



**The Effect of Humanitarian Supply Chain Management Practices
on Emergency Responses: Ethiopian Public Health Institute**

By

Tinsae Eshetu

**A Thesis submitted to Addis Ababa University College of Business and
Economics School of Commerce in Partial Fulfillment of the Requirements
for the Degree of Masters of Arts in Logistics and Supply Chain
Management**

Advisor: Shiferaw Mitiku (Ph. D)

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Addis Ababa, Ethiopia

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DECLARATION

I, Tinsae Eshetu declare that this thesis entitled “The Effect of Humanitarian Supply Chain Management Practices on Emergency Responses: Ethiopian Public Health Institute” is the result of my own work, and I have correctly credited all the sources of the study materials. Aside from the research advisor's guidance, feedback, and suggestions, I generated it on my own.

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CERTIFICATION

This is to certify that the thesis entitled “The Effect of Humanitarian Supply Chain Management Practices on Emergency Response: Ethiopian Public Health Institute is submitted to Addis Ababa University School of Commerce for the award of the Degree of Master of Arts in Logistics and Supply Chain Management has been carried out by Tinsae Eshetu under my guidance and supervision.

Advisor: Dr. Shiferaw Mitiku

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Acronyms

ESC	Emergency Supply Chain
ESHM	Emergency Supply Chain Management
EPHI	Ethiopian Public Health Institute
EPSS	Ethiopian Pharmaceutical Supply Service
PHEM	Public Health Emergency Management
HLM	Humanitarians Logistics Management
HSCM	Humanitarian Supply Chain Management
NGO	Non-Governmental Organization
SCM	Supply Chain Management
SCR	Supply Chain Resilience
PPA	Procurement and Property Administration
PPD	Public Procurement Directive
PPL	Public Procurement Manual

Abstract:

The main purpose of this study was to investigate the effect of humanitarian supply chain management (SCM) practices on emergency response, focusing on the case of the Ethiopian Public Health Institute (EPHI). As we know humanitarian supply chain is very complex and challenging process that requires care full preparedness by logistics capacity and capability. However, there are limited evidences on the factors that affect public health emergency response in developing countries especially in Ethiopia. The researcher adapted explanatory research approach, by examining eight independent variables. The research methodology was quantitative research and a questionnaire was used for data collection. The study conducted at Ethiopian public health institute. Data was coded and entered in to Statistical Package for Social Sciences (SPSS) version 25 and Descriptive statistics like mean, standard deviation, frequency, graphs and inferential statistical like multiple linear regression techniques were employed. The reliability is checked by Cronbach's alpha coefficients of all dependent and independent variables are greater than 0.70 confirming acceptable. The study was used a conceptual framework which identifies eight key dimensions of humanitarian SCM practices: capacity building, Need assessment, procurement management, warehousing management, Inventory management, distribution management, fleet management, and reverse logistics management and their effect on emergency of EPHI.

The study used census method approach of sample size determination with study's sample size of 154. With doing so, the researcher, used closed ended 5point likert -scale questioner for data collection. The result of the research revealed that the humanitarian supply chain management practices were moderately practiced in EPHI and from the eight independent variables three of them (distribution management, inventory management and capacity building) were statistically significant and positive effect on its emergency response. The researcher further recommended, focusing on the perspectives of coordination and collaboration with donors, strategic supplier partnership practices, and information sharing practices.

Key Words: *Humanitarian, supply chain management. Needs assessment, capacity building, procurement, warehouse, inventory, and distribution, fleet and reverse logistics*

CHAPTER ONE

1 INTRODUCTION

This chapter consists of background of the study, background of the organization, statement of the problem, research questions, objective of the study, significance of the study, scope of the study and Organization of the study

1.1 Background of the study

Serious catastrophes of many types can occur worldwide, including natural and manmade events like the Sichuan earthquake (2008), the US Hurricane Katrina (2005), and the Indian Ocean tsunami (2004). Generally, Earthquakes, typhoons, floods, and droughts. Our planet has suffered greatly as a result of these calamities (Ergonul S. 2005 & Chandre, 2007).

In African, the problems provided by humanitarian crises are particularly intense due to a confluence of circumstances including socio-economic vulnerabilities, political instability, and environmental threats (Garcia, Johnson, and Osei, 2024). Therefore, in order to increase the effectiveness, resilience, and efficiency of emergency response operations throughout the continent, it is imperative that HSCM techniques be strengthened (Brown & Smith, 2023). Studies have indicated that allocating resources towards capacity building programs, strategic procurement methods, and sophisticated distribution management systems can markedly improve the readiness and responsiveness of aid agencies operating in Africa (Wang, Johnson, & Osei, 2024).

It can't be emphasized enough about the significance of efficient humanitarian supply chain management in Africa, a region that is more vulnerable to a variety of disasters (Dilley, Chen, Deichmann, Lerner-Lam, Arnold, & Agwe, 2005). Stress how important it is to comprehend the local environment, develop resilience, and involve the community in humanitarian endeavors. These considerations are especially important in areas like Ethiopia, where effective emergency responses depend on a proactive and culturally aware approach to supply chain management.

HSCM requires the process of effective and cost-efficient plans, implementations and controls for aid flows (i.e., materials, goods, services, financial resources, information) from

the point of origin to the point of consumption with the intention of meeting the aid recipients' requirements (Dubey, 2022).

A broad variety of activities, including planning, sourcing, transportation, warehousing, tracking, tracing, and customs clearance from the place of origin to the site of consumption, are included in humanitarian logistics management (HLM). According to Van Wassenhove (2006), HLM is sometimes described as a system or procedure that comprises leveraging knowledge to organize people and resources in support of impacted and vulnerable communities.

Various writers have characterized supply chains as the web of companies engaged, via upstream and downstream connections, in the various procedures and undertakings that generate value as goods and services that end up in the hands of the final consumer (Erturgut, & Soyseker, 2011).

Humanitarian supply chain management (SCM) is recognized as a novel and formidable research domain due to the substantial uncertainty and complexity inherent in disasters (Day, 2012; Kovács and Spens, 2007; Holguín-Veras, 2012).

Emergency response encompasses a broad array of activities and practices aimed at mitigating the immediate effects of disasters and crises, with the ultimate goal of saving lives, protecting property, and restoring normalcy in affected communities (Smith, 2019)). In recent years, there has been a notable increase in the frequency and intensity of emergencies driven by factors such as climate change, population growth, urbanization, and geopolitical instability.

Critical activities encompass a range of measures aimed at mitigating the impact of disasters or crises. These include initiating the emergency operations plan, activating emergency operations centers, evacuating affected areas, establishing shelters for mass care, providing rescue and medical assistance, engaging in firefighting efforts, conducting search and rescue operations, safeguarding emergency infrastructure, restoring essential services, managing fatalities, and ensuring the security of affected regions through the deployment of law enforcement or military personnel (Nikbakht & Farahani, 2011).

Humanitarian supply chain management (SCM) aims to prioritize needs in order to effectively respond to affected individuals both during and after a crisis. Assisting

individuals in need is at the core of humanitarian supply chain management (Van Wassenhove, 2006; Tatham, 2009)

1.2. Background of the organization

The Ethiopian Public Health Institute (EPHI) traces its origins to its founding in 1922 by American missionary Dr. Thomas Lambie as the Medical Research Institute. Over the years, EPHI has undergone significant transformations, evolving into the national research institute of health in 1977 and subsequently being reconstituted under the Ministers Regulation No 4/1996. Its scope has expanded to encompass critical areas such as Laboratory, Public Health Emergency Management and research reflecting its enduring commitment to enhancing Ethiopia's people health. EPHI's enables close collaboration with the Government of Ethiopia and international partners to fortify the nation's healthcare infrastructure and response capabilities (Ethiopian Public Health Institute, 2012; Dilley, S., Smith, J., & Johnson, B., 2005).

1.3 Statement of the problem

The main objectives of HSCM are to reduce human suffering, more especially to stop additional human deaths and damages, and to treat injured and unwell people right away (Kant, S., Zegeye, Z., & Tesfaye, 2022). These days, scholars and professionals are interested in this field (Dubey, Gunasekaran, Childe, Papadopoulos, & Hazen, 2022).

Ethiopia is vulnerable to a wide range of humanitarian crises, such as conflicts, disease outbreaks, floods, and droughts, like many other African nations (Patel & Nguyen, 2023). The Ethiopian government and aid organizations have been actively engaged in enhancing HSCM procedures to improve emergency response capacities in response to these difficulties (Chen, Wang, & Wu, 2023). However, significant gaps remain in areas such as needs assessment, warehousing management, and fleet management, which hinder the timely and effective delivery of humanitarian aid (Lee & Kim, 2023).

Bale and Kant's (2023) findings underscore the urgent need for optimized transportation strategies and streamlined aid delivery processes, highlighting the potential impact of improved HSCM practices on organizational performance during crises. Similarly, Tufa's (2023) identification of challenges in pharmaceutical procurement and transportation management at the EPHI underscores the importance of addressing operational hurdles within health-focused supply chains.

According to the Ethiopian Public Health Institute Strategic Plan for the period of 2020/21 (EPHI-SPM-III), the outputs of the SWOT analysis regarding internal factors (Strengths and Weaknesses) and external factors (Opportunities and Threats) have identified critical weaknesses significantly affecting humanitarian response efforts. Among these weaknesses are the weak public health emergency preparedness as outlined in the Ethiopian Public Health Emergency Management Framework and the deficient procurement system coupled with the absence of appropriate procurement directives for essential research inputs, including research reagents, chemicals, instruments, equipment, and drugs. Consequently, it is imperative to address these identified weaknesses through targeted research interventions (Ethiopian Public Health Institute, 2020).

The discrepancies highlighted in the Assessment of Ethiopian public procurement system (2021), emphasize the necessity of aligning procurement policies with emergency response; Overlapping Ethiopian public procurement policy and framework (e.g., between Public Procurement Directive (PPD) and Public Procurement Law (PPL) or Public Procurement Manual and PPL). Addressing policy gaps in procurement and property administration is essential for EPHI's effectiveness in promoting public health objectives to enhance agility and effectiveness.

In addition to that I gathered the information from 8PHEM officers and 1 procurement manager they are working on emergency response activities answer back to my question is that they face challenges related to emergency commodities like shortage of supplies, delay of ordered supplies, warehouse space problem, and shortage of transportations to deliver commodities to beneficiaries.

This study fills a notable research gap to the knowledge of the researcher, previous researches has primarily focused on factors affecting HSCM perspectives rather than fundamental activities within humanitarian supply chains, particularly within governmental organizations like the Ethiopian Public Health Institute. By addressing these key dimensions, the research aims to enhance the speed, timeliness, and responsiveness of supply chain services, ultimately improving emergency response outcomes.

1.4 Research Question's

- How the Capacity Building practices of EPHI affects its emergency response?
- How need assessment practices of EPHI affects its emergency response?
- How procurement management practices of EPHI affects its emergency response
- How warehousing management practices of EPHI affect its emergency response?
- How inventory management practices of EPHI affects its emergency response?
- How the distribution management practices of EPHI affects its emergency response?
- How fleet management practices of EPHI affect its emergency response?
- How reverse logistics management practices of EPHI affects its emergency response?

1.5 Objectives of the study

1.5.1 General Objectives of the study

To examine the effect of humanitarian supply chain management practices of EPHI on its emergency responses.

1.5.2 Specific Objectives

- To assess the effect of capacity building practices of EPHI on its emergency response.
- To examine the effect of need assessment practices of EPHI on its emergency response.
- To analyse the effect of procurement management practices of EPHI on its emergency response.
- To assess the effect of fleet management practices of EPHI on its emergency response.
- To examine the effect of warehousing management practices of EPHI on its emergency response.
- To examine the effect of inventory management practices of EPHI on its emergency response.
- To assess the effect of distribution management practices of EPHI on its emergency response.
- To analyse the effect of reverse logistics management practices of EPHI on its emergency response.

1.6. Definition of Terms/Operational Terms

Capacity Building: is the intentional and on-going process of improving a person's, group's, or community's capacity to function successfully, economically, and sustainably in order to meet predetermined goals and objectives (United Nations Development Programme,1998).

Needs assessment: entails determining the precise requirements, problems, or obstacles that needs to be resolved in order to enhance performance or produce the intended outcomes (Rothwell, & Kazanas, 2008).

Procurement management: The act of strategically obtaining products, services, or labour from outside sources in order to meet an organization's demands in an economical and effective way is known as procurement management (Monczka, Handfield, Giunipero, & Patterson, 2015).

Warehouse management: the efficient planning, organizing, and controlling of storage facilities and operations to ensure the timely and cost-effective handling of goods within a supply chain. It encompasses activities such as inventory control, order picking, packing, and shipping to optimize the flow of products and meet customer demands effectively (Rushton, Croucher, & Baker, 2014)

Inventory management: entails planning, organizing, and managing the flow of goods and materials within an organization in order to maintain appropriate levels of stock to meet the demand while minimizing costs and maximizing efficiency (Chopra & Meindl, 2016).

Distribution management: the planning, organizing, and control of the movement of commodities from the site of production to the point of consumption to guarantee the prompt delivery of goods to clients (Chopra & Meindl, 2016).

Fleet management: plays a pivotal role in ensuring the timely and efficient transportation of humanitarian aid during emergency responses. It encompasses a range of practices aimed at optimizing the use of vehicles, enhancing safety, and maximizing the delivery of essential supplies to disaster-affected areas (Tomasini & Van Wassenhove, 2009).

Revers Logistics: refers to the strategic process of managing the reverse flow of products and materials from the customer back to the producer or distributor, with the aim of

recovering value or disposing of them properly (Govindan, K., Soleimani, H., & Kannan, D. 2015).

Supply chain management (SCM): is the management of the flow of goods and services, including the movement and storage of raw materials, work-in-process inventory, and finished goods from point of origin to point of consumption (Chopra & Meindl, 2016).

Humanitarian Supply Chain Management: refers to the coordination and optimization of the flow of resources, information, and services to meet the needs of affected populations during emergencies and disasters (Thomas & Mizushima, 2005). In addition to that it is responsible for delivering essential goods and services to populations affected by natural disasters, conflicts, or other emergencies (Kovács & Spens, 2007).

Emergency response: refers to the immediate actions taken to address the needs of affected populations during disasters, conflicts, or other emergencies. This involves providing life-saving assistance such as food, water, shelter, healthcare, and protection to those affected by the crisis (Smith, 2019).

1.7. Significance of the study

This study will help to improve HSCM practices at EPHI specifically for the PHEM center and General Service directorates and other humanitarian organizations working on emergency response. Furthermore, the study will benefit or serve as baseline data for the practitioners, policymakers and potential researchers for future studies, and it will add to the knowledge base HSCM.

1.8. Scope of the study

The scope of this study is limited on National EPHI public health emergency management Center and general service directorate HSCM practices and its effect on emergency response.

The geographic scope of this study is National staffs located in Addis Ababa PHEM center and General Service directorate. The conceptual scope of this study is focusing on HSC practices; need assessment, procurement, warehousing, inventory management, fleet management and reverse logistics management. This is because of important to conduct a real assessment based on actual HSC practices of EPHI.

This study will not consider the remaining SC practices that means it will not mean to cover all concerns related to the HSC operated by Local and international NGOs in Ethiopia. Furthermore, the temporal scope of the study will be delimited to the period of year Jun 2024.

1.9. Organization of the paper

The paper organized as follows: The first chapter will be the introduction which contains background of the study, background of the institute, statement of the problem, Research Questions, main research and sub research questions, objectives of the study: general and specific, research hypothesis, definition of terms, significance of the study, delimitation/scope of the study, organization of the paper. The second chapter will be about literature reviews: includes theoretical literature, empirical literature and conceptual framework. The third chapters will discussions about methodology of the study, which includes description about study area, research design, data source and collection method, sampling techniques and sample size determination, method of data analysis, reliability and validity analysis, and ethical consideration. The fourth chapter will present result and discussion. The fifth chapter will present summary, conclusion, recommendation and future research forward.

CHAPTER TWO

2 REVIEW of RELATED LITRATURE

Introduction

This chapter examines the literature upon which this research is based. It covers the conceptual Review, theoretical review and empirical review/review of related literature.

2.1. Theoretical Literature Review

2.1.1. Humanitarian supply chain management

A successful relief operation depends on humanitarian logistics, which focuses on the effective management of information, material, and service flows to meet the immediate needs of the affected populations in emergency situations, such as those that arise during and after natural or man-made disasters (Sheu, 2007).

The term "humanitarian supply chain" refers to the method by which nonprofit organizations organize, carry out, and oversee the effective and efficient movement and storage of goods and related materials from the point of origin to the point of consumption for the purpose of reducing the suffering of the most vulnerable individuals. Their role includes a variety of tasks, as planning, arranging, obtaining, moving, storing, following and tracing, and customs clearing, (Anjomshoae, 2022).

The main objective of HSCM is to reduce human suffering, more especially to stop additional human casualties and injury, and to treat injured and unwell people right away (Kant, Z, & T, 2022).

2.1.2. Humanitarian supply chain management practices

The Successful HSCM operations need to ensure that the appropriate supplies are procured and transported "in the right quantities, to the right people at the right place and at competitive prices" (Herman, 2007).

The benefit of achieving supply chain efficiency during humanitarian operations is the minimization of the extent of suffering of the affected communities and to avoid any further

loss of lives (Zhao, Xie, & Zhang, 2002). As a result, it is essential that the humanitarian supply chain be agile, adaptable and reactive.

Providing services to humanity in an impartial, fair, and discrimination-free manner is one of the shared objectives of humanitarian organizations (HOs). The major duties of HO are still to respond to natural disasters, defend human rights, offer aid, and advance the common goal of ensuring everyone has access to personal and societal security, safety, and dignity without regard to financial gain.

2.1.2.1. Capacity building

Capacity building involves developing the skills, knowledge, and resources necessary to effectively manage and respond to emergencies. This includes training personnel, establishing response protocols, and investing in infrastructure and technology (Abidi & Dar, 2023).

Through capacity building, humanitarian organizations share knowledge, expertise, and good practices to react better and faster to emergencies. In turn, working in a coordinated and complementary way will help them respond to humanitarian needs effectively and efficiently

2.1.2.2. Needs assessment

Need assessment is a systematic process of identifying, analysing, and prioritizing the needs of a target population or organization. It involves gathering and interpreting data to determine the gaps between the current state and the desired state, in order to inform the development and implementation of interventions or solutions to address those needs (Altschuld & Kumar, 2010).

The need assessment practices of humanitarian supply chain management (HSCM) involve identifying, visualizing, estimating, and controlling challenges that disrupt the practice and performance of humanitarian logistics management, posing a significant threat to access for healthcare services to beneficiaries (Al-Dahasha & Kulatunga, 2018).

2.1.2.3. Procurement Management

HL procurement requires agility and the capacity to navigate local marketplaces and suppliers. It entails procuring products and services under urgent and frequently unpredictable situations (Tomasini & Van Wassenhove, 2009).

The following theoretical review provides insights into the key concepts and principles related to procurement management in HSCM practices

The strategic sourcing process is fundamental in procurement management, as it involves identifying, evaluating, and selecting suppliers to meet the specific needs of humanitarian organizations during disaster relief operations (Tatham & Kovács, 2010). It aims to establish long-term relationships with suppliers, ensuring a reliable and sustainable supply of essential goods and services in humanitarian settings.

Supplier selection is another critical aspect of procurement management in HSCM. The process involves evaluating potential suppliers based on criteria such as reliability, cost-effectiveness, quality, and ethical standards (Pettit, Beresford, & O'Keefe, 2010). Effective supplier selection contributes to building a resilient and responsive supply chain network, capable of meeting the dynamic demands of disaster-affected areas.

Contract management is essential for governing the relationships between humanitarian organizations and their suppliers. It involves negotiating and formalizing agreements that outline the terms and conditions of procurement, including pricing, delivery schedules, quality standards, and ethical considerations (Tomasini & Van Wassenhove, 2009). Effective contract management ensures transparency, accountability, and compliance with ethical and legal standards in procurement practices.

Ethical considerations in procurement management are paramount in humanitarian SCM practices. Humanitarian organizations must adhere to ethical principles and guidelines in their procurement processes, considering factors such as fair trade, environmental sustainability, and social responsibility (Abidi, de Leeuw, & Klumpp, 2014). Ethical procurement practices contribute to building trust with suppliers and local communities, fostering sustainable partnerships in disaster-affected regions.

Generally, procurement management in humanitarian SCM practices encompasses strategic sourcing, supplier selection, contract management, and ethical considerations. Understanding and applying these principles is crucial for enhancing the effectiveness and efficiency of procurement processes in disaster relief and emergency response operations.

2.1.2.4. Warehousing management

Warehousing operations play a crucial role in the storage, handling, and distribution of humanitarian aid and relief supplies. The design and management of warehouses are essential for ensuring the efficient flow of goods through the supply chain, particularly in the context of disaster relief operations (Pettit, Beresford, & O’Keefe, 2010). Effective warehousing practices contribute to the timely and accurate delivery of essential supplies to affected populations.

2.1.2.5. Inventory management

Inventory management is a critical aspect of humanitarian supply chain management, involving the planning and control of inventory levels to ensure the availability of essential goods and supplies for disaster relief and emergency response operations (Tomasini & Van Wassenhove, 2009). Effective inventory management practices are essential for minimizing stock outs, reducing excess inventory, and optimizing the allocation of resources in humanitarian settings.

The main challenges in warehousing and inventory control practices in humanitarian supply chains include issues related to infrastructure, security, capacity, and resource constraints (Abidi, de Leeuw, & Klumpp, 2014). These challenges impact the efficiency and effectiveness of warehousing and inventory management, requiring innovative solutions to address the unique operational requirements of humanitarian logistics.

2.1.2.6. Distribution management

A key component of distribution management is the movement of products from the point of origin to the point of consumption. When it comes to emergency response, efficient distribution management plays a critical role in guaranteeing that affected populations receive vital supplies on time (Sheu, 2007). This could entail a series of intermediaries passing the product down the chain within the organization before it finally reaches the beneficiaries.

The inventory optimization strategies like demand forecasting and stockpiling, will reduce response times and guaranteeing the availability of necessary supplies during emergencies are benefits of maintaining appropriate inventory levels (Tatham & Kovács, 2010).

2.1.2.7. Fleet Management

According to Das, (2020) Transport is defined as “the activities involved in moving supplies from the point of origin to internal customers or beneficiaries.” The goal of transportation is to physically carry supplies to their destination in a dependable and without any damage, also just in time, efficiently and in cost effective way.

Fleet management practices in HSCM encompass a range of strategies aimed at optimizing transportation operations and enhancing the delivery of humanitarian aid during emergency responses. By leveraging specialized modes of transport, prioritizing security and safety, and implementing efficient route planning and maintenance protocols, organizations can improve the effectiveness and efficiency of fleet management in humanitarian supply chains (Tomasini & Van Wassenhove, 2009).

2.1.2.8. Reverse Logistics

“The process of planning, implementing, and controlling the efficient, cost-effective flow of raw materials, in-process inventory, finished goods, and related information from the point of consumption to the point of origin for the purpose of recapturing value or proper disposal” (Rogers and Tibben-Lembke, 1999).

Reverse logistics (RL) is a more comprehensive supply chain management procedure called returns management. Forward and reverse logistics should be a part of an entire supply chain. The success of an organization is greatly influenced by forward logistics operations, which in turn boost reverse logistics activities.

2.1.3. Emergency response

The term "emergency response" describes coordinated activities and measures made to address and minimise the immediate consequences of crises or disasters with the goal of preserving life, safeguarding property, and returning things to normal as soon as possible (Smith, Johnson, & Brown, 2018).

Van Wassenhove (2006) delineates the four phases of disaster management: mitigation, preparedness, response, and rehabilitation. The initial phases, mitigation and preparedness, focus on preventing or minimizing the adverse impacts of disasters. Conversely, the latter phases response and rehabilitation, address the immediate aftermath of a disaster and the long-term efforts to rebuild and restore the affected community.

The emergency response phase entails quick deployment of needed personnel, equipment, and supplies to the catastrophe site. Depending on the magnitude and nature of the disaster, a combination of medical teams, law enforcement or military personnel, fire-fighters, and search teams equipped with the required vehicles and equipment are typically dispatched immediately following the incident. The success of a disaster management system depends on the creation of an efficient response plan for coordinating relief efforts and activities. (Nikbakht & Farahani, 2011).

Access to emergency medical treatment and healthcare services is critical for addressing injuries, illnesses, and other health needs arising during emergencies (WHO, 2020). Healthcare facilities should be equipped to provide essential medical services and support to affected populations (CDC, 2019).

A prompt response is critical for minimizing loss of life and property during emergencies (Comfort, Boin, & Demchak, 2012). Delays in deploying resources can result in increased casualties and prolonged suffering among affected populations (Smith & Wenger, 2017).

Security measures should address potential threats, including violence, looting, and exploitation (UN Security Council, 2021).

Engaging affected communities as partners in emergency response promotes ownership, resilience, and sustainability (Oxfam, 2019). Participation mechanisms should empower communities to voice their needs, preferences, and priorities and contribute to decision-making processes (UNDP, 2018).

Providing aid to vulnerable people is at the core of humanitarian supply chain management (HSCM) (Tatham, 2009). Van Wassenhove (2006) emphasizes the importance of Humanitarian Supply Chain Management (HSCM) in prioritizing needs and efficiently utilizing resources to respond to affected people during and after disasters.

2.2 Empirical literature review

2.2.1 The effect of capacity building practices on emergency response

According to Kant, Zegeye, and Tesfaye (2022), the main objective of HSCM is to lessen pain and stop more deaths. This is consistent with the overarching humanitarian goal of aid

delivery, human rights protection, and guaranteeing access to security and dignity (Anjomshoae, 2022).

Capacity-building practices encompass training, resource allocation, organizational structure, and collaboration. Research by Smith, Johnson, & Brown, (2018) emphasizes that organizations with robust capacity-building programs demonstrate better preparedness and response during crises. Additionally, Jones (2017) underscores the need for consistent capacity development to enhance emergency response capabilities.

Building capacity is crucial for enhancing the humanitarian sector's ability to effectively tackle emerging challenges. By pooling knowledge and experience, organizations can respond more rapidly to emergencies. Al-Dahasha and Kulatunga (2018), advocate for a systematic approach to recognizing and rating demands, which ensures that obstacles in humanitarian logistics are promptly identified and addressed.

H₁: Effective capacity building practices positively influences the EPHI'S emergency response.

H₀: Effective capacity building practices has no effect on EPHI'S emergency response.

2.2.2 The effect of need assessment practices on emergency response

According to Wakjira and Kant (2022), rigorous need assessment processes are essential in humanitarian supply chain management to ensure efficient and effective allocation of resources to address the needs of affected populations. This empirical evidence supports the hypothesis that robust need assessment processes, exemplified by those implemented by EPHI, play a crucial role in optimizing resource allocation and enhancing the timeliness of emergency response efforts.

H₁: Implementing rigorous need assessment processes at EPHI improves the timeliness of emergency response.

H₀: Implementing rigorous need assessment processes at EPHI has no effect on the timeliness of emergency response.

2.2.3 The effect of procurement management practices on emergency response

Tomasini and Van Wassenhove (2009) argue that adaptability and the ability to manage unforeseen circumstances are crucial for procurement in humanitarian supply chain

management (HSCM). Procurement management, which encompasses efficient and economical acquisition, including supplier selection, ethical considerations, and strategic sourcing, plays a pivotal role (Pettit, Beresford, & O'Keefe, 2010; Tatham & Kovács, 2010).

According to Tesfaye and Tadesse (2021), a study investigating the impact of procurement management practices on emergency response effectiveness in the healthcare sector found that organizations with efficient procurement processes could acquire necessary supplies promptly. This led to improved response times during emergencies.

Furthermore, Alemu, Asfaw, & Teklemariam, (2020) emphasized the importance of streamlined procurement practices in enhancing disaster response operations. The study highlighted that effective procurement management is crucial for ensuring the availability of critical resources during emergencies, thereby influencing the overall success of emergency response efforts.

In a similar vein, Berhanu and Mulatu (2019) conducted a study examining the relationship between procurement efficiency and emergency response outcomes in public health institutions. The findings indicated that organizations with well-established procurement systems were better equipped to respond swiftly to emergencies and meet the urgent needs of affected populations, ultimately leading to improved overall response outcomes.

H₁: An Efficient procurement management practices positively affect emergency response capacity of EPHI.

H₀: An efficient procurement management practice has no effect on emergency response capacity of EPHI.

2.2.4 The effect of warehousing management practices on emergency response.

Lemma and Alemu (2021) investigated the impact of warehousing management practices on emergency response preparedness in the healthcare sector. Their research findings highlighted that organizations with efficient warehousing systems were better equipped to store and manage essential supplies, leading to improved readiness and response capabilities during emergencies. In a similar context, a study conducted by Berhe and Gebre (2019) examined the relationship between warehousing efficiency and emergency response readiness in public health institutions. The results indicated that organizations with well-organized warehousing

processes were more prepared to respond promptly to emergencies, thereby positively impacting overall emergency response readiness and effectiveness.

H₁: An effective warehousing management practices play a positive role in enhancing EPHI's emergency response.

H₀: An effective warehousing management practices has no any role in enhancing EPHI's emergency response.

2.2.5 The effect of inventory management practices on emergency response

According to Girma and Assefa (2020), organizations with streamlined inventory management systems were better equipped to maintain adequate stock levels, reduce wastage, and respond promptly to emergency needs, ultimately improving overall emergency response outcomes.

In a similar context, a study conducted by Berhe and Gebre (2018) examined the relationship between inventory management efficiency and emergency response readiness in public health institutions. The results demonstrated that organizations with effective inventory management processes were better prepared to address emergency needs promptly, leading to improved response outcomes and overall operational efficiency.

H₁: Modernized inventory management practices optimize resource utilization, minimize shortages, and reduce delays in emergency situations.

H₀: A modernized inventory management practices has no effect on optimizing resource utilization, minimizing shortages, and reducing delays in emergency situations.

2.2.6 The effect of distribution management practices on emergency response

According to Anjomshoae, (2022), the importance of effective distribution management in ensuring the efficient flow of goods and services to aid recipients, ultimately contributing to enhanced organizational performance in humanitarian settings.

In a similar context, Bale and Kant (2022) examined the effect of humanitarian supply chain management practices on organizational performance, focusing on the Norwegian Refugee Council in West Guji Zone field office. The study underscored the significance of distribution management practices in optimizing organizational performance and response capabilities in humanitarian operations and also a study by Wakjira and Kant (2022) investigated that

organizations with efficient distribution processes were better equipped to ensure the prompt and fair distribution of emergency resources, leading to improved response effectiveness and outcomes

H₁: Efficient distribution management processes of EPHI positively affect its emergency response capacity.

H₀: Efficient distribution management practices of EPHI have no effect on its emergency response capacity.

2.2.7 The effect of fleet management practices on emergency response.

Organizations that prioritize fleet maintenance and strategic deployment of resources were better equipped to overcome logistical challenges, ensuring timely and efficient response to emergencies and the role of fleet management in enhancing emergency response capabilities in healthcare settings (Berhanu; 2020; Tesfaye & Alemu, 2021). The research findings indicated that organizations with well-maintained fleets and efficient deployment strategies were able to improve response times, reach remote areas promptly, and deliver critical services and supplies effectively during emergencies.

In a related context, a study conducted by Tadesse and Lemma (2019) focused on the importance of fleet optimization in disaster response operations. The research emphasized that effective fleet management practices play a crucial role in enhancing the agility and responsiveness of organizations during emergencies, ultimately improving overall emergency response effectiveness.

H₁: A well-maintained and strategically deployed fleet resources of EPHI positively affect its emergency response capacity.

H₀: A well-maintained and strategically deployed fleet resources of EPHI has no effect on its emergency response capacity.

2.2.8 The effect of reverse logistics management practices on emergency response.

A study by Mengistu and Tadesse (2021) indicated that organizations with efficient reverse logistics processes for resource recovery and disposal were able to minimize waste, reduce environmental impact, and ensure the sustainable management of properties during

emergencies, ultimately improving the overall effectiveness of emergency response operations.

In a related context, a study conducted by Alemu and Lemma (2019) focused on the importance of sustainable practices in reverse logistics for disaster response operations. The research emphasized that effective resource recovery and disposal strategies contribute to sustainable emergency response efforts, ensuring the efficient use of resources and minimizing negative environmental impacts.

H₁: A Well-organized reverse logistics practices of EPHI positively affect its emergency response capacity.

H₀: A Well-organized reverse logistics practices of EPHI has no effect on its emergency response capacity.

2.3 Theoretical Framework of the study

2.3.1 Transaction cost economics:

Transaction cost economics (TCE) emphasizes the importance of minimizing transaction costs associated with coordinating economic activities within organizations (Williamson, 1981). In the context of emergency response, TCE can be applied to understand how different practices influence the efficiency and effectiveness of resource allocation and coordination efforts

2.3.1 Stakeholder Theory

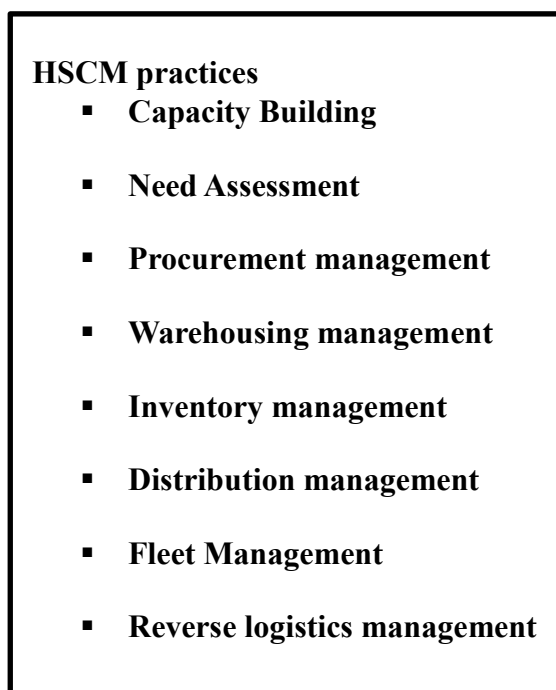
Stakeholder theory emphasizes the importance of considering the interests and relationships of various stakeholders in organizational decision-making and performance (Freeman, 1984). Stakeholder theory can provide insights into how different stakeholders influence and are influenced by organizational practices, impacting emergency response capabilities.

In general, The Transaction Cost Economics (TCE) theory, proposed by Williamson (1985), and the Stakeholder Theory, introduced by Freeman (1984), provide valuable insights into the operations of organizations like the Ethiopian Public Health Institute (EPHI). TCE emphasizes the importance of organizational capacity, information gathering, strategic procurement, and efficient inventory management in reducing transaction costs and improving operational efficiency (Williamson, 1985). On the other hand, the Stakeholder

Theory underscores the significance of needs assessment, stakeholder engagement in procurement processes, and effective inventory management in meeting stakeholder expectations and enhancing service delivery (Freeman, 1984). By integrating these theories, EPHI can align its emergency response efforts with stakeholder requirements, optimize resource allocation, build trust with stakeholders, and ensure timely availability of emergency supplies, thereby enhancing its operational efficiency and effectiveness in emergency response effort

2.4 Conceptual Framework of the study

Independent Variables



Dependent Variables

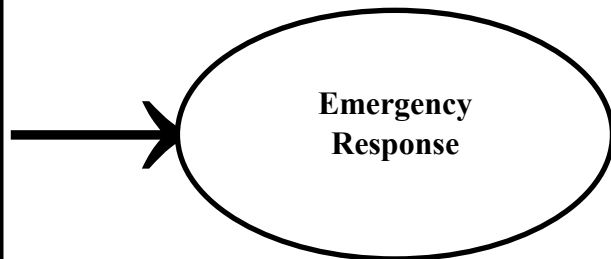


Figure 1 Conceptual framework of the study.

2.5. Summary of Hypothesis

H_{1a}: Effective capacity building practices positively influences the EPHI'S emergency response.

H_{0a}: Effective capacity building practices has no effect on EPHI'S emergency response.

H_{1b}: Implementing rigorous need assessment processes at EPHI improves the timeliness of emergency response.

H₀ b: Implementing rigorous need assessment processes at EPHI has no effect on the timeliness of emergency response.

H₁c: An Efficient procurement management practices positively affect emergency response capacity of EPHI.

H₀ c: An efficient procurement management practice has no effect on emergency response capacity of EPHI.

H₁d: An effective warehousing management practices play a positive role in enhancing EPHI's emergency response.

H₀d: An effective warehousing management practices has no any role in enhancing EPHI's emergency response.

H₁e: Modernized inventory management practices optimize resource utilization, minimize shortages, and reduce delays in emergency situations.

H₀e: A modernized inventory management practices has no effect on optimizing resource utilization, minimizing shortages, and reducing delays in emergency situations.

H₁f Efficient distribution management processes of EPHI positively affect its emergency response capacity.

H₀f: Efficient distribution management practices of EPHI have no effect on its emergency response capacity.

H₁g: A well-maintained and strategically deployed fleet resources of EPHI positively affect its emergency response capacity.

H₀ g: A well-maintained and strategically deployed fleet resources of EPHI has no effect on its emergency response capacity.

H₁h: A Well-organized reverse logistics practices, positively affect its emergency response capacity.

H₀h: A Well-organized reverse logistics practices of EPHI has no effect on its emergency response capacity

2.6 Identified literature gaps:

I read many researches studies that have done in the context HSCM practices. However, most researches had done in non-governmental organizations HSCM Practices and their effect on organizational performance not in governmental organizations HSCM; in addition to that, none of them had done at Ethiopian Public Health Institute from the perspective of capacity building, need assessment, procurement management, warehousing management, inventory management, distribution management, fleet management and reverse logistics management practices of HSCM that affect emergency response.

Previous research fails to provide a comprehensive understanding of how Ethiopian governmental organizations can optimize their HSCM practices to enhance their ability to respond to emergencies efficiently and effectively. Thus, there is a significant empirical gap that necessitates further investigation to fill the void in knowledge and inform evidence-based policymaking and practice in the realm of EPHI - HSCM and emergency response.

CHAPTER THREE

3. METHODOLOGY of THE STUDY

This chapter deals with the methodology used by the study: that is the research approach, research design, target population and sampling design, source and type, data Collection methodology, data collection instrument, data analysis, validity and reliability and ethical considerations to achieve the main objective for the research.

3.1 Description of the research area

The study was conducted on Ethiopian Public Health Institute. The mission of this Institute is to improve the health of the general public of Ethiopia through undertaking research on priority health and nutrition issues for evidence based information utilization and technology transfer; effective public health emergency management; establishing quality laboratory system; and training public health practitioners and researchers for best public health interventions. The HSCM practices were evaluated & their cumulative effect was studied with respect to emergency response. In relation to this, the study area is located in Addis Ababa head office key areas of work in EPHI included in the study are public health emergency management, procurement office and general service fleet management.

3.2. Research approach

According to Creswell (2014), there are three types of the research approach. These are qualitative, quantitative, and mixed research. In this study the researcher employing quantitative research approaches. This is due to the research mainly concentrated on the data collected using a close- ended questionnaire and answers from respondents were composed using a five point Likert scale to fulfilled the mentioned objectives and to give condensed pictures of the study then analyzed by using statistical software SPSS.

3.3 Research design

The researcher used a descriptive research designs to assess and analyze the humanitarian supply chain management practices & their effect on emergency response using frequencies, mean and standard deviation. The descriptive method is selected since it describes the study systematically, factually, and accurately (Suryabrata, 2003). The design provides an in- depth and comprehensive inquiry required to be conducted to have a description of the subject under study. After the information was composed with the help of the designed questionnaire

the outcome is organized by descriptive statistical techniques like percentage and frequency distribution will use in the form of table and graphs. Inferential statistical techniques like multiple linear regression was used under explanatory design to describe the effect of independent variables to dependent variable.

3.4 Target Population and Sampling Design

Due to the small size of the target population of the study, a sampling technique was not applied for this study. A Census study was used to develop the population of the research under discussion. The logic behind using census was that the researcher uses purposive sampling and thinks the sizes of the population of a given organization convenient. According to year 2024 EPHI- HR record the organization has a total of 1430 numbers of staffs. From this staff, the study included EPHI's entire member of PHEM officers, Procurement staffs and fleet management staffs who are currently works in emergency response related functions of the organization.

Purposive sampling technique were used for the choices of employees of EPHI, where a total of 143 PHEM officers (36 officers from early warning and surveillance, 29 officers from public health emergency preparedness, 59 officers from Public health emergency response, Recovery and Rehabilitation, 19 officers from PHEM boarder health), 9 officers from Procurement unit and 2 managers from Fleet management were drawn as a sample population using Census method. The sample populations were 154 with the exclusion of 1276 researchers', laboratory practitioners, administrative staffs, drivers, cleaners, messengers and security guards.

3.5. Data Source and Type

Primary and secondary data sources were employed in this investigation. Primary data will be collected using questionnaires to obtain the opinions of the respondents. To achieve the purpose of this research, the researcher developed a questionnaire that covers the research questions of the study. It includes a closed-ended questionnaire with the help of expert views and suggestions. While Secondary data collected from published and unpublished materials through reviewing reports, journals, and relevant documents gathered from the EPHI head office.

3.6 Data Collection Methodology

For the data collection process, structured questioner used. The questionnaire contains close-ended questions in the form of a 5 point Likert scale. With the help of expert views and suggestions, a self- administered questioner was prepared. Then the final questioner distributed after suggested and amendment. A hard copy of questionnaires distributed to selected EPHI head office staffs

3.7 Data Collection Instrument

The ultimate objective of the questionnaire is mainly to get actual data by providing a close ended question which can be easily answered through 5 point Likert scaling method. These scale assistance respondents to indicate their views on a scale of 1 up to 5. Accordingly, indicators representing variables in research framework were captured using a 5-point Likert scales, ranging from strongly disagree to strongly agree. The questionnaire was structured in three majorly divided sections of questions that aim at gathering evidence on the HSCM practice and their effect in emergency response. The first section dealt with general information or profile of respondents, the second section (2) was about HSCM practices of EPHI, the third section (3) emphasized on questions about HSCM practices of EPHI for the case of emergency.

3.8 Data collection procedure

In order to get permission for the commencement of the data collection, the data collection process primarily started with briefing the overall research intention and data collection procedure to the human resource management of EPHI head office.

The source of data for this study is a questionnaire and the respondents will be assured that the information provided to them is confidential and the researcher will use it exclusively for academic purpose. In addition, respondents will be informed to omit anything that mentioned personal identity detail and reference in the given questionnaire. That helps me to decline the biasedness of the response collected from the given respondents. Aside from that, various forms of study of research, articles, and books are cited extensively as reference throughout the study.

3.9 Data Analysis Methods

In Research, data analysis is a tool that is very useful in decision making. Interpretation of the analysis will bring about the meaning of the data into useful information which gives us useful information to answer the research objective and overall research problem.

Version 25 of SPSS was used to code, enter, clean, and analyze the data obtained from the questionnaire.. The responses were measured, compared, and defined using descriptive statistics and inferential statistics such as mean, frequency, percentage, graphs and multiple linear regression was utilized to evaluate the data and establish whether or not there was a meaningful effect of HSCM practice on emergency response.

Averages (mean) were computed for every Likert scale construct in the descriptive data analysis, ranging from Strongly Disagree = 1 to Strongly Agree = 5. Thus, the weight was represented by the numbers entered into SPSS version 25, and in order to comprehend the mean values, the weighted averages for the scales were computed. The weighted mean values are interpreted by calculating the degree of agreement for each humanitarian supply chain management practice and its effect on emergency response was determined using a weighted mean between 1.00 and 1.79, which was interpreted as never practiced, 1.80 and 2.59 as poorly practiced, 2.60 and 3.39 as moderately practiced, 3.40 and 4.19 as well-practiced, and 4.20 and 5.00 as extensively practiced. (Alfarra, W.A.'s 2009).

3.10 Validity and Reliability

Validity deals with truthfulness of conclusions that are generated by a study (Silverman, 1999). The subjective judgment on data collection and its analysis is the main concern. Construct validity establishing correct operational measures for the concepts being studied (John & Soto, 2007).

A research's reliability is majorly concerned with the question of whether the results of the study are repeatable. In other term, reliability evaluates the degree in which same findings can be obtained if the specific research is to be developed once again (Silverman, 1997).

In this study, a pretesting of questionnaires was executed Based on literature review findings, a combination of work of Wolde (2019) & Yaregal (2019) was adopted with thoughtful amendment and re-arrangement of the questions to fit the specific purpose to determine the validity of the questionnaire.

The questionnaire was therefore tested on 16 respondents. Out of the 154 questionnaires 16 questionnaires were given for pretesting purposes to 13 PHEM officers and 3 procurement staffs from the target population. After pretesting work, the questionnaires were reviewed and constructive feedbacks were included.

The Most common technique used to assess the reliability is Cronbach’s Alpha reliability coefficient. According to George and Mallery (2003), Cronbachs Alpha reliability coefficient normally ranges between 0 and 1. The closer the coefficient gets to 1, the greater the internal consistency of the items in the scale. Consequently, the acceptable values of alpha, greater than or equals to 0.70 Cronbach’s alpha are acceptable values as stated by Cronbach (1951). As illustrated in table 3.1, the Cronbach’s alpha coefficients of all dependent and independent variables are greater than 0.70 confirming the fact that the instrument for this research is reliable.

Table 3.1 Reliability Statistics

Variables	N	Cronbach’s Alpha results
Capacity building practices	14	.895
Need assessment practices	7	.894
Procurement management practices	15	.948
Warehouse management practices	11	.955
Inventory management practices	7	.862
Distribution management practices	9	.874
Fleet management practices	10	.911
Reverse logistics management practices	10	.946
Emergency response	11	.895

Source: SPSS output, 2024

3.10 Ethical consideration

Ethical clearance was obtained from Addis Ababa university school of commerce department of logistics and supply chain management. Before starting data collection, permission was obtained from the concerned bodies of Ethiopian public health institute. During quantitative data collection the participants got detailed information about the study and clarification were given as required in their own language by data collectors. Each study participant were informed that they can refuse or discontinue participation at any time and they were informed the fact that information were recorded without their name being mentioned. Only codes were used to keep it anonymous and maintain confidentiality to respondent.

CHAPTER FOUR

4. RESULTS, DISCUSSION AND ITERPRETATION

This chapter deals with results, discussion and interpretation. It consists of two main parts; the first one is about the background information of the respondents. The second one consists of the collected data from employees of EPHI. In this regard therefore 154 questionnaires were prepared and distributed to the participants of the study. Out of those questionnaires, 143 were responded properly. While the other 1 questionnaire was incomplete, 4 questionnaires were not returned and there rest 6 questioners was not filled b/c the researcher wouldn't gate study participant.

Result

4.1. The response rate of Participants

Items	Number of questioner	Percent
Complete	143	93%
Not returned	4	2%
Incomplete	1	1%
Not filled	6	4%
	154	100%

Table 4.1 Questionnaire Response rate

As indicated in the above table, 154 questionnaires were distributed accordingly and from these 143 respondents were filled and returned the questionnaires. In this regard, the researcher excluded those 1 incomplete and 6 not filled questionnaires from the data entry and analysis. In addition to this, the rest 4 questionnaires which were distributed to PHEM officer were not returned; this also was excluded from data entry and analysis. Therefore, the response rate of this study is 93 %.

4.2. Socio Demographic Characteristics of Respondents

Table 4.2 Respondent's profile

Category		Frequency	Percent
Gender	Male	103	72
	Female	40	28
Age	19-30 years	26	18.2
	31-45 years	107	74.8
	>45 years	10	7.0
Educational Back ground	Diploma	6	4.2
	First Degree	55	38.5
	Masters	82	57.3
Position	Director	6	4.2
	Coordinator	17	11.9
	Officer	107	74.8
	Other	22	9.1
Years of Experience in Health Sector	Less than 5 years	40	28.0
	6-10years	41	28.7
	above 10 years	62	43.4
Years of Experience in EPHI	Less than 5 years	77	53.8
	6-10years	54	37.8
	above 10 years	12	8.4

Source: own survey, 2024

Gender

As shown in gender respondents, 72% of the respondents are male, 28% of the respondents are female. From this therefore the number of male respondents is higher than that of female respondents.

Age

From the table showing 18.2% of respondents were between the age of “19-30”years, 74.8% of respondents were between the age of “31-45”years and 7% of respondents were >45years

Educational Back ground

From the table showing the educational Back ground of the respondents 4.2% of the respondents are diploma holders, 38.5% are degree holders and 57.3% of the respondents hold master’s degree. Therefore, this shows that higher number respondents are educated and certified from higher institutions.

Position

As shown in table 4.2, the highest number of respondents are officers 74.8%, coordinator 11.9%, Directors 4.2% and the rest comprise of other 9.1%. From this therefore, it could be said that most of the respondents are in officer level positions.

Years of Experience in Health Sector

As can be seen from the table 4.2 the highest number of respondents have a service year in the health sector of above 10 years 43.4% followed by 28.7% respondents having 6-10 years of experience in health sector and 28% also has work experience of <5years of respondent in health sector. Within the categories of above 10 years of experience which highlights that most are well experienced in their work.

Years of Experience in EPHI

As can be seen from the table 4.2 the highest number of respondents have a service year in EPHI were less than 5years is 53.8% followed by 37.8% 6-10 years’ experience in EPHI, and 8.4% of respondents has above 10years experience in EPHI. Within the categories of 1 up to 10 years of experience which highlights that most are well experienced in their work.

4.3 Humanitarian Supply Chain Management Practices

Primary data was collected from respondents about the humanitarian Supply Chain Management practices in their organizations under capacity building, needs assessment, procurement management, warehousing management, inventory management, distribution management, fleet management, reverse logistics management and their effect on emergency response processes. Respondents gave responses by using the five point Likert scale. The findings will be discussed below.

4.4 Humanitarian Supply Chain Management Practices of EPHI

In this section the respondents give their level of agreement by numbers ranging from 1 to 5; here those numbers indicate 1 is "strongly disagree (SD)", 2 indicates "disagree (DA)", 3 indicates "Neutral (N)", 4 indicates "agree (A)" and 5 indicates "strongly agree (SA)". Therefore, the mean scores between 1.00-1.79 is interpreted as never practiced, the mean scores of 1.80-2.59 is interpreted as poorly practiced, the mean scores between 2.60-3.39 interpreted as moderately practiced, the mean scores between 3.40-4.19 as highly-practiced, and the mean scores between 4.20-5.00 as very-highly practiced. Thus, the following section provides the result of respondent.

4.4.1 Descriptive statistics of Capacity Building Practice

Sr. No	I-Variables: HSCM Practices	Descriptive statistics	
		Mean	Std. Deviation
1.	Capacity Building Practice		
1.1	The training programs provided by EPHI are relevant to emergency response needs.	4.01	1.23
1.2	EPHI provides sufficient resources (financial, human, and material) for capacity building activities.	3.43	1.17
1.3	The frequency of capacity building initiatives at EPHI is adequate.	3.34	1.18
1.4	EPHI effectively evaluates the outcomes of its capacity building programs.	2.74	1.22
1.5	EPHI fosters a culture of continuous learning and improvement among its staff.	3.31	.95
1.6	The training materials and methods used by EPHI are engaging and effective.	3.53	.99

1.7	EPHI encourages staff participation and engagement in capacity building activities.	3.58	.98
1.8	The leadership at EPHI-PHEM prioritizes capacity building as a key component of emergency preparedness.	3.57	1.10
1.9	EPHI gives regular trainings to PHEM staffs to enhance individual capacity and responsiveness.	3.37	1.06
1.10	EPHI build staffs capacity base on their needs for emergency response	3.47	.98
1.11	EPHI formulates needs assessment forms/systems to assess demands of PHE relief supplies.	3.42	.98
1.12	The skills and knowledge gained through capacity building activities contribute to effective emergency response.	3.57	.95
1.13	The institute evaluates progress and takes feedback after capacity building.	2.93	1.10
1.14	I believe that the capacity building practices at EPHI positively impact its emergency response capabilities.	3.60	1.15
	Grand mean of capacity building practices	3.42	

Table: 4.4.1 capacity building practices

The above table 4.4.1 shows the HSCM practices of EPHI in terms of its capacity building practices accounts grand mean score of 3.42 implies that EPHI has been highly practiced to build the capacities of its personnel, which is essential for the institution to effectively carry out its public health emergency response. This can include various initiatives such as training programs, professional development opportunities, knowledge-sharing sessions, and the implementation of effective human resource management practices (Kapucu , Augustin, and Krause 2019).

Yamoah and Maiyo (2013) conducted a study related to my research finding is that to ascertain the effect of capacity building on employee performance, with a specific focus on MTN Communication Limited. The researchers found that when training is provided effectively, it has a significant positive impact on employee performance. However, they also established that training alone does not always address issues related to job performance (Yamoah & Maiyo, 2013).

4.4.2. Descriptive statistics of Needs Assessment Practices

Sr. No	I-Variables: HSCM Practices	Descriptive statistics	
1.	Needs Assessment Practice	Mean	Std. Deviation
2.1	EPHI conducts regular need assessments to identify potential emergency scenarios affecting beneficiaries.	3.31	1.06
2.2	The need assessment methodologies related to aid supplies employed by EPHI are comprehensive and systematic	3.11	1.03
2.3	The findings of need assessments conducted by EPHI are effectively communicated to decision-makers.	3.25	.97
2.4	EPHI allocates resources based on the findings of need assessments.	3.21	1.04
2.5	The institute formulates needs assessment forms/systems to asses' demands of Beneficiaries aid supplies.	3.09	1.02
2.6	The institute asses needs of relief supplies by quarterly.	2.84	.85
2.7	The need assessments conducted by EPHI in prioritizing emergency response efforts to address beneficiaries' needs.	3.32	.81
	Grand mean of needs assessment practices	3.16	

Table: 4.4.2 needs assessment practices

Assessing needs is an important element to deliver the demand on time (Watkins, West Meiers & Visser, 2012). Based on the table 4.4.2 the HSCM practices of EPHI in terms of its need assessment practices accounts grand mean score of 3.16. Accordingly it was found that need assessment is moderately practiced at EPHI.

4.4.3 Descriptive statistics of Procurement Management Practices

Sr. No	I-Variables: HSCM Practices	Descriptive statistics	
		Mean	Std. Deviation
1.	procurement management practices		
3.1	The procurement process of emergency-related supplies and services is swift and efficient.	2.73	1.05
3.2	Emergency resources (such as medical supplies, equipment, etc.) are readily available (pre-positioned) during crisis situations due to our procurement practices.	2.98	1.18
3.3	EPHI procurement procedures allow for quick adjustments and adaptations (Agility) during emergency scenarios.	2.83	1.17
3.4	The quality of items procured through our procurement process meets the standards required for handling emergency response.	3.14	.99
3.5	EPHI procurement practices ensure to acquire necessary emergency-related resources at reasonable costs, facilitating effective emergency response without overspending.	2.91	1.45
3.6	EPHI procurement team maintains effective communication and coordination with suppliers, ensuring timely delivery of essential resources during emergencies.	3.09	1.01
3.7	The procurement process in EPHI positively contributes to reduce the time taken for emergency response activities.	3.17	1.13
3.8	Resources procured through EPHI procurement process are sustainable and can be relied upon for the duration of emergency situations.	3.10	1.09618
3.9	The EPHI's procurement system results in speedy acquisition of items for public health emergency management operations.	3.06	1.10
3.10	Third party procurement firms (EPSS) are outsourced with the EPHI to speed up procures items based on the request in the time of Emergency response.	3.38	1.08
3.11	The EPHI Procurement department maintains good supplier relations	3.28	.85
3.12	Emergency items procured or supplied are based on requests made by PHEM Staffs of the institute.	3.49	1.05
3.13	Procurement of emergency items match with item type &	3.19	1.07

	volume demanded by the program.		
3.14	Procurement group in the institute makes on time delivery of demanded items with no delay.	3.08	.96
3.15	The procurement team in the institute consists of sufficient personnel with required skills.	3.15	1.08
	Grand mean of procurement management practices	3.11	

Table: 4.4.3 procurement management practices

Based on the table 4.4.3 the HSCM practices of EPHI in terms of its procurement management practices accounts grand mean score of 3.11 accordingly, it was found that procurement management is moderately practiced at EPHI. The moderate levels of procurement practice implementation found in this study are consistent with the findings of Mwikali and Kavale (2012), who reported similar levels of procurement practice maturity in Kenyan university of agriculture.

4.4.4 Descriptive statistics of Warehouse Management Practice

Sr. No	I-Variables: HSCM Practices	Descriptive statistics	
		Mean	Std. Deviation
1.	Warehouse management practice		
4.1	Emergency supplies related are easily accessible from our organization's warehouses during crisis situations.	3.24	1.03
4.2	Our warehousing management practices ensure efficient tracking and management of emergency-related inventory, facilitating timely access during emergencies.	3.40	.99
4.3	Our warehouses are equipped to quickly deploy necessary emergency resources to relevant emergency response teams when needed.	3.19	.10
4.4	Our warehousing practices optimize space to accommodate sufficient emergency supplies for handling emergency-related situations	2.85	1.20
4.5	Safety and security measures in our warehouses ensure the protection of emergency-related supplies from theft, damage, or unauthorized access, even during emergencies.	3.28	1.13
4.6	Our warehousing management practices allow for swift adaptation to changing demands during emergency situations, ensuring continuous availability of EPHI resources.	3.23	1.10

4.7	Warehousing operations are well-integrated with logistics planning, enabling seamless transportation and distribution of emergency-related supplies during emergencies.	3.20	.10
4.8	Our warehousing management practices comply with relevant regulatory standards for handling and storing emergency-related materials, even under emergency conditions.	3.28	1.03
4.9	The integrity of emergency-related resources is effectively maintained within EPHI, s warehouses, ensuring their usability and reliability during emergencies.	3.41	.97
4.10	EPHI agency has sufficient and suitable warehouses for Emergency supplies.	3.10	1.21
4.11	Emergency relief supplies (donated & procured) are Properly managed in the EPHI, s warehouse.	3.18	1.12
	Grand mean of warehouse management practices	3.21	

Table: 4.4.4 warehouse management practice

According to Lemma and Alemu, (2021) the efficient warehousing management practices can enhance an organization’s ability to store and manage essential supplies, thereby improving its readiness and response capabilities during emergencies. Based on the table 4.4.4 the HSCM practices of EPHI in terms of its warehouse management practices accounts grand mean score of 3.21 accordingly, it was found that warehouse management is moderately practiced at EPHI.

4.4.5 Descriptive Statistics of Inventory Management practices

Sr. No	I-Variables: HSCM Practices	Descriptive statistics	
		Mean	Std. Deviation
5.	Inventory Management practice		
5.1	The availability of essential medical supplies and equipment is adequately maintained during emergency situations.	3.08	1.03
5.2	Inventory tracking systems at EPHI effectively monitor stock levels of critical supplies.	3.13	.97
5.3	The organization's ability to respond to emergencies is enhanced by efficient inventory management practices.	3.29	.91
5.4	Staff training on inventory management procedures contributes significantly to improving emergency response effectiveness.	3.34	.93

5.5	The organization has sufficient backup stockpiles to handle unexpected surges in demand during emergencies.	2.77	1.13
5.6	There is a clear protocol in place for prioritizing the allocation of limited resources during emergencies.	3.02	1.06
5.7	Collaborations with external partners and suppliers play a crucial role in maintaining adequate inventory levels for emergency response.	3.29	1.08
	Grand mean of Inventory Management practices	3.13	

Table 4.4.5 inventory management practices

Based on the table 4.4.5 the HSCM practices of EPHI in terms of its inventory management practices accounts grand mean score of 3.13 accordingly, it was found that inventory management is moderately practiced at EPHI. The positive relationship between inventory management practices and emergency response differs from the findings of Gichure and Kagiri (2015), who reported no significant relationship in the Kenya.

4.4.6 Descriptive Statistics of Distribution management practice

Sr.no	I-Variables: HSCM Practices	Descriptive statistics	
		Mean	Std. Deviation
6.	Distribution management practice		
6.1	The efficiency of EPHI distribution management system significantly influences emergency response capability.	3.61	1.05
6.2	Adequate resources are allocated to distribution management, enhancing our preparedness for emergencies.	3.26	.98
6.3	The coordination between distribution management teams and emergency response teams is effective during crisis situations.	3.36	.92
6.4	Timely and accurate information exchange within the distribution management network positively impact emergency response time.	3.54	.83
6.5	Continuous evaluation and improvement of distribution management processes contribute to our overall emergency preparedness.	3.52	.963
6.6	Distribution teams with in PHEM are properly structured to enable on the spot situational decisions	3.31	1.01

6.7	Third party Distribution firms (EPSS) are outsourced with the institute to distribute items based on the request in the time of Emergency.	3.51	.86
6.8	The third party logistics providers (EPSS) outsourced by the institute are convenient for distribution and reduce operational cost.	3.39	.76
6.9	PHEM focal persons at woreda level are well acquainted of the Institute's distribution system and procedures	3.15	.98
	Grand mean of distribution management practices	3.40	

Table 4.4.6: distribution management practices

Based on the table 4.4.6 the HSCM practices of EPHI in terms of its distribution management practices accounts grand mean score of 3.40 accordingly, it was found that distribution management is highly practiced at EPHI. a study in Tanzania revealed that distribution challenges, including limited storage capacity, inadequate transportation, and weak communication systems, contributed to delays in the delivery of essential medicines during public health emergencies (Mori, Robberstad, Barker, Matovu, Bygbjerg, & Norheim, 2013).

4.4.7 Descriptive Statistics of Fleet Management practice

Sr. No	I-Variables: HSCM Practices	Descriptive statistics	
		Mean	Std. Deviation
7.	Fleet Management practice		
7.1	The condition and maintenance of EPHI, s fleet is good to respond to emergencies promptly.	3.10	.98
7.2	Adequate resources are allocated to fleet maintenance and upkeep, enhancing our preparedness for emergency situations.	3.21	.85
7.3	The coordination between fleet management teams and emergency response teams is effective during crisis situations.	3.19	.84
7.4	The institute uses all kinds of transportation for transportation of items & personnel.	3.40	.91
7.5	Third party transportation firms are outsourced with the Institute in moving of items & people to the requested areas in the time of emergency.	3.34	.96
7.6	Emergency aid supplies are effectively and efficiently Supplied to places where they are requested.	3.36	.91
7.7	The availability of well-trained drivers is in place for emergency response operation.	3.32	1.00

7.8	Continuous evaluation and improvement of fleet management processes contribute to our overall emergency preparedness.	3.50	1.02
7.9	The institute engages to support transportation Firms that deliver the transportation in its emergency actions.	3.34	.93
7.10	There is a pre-selected list of transportation firms to be outsourced during the time of emergency.	3.13	.89
	Grand Mean of Fleet Management Practices	3.29	

Table: 4.4.7 fleet management practices

A study conducted by Tadesse and Lemma (2019) focused on the importance of fleet optimization in disaster response operations. The research emphasized that effective fleet management practices play a crucial role in enhancing the agility and responsiveness of organizations during emergencies, ultimately improving overall emergency response effectiveness. Based on the table 4.4.7 the HSCM practices of EPHI in terms of its fleet management practices accounts grand mean score of 3.29 accordingly, it was found that fleet management is moderately practiced at EPHI.

4.4.8 Descriptive Statistics of Reverse Logistics Management practice

Sr. No	I-Variables: HSCM Practices	Descriptive statistics	
		Mean	Std. Deviation
8.	Reverse Logistics Management practice		
8.1	The institute have its own system for back ward flow of relief supplies after response	3.00	1.19
8.2	Third party logistics firms (EPSS) are outsourced with the institute to use reverse logistics after response.	2.99	1.03
8.3	The third party logistics providers (EPSS) outsourced by the institute are to deliver previously reversed relief supplies when there is any outbreak happen in another area.	2.91	.91
8.4	PHEM focal persons at woreda level are well acquainted of the Institute reverse logistics system and procedures.	2.78	1.01
8.5	The third-party logistics providers (EPSS) outsourced by the institute recognizes the urgency of the emergency condition.	2.88	.97
8.6	EPHI is using reverse logistics management with the ability to respond to emergencies promptly.	2.90	.92

8.7	Adequate resources are allocated to reverse logistics processes, enhancing our preparedness for emergency situations.	2.84	1.02
8.8	The coordination between reverse logistics management teams and emergency response teams is effective during crisis situations.	3.05	1.08
8.9	Timely and accurate retrieval of critical assets through reverse logistics is in place during emergency response.	3.05	1.02
8.10	The efficiency of our reverse logistics management significantly influences our ability to respond to emergencies promptly.	3.25	1.01
	Grand Mean of Reverse Logistics Management practice	2.96	

Table 4.4.8: reverse logistics management practice

Mengistu and Tadesse (2021) found that organizations with efficient reverse logistics processes for resource recovery and disposal were able to minimize waste, reduce environmental impact, and ensure the sustainable management of properties during emergencies. Their research findings indicated that these practices ultimately improved the overall effectiveness of emergency response operations. Based on the table 4.4.8 the HSCM practices of EPHI in terms of its reverse logistics management practices accounts grand mean score of 2.96 accordingly, it was found that reverse logistic management is moderately practiced at EPHI.

4.5 Summary of Humanitarian Supply Chain Management Practices

The eight acknowledged practices are as follows: capacity building (3.42), need assessment (3.16), procurement management (3.11), warehouse management (3.21), inventory management (3.13), distribution management (3.40), fleet management (3.29), and reverse logistics management (2.96), each with their respective grand mean values. The overall grand mean value for HSCM practices, as shown in the table 4.5.1 below, is 3.21. This value suggested HSCM practices moderately practiced in EPHI under study

Table 4.5.1 summary of HSCM practices' mean of mean value

Variables of HSCM Practices	N	Grand Mean
Capacity building	143	3.42
Needs assessment	143	3.16
Procurement management	143	3.11
Warehouse management	143	3.21
Inventory management	143	3.13
Distribution management	143	3.40
Fleet management	143	3.29
Reverse logistics management	143	2.96
Mean of mean for HSCMP		3.21

Source: own survey, 2024

4.6 Emergency Response Activities

Here the expected activities done in case of emergency response in humanitarian setting..

Sr.no	II-Variable: Emergency Response Activities in HSCM	Descriptive statistics	
		Mean	Std. Deviation
1.	Emergency Response Activities		
1.1	EPHI prepares an effective response plan before and during emergencies	3.78	.93
1.2	EPHI activates emergency operations plan during emergency	3.89	1.03
1.3	EPHI activates emergency operations center immediately when emergency happens.	3.77	1.10
1.4	EPHI Performs search and rescue operation during	3.30	1.24

	Emergency response		
1.5	EPHI identifies and Evacuates disaster prone communities (victims)	3.17	1.19
1.6	EPHI Provides emergency rescue and medical care for victims	3.44	1.12
1.7	EPHI makes Opening shelters accessible and provide necessary services to evacuees in a timely manner.	3.14	1.17
1.8	EPHI is effectively working on firefighting service during emergency response.	3.45	1.08
1.9	Infrastructure, such as transportation systems, power plants, communication networks, and water treatment facilities, are promptly safeguard and restored by EPHI during and after any emergencies.	3.12	1.07
1.10	EPHI's response teams effectively address fatality management during emergencies	3.47	1.02
1.11	Lessons learned from past emergencies are documented and incorporated into future emergency response plans.	3.56	1.10
	Grand Mean of emergency response	3.46	

Table: 4.6 Emergency Response Activities

According to Nikbakhs and Farahani, 2011, Major activities during emergency Response includes Activating emergency operations plan, Activating emergency operations centers, Evacuating disaster areas, Opening shelters and providing mass care, Providing emergency rescue and medical care, Firefighting, Performing search and rescue, Providing emergency infrastructure protection and recovering lifeline Services, Establishing fatality management and Ensuring the security of affected areas by deploying police or military forces. These aspects need to be taken in to concern while carrying out emergency activities in humanitarian setting.

The above table 4.5 shows the emergency response activities of EPHI in terms of its HSCM practices accounts grand mean score of 3.46 accordingly, it was found that emergency response activities is highly practiced at EPHI.

4.7. The effect of Humanitarian supply chain practices on emergency response

Based on the analyzed information the effect of capacity building, need assessment, procurement management, warehouse management, inventory management, distribution

management, fleet management and reverse logistics management practices were the grand mean of mean score is 3.21 indicates that HSCM practice is moderately practiced in EPHI.

4.8 Assumptions of Multiple linear Regressions

Multiple linear regressions rely on several key assumptions, including linearity, normality of residuals, independence, homoscedasticity, and lack of multicollinearity (Wooldridge, 2020). If these underlying assumptions are violated, the validity and reliability of the regression results may be compromised.

4.8.1 Normality of Distribution

This graphical approach complements the assessment of normality through examining the symmetry and bell-shaped pattern of a histogram. Together, these techniques provide a comprehensive evaluation of the underlying distribution of the data before proceeding with further statistical analyses that often rely on the normality assumption (Razali & Wah, 2011). This assumption is made so as to check if the data are normally distributed or not. Annexed in appendix II as figure 4.8.1

4.8.2 Linearity Test

If the data is normally distributed, the points in the normal plot should fall closely along a straight diagonal line. This alignment of the data points along the diagonal line would also suggest that the effect of dependent variables on independent variables can be represented by a straight line, indicating linearity between the variables (Hancock & Mueller, 2010). Annexed in appendix II as figure 4.8.2

4.8.3. Homoscedasticity

As discussed by Tabachnick and Fidell (2013), the scatterplot of residuals is a widely used graphical method to assess the assumption of homoscedasticity in regression analysis. Homoscedasticity refers to the condition where the residuals, or the differences between the predicted and observed values, have a constant variance across different levels of the independent variables. The researcher's observation of the random, horizontal scatterplot pattern confirms that the data used in this study satisfies the homoscedasticity assumption, providing support for the validity of the regression analysis. Annexed in appendix II as figure 4.8.3

4.8.4 Multi-collinearity test

The existence of multicollinearity in regression analysis can cause a problem, as it signifies the incorporation of redundant information. This can lead to unstable estimates of the regression coefficients (Gujarati & Porter, 2009). The absence of multicollinearity can be verified through two main approaches:

Examining the correlation coefficients of the predictor variables if any of the correlation coefficients have magnitudes of 0.80 or above, it suggests the presence of multicollinearity. This is because tolerance values should typically fall within the range of 0.1 to 1 to indicate the absence of multicollinearity (Hair, Black, Babin, & Anderson, 2019).

Analyzing the Variance Inflation Factor (VIF) if the VIF value for a variable is within the range of 1 to 10, it indicates the absence of multicollinearity. VIF values greater than 10 would suggest the presence of multicollinearity (Kutner, Nachtsheim, Neter, & Li, 2004).

Table 4.8.4 Multi-collinearity test

Independent variables	P-value	Collinearity statistics	
		Tolerance	VIF
Capacity building practices	.046	.265	3.771
Need assessment practices	.280	.329	3.043
Procurement management practices	.744	.308	3.243
Warehouse management practices	.358	.291	3.437
Inventory management practices	.003	.279	3.588
Distribution management practices	.000	.342	2.927
Fleet management practices	.068	.331	3.026
Reverse logistics management practices	.772	.479	2.090

Source: own survey, 2024

Based on the table 4.8.4 the tolerance values for the eight independent variables are all greater than 0.1, indicating that the variables do not exhibit multicollinearity. According to

Hair, Black, Babin, & Anderson, (2019), the tolerance values above 0.1 suggest multicollinearity is not a concern, as the variability of each independent variable is not largely explained by the other independent variables. The VIF (Variance Inflation Factor) values for all the variables are less than 10, which also confirms that there is no issue of multicollinearity in the model. Kutner, Nachtsheim, Neter, & Li, (2004) state that VIF values below 10 indicate that multicollinearity is not a problem, as a VIF exceeding 10 would suggest high collinearity.

In summary, the independent variables with statistically significant relationships with the dependent variable are Capacity Building Practices, Inventory Management Practices, and Distribution Management Practices. The rest of the independent variables do not have statistically significant relationships with the dependent variable. Multicollinearity does not appear to be a major concern for any of the independent variables.

4.7.5 Auto-Correlation (Independence) test

Based on the below table 4.7.5 auto-correlation model summary provided, the Durbin-Watson statistic is 1.988. According which indicates the value is close to 2, is called no autocorrelation present in the regression model.

This finding is supported by Gujarati and Porter (2009), who state that "a Durbin-Watson statistic close to 2 indicates the absence of autocorrelation" (p. 442). Additionally, Hair, Black, Babin, and Anderson (2019) note that "values in the range of 1.5 to 2.5 are generally considered normal and indicate the absence of autocorrelation" (p. 309).

Table 4.8.5 model summery

Model Summary ^b					
model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.822 ^a	.676	.657	.44959	1.988
a. Predictors: (Constant), capacity building, need assessments, procurement, warehouse, inventory, distribution, fleet, and reverse					

Source: own survey, 2024

4.9 Multiple Linear Regressions on the effect of humanitarian supply chain management practice on emergency response

Multiple linear regressions are a powerful tool for understanding complex relationships and making predictions. It allows researchers to examine the relative importance of multiple factors in influencing a particular outcome, which can inform decision-making and guide further research (Wooldridge, 2020).

The strength of the overall model is typically measured by the coefficient of determination (R-squared), which represents the proportion of the variance in the dependent variable that is explained by the independent variables in the model. The adjusted R-squared, which takes into account the number of independent variables, is also commonly reported to provide a more conservative estimate of the model's explanatory power (Tabachnick & Fidell, 2019).

As indicated in the above table 4.8.5 The R-squared value of 0.676 suggests that the independent variables (HSCM Practices) in the model account for approximately 67.6% of the variance in the dependent variable which is Emergency response. This means that the independent variables included in the study are able to explain a significant portion of the variation in the emergency response and factors other than those studied contribute 32.4% to the emergency response. Therefore, further research should be conducted to investigate what those other factors are that account for 32.4% to the emergency response..

Furthermore, the adjusted R-squared value, which takes into account the number of predictors in the model, is reported to be higher than the level of 0.5. This implies that the independent variables have a considerable influence on the dependent variable, and the regression model is sufficiently explanatory.

The independent variables and the dependent variable, as reflected by the R-value of 82.20% indicate a positive influence. This suggests that the independent variables are highly affecting the dependent variable.

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	45.275	1	45.275	166.462	.000 ^b
	Residual	38.350	141	.272		
	Total	83.625	142			
2	Regression	53.010	2	26.505	121.203	.000 ^c
	Residual	30.615	140	.219		
	Total	83.625	142			
3	Regression	55.229	3	18.410	90.114	.000 ^d
	Residual	28.396	139	.204		
	Total	83.625	142			
4	Regression	56.222	4	14.055	70.781	.000 ^e
	Residual	27.404	138	.199		
	Total	83.625	142			
Dependent variable: Emergency response						
Predictors: (Constant), Distribution management, Capacity building, Inventory management & fleet management. There is a significant relationship b/n Distribution management practice, Capacity building, Inventory management practice, Fleet management practice.						

Source: own survey, 2024

4.9.1. Regression Coefficients

According to Field (2018), when all other independent variables are held constant, the standardized beta coefficient "represents the change in the dependent variable associated with

change of one unit in the independent variable." This makes it possible to compare the relative weights of all the independent variables in the model directly.

Standardized beta coefficients are useful for comparing the relative strength of the effects of different independent variables on the dependent variable in a multiple regression model (Field, 2018). The higher the absolute value of the standardized beta coefficient, the stronger the effect of that independent variable on the dependent variable, holding all other variables constant (Schroeder, Sjoquist, & Stephan, 1986)

Table 4.9.1.Regression Coefficients

Coefficients ^a										
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-.099	.238		-.418	.677	-.569	.371		
	Capacity building	.210	.105	.192	2.012	.046	.004	.417	.265	3.771
	Need assessment practices	.094	.087	.093	1.084	.280	-.077	.265	.329	3.043
	Procurement management practices	.028	.084	.029	.327	.744	-.139	.194	.308	3.243
	Warehouse management	-.072	.078	-.084	-.922	.358	-.228	.083	.291	3.437
	Inventory management practice	.286	.095	.281	3.022	.003	.099	.474	.279	3.588
	Distribution management practice	.376	.098	.323	3.843	.000	.183	.570	.342	2.927

Fleet management practice	.174	.095	.157	1.837	.068	-.013	.361	.331	3.026
Revers logistics managment practice	-.019	.065	-.021	-.290	.772	-.148	.110	.479	2.090
a. Dependent Variable: Emergency response									

Source: own survey, 2024

According to Kutner, Nachtsheim, Neter, and Li (2005), a negative constant (intercept) term in a multiple linear regression model can be interpreted as the negative value of the intercept parameter 0 indicates that when all the predictor variables reach zero, the mean response will be negative.

The above table 4.9.1 shows that the coefficient of the constant term (0.099) were negative which means there are other factors not included in the model that are contributing to a negative baseline emergency response. The included independent variables then act to increase the emergency response from this negative starting point.

A standardized beta coefficient compares the strength of the effect of each independent variable to the dependent variable, it shows that distribution has the first positive significant effect ($\beta = 0.323$ or 32.3%), being followed by inventory management ($\beta = 0.281$ or 28.1%), capacity building ($\beta = 0.192$ or 19.2%), fleet management ($\beta = 0.157$ or 15.5 %), need assessment ($\beta = 0.093$ or 9.3%) and as a final point, procurement management ($\beta = 0.029$ or 2.9%) respectively and procurement management has the least significant effect on the dependent variable. On the other hand warehouse management and reverse logistics management has the negative beta coefficient and the independent variables are held at zero, the predicted emergency response is a negative value.

Furthermore, the p-value for distribution has 0.000, inventory management has 0.003, capacity building has 0.046 and the p value of the other predictors has $p > 0.05$ which is not statistically significant. This points out that the distribution management, inventory management and capacity building practices are statistically significant besides other independent variables in the model has not significant contribution to the emergency response activities.

4.10 Hypothesis Testing

The null hypothesis should be rejected if the p-value is less than the significance level, which is typically 0.05. On the other hand, the null hypothesis should not be rejected if the p-value is greater than or equal to 0.05(Corder & Foreman, 2014, p. 29).

Table 4.10.1 Hypothesis Result

No.	Hypothesis	Stand. Beta	P-value	Decision
H _{1a}	Capacity building practice has statistically significant effect on EPHI's emergency response	.193	0.046	H ₁ Accepted
H _{0b}	Need assessment practice has no statistically significant effect on EPHI's emergency response	.093	0.280	H ₁ Rejected
H _{0c}	Procurement management practice has no statistically significant effect on EPHI's emergency response	.029	0.744,	H ₁ Rejected
H _{0d}	warehouse management practice has no statistically significant effect on EPHI's emergency response	-.084	0.358	H ₁ Rejected
H _{1e}	Inventory management practice has statistically significant effect on EPHI's emergency response	.281	0.003	H ₁ Accepted
H _{1f}	Distribution management practice has statistically significant effect on EPHI's emergency response	.323	0.000	H ₁ Accepted
H _{0g}	Fleet management practices no statistically significant effect on EPHI's emergency response	.157	0.068	H ₁ Rejected
H _{0h}	Reverse logistics management practice has no statistically significant effect on EPHI's emergency response	-.021	0.772	H ₁ Rejected

CHAPTER FIVE

5. SUMMARY, CONCLUSION AND RECOMMENDATION

Introduction

This chapter presents a summary of the key findings from the study. Based on the results, the researcher draws conclusions and makes recommendations. The conclusions are based on the evidence and data collected through the study. Additionally, the researcher provides suggestions for future research that could build upon or expand on the current work.

5.1 Summary

This study is intended to weigh the humanitarian supply chain management practices and its effect on emergency response in EPHI. By analyzing the practices and effect of eight factors of HSCM practices (capacity building, needs assessment, procurement, warehouse, inventory, distribution, fleet, and reverse logistics) and Emergency Response activities of EPHI. The result of the study indicates that there is a positive effect of HSCM practices on emergency response.

The study result showed that a mean of mean value of HSCM practices accounts 3.21 which indicates the HSCM practices moderately practiced in EPHI and the emergency response (the outcome variable) activities in terms of its HSCM practices which are activating emergency operations plan and emergency operations centers, Evacuating disaster areas, Opening shelters and providing mass care, Providing emergency rescue and medical care, Firefighting, Performing search and rescue, Providing emergency infrastructure protection and recovering lifeline Services, Establishing fatality management and Ensuring the security of affected areas by deploying police or military forces accounts grand mean score of 3.46 was found that highly practiced at EPHI.

The finding suggests that multiple linear regression analysis were made to examine the effect of HSCM practices on emergency response the considered practice were capacity building, needs assessment, procurement management, warehouse management, inventory management, distribution management, fleet management and reverse logistics management from all of this practices the effect of distribution ($\beta = 0.323$ or 32.3%), inventory management ($\beta = 0.281$ or 28.1%), capacity building ($\beta = 0.192$ or 19.2%), fleet management (β

=0.157 or 15.5%), need assessment ($\beta = 0.093$ or 9.3%) and procurement management ($\beta = 0.029$ or 2.9%) affect the emergency response of EPHI.

5.2 Conclusion

The finding of this study revealed that the effect of humanitarian supply chain management practices on emergency response is moderately practice in EPHI. The HSCM practices, especially distribution management, inventory management, and capacity building, have a significant positive effect on the emergency response capabilities however, other predictor variables included in this study were the p-value > 0.05 has no statistically significant.

5.3 Recommendation

The study identifies distribution management, inventory management and capacity building as key practices that significantly influence the effectiveness of emergency response activities. This can guide organizations on where to focus their efforts.

The study quantifies the impact of these practices, providing a clear understanding of their importance. For instance, efficient distribution management practices, modernized inventory management practices and effective capacity building practices can increase the likelihood of an effective emergency response by 32.3%, 28.1% and 19.2% respectively.

The findings of this study can inform decision-making within organizations, helping them prioritize investments in these key areas.

The results could have implications for policy-making and standard-setting, encouraging the adoption of these practices across organizations involved in emergency response.

The study provides a foundation for further research to explore these practices in more in depth and understand how they can be optimized.

In general, these findings provide valuable insights for organizations involved in emergency response activities, guiding them on where to focus their efforts and resources to improve their effectiveness.

5.4 Future research direction

This study falls little of addressing all magnitudes of humanitarian supply chain management practices that affect emergency response activities. Further research is recommended, focusing on the perspectives of coordination and collaboration with donors, strategic supplier

partnership practices, and information sharing practices. These areas play crucial roles in enhancing the effectiveness and efficiency of humanitarian supply chains during emergencies. By delving deeper into these aspects, a more comprehensive understanding can be gained, leading to improved strategies and outcomes in managing humanitarian operations.

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APPENDIX I: QUESTIONNAIRE

ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE

LOGISTIC AND SUPPLY CHAIN MANAGEMENT DEPARTMENT

Questionnaire to be filled by the staff of Ethiopian public health institute

Dear Sir\ Madam,

I am student at Addis Ababa University School of Commerce attending a Master Degree in Logistics and Supply Chain Management. I am undertaking a thesis entitled on “The Effect of Humanitarian Supply Chain Management Practices on Emergency Responses: Ethiopian public health institute” for the partial fulfilment of my master’s degree. I kindly request your co-operation in responding the following questions for the successful completion of the study. The overall purpose of this questionnaire is exclusively academic. Your response will not be used for any other purpose; it will be kept confidential.

Your sincerely, assistance and co-operation will be highly appreciated.

Tinsae Eshetu, hanieshetsept19@gmail.com

Tell +251-913423923

Demographic Information:

- 1) Gender: Male Female
- 2) Age: 19 – 30years 31 -45 years Above 45 years
- 3) Educational Background: Diploma holder Bachelor's Degree
Master's and Above
- 4) Years of Experience in Public Health Sector:
- 1) < 5years 2) 6-10 years 3) Above 10 years
- 5) Position in the organization? Director Manager Coordinator
Officer Other (please specify): _____
- 6) Year of experience in EPHI
- 1) < 5years 2) 6-10 years 3) Above 10 years

PART II: GENERAL QUESTIONS

Humanitarian Supply Chain Management practice of EPHI

Please answer the below questions by using a tick mark (√) on the appropriate cell of the supply chain management practice of EPHI. Each question on using a 5 Point Likert - Scale where:

1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

S.No	I-Variables: Supply Chain Management Practices	Scale				
		1	2	3	4	5
1.	Capacity Building					
1.1	The training programs provided by EPHI are relevant to emergency response needs.					
1.2	EPHI provides sufficient resources (financial, human, and material) for capacity building activities.					
1.3	The frequency of capacity building initiatives at EPHI is adequate.					
1.4	EPHI effectively evaluates the outcomes of its capacity building programs.					
1.5	EPHI fosters a culture of continuous learning and improvement among its staff.					
1.6	The training materials and methods used by EPHI are engaging and effective.					
1.7	EPHI encourages staff participation and engagement in capacity building activities.					
1.8	The leadership at EPHI-PHEM prioritizes capacity building as a key component of emergency preparedness.					
1.9	EPHI gives regular trainings to PHEM staffs to enhance individual capacity and responsiveness.					
1.10	EPHI build staffs capacity base on their needs for emergency response					
1.11	EPHI formulates needs assessment forms/systems to asses' demands of PHE relief supplies.					
1.12	The skills and knowledge gained through capacity building activities contribute to effective emergency response.					
1.13	The institute evaluates progress and takes feedback after capacity building.					

1.14	I believe that the capacity building practices at EPHI positively impact its emergency response capabilities.				
2.	Needs Assessment				
2.1	EPHI conducts regular need assessments to identify potential emergency scenarios affecting beneficiaries.				
2.2	The need assessment methodologies related to aid supplies employed by EPHI are comprehensive and systematic				
2.3	The findings of need assessments conducted by EPHI are effectively communicated to decision-makers.				
2.4	EPHI allocates resources based on the findings of need assessments.				
2.5	The institute formulates needs assessment forms/systems to asses' demands of Beneficiaries aid supplies.				
2.6	The institute asses needs of relief supplies by quarterly.				
2.7	The need assessments conducted by EPHI in prioritizing emergency response efforts to address beneficiaries' needs.				
3.	Procurement management				
3.1	The procurement process of emergency-related supplies and services is swift and efficient.				
3.2	Emergency resources (such as medical supplies, equipment, etc.) are readily available (pre-positioned) during crisis situations due to our procurement practices.				
3.3	EPHI procurement procedures allow for quick adjustments and adaptations (Agility) during emergency scenarios.				
3.4	The quality of items procured through our procurement process meets the standards required for handling emergency response.				

3.5	EPHI procurement practices ensure to acquire necessary emergency-related resources at reasonable costs, facilitating effective emergency response without overspending.				
3.6	EPHI procurement team maintains effective communication and coordination with suppliers, ensuring timely delivery of essential resources during emergencies.				
3.7	The procurement process in EPHI positively contributes to reduces the time taken for emergency response activities.				
3.8	Resources procured through EPHI procurement process are sustainable and can be relied upon for the duration of emergency situations.				
3.9	The EPHI's procurement system results in speedy acquisition of items for public health emergency management operations.				
3.10	Third party procurement firms (EPSS) are outsourced with the EPHI to speed up procure items based on the request in the time of Emergency response.				
3.11	The EPHI Procurement department maintains good supplier relations				
3.12	Emergency items procured or supplied are based on requests made by PHEM Staffs of the institute.				
3.13	Procurement of emergency items match with item type & volume demanded by the program.				
3.14	Procurement group in the institute makes on time delivery of demanded items with no delay.				
3.15	The procurement team in the institute consists of sufficient personnel with required skills.				
4	Warehouse management				
4.1	Emergency supplies related are easily accessible from our organization's warehouses during crisis situations.				

4.2	Our warehousing management practices ensure efficient tracking and management of emergency-related inventory, facilitating timely access during emergencies.				
4.3	Our warehouses are equipped to quickly deploy necessary emergency resources to relevant emergency response teams when needed.				
4.4	Our warehousing practices optimize space to accommodate sufficient emergency supplies for handling emergency-related situations				
4.5	Safety and security measures in our warehouses ensure the protection of emergency-related supplies from theft, damage, or unauthorized access, even during emergencies.				
4.6	Our warehousing management practices allow for swift adaptation to changing demands during emergency situations, ensuring continuous availability of EPHI resources.				
4.7	Warehousing operations are well-integrated with logistics planning, enabling seamless transportation and distribution of emergency-related supplies during emergencies.				
4.8	Our warehousing management practices comply with relevant regulatory standards for handling and storing emergency-related materials, even under emergency conditions.				
4.9	The integrity of emergency-related resources is effectively maintained within EPHI, s warehouses, ensuring their usability and reliability during emergencies.				
4.10	EPHI agency has sufficient and suitable warehouses for Emergency supplies.				
4.11	Emergency relief supplies (donated & procured) are Properly managed in the EPHI, s warehouse.				
5.	Inventory Management				
5.1	The availability of essential medical supplies and equipment is adequately				

	maintained during emergency situations.				
5.2	Inventory tracking systems at EPHI effectively monitor stock levels of critical supplies.				
5.3	The organization's ability to respond to emergencies is enhanced by efficient inventory management practices.				
5.4	Staff training on inventory management procedures contributes significantly to improving emergency response effectiveness.				
5.5	The organization has sufficient backup stockpiles to handle unexpected surges in demand during emergencies.				
5.6	There is a clear protocol in place for prioritizing the allocation of limited resources during emergencies.				
5.7	Collaborations with external partners and suppliers play a crucial role in maintaining adequate inventory levels for emergency response.				
6.	Distribution management				
6.1	The efficiency of EPHI distribution management system significantly influences emergency response capability.				
6.2	Adequate resources are allocated to distribution management, enhancing our preparedness for emergencies.				
6.3	The coordination between distribution management teams and emergency response teams is effective during crisis situations.				
6.4	Timely and accurate information exchange within the distribution management network positively impact emergency response time.				
6.5	Continuous evaluation and improvement of distribution management processes contribute to our overall emergency preparedness.				
6.6	Distribution teams with in PHEM are properly structured to enable on the				

	spot situational decisions				
6.7	Third party Distribution firms (EPSS) are outsourced with the institute to distribute items based on the request in the time of Emergency.				
6.8	The third party logistics providers (EPSS) outsourced by the institute are convenient for distribution and reduce operational cost.				
6.9	PHEM focal persons at woreda level are well acquainted of the Institute's distribution system and procedures				
7.	Fleet Management				
7.1	The condition and maintenance of EPHI, s fleet is good to respond to emergencies promptly.				
7.2	Adequate resources are allocated to fleet maintenance and upkeep, enhancing our preparedness for emergency situations.				
7.3	The coordination between fleet management teams and emergency response teams is effective during crisis situations.				
7.4	The institute uses all kinds of transportation for transportation of items & personnel.				
7.5	Third party transportation firms are outsourced with the Institute in moving of items & people to therequested areas in the time of emergency.				
7.6	Emergency aid supplies are effectively and efficiently Supplied to places where they are requested.				
7.7	The availability of well-trained drivers is in place for emergency response operation.				
7.8	Continuous evaluation and improvement of fleet management processes contribute to our overall emergency preparedness.				
7.9	The institute engages to support transportation Firms that deliver the transportation in its emergency actions.				

7.10	There is a pre-selected list of transportation firms to be outsourced during the time of emergency.				
8.	Reverse Logistics				
8.1	The institute have its own system for back ward flow of relief supplies after response				
8.2	Third party logistics firms (EPSS) are outsourced with the institute to use reverse logistics after response.				
8.3	The third party logistics providers (EPSS) outsourced by the institute are to deliver previously reversed relief supplies when there is any outbreak happen in another area.				
8.4	PHEM focal persons at woreda level are well acquainted of the Institute reverse logistics system and procedures.				
8.5	The third-party logistics providers (EPSS) outsourced by the institute recognizes the urgency of the emergency condition.				
8.6	EPHI is using reverse logistics management with the ability to respond to emergencies promptly.				
8.7	Adequate resources are allocated to reverse logistics processes, enhancing our preparedness for emergency situations.				
8.8	The coordination between reverse logistics management teams and emergency response teams is effective during crisis situations.				
8.9	Timely and accurate retrieval of critical assets through reverse logistics is in place during emergency response.				
8.11	The efficiency of our reverse logistics management significantly influences our ability to respond to emergencies promptly.				
S.No	II-Variable: Emergency Response:	Scale			
1.	Emergency Response:	1	2	3	4

1.1	EPHI prepares an effective response plan before and during emergencies				
1.2	EPHI activates emergency operations plan during emergency				
1.3	EPHI activates emergency operations center immediately when emergency happens.				
1.4	EPHI Performs search and rescue operation during Emergency response				
1.5	EPHI identifies and Evacuates disaster prone communities (victims)				
1.6	EPHI Provides emergency rescue and medical care for victims				
1.7	EPHI makes Opening shelters accessible and provide necessary services to evacuees in a timely manner.				
1.8	EPHI is effectively working on firefighting service during emergency response.				
1.9	Infrastructure, such as transportation systems, power plants, communication networks, and water treatment facilities, are promptly safeguard and restored by EPHI during and after any emergencies.				
1.10	EPHI's response teams effectively address fatality management during emergencies				
1.11	Lessons learned from past emergencies are documented and incorporated into future emergency response plans.				

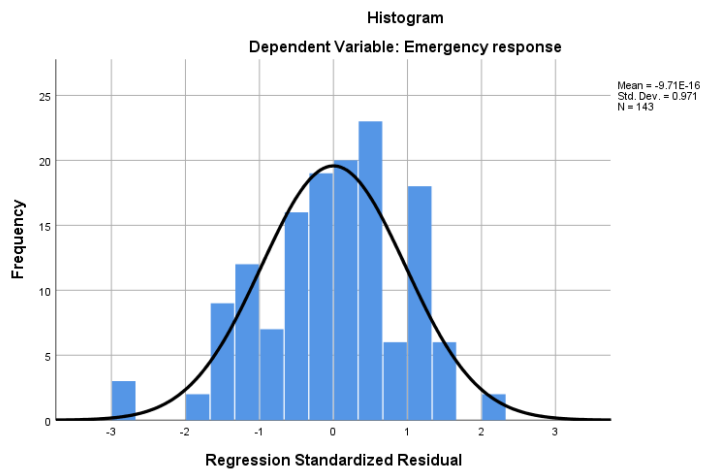


Figure 4.8.1

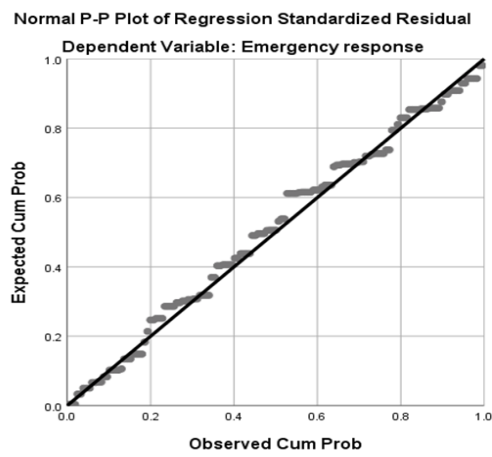


Figure 4.8.2

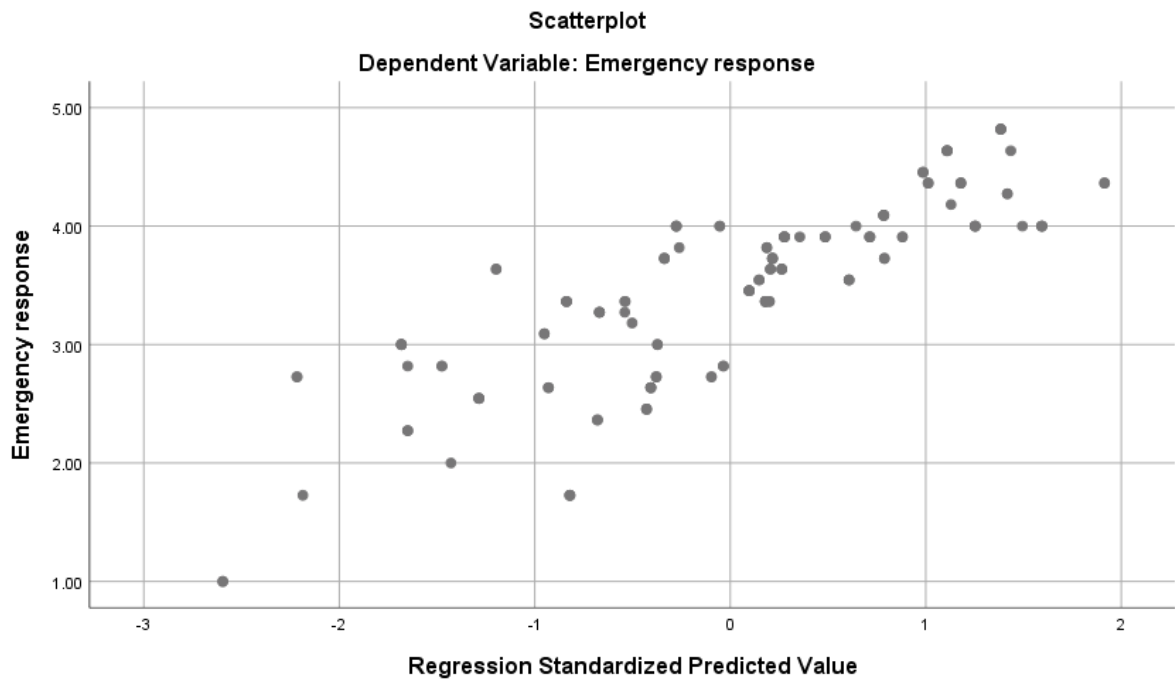


Figure 4.8.3

