
Hospital 8 (General hospital)	5(2)	5(2)	5(2)	30	26-45	Moderate risk
Hospital 9 (Trauma center)	5(3)	5(3)	5(2)	40	36-45	High risk
Hospital 10 (Tertiary hospital)	5(2)	5(3)	5(3)	40	36-45	High risk
Hospital 11 (General hospital)	5(2)	5(2)	5(1)	25	15-25	Low risk

AHM- all hazard measures.

DISCUSSION

Disaster is not avoidable but disaster preparedness is in our hands to minimize its impact(WHO, 2019). Hospitals are crucial for disaster response and to manage crises effectively by involving proactive measures to mitigate the impact of natural or manmade disasters. For effective prevention and response to disasters or emergencies, hospitals require a comprehensive preparedness approach that involves strategies, training of staff, community involvement, and using appropriate tools to ensure patient safety and manage resources during emergencies (WHO, 2011)

However, this study finding showed that most (82%) of public hospitals in Addis Ababa have low levels of preparedness. The overall level of readiness score for all hospitals is 61.7%. The finding is relatively similar with the previous studies conducted in the Western and Northwestern parts of Ethiopia in which all or most hospitals were under the category of low or weak levels of readiness for disaster (Woyessa *et al.*, 2020, Workneh, 2022). It is also similar with most sub-Saharan African hospitals in which their disaster preparedness status is low(Farah et al., 2023). But it is low compared with studies conducted in Saudi Arabian hospitals which was 69.8%(Khan et al., 2021).

Hospitals are expected to create a safe environment for staffs, patients, and visitors to provide healthcare services to disaster casualties. Therefore, an effective hospital disaster risk management program should be planned and implemented(Abbasabadi Arab et al., 2019). However, our study findings for a safe environment during disaster response in public hospitals are low. Even if all hospitals have preparedness plans, the majority were not updated and tested. Disaster committees did not have regular meetings to identify hazards, and to test and update the plan. Most hospitals have faced real disasters in the last two years and the common challenges during disaster management were related to low preparedness which includes a shortage of supplies, equipment, human resources, space, lack of coordination, no appropriate activation mechanism, delayed activation of disaster, disorganization, resource utilization problem, overflow of attendant and security issues.

Disaster management is essential for strategically organizing resources to minimize the impact of disaster. It is a process of effective preparedness and response to disasters. The process involves

a systematic approach to prevention, preparedness, response, and recovery. Disaster management is about organizing and directing resources to cope with a disaster(Tulane, 2021).

This study finding showed that the majority of hospitals have disaster management focal persons but only 2 have management/leadership training experience. This may have an impact for preparedness and response to disaster management. Because hospital emergency and disaster managers need a deeper understanding of emergency project management knowledge and skills for best practices in the healthcare setting.

Hospital leadership and management-related preparedness for disaster management is low for this study. The majority (91%) of hospital managers have a low level of commitment, support, and participation in disaster risk management. There was no regular meeting with the disaster committee, no risk identification and prioritization for emergency and disaster preparedness and response. This can be a possible reason that most Hospitals have low levels of disaster response readiness. Because effective and ethical leadership during a disaster requires several essential skills. Good management practice in a resource-limited setting is to utilize and deploy those resources most effectively. Communication, time management, procurement management and human resource management are very important managerial roles to play in the disaster management (Karlene, 2017).

Leaders in disaster management need project management knowledge. It is because project management knowledge generated through well-designed, effectively executed study findings is crucial to organizational future capacity for better achievement of goals for preparedness and response which is aimed for preventing injury, illness, disability, and death, and supporting recovery (Lurie et al., 2013).

Disaster risk assessment is an approach to determine the nature and extent of disaster risk by recognizing potential hazards and evaluating the current conditions of exposure and vulnerability which may harm people, services, property, livelihoods, and the environment. (UNDRR, 2017)

Perception of disaster risk is an essential indicator for preparedness. Studies have showed that risk perception for disaster has a positive relation with hospital preparedness.

This study showed that hospital disaster focal persons' and managers' perception of disaster risk was high for the majority of tertiary-level hospitals. It is similar with other studies conducted in Western Ethiopia and other hospitals in sub-Saharan African countries((Woyessa *et al.*, 2020,

Farah, Pavlova and Groot, 2023). This may be the similarity of disaster type and occurrence in the countries and study areas.

CHAPTER- 5 - CONCLUSIONS AND RECOMMENDATIONS

5.1. CONCLUSION

The purpose of this study is to assess the disaster risks and preparedness status of public hospitals in Addis Ababa and to recommend the responsible bodies for corrective actions according to the study findings. Based on the findings in this study, the following are conclusions.

The disaster management preparedness level is low for most of the studied public hospitals in Addis Ababa. Even if the majority of hospitals have disaster focal persons and their profession is emergency-related, most of them have no management/leadership training experience.

The majority of hospital disaster preparedness and response plans were not tested and updated.

Most of the hospitals have faced real disasters and the common disaster was road traffic accidents.

The common challenges during disaster response were supply shortage, space shortage, disorganization, resource management problems, delayed response, and security issues.

Hospital preparedness in the coordination of emergency and disaster management, disaster response and recovery planning, human resources management, logistics, and finance are low.

It is also found that hospital managers' commitment, support, and participation in disaster risk management is low in most of the studied public hospitals in Addis Ababa.

Disaster risk perception level of hospital focal persons/managers is high to a moderate level and most tertiary-level hospitals have a high level of disaster risk perception.

5.2. RECOMMENDATIONS

The study was aimed to assess disaster risks and preparedness status of public hospitals in Addis Ababa and to recommend the responsible bodies for corrective actions based on the study findings. This study can be used as input for different concerned bodies and stakeholders in the area to take measures for correction. As it is known, disasters cannot be avoidable and the only

option that we have in our hands is preparation to respond to disaster and minimize its impact. So, preparation should be given for great attention. Based on the findings, the following recommendations are suggested for concerned bodies and organizations

To hospital managers and responsible focal persons

Disaster preparedness level is low for the majority of hospitals which indicates that great emphasis is not given to it. So, it is recommended to give attention and organize hospital disaster management based on standards. Even if there is a disaster response preparedness plan, it is not updated and tested. It is recommended to be tested at least annually and make amendments accordingly. Disaster-specific plans should be prepared based on the identified and prioritized disasters for each hospital.

Focal persons should take management and leadership training to improve their knowledge and skills to organize and lead disaster management activities more effective way.

Hospital managers need to have support, commitment, and participation for disaster preparedness and response activities to correct their current low level.

The disaster committee need to have regular meetings to have updated preparedness status and should work on risk identification, prioritization, planning to test, training of staffs, supply and material readiness, space preparation, stakeholder involvement and management.

To health bureau and Federal Ministry of Health

Nationally, disaster management has given a great emphasis for prevention and response at all levels. But the current finding for hospital disaster preparedness level is low. So, it is recommended to have standard national monitoring and evaluation mechanisms to strengthen their preparedness and response status.

Preparedness related to communicable disease is better prevention is better as observed from hospitals but for trauma and related accidents, preparedness is not much better. So it is better to have more attention for trauma-related disasters as it more common in our country.

It is recommended to have better disaster management training access for hospital staffs since the majority are not trained.

The presence of disaster management program in the country is highly recommended to have professionals in the field for better disaster management practice in the health care system.

5.3. Suggestions for Further Study

This study was conducted in Addis Ababa public hospitals and it did not include the private hospitals. The is also limited in Addis Ababa. So, it is suggested to conduct further studies including private hospitals and regional hospitals for a better understanding of hospital preparedness status for disaster response at the national level. Furthermore, the interviewed participants were disaster-focal persons and managers of hospitals. For better clarification and to identify reasons for the low level of preparedness, additional studies with the involvement of hospital staff and stakeholders are needed.

References

- Abbasabadi Arab, M., Khankeh, H. R., Mosadeghrad, A. M., & Farrokhi, M. (2019). Developing a Hospital Disaster Risk Management Evaluation Model. *Risk Management and Healthcare Policy*, 12, 287–296. <https://doi.org/10.2147/RMHP.S215444>
- Abebe, M. (2009). *Emerging trends in disaster management and the Ethiopian experience: Genesis, reform and transformation*. 1(2).
- Akita. (2023, June 21). *4 Phases of Disaster Management Explained (the Easy Way)* – AkitaBox. <https://home.akitabox.com/blog/4-phases-of-disaster-management/>
- Alemayehu, M., Woldemeskel, A., Olani, A. B., & Bekelcho, T. (2023). Epidemiological characteristics of deaths from road traffic accidents in Addis Ababa, Ethiopia: A study based on traffic police records (2018–2020). *BMC Emergency Medicine*, 23(1), 19. <https://doi.org/10.1186/s12873-023-00791-0>

- Aliyu, A. (2015). Management of disasters and complex emergencies in Africa: The challenges and constraints. *Annals of African Medicine*, 14(3), 123–131. <https://doi.org/10.4103/1596-3519.149894>
- Ayenew, T., Tassew, S. F., & Workneh, B. S. (2022). Level of emergency and disaster preparedness of public hospitals in Northwest Ethiopia: A cross-sectional study. *African Journal of Emergency Medicine*, 12(3), 246–251. <https://doi.org/10.1016/j.afjem.2022.05.007>
- Baroudi, S., & Rapp, R. R. (2012). Disaster Restoration Projects: A Conceptual Project Management Perspective. *Aust J Constr Econ Build, Conf Ser.*, 1, 72–79. <https://doi.org/10.5130/ajceb-cs.v1i2.3168>
- CDC. (2019, September 25). *Natural and Human-Made Disasters | Epidemic Intelligence Service | CDC*. <https://www.cdc.gov/eis/field-epi-manual/chapters/Natural-Human-Disasters.html>
- Disaster | UNDRR. (2007, August 30). <http://www.undrr.org/terminology/disaster>
- Emergency Management. (2024). *How do you use project management in disaster response?* <https://www.linkedin.com/advice/0/how-do-you-use-project-management-disaster>
- Farah, B., Pavlova, M., & Groot, W. (2023). Hospital disaster preparedness in sub-Saharan Africa: A systematic review of English literature. *BMC Emergency Medicine*, 23(1), 71. <https://doi.org/10.1186/s12873-023-00843-5>
- Firissa, Y. B., Sultan, M., Abdelwahab, M., & Kifle Belachew, F. (2023). Disaster response readiness assessment of public hospitals in Addis Ababa City, Addis Ababa, Ethiopia. *African Journal of Emergency Medicine*, 13(3), 210–216. <https://doi.org/10.1016/j.afjem.2023.06.004>
- George, T. (2023). *Mixed methods research*.
- global conflict tracor. (2023). *Conflict in Ethiopia*. Global Conflict Tracker. <https://cfr.org/global-conflict-tracker/conflict/conflict-ethiopia>
- Goosman, A. (2019, April 23). *Natural Disasters—Five Year Review*. Disaster Empire. <https://disasterempire.com/natural-disaster/natural-disasters-five-year-review/>

- Hunter, D., McCallum, J., & Howes, D. (2019). Defining Exploratory-Descriptive Qualitative (EDQ) research and considering its application to healthcare. *Journal of Nursing and Health Care*, 4(1), Article 1. <http://dl6.globalstf.org/index.php/jnhc/article/view/1975>
- IFRC. (2024, March 12). *Homepage | IFRC*. <https://www.ifrc.org/>
- Jeremiah, S. (2021). *CHAPTER THREE RESEARCH METHODOLOGY 1.0. Introduction*.
- Karlene, R. (2017, October 12). *(1) Importance of Project Management in Disaster Relief Efforts | LinkedIn*. <https://www.linkedin.com/pulse/importance-project-management-disaster-relief-efforts-karlene-russell/>
- Kesto, D., & Diribsa, H. (2022). Emergency Project Management Practice in Ethiopia: The Case of World Vision Humanitarian Crises Response Projects in Tigray. *International Journal of Project Management and Productivity Assessment*, 10, 1–15. <https://doi.org/10.4018/IJPPMA.301597>
- Khan, A., Alowais, J., Nofal, A., & Alama, T. (2021). Assessment of disaster preparedness at general hospitals in Al-Madinah Al-Munawarah Province, Western Region of Saudi Arabia: A study of pre intervention and post intervention test scores from 2017 to 2019. *Saudi Medical Journal*, 42(5), 537–542. <https://doi.org/10.15537/smj.2021.42.5.20200804>
- Linda, D. (2024). *Disaster Preparedness: Crisis Communication Plan Model | Digital Preservation Management*. <https://dpworkshop.org/dpm-eng/workshops/management-tools/disaster-preparedness/communication.html>
- Lurie, N., Manolio, T., Patterson, A. P., Collins, F., & Frieden, T. (2013). Research as a Part of Public Health Emergency Response. *New England Journal of Medicine*, 368(13), 1251–1255. <https://doi.org/10.1056/NEJMs1209510>
- Mahesh EV. (2024). *Disaster project management | IAPM*. <https://www.iapm.net/en/blog/disaster-project-management/>
- MPS, R. J. (2019). Continuity Planning for the Health Care Delivery System: *Delaware Journal of Public Health*, 5(4), 81–89. <https://doi.org/10.32481/djph.2019.10.020>

- OCHA. (2024, March 25). *Ethiopia: Floods - Nov 2023* | ReliefWeb. <https://reliefweb.int/disaster/fl-2023-000229-eth>
- Pells, D. (2023, November 3). An Introduction to Urgent Emergency Project Management. *PM World Journal*. <https://pmworldjournal.com/article/an-introduction-to-urgent-emergency-project-management>
- PMBOK. (2017). *PMBOK® GUIDE - PDF Drive*. <http://www.pdfdrive.com/pmbok-guide-d52152990.html>
- Siddique, S. (2017). *Disaster-Related Project Management—An Organizational Perspective*. https://www.academia.edu/36052909/Disaster_Related_Project_Management_An_Organizational_Perspective
- Tager, A. (2022, May 4). Project Management Approach in Emergency Management. *Domestic Preparedness*. <https://domesticpreparedness.com/articles/home-5>
- Tulane. (2021, September 3). *What Is Disaster Management: Prevention and Mitigation*. <https://publichealth.tulane.edu/blog/what-is-disaster-management/>
- UCF. (2024). THE DISASTER MANAGEMENT CYCLE: 5 KEY STAGES & HOW LEADERS CAN HELP PREPARE. *University of Central Florida ,Leadership and Management*.
- UNDRR. (2017, February 2). *Disaster risk assessment* | UNDRR. <http://www.undrr.org/terminology/disaster-risk-assessment>
- UNHCR. (2023). *Ethiopia Refugee Crisis: Aid, Statistics and News* | USA for UNHCR. <https://www.unrefugees.org/emergencies/ethiopia/>
- WHO. (2011). *Hospital emergency response checklist*. <https://www.who.int/publications-detail-redirect/hospital-emergency-response-checklist>
- WHO. (2019). *Health Emergency and Disaster Risk Management Framework*. <https://doi.org/HealthEmergencyandDisasterRiskManagementFramework>. Geneva: World Health Organization; 2019. Licence: CC BY-NC-SA 3.0 IGO.

- WHO. (2023). *Crisis in Northern Ethiopia*. <https://www.who.int/emergencies/situations/crisis-in-tigray-ethiopia>
- WHO, W. H. (2015). *Hospital safety index: Guide for evaluators*. World Health Organization. <https://iris.who.int/handle/10665/258966>
- Workneh, T. A. (2022). Level of emergency and disaster preparedness of public hospitals in Northwest Ethiopia: A cross-sectional study. *African Journal of Emergency Medicine*, 2022(12). <https://doi.org/10.1016/j.afjem.2022.05.007>
- World Population Review. (2024). *Addis Ababa Population 2024*. <https://worldpopulationreview.com/world-cities/addis-ababa-population>
- Woyessa, A. H., Teshome, M., Mulatu, B., Abadiga, M., Hiko, N., & Kebede, B. (2020). Disaster Preparedness in Selected Hospitals of Western Ethiopia and Risk Perceptions of Their Authorities. *Open Access Emergency Medicine*, 12, 219–225. <https://doi.org/10.2147/OAEM.S260314>
- WPR. (2024). *Addis Ababa Population 2024*. <https://worldpopulationreview.com/world-cities/addis-ababa-population>
- Yeo, J., Knox, C. C., & Jung, K. (2018). Unveiling cultures in emergency response communication networks on social media: Following the 2016 Louisiana floods. *Quality & Quantity*, 52(2), 519–535. <https://doi.org/10.1007/s11135-017-0595-3>
- Yimere, A. (2023, September 13). *Addis Ababa faces growing climate change risks like heat, drought and floods, study warns*. The Conversation. <http://theconversation.com/addis-ababa-faces-growing-climate-change-risks-like-heat-drought-and-floods-study-warns-212492>
- Zibulewsky, J. (2001). Defining disaster: The emergency department perspective. *Proceedings (Baylor University. Medical Center)*, 14(2), 144–149. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1291330/>

ANNEX – I

QUESTIONNAIRE

Participant Informed consent

Dear Participants;

I am a graduate student at Addis Ababa University School of Commerce and currently I am conducting a research for the completion of my masters in Project Management. This study is on **Disaster preparedness status of public hospitals and associated factors in Addis Ababa city , Addis Ababa -Ethiopia**. The purpose of this study is to assess the Disaster preparedness status of public hospitals in Addis Ababa city and to identify factors associated to it. The finding from this study is used as an input for the responsible stakeholders for the possible solution. Your participation in this research study is voluntary and will take about 20 minute. The information provided will be used for academic purpose only and your name or any identification will not be mentioned. Therefore, I kindly request your assistance to respond the questionnaire noting that your response will be kept confidential. If you have any questions or comment regarding this research study, you may contact me at

E-mail: andualemwubete@yahoo.com, Tel 0920531585

Thank you very much for your time and cooperation.

Andualem Wubetie

PART – I: leadership and hospital related data

1. Name of hospital (code)-----
2. Level of hospital -----
3. Total number of Emergency bed-----
4. Total number of hospital bed -----
5. Total number of annual emergency visit -----
6. Position and profession of the focal person in the hospital for disaster response -----
7. Year of experience in the positions -----

8. Do you have disaster preparedness and response training experience? yes no
9. Management /leadership training ? yes no
10. Presence of disaster preparedness plan in document form yes no
11. If no hospital disaster response preparedness plan, what is the reason? -----

12. Regular meeting of ICG and chaired by assigned incident commander yes no
13. If no, why -----

14. Are there assessed and identified disaster risks yes no
15. If yes, are risks prioritized? Yes no
16. Does the prepared disaster plan tested yes no
17. If yes, how?
18. Did you perform disaster drill (frequency) yes no
19. Did you faced real disaster in your hospital yes no
20. If yes, how much -----
21. What was the challenge for disaster response -----

22. Are there trained staffs in disaster management? yes no
23. If no, why? .-----

24. What are activation mechanisms during disaster? -----

Hospital leadership and management

S.no	Questions	Response			Remark
		Low (1)	Average(2)	High(3)	
1.	Allocating resources to implement plans,				
2.	Developing community involvement programs for the success of the disaster risk management				
3.	Manager's attention to the prevention stage of the disaster risk management and enhance the safety of the hospital environment.				
4.	Developing guidelines and standards to create a safe and sustainable environment for patients and staffs				
5.	There is a well-established structure for the disaster risk management				

6.	There is a good external relationship established with community relief organizations.				
7.	Hospital managers developed protocols to use their resources and technical assistance for disaster situation management				

PART -II – Hospital disaster response preparedness plan assessment

Coordination of emergency and disaster management activities					
s.no	Questions	Safety level			Remark
		Low (1)	Average (2)	High (3)	
1.	Hospital Emergency/Disaster Committee				
2.	Committee member responsibilities assigned and training given				
3.	Designated emergency and disaster management coordinator				
4.	Preparedness program for strengthening emergency and disaster response and recovery				
5.	Hospital incident management system				
6.	Emergency Operations Centre (EOC)				
7.	Coordination mechanisms and cooperative arrangements with local emergency/disaster management agencies				
8.	Coordination mechanisms and cooperative arrangements with the health-care network				
Hospital emergency and disaster response and recovery planning					
1.	Hospital emergency or disaster response plan				
2.	Hospital hazard-specific subplans				
3.	Procedures to activate and deactivate plans				
4.	Hospital emergency and disaster response plan exercises, evaluation and corrective actions				
5.	Hospital recovery plan				
Communication and information management					
1.	Emergency internal and external communication				
2.	External stakeholder directory				
3.	Procedures for communicating with the public and media				
4.	Management of patient information				
Human resources					
1.	Staff contact list				
2.	Staff availability				
3.	Mobilization and recruitment of personnel during an emergency or disaster				
4.	Duties assigned to personnel for emergency or disaster response and recovery				

5.	Well-being of hospital personnel during an emergency or disaster				
Logistics and finance					
1.	Agreements with local suppliers and vendors for emergencies and disasters				
2.	Transportation during an emergency				
3.	Food and drinking-water during an emergency				
4.	Financial resources for emergencies and disasters				
Patient care and support services					
1.	Continuity of emergency and critical care services				
2.	Continuity of essential clinical support services				
3.	Expansion of usable space for mass casualty incidents				
4.	Triage for major emergencies and disasters				
5.	Triage tags and other logistical supplies for mass casualty incidents				
6.	System for referral, transfer and reception of patients				
7.	Infection surveillance, prevention and control procedures				
8.	Psychosocial services				
9.	Post-mortem procedures in a mass fatality incident				
Evacuation, decontamination and security					
1.	Evacuation plan				
2.	Decontamination for chemical and radiological hazards				
3.	Personal protection equipment and isolation for infectious diseases and epidemics				
4.	Emergency security procedures				
5.	Computer system network security				

PART III: Hospital managers' perceived risks for major types of disaster events

Hospital managers' perceived risks of major types of disaster events.					
s.no	Types of perceived disaster risks	Level of perceived disaster risk			
1.	Natural disaster	Low (1)	Moderate (2)	High (3)	Remark
	Flood				
	Landslide				
	Biological (air born ds, water born, vector born, food born, animal....)				
2.	Man made				

	Technological				
	Industrial hazards (chemical spill, gas leak, radiation)				
	Structural collapse(building collapse, dam/bridge failures)				
	Transportation (air, road, rail)				
	Infrastructure disruption:(power outage, water supply, waste water)				
	Social				
	Armed conflict				
	Civil unrest				
	Terrorism activity				
	Financial crisis (hyper inflation crisis, currency crisis)				