

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI  
COLLEGE OF HUMANITIES AND SOCIAL SCIENCES**

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**ASSESSING THE RELATIONSHIP BETWEEN SUPPLY CHAIN MANAGEMENT  
PRACTICES AND HEALTHCARE DELIVERY**

**By**

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Science and Technology, Kumasi in Partial Fulfilment for the Degree of the Award of**

**MASTER OF SCIENCE IN  
LOGISTICS AND SUPPLY CHAIN MANAGEMENT**

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## DECLARATION

I hereby declare that this thesis is the result of my original work towards the Master of Science in Procurement and Supply Chain Management, and that, to the best of my knowledge, it neither contains material published by another person nor materials which have been accepted for the award of any other degree of the University, except where due acknowledgments have been made in the text.

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## ABSTRACT

Many developing nations spend a lot of money on purchasing medical supplies, but an estimated 60% to 80% of their populations, particularly in rural regions, may not always have access to the most basic medical supplies. If health services are to be successful and trustworthy, frequent provision of enough volumes of relevant health commodities is essential. The goal of this study was to evaluate how healthcare institutions manage their health commodities and how that affects how well treatment is delivered. This study employed multiple methodologies. The study employed a quantitative research methodology together with descriptive and explanatory research approaches. The logistics and supply chain staff at the middle and higher management levels of all the hospitals examined made up the study's target group. To address the research questions, data from both quantitative and qualitative sources were gathered. Data were collected using both questionnaires and interviews, and both quantitative and qualitative analyses were performed using SPSS, graphs, tables, and statistics. To choose the best sample for the investigation, convenient stratified random sampling was utilized. The study concluded that managing health commodities effectively improves and increases the efficiency of providing health services. Based on the research's conclusions, the Ghana Health Service now has a better understanding of logistics management and how it relates to the provision of healthcare. This study also highlights the significance of logistics management for improved healthcare service delivery by connecting these problems to service delivery. The study advises health organization leadership to spend money on efficient logistics management as a result. One of the long-term and strategic benefits of implementing good logistics management methods is better, higher-quality healthcare.

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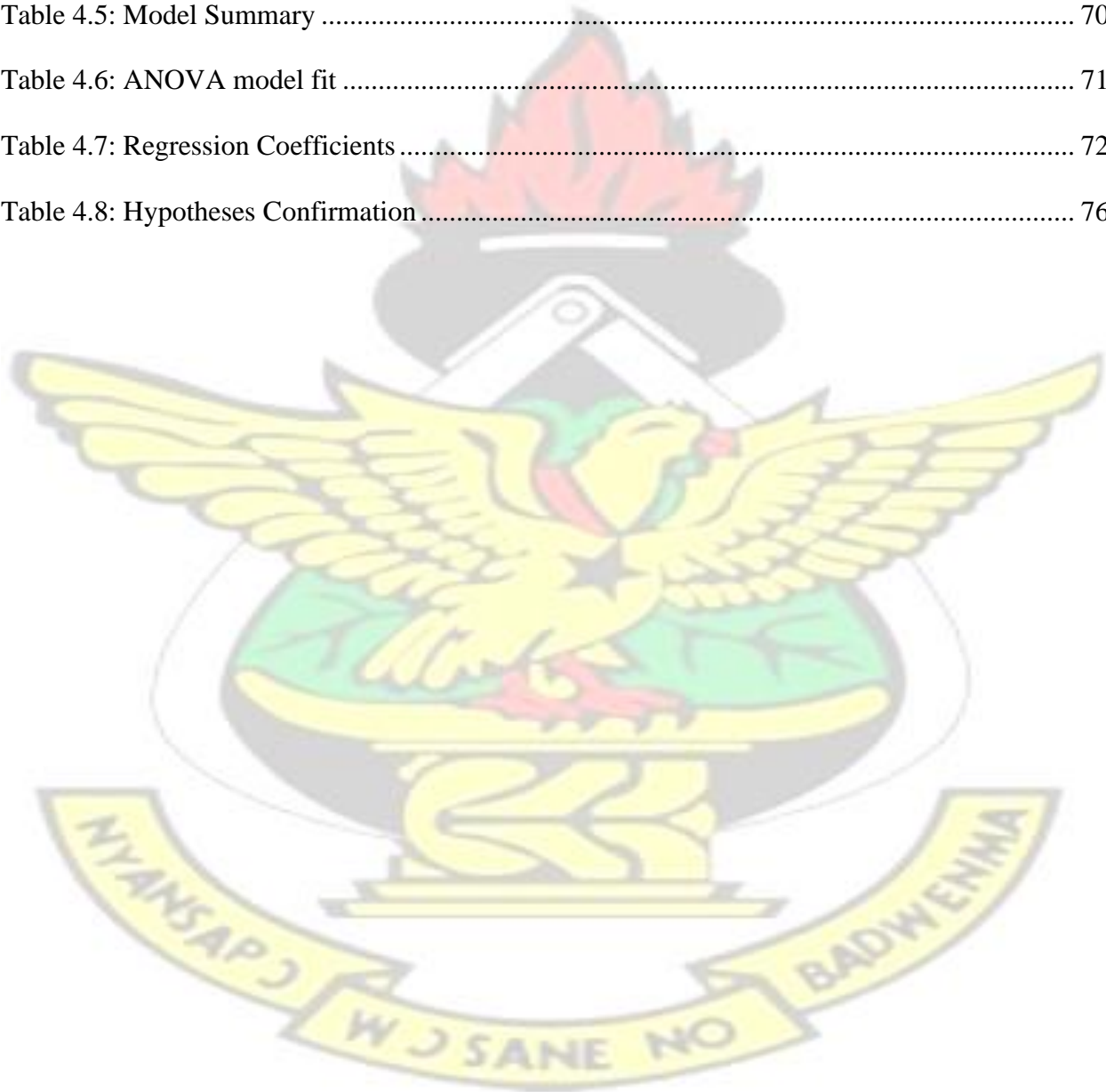
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## LIST OF ABBREVIATIONS



<b>SCM</b>	Supply Chain Management
<b>MoH</b>	Ministry of Health
<b>GHS</b>	Ghana Health Service
<b>CMS</b>	Central Medical Stores
<b>RMS</b>	Regional Medical Store
<b>SDP</b>	Service Delivery Points
<b>RHA</b>	Regional Health Administration
<b>DHA</b>	District Health Administration
<b>CHAG</b>	Christian Health Association of Ghana
<b>USAID</b>	United States Development Agency
<b>SSDM</b>	Stores, Supplies and Drug Management
<b>MDGs</b>	Millennium Development Goals
<b>WHO</b>	World Health Organisation
<b>SCM</b>	Supply Chain Management
<b>SPSS</b>	Statistical Package for Social Sciences
<b>GhiLMIS</b>	Ghana Integrated Logistics Management Information System
<b>DHMTs</b>	District Health Management Teams

**CHPS** Community-Based Health Planning Services

**LMIS** Logistics Management Information System

**RBV** Resource-Based View

**TCE** Transaction Cost Economics

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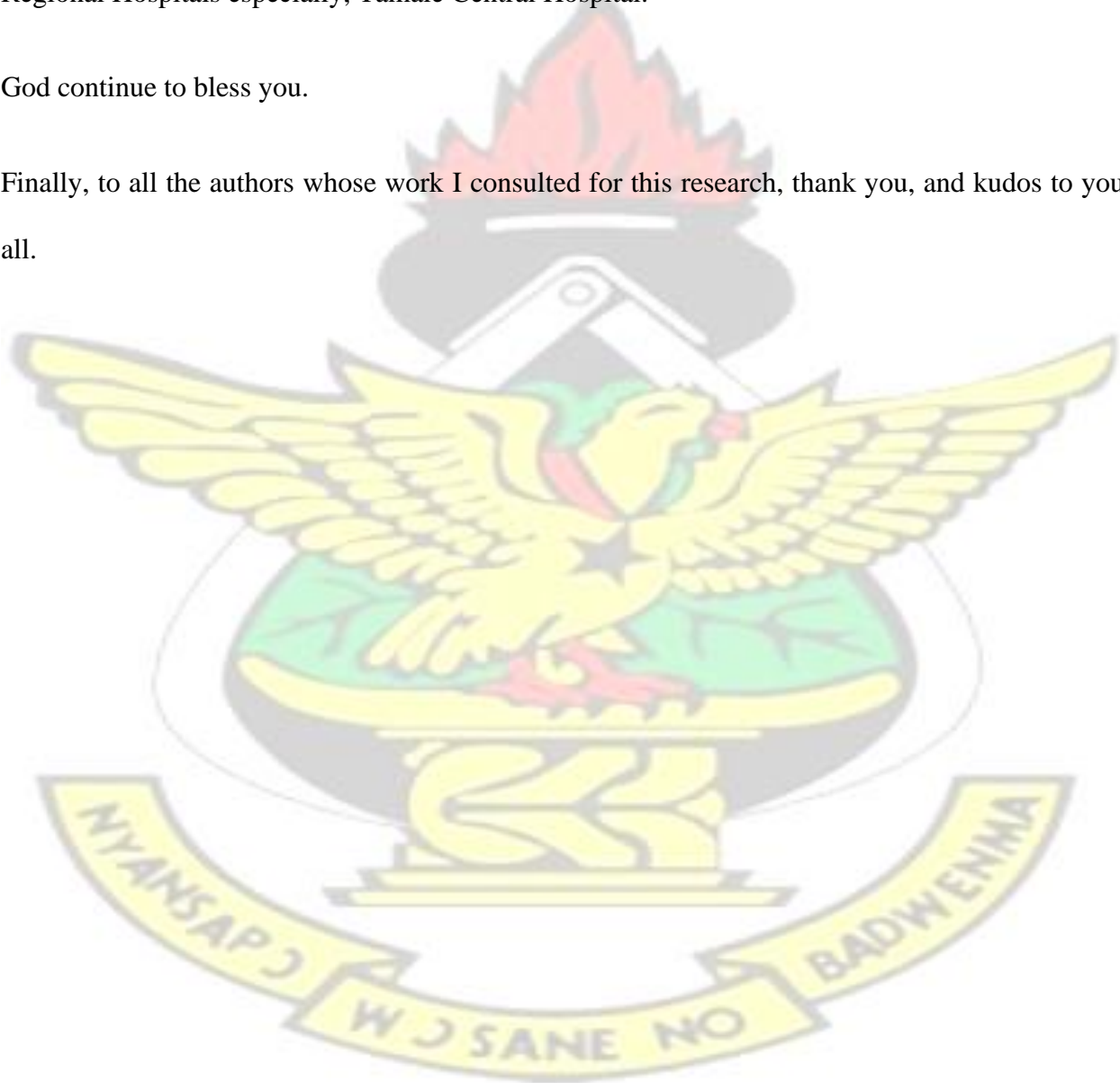


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## DEDICATION

I dedicate this thesis to the Almighty Allah through his undeserved grace and kindness I was able to complete this work.

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## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background to the Study

Citizens should prioritize having access to medicine, according to the World Health Organization (WHO). According to Imprints (2009) and Yadav et al. (2011), it is essential that the availability of resources be constantly maintained at sufficient levels, with appropriate quantities and quality, while also being affordable for individuals and communities. Marks (2009) posits that a significant number of individuals, around two billion, face a lack of access to essential medications. The author further suggests that the provision of suitable treatment and medication has the potential to save the loss of four million lives each year across Africa and Southeast Asia. Based on this metric, the World Health Organization (WHO) and 192 states have committed to achieving the Millennium Development Goals (MDGs) over a span of eight thousand years. The fourth purpose listed is to lower the mortality rate among children, while the fifth objective is to improve maternal health. The sixth objective focuses on combating HIV/AIDS, malaria, and other diseases (WHO, 2012). The World Health Organization (WHO) focuses on many aspects such as strategy, access, quality, and objective usage in order to ensure the availability of medications (USAID, 2008a).

Developing nations, such as Ghana, often have significant challenges in establishing enough reserves of resources necessary for the development of productive industries. Following the occurrence of a fire outbreak at the central clinical stores in Accra, the Ministry of Health (MOH) has established the abbreviated central clinical stores (TCMS). This entity is tasked with the procurement, storage, and distribution of pharmaceuticals and medical supplies to healthcare facilities nationwide, including general hospitals and dispensaries. Normal challenges inside the public prosperity structures, which impact the store chains, consolidate inadequate deciding,

lacking resources, defers in sponsoring installment and long lead times (offering and gathering) and course (Appohwood and Makafui, 2019). To add to the complexities, there are commonly a couple of benefactor funded program unequivocal store ties that spat agreed with the public prosperity structures. In the wellbeing business, where assets are as of now restricted, shortcomings might emerge because of these possibly excess endeavors across the stockpile chains. The spotlight will be on troubles in the store network the leading group of general meds. Also, it is trying to quantify execution markers like drug item accessibility, making it much of the time testing to distinguish requirements and chances to upgrade the inventory network. ( WHO, 2006).

Drugs openness and complete prosperity costs are to a not completely firmly established by a medication acquisition system. Drug purchases account for the majority of health spending in most emerging nations—Ghana is not an exception—after labor costs. The accessibility of the fitting prescriptions in adequate amounts at sensible costs and as per laid out quality norms is ensured by a proficient obtainment framework.

Costs associated with medication storage and distribution also play a significant role in a health care budget, and transportation costs can exceed the cost of the medications themselves. Arranging a structure for taking care of and dispersing drugs, clinical supplies and equipment could be mind boggling and critical. Fruitful drug movement lays on a nice system plan and extraordinary organization, which is the explanation tasks the chiefs is a critical piece of the Ghana Prosperity Organization's splendid strategy. Due to decentralization and prosperity region change, prosperity organizations are composed as one goes down the arranged movement of prosperity structure from the general population to the sub-district.

The increasing difficulties in making efficient use of limited resources necessitate the establishment of essential designs to ensure adequate and high-quality medical care delivery. It is important that obtaining and movement activities of clinical supplies are endeavored by completely pre-arranged staff using extraordinary techniques, working in appropriate work environments with incredible correspondences and with permission to trustworthy stock and use information.

Generally, inside the overall creation organization, systems length the physical and momentary openings. By bringing down the cost for many everyday items for all individuals, productive and successful coordinated operations makes the worldwide economy conceivable. According to Kaplan and Concierge (2011), to address the cost crisis in clinical consideration, the cost of giving clinical benefits ought to be seen. Further, as per Kaplan and Doorman, it is important to understand the cycles to fathom the expense of giving medical care. According to the Leading group of Creation network According to The Chiefs Specialists (2016), the role of leaders in the production network involves the planning, execution, and control of the efficient and effective flow and capacity of goods, services, and associated information from the point of origin to the point of consumption in order to fulfill customers' requirements. The executives' interpretation of planned operations demonstrates the significance of coordinated factors for SCM. The Cooper et al. developed SCM system involves three sections which integrate business processes, the board parts and stock organization structure. Yadav et al. (2011) suggest that a functioning medication production network, which includes proficient transportation, appropriate warehousing, and acquisition, is essential to ensure that people access basic medications and to guarantee their nature.



Research conducted on the Nexus informational index of South Africa revealed three relevant studies that examined issues in supply chain management (SCM) affecting organizational operations in southern Africa (Dzuke, 2015; Lewis, 2005; Ndlovu, 2012). In a recent scholarly investigation conducted by Gomera and Mafini (2020), an examination was undertaken to explore the intricacies of the production network, borders, and disruptions within the animal feed business in South Africa. Anyway, no assessments were found that perceive the blocks in the creation organization of basic medications in the Ghanaian general prosperity region.

This suggestion focused in on assessing the continuous status of drugs store network the board structure in the overall prosperity region in Ghana. In particular, it saw what store network the executives rehearse mean for how medical care is conveyed overall.

## **1.2 Problem Statement**

As per a World Wellbeing Association Nation Report on Ghana in 2009, one of the fundamental difficulties of Public Medications Strategy in Ghana is guaranteeing an interfered with supply of fundamental meds that are viable and of good quality, truly and monetarily open and utilized normally. To meet this goal, Ghana laid out a public fundamental medications supply framework, which contains the Focal Clinical Stores and dissemination offices from the integral to territorial, and office levels. The public manufacturing system in Ghana has seen many modifications in recent years, with multiple models being developed, tested, and implemented to establish optimal procedures and enhance collaborations with diverse sectors within the Ghanaian healthcare industry. By and large, there has been comparability of training the nation over with a couple of confined frameworks set up in a setting because of exceptional conditions. Rather than these being the standard, they are fairly the exemption. In the current act of funding medical care conveyance through the Public Health care coverage conspire (NHIS), the public stockpile framework is

changing to have the option to adjust to the new change in perspective. The general guideline and ideal thing has been that, the public inventory network ought to be effective, client centered, and monetarily economical.

The implementation of the Public Procurement Act, Act 663 (2003) has many impacts on the public procurement system. The implementation of the liberating initiative has presented some difficulties that, if addressed, might contribute to the enhancement of procurement and delivery practices. The concept of open doors, fairness in practices, accountability, and productivity is integral to the cycle of supply chain management. These factors should ultimately result in a deviation that provides value for money, from which an incentive could be derived. This incentive could be the establishment of a conducive environment that allows the supply chain to thrive and expand (WHO, 2009).

In any case, there are still shortages in the clinical stock frameworks prompting low accessibility and significant expense of fundamental prescriptions. Against this foundation, the Service of Wellbeing (MoH) in association with the US Organization for Worldwide Turn of events (USAID) and the Worldwide Asset, as of late presented the Ghana Coordinated Planned operations. The executives Data Framework (GhiLMIS) to further develop Ghana's wellbeing store network. The framework by and by typifies all critical coordinated factors and production network exercises of the Ghana Wellbeing Administration. The new data framework is a web based global positioning framework that gathers and examinations information to empower government lessen squander coming about because of terminated items, distinguish fake items and guarantee that quality products are accessible to wellbeing offices in the administration of wellbeing wares.

Crises and fiascos stretch any wellbeing establishments association's ability to convey the most suitable supplies where and when they are required. Viable clinical supplies the executives in

wellbeing offices particularly in Ghana fails to impress anyone. Quiet, the new worldwide Coronavirus pandemic has additionally brought to the front the requirement for a powerful and efficient coordinated operations the executives in the wellbeing area, everything being equal. The present worldwide pandemic combined with the yearly Cerebral Spine Meningitis (CSM) episode in northern Ghana has seriously uncovered the deficiencies in wellbeing medications supplies the board in our country. With more than 400 instances of meningitis revealed in the northern locales with 40 people losing their lives in just 2020, the Ghana Wellbeing unveiled that the 2020 episode of Meningitis in the Upper West District was brought about by another type of microorganisms that has no immunization. The Ghana Wellbeing Administration anyway said, despite the fact that there was no immunization for this strain causing the flare-up, the circumstance might have been exceptional overseen assuming the Assistance had sufficient monetary assets. Despite that, when wellbeing specialists knew that the Cerebral Spinal Meningitis (CSM) was pervasive in the north as a result of existing weather patterns, all hands ought to have been placed at hand to guarantee legitimate wellbeing strategies the executives to manage what is going on. A few investigations including those by Mwangangi (2016), and Tsegaye (2018) broadly inspected the impact of coordinated operations the board and strategies the executives rehearse on the presentation of assembling firms and hierarchical execution separately.

A typical misstep of the medical services industry is the differentiation among items and administrations, which might add to botch of the medical care inventory network. Notwithstanding its significance, hypothetical turn of events, and prevalence in the business and scholastic press, there is minimal experimental exploration that obviously connects medical services store network drives to generally speaking hierarchical viability and examines their effect overall among medical services industry members. Subsequently, more examinations are expected to depict the condition



of medical services store network and distinguish existing difficulties and open doors for quality upgrades in medical services settings.

It is on this premise that this study inspected exhaustively the production network of fundamental prescriptions of public medical clinic area in Ghana, involving wellbeing foundations in Tamale City as a contextual investigation.

### **1.3 Objectives of the Study**

The primary aim of this research is to evaluate the present condition of the pharmaceuticals supply chain management system within the public health sector in Ghana. This assessment will be conducted by examining health facilities located in the Northern Region as a specific case study. In order to accomplish the overarching goal, a series of particular goals have been established to be fulfilled.

1. To examine the relationship between procurement management and healthcare delivery.
2. To investigate the relationship between warehousing and storage and healthcare delivery.
3. To examine the relationship between inventory management control and healthcare delivery.
4. To investigate the relationship between customer relationship management and healthcare delivery.
5. To examine the relationship between information flow and healthcare delivery.

### **1.4 Research Questions**

1. What is the relationship between procurement management and healthcare delivery?
2. What is the relationship between warehousing and storage and healthcare delivery?
3. What is the relationship between inventory management control and healthcare delivery?



4. What is the relationship between customer relationship management and healthcare delivery?

5. What is the relationship between information flow and healthcare delivery?

### **1.5 Justification of the Study**

Production network exercises give huge open doors to progress and cost regulation in medical services. However, there is a dearth of information on how to enhance healthcare logistics processes in the literature.

Even minded research portrays that store network the executives contribute profoundly to authoritative exhibitions. Tan et al (1998) found that client connection and obtainment practice influence the adequacy of production network the executives' techniques and lead to the monetary and market exhibitions. This examination will be extremely huge in the accompanying regions: To the public authority, the review gives better comprehension on the inventory network the board practices and medical care conveyance. This will eventually assist in the definition of approaches and guidelines that with canning assist with getting productivity and adequacy the stockpile chains of clinical supplies. For the administrators of the clinics under study, the review will educate them regarding the basic inventory network the board factors that influence medical care conveyance, which could give some knowledge on the most proficient method to manage difficulties that upset fruitful stock administration. Likewise, production network exercises in the confidential areas have been obscure to the central parts in the economy despite the fact that legislative elements and public obtainment specialists have persistently attempted to further develop inventory network the board and public acquisition rehearses. This exploration will amount to the current information on production network the executives and its practices in the public area. Lastly, this research would

be very beneficial to the state because it will reveal the successes and failures of supply chain management in public health.

### **1.6 Research Methodology**

Survey research has been widely used as a prominent methodology in the field of logistics and supply chain management research, as shown by its historical popularity (Gammelgaard, 2004; Mentzer and Kahn, 1995). In a similar vein, the present research used the survey methodology. The data used in this research were collected from two main sources, namely primary and secondary sources. The primary source of data collection was the employees of Regional Medical Stores, together with personnel from various levels of health facilities within the area. By using questionnaires. The data collected from the administered questionnaires was analyzed using computer tools, including Statistical Package for Social Sciences (SPSS) and Microsoft Excel.

### **1.7 Scope of the Study**

This research focuses on the challenges pertaining to the supply chain management of general medications in the northern area, specifically within the context of public health. The primary focus of this work is analytical and explanatory in character. According to Aaker and Day (1986), analytical investigation is used to get insights into the overarching concept of a problem, the potential alternative choices, and the relevant aspects that need to be considered. The review zeroed in fundamentally on the Ghana Medical care Administration in regard of store network the executives. The review was done at the wellbeing foundations in the Tamale Metropolitan Area, and was restricted to the stock administration frameworks embraced in overseeing wellbeing items which help in medical care conveyance. The health facilities' procurement officers, supply chain practitioners, and logisticians provided the data. The review considered five center parts of

inventory network the board which included: acquirement the board, warehousing the executives, client relationship the executives, stock administration and data stream the executives.

### **1.8 Limitations of the Study**

Each exploration study, regardless of how well it is conducted, faces a few impediments. This research was not an exception. Due to the limited timeframe, the scope of this research was limited geographically to the Northern Region, which hampered its successful completion. The significant issues that the review tried to address may not be likewise existent in other wellbeing local stores. This implies the discoveries may not be excessively comprehensive, because of the restricted extent of the review. Also, there were a few instances of information misfortune in the reactions, the type of staff who answered the poll and a few surveys were rarely returned. Because of this test, information gathered were checked and yet again tried completely to develop their legitimacy and unwavering quality. By and by, the factual aftereffects of these tests were very great, which delivered such blunders irrelevant.

### **1.9 Organization of the Study**

The research is organized into five distinct chapters. In Chapter One, an examination was conducted on the introductory section, which provides the contextual framework for the investigation and presents the focal point of the project, including the problem statement, study objectives, research inquiries, research methodology and design, rationale for the study, study scope, and limitations of the research. Chapter 2 of the research paper included an extensive examination of pertinent scholarly literature, specifically focusing on previous studies that are directly relevant to the current investigation. The third chapter of the document included the approach used in the investigation. Chapter four of the study elucidated the comprehensive

examination and systematic presentation of the data produced from the research method and fieldwork. Chapter five encompasses the comprehensive compilation of the summary of results, suggestions, and conclusion.

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## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter undertook an examination of the literature pertaining to the topic. The study was conducted using the following components: the applied survey, observational review, logical framework, and hypotheses of the study. The literature was evaluated in line with the stated objectives of the research. The writing under examination was mostly based on data derived from published reference sources such as books, online journals, articles, and scholarly publications. The study provided an overview of previous research endeavors that have been conducted on the topic of supply chain management and its impact on the organizational performance of healthcare institutions.

#### **2.2 Conceptual Review**

In this section, key concepts including supply chain management and its various dimensions among others are defined.

#### **2.3 Supply Chain Management**

Supply chain management (SCM) is an encompassing methodology that involves the strategic coordination and oversight of several components, including materials, logistics, services, and information flow. This integrated approach commences with the meticulous planning and supervision of these aforementioned elements, which span from suppliers to manufacturers or service providers, ultimately culminating in the delivery to the end consumer. It pertains to a very substantial alteration in corporate management practices. It is considered to be an effective method for companies to enhance their presenting skills. The management of a production network

encompasses a variety of strategies and methodologies aimed at effectively integrating suppliers, manufacturers, distributors, and customers to enhance the long-term performance of individual enterprises and the whole supply chain in a robust and high-performing business model. It is expected that the effective adoption of Supply Chain Management (SCM) would enhance the interconnectivity between suppliers in the upstream and consumers in the downstream, leading to heightened levels of customer satisfaction and improved overall corporate performance. Previous studies have shown that supply chain management (SCM) has a significant role in determining a company's success. There is a consensus among scholars and practitioners alike that the implementation of effective supply chain management strategies may provide a substantial competitive edge. Hence, the primary goal of a supply chain manager is to establish a cohesive linkage between end customers, distribution channels, manufacturing processes, and procurement operations, with the aim of satisfying consumers' service expectations while maintaining a competitive advantage via reduced overall costs.

### **2.3.1 Supply Chain Management Practices**

According to Koh et al. (2007), production network management practices include a set of activities implemented inside an organization to facilitate efficient management of its supply chain. The primary objectives of supply chain management are to enhance operational efficiency, reduce inventory levels, and minimize lead time. The primary objectives of supply chain management are to enhance market share and enhance supply chain integration (Koh et al., 2007). Production network management techniques may be classified into many categories. Donlon (1996) implemented inventory network management strategies, which include supplier management, outsourcing, process time compression, continuous communication flow, and information technology sharing. In their study, Li et al. (2005) defined store network management practices as

the set of activities that organizations do to enhance the efficient management of the supply chain. In their study, Otto and Kotzab (2003) identified Inventory Network Management as a distinct kind of strategic management that is particularly relevant within the context of retailers and suppliers. Alvarado and Kotzab (2001) observed the practice of production network management aims to mitigate the negative effects of duplication by prioritizing core competencies and implementing inter-organizational protocols such as activity-based costing or electronic data interchange. Additionally, the reduction of unnecessary inventory levels is achieved by postponing customizations until the latter stages of the supply chain. In their study, Koh et al. (2007) classified supply chain management practices into several distinct categories. These categories include: close collaboration with suppliers, close collaboration with customers, just-in-time supply, strategic planning of supply chain benchmarking, limited number of suppliers, inventory holding and subcontracting, electronic procurement, outsourcing, and multiple suppliers. Ellram, Tate, and Billington (2007) outlined seven theoretical processes of service supply chains, including information flow, capacity and skill management, demand management, customer relationship management, supplier relationship management, service delivery management, and cash flow. In general, the management practices of supply chains can be categorized into various areas, including procurement management, demand management, customer relationship management, transportation management, warehousing management, supplier relationship management, capacity and resource management, service performance, information and technology management, supply chain finance, and order process management (Chong, et al., 2010). The store network framework comprises of players at the focal level down to the wellbeing office level. As an objects of this review, the inspected around five significant production network the executives



practices of chosen wellbeing establishments in the Tamale Metropolitan area and surveyed their impact on medical care conveyance. These are talked about exhaustively beneath.

### **2.3.2 Procurement Management**

Procurement refers to the process of acquiring goods, services, or works at the most optimal overall cost of ownership. This involves obtaining the desired quantity and quality of items, ensuring timely delivery, sourcing from appropriate locations, and utilizing the appropriate contractual agreements. The primary beneficiaries of procurement are typically corporations or individuals, who seek to obtain goods or services for their immediate benefit or use. In essence, obtainment may be seen as a competency within business management that ensures the identification, acquisition, access, and administration of external resources necessary for an organization to fulfil its fundamental objectives.

In the Ghana Health Service, the Focal Clinical Stores obtains prescriptions for the whole nation in light of collected item usage from the Territorial Clinical Stores and educating clinics. The Local Clinical Stores supply meds to the general population and some of the time, confidential wellbeing offices in the area. Notwithstanding, all offices can secure prescriptions from the confidential drug makers and wholesalers (Adu-Poku et al., 2011). The aim of this study's regional hospitals is always to ensure that patients have access to the medical supplies they require for treatment. To meet this goal, an obtainment plan is frequently figured out toward the start of each and every year. This plan is typically a total of prerequisites created by all client divisions of the medical clinic. The arrangement is verified by the Entity Tender Committee (ETC) and supports it as the acquirement plan for the year. Acquirement is started by reminders from the client offices and these depend on acquisition plans. The interaction relies upon whether the things are being looked for from the RMS or the open market. Where things are from the Territorial Clinical Stores, the



order is supported by the Clinical Administrator and afterward submitted to the store. With open market acquisition, the accompanying key cycles are involved:

- Endorsement is looked for in view of the notice and a solicitation for citation is conveyed.
- Price is taken into consideration when evaluating quotations;
- an evaluation report is created and sent to the facility head;
- a report is presented to the ETC for approval;
- awards are created and purchase orders are issued.

Lack of medication items is a main consideration hindering the smooth conveyance of wellbeing administrations in many regions of the planet, including the created world (Fox et al., 2009). It is a significant proportion of the adequacy of the store network methods in any wellbeing framework. Deficiencies could radiate from a significant number of the parts of the framework, dynamic drug fixing makers, completed item producers, wholesalers, and end-client offices and from controllers of the drug business. The provision of health services becomes more expensive as a result of shortages. This occurs both directly and indirectly on the patient's treatment, as the patient may be required to acquire an alternative, which may be costly, from non-traditional distributors at a higher cost. Following the total hellfire of the Focal Clinical Stores which consumed all clinical supplies esteemed at more than \$80 million, improvement accomplice Worldwide Asset teamed up with the Ghana Wellbeing Administration to execute a structure contracting. The system contracting was to guarantee that all fundamental meds are secured by the Focal Clinical Stores. Resulting to that, all clinical supplies are shipped to SDP by a 3PL to guarantee least clinical stock stays at the clinical stores.

### **2.3.3 Warehousing and Storage Management**

Warehousing is a significant part of each and every store network framework. Simply put, warehousing is the process of storing finished goods until they are sold. Warehousing assumes a significant part in strategies tasks of a firm. The productivity of an association's promoting relies upon the proper choice it takes on warehousing. The Ghana Health Service's vision statement describes warehousing as follows: to guarantee ordinary accessibility of wellbeing items conveyed to wellbeing organizations at reasonable costs, fit for answering the complete product necessity and as a focal point of greatness involving best practices away and dispersion of value, protected and effective wellbeing wares". The Local Clinical Stores (RMS) is the principal stockpiling focuses for clinical supplies of the Ghana Wellbeing Administration. Be that as it may, each Help Conveyance Point (SDP) has stores for capacity and safe keeping of clinical products coming from the Provincial Clinical Stores and Focal Clinical Stores. According to Zaffran et al., the five priority objectives of the Vision 2020 Vaccine Supply and Logistics System Zaffran et al , the introduction of newer vaccines has made it necessary for developing nations to devise strategies and plans to enhance the logistics and supply chain system for vaccines. 2013). Zaffran et al (2013) again express that extra room for antibodies have turned into a test in many nations studied, subsequently Ghana required a greater extra room for its Extended Program on Vaccination (EPI) in 2015 and past attributable to the improvement of fresher immunizations, as the nature of immunizations might be unfavorably impacted on the off chance that legitimate and sufficient storerooms are not given. Inside the Ghana Wellbeing Administration, the warehousing and stockpiling exercises attempted supply chiefs and logisticians mainly incorporate; stores capacity management, Activity Based Costing (ABC), Receipt and Put Away, Pick and Pack, Generation of Pick Lists, and Stock Taking are all included in this package.

### **2.3.4 Inventory Management and Control**

Stock control is the premise of organizing the progression of meds and clinical supplies in the production network. A stock control framework illuminates the administrator what to arrange, when to arrange, the amount to arrange so clients can be served consistently. An effective inventory management system minimizes product spoilage and expiration at all times stages. The establishment of the highest and lowest amounts for medications and other health supplies is a common practice when precise inventory control systems are implemented at all levels. The generally rehearsed intermittent requesting, or constrained requesting stock control framework at the Territorial Clinical Stores and Focal Clinical Stores guarantees that toward the finish of each audit period (quarterly for most RMS and month to month for SDP), coordinated factors staff at those levels survey every single stock level and request to the point of bringing stock levels up to the greatest. Despite the fact that guaranteeing consistency in stock control might be important, each SDP is expected to lay out nearby stock control systems that incorporate a stock status evaluation (estimated in long stretches' of stock) and furthermore to lay out a crisis request moment that a request should be set for certain drugs regardless of whether the finish of the survey time frame has not been reached. Laying out and keeping up with compelling stock records and strategies are the premise of planning the progression of medications in the appropriation framework and the essential security against spillage and wastage. Structures are utilized for demanding and giving medications and wellbeing supplies, for monetary bookkeeping, and for setting up the utilization and stock equilibrium reports essential for acquirement. Key stock exercises inside the Ghana Wellbeing Administration incorporate; Parcel The executives and Following, Issues and Changes, Stock Exchanges (Utilization, Move, Wastage, Quarantine, Reviews).



### **2.3.5 Customer Relationship Management**

Organizations depend on their clientele and hence should possess an understanding of both present and future customer demands, fulfill client requirements, and strive to exceed client expectations. Client Relationship Management (CRM) plays a crucial role in supply chain management (Abdelsalam and Siddig, 2014). According to Abdelsalam and Siddig (2014), the implementation of effective client relationship practices by a company can have a significant impact on the hierarchical outcome in store network management practices and its overall performance. It is suggested that client relationship management should be perceived as a consistent organizational activity that involves the integration of selling, marketing, and service strategies. In essence, the aim is to assess the authentic requirements of the customer via the use of various processes and technologies. This involves coordinating internal product and service development efforts in order to enhance customer satisfaction and loyalty.

Most of the time, the focus of customer relationship management is on how the company can best manage the customer function to meet the ever-changing needs and wants of its customers. It incorporates approaches to overseeing client input, associations with them and further developing client assistance. According to Holmberg (2015), building relationships with customers necessitates employee training, The implementation of managerial assistance systems, fostering internal communication transparency, and active engagement in communication with the outside world. The executives of a corporation might enhance their understanding of customers by comprehending their clients' demands and needs. Bearnon (2014) posits that enhancing customer connections may have a positive impact on demand analytics, hence facilitating effective material, resource, and operational planning. It will likewise prompt outcome in their general production network the executives' endeavors. A firm that keeps areas of strength for a with its clients acquires



a benefit over its opponents by building a boundary to pad them against contest. Client relationship likewise includes brief conveyance items and administrations. Client relationship primarily remembers exercises, for example, imparting data for item trademark to clients, regarding reports for orders with clients during request booking and conveyance times (Flynn and Flynn, 2005).

### **2.3.6 Information Flow Management**

As indicated by Bowersox et al., 2002, data stream distinguishes explicit areas inside a calculated framework that have necessities. Information also aids in the integration of the various components of the supply chain. The transportation needs within each logistical extent vary based on factors such as the quantity of the order, the quantity of supplies, and the critical nature of the transport. The primary reason for data streams the board is to unite these differentials to work on the general execution of the inventory network. Where these various parts contain the real strategies work, data empowers harmonization of arranging and control of regular tasks. Protected to say that, without exact and satisfactory data, the work associated with the strategic framework can be unproductive.

Azevedo et al. (2007), while the calculated framework changes over materials into items, through the production of significant worth for clients, the data and correspondence frameworks convert information into data, to work with administrative direction. Data is an asset to be utilized for dynamic that consequently improves strategic viability, productivity, and adaptability. Companies may, in turn, become more competitive as a result of these factors.

Powerful coordinated operations the board in the undertaking depends to a great extent on the progression of data, that ought to happen as without a hitch and rapidly as could be expected, to furnish chiefs with exhaustive information (Snort and Nowakowska, 2007). The use of PCs, web

and data correspondence frameworks should be visible in essentially activity of any kind in the coordinated operations industry, for example, transportation, warehousing, request handling, materials the board, and acquirement. It can assist organizations to accomplish upper hands by giving clients predominant administrations (Adebambo and Toyin, 2011).

According to a coordinated operations viewpoint, data streams, for example, client orders, charging, the inventory levels and customer information are intricately linked to the execution of distribution channels. There are several methods by which data may be shared and supervised, including traditional methods such as mail or phone communication, as well as more contemporary methods such as the use of sales representatives or the internet. Additionally, electronic information exchange (EDI) has emerged as a modernized approach to facilitate the transfer of data across organizations (Kotler et al., 2005). As per Maurer (2011), the time taken to deal with any client issues, opportune conveyance, functional adaptability and supported quality have become central in effective business today. The utilization of effective communication and information technology is largely responsible for the success of aligning a supply chain to achieve these outcomes. Correspondence between individuals from store network expects that important data is moved from its place of origin to the mark of purpose. Maurer (2011) additionally noticed that the exchange of data involves a proficient progression of data between frameworks, frameworks and individual which is straightforwardly connected with the powerful interoperability between the different elements taking care of the pertinent data.

IT is by and large separated into situating, following, and correspondence innovation foundation. With great correspondence and collaboration along the production network, ICT and LIS empower the mix of functional and data stream, which gives straightforward organizations to providers and clients. As per Zhang et al (2011), inventory network perceivability can build the cooperation

among store network individuals by means of constant information sharing and improve time sensitive conveyance (Iyer et al, 2004). According to Golicic et al. (2002), the availability of sufficient data and improved visibility and communication among different stakeholders in the supply chain enable multiple parties to promptly make informed decisions.

### **2.3.7 Healthcare Delivery**

According to the World Health Organization (WHO), health is defined as the achievement of a condition characterized by physical, mental, emotional, and social well-being, as opposed to mere lack of sickness. This research provides a definition of healthcare delivery as the operational and administrative dimension of healthcare that emphasizes the overall accessibility of medical resources, hence contributing to the delivery of healthcare services of superior quality. The lucidity of the functional definitions gave above drives one to break down the causal connections between the factors (coordinated operations the board practices, data and correspondence innovation and medical services conveyance). The examination region in this manner sees medical care conveyance, how it meets and fulfills clients wanted needs for which reason they visited the wellbeing office. This suggests that, the nature of medical services conveyance impacted the degree of fulfilment that clients got from visiting the wellbeing office. On the other hand, chronic weakness care conveyance will impact the degree of consumer loyalty. This will again deter the client from visiting same wellbeing office sometime later and they will inform others concerning their awful encounters.

### **2.3.8 Health Care System in Ghana**

The arrangement of medical care administrations is critical for the prosperity and thriving of any general public. "the concept of healthcare pertains to the upkeep and enhancement of both physical and mental well-being, with a particular emphasis on the delivery of health care," according to the



Oxford English Dictionary, is the definition of healthcare. Medical care administrations in Ghana are given in essential, optional, and tertiary wellbeing organizations. The essential medical care framework incorporates all establishments (facilities, wellbeing focuses, and clinics) and people whether private, public or customary. A wellbeing place is liable for giving clinical, general wellbeing, and administrations of maternity to the confines of region utilizing a blend of center based, ordinary effort, and mass missions in close cooperation with networks, local area establishments and pioneers, and local area-based wellbeing laborers and wellbeing organizations. The locale medical clinics capabilities as the principal reference focuses in the essential medical services framework. The health centers are standby facilities for the district's health centers and provide clinical (outpatient and inpatient) and maternity services.

Additionally, the local emergency clinic is the subsequent reference level, which goes about as the specialized point of convergence for specific clinical and demonstrative consideration in expansive particular regions like medication, general a medical procedure, pediatrics, and obstetrics and gynecology. The showing medical clinics structure the summit of particular consideration in the country. They are the main preparation and examination establishments and deal undergrad and postgraduate preparation for specialists and other wellbeing experts.

### **2.3.9 Management of Health Services**

Bossert et al., 2000, the GHS and Teaching Hospital Act of 1996 permitted the Ghana Health Service (GHS), an independent state agency, to provide health care and decentralize the health sector. The goal of decentralization was to delegate responsibility for providing public health care to the GHS while simultaneously strengthening the Ministry of Health's role in regulation and policy oversight. By and by in Ghana, wellbeing the executives is decentralized. The Ghana Wellbeing Administration has set up designs, for example, the District Health



Management Teams (DHMTs), Provincial Wellbeing the executives Endlessly groups at the Help's base camp. These designs are helped by wellbeing office supervisory groups. Each of these various levels of management has a budget and a management center that is in charge of creating a clear work plan that is backed by a stated operating budget. The decentralization of the management of healthcare services has been a crucial aspect of Ghana's healthcare sector since the establishment of the District Health Management Teams (DHMTs) in 1978. A significant component of Ghana's decentralization efforts has been the establishment of budget management centers that possess the authority to independently formulate and oversee budgets.

Policy development and execution are being conducted by several entities as an integral component of the health transformation system.

The Service of Wellbeing (MoH) is as yet answerable for strategy plan while the Ghana Wellbeing Administration initiated in 2003 is currently exclusively liable for overseeing medical care administration conveyance. As per Gyimah et al. (2009), the standards supporting the execution of the area wide methodology in Ghana incorporate an understanding between the Public authority of Ghana and wellbeing accomplices on a concurred and facilitated program of work, a coordinated way to deal with subsidizing, and normal execution and assessment game plans. Under this construction, the Service of Wellbeing readies a yearly program of work, which is financed by the public authority of Ghana, inside created assets, and giver reserves. The Service of Wellbeing and its accomplices meet two times per year to audit and settle on area wide execution targets, and survey them where fitting.

### **2.3.10 Number and Distribution of Ministry of Health Facilities**

There is a mix of public and private providers in Ghana's healthcare system, with some religiously affiliated facilities also in the mix. More than 70% of all hospitals in Ghana are now owned and

operated by the public sector, which receives funding from the government. There are now 6,815 health institutions in Ghana, including four teaching hospitals and three mental hospitals, as stated in the 2017 study titled "The Health Sector in Ghana: Facts and Figures." the following: 855 health centers, 328 Midwife and Maternity facilities, 4185 Community-Based Health Planning Services (CHPS), 10 Regional Hospitals, 267 Hospitals, 137 District Hospitals, 1003 Clinics, 34 Polyclinics. There are 579 clinics and hospitals spread out over the North.

### **2.3.11 Overview of the Pharmaceutical Supply Chain in Ghana**

The drug store network is a significant component of a wellbeing framework that includes makers, providers, outsider specialist co-ops, brokers, patients, exercises like planned operations and incorporates viewpoints like data frameworks and money (Jaberidoost et al., 2013), all determined to convey prescriptions and clinical items in the right amount and right quality, with flawless timing and at the right expense for a client in order to enhance all partners. The medication esteem chain is a significant part of any wellbeing framework execution. Compelling administration of illnesses is made conceivable through the foundation of productive obtainment and hearty store network the executives frameworks that guarantee the satisfactory inventory of fundamental medications consistently and at reasonable expenses. A dependable operations organization will likewise empower admittance to fundamental meds while permit the observing of medication use to more readily evaluate the objective medication use and guarantee supportability of the drug inventory network. This is critical to any wellbeing framework as it limits chances of stock outs, expiries, pointless waste and pilferage of meds and clinical items. It likewise guarantees accessibility and admittance to fundamental drugs by the populace consistently as lack of these meds will think twice about quiet consideration, prompting enduring of patients, improvement of microbial opposition strains that are challenging to treat and wind up turning into a general

wellbeing risk, hence a threat to the populace all in all and even passing (Daniel et al., 2012). Drug deficiencies may likewise prompt patients getting the unacceptable quality consideration and deferment of treatment or medical procedure (Kaiser, 2011: Rosoff, 2012). As indicated by Le et al. (2011), it will likewise prompt patients encountering expanded medical services costs, drug blunders, unfavorable results, off base solutions, missed measurements and diminished patient adherence to prescription, which will additionally demolish patient therapy results.

Inventory network the board consequently, is the intentional making of significant worth for partners and clients through the joining of cycles across the store network Rossetti, 2011 It includes association and control of movements of every kind engaged with obtaining, getting, assembling and strategies exercises (Wisner et al., 2012).

In Ghana, the significant test of Public Meds Strategy is guaranteeing an intruded on supply of fundamental prescriptions that are viable and of good quality, genuinely and monetarily open and utilized judiciously. To achieve this goal, Ghana set up public fundamental drugs supply frameworks, which comprises of a Focal Clinical Store and dispersion offices from the vital to provincial, locale and office levels.

The public production network in Ghana has over the course of the last years gone through changes with a few models proposed, tried or potentially attempted to characterize best practices and to refine the utilitarian associations with different divisions inside the wellbeing area. All in all there has been consistency of training the nation over with a couple of limited frameworks set up in a settings because of impossible to miss conditions. These have been the exemption as opposed to the standard. In the ongoing act of supporting medical services conveyance through a National health Insurance Scheme (NHIS) (or needs to develop) to have the option to adjust to the new



worldview. The general standard and ideal has been that the public store network ought to be "productive, client centered, and monetarily reasonable.

The implementation of the Public Obtainment Act, Act 663 (2003) has had various impacts on the public retail sector. The act of liberation, as shown by the drive in question, presents a set of difficulties that, if well managed, may lead to the development and implementation of effective acquisition and distribution practices. The equitable practices, ethical standards, accountability, and efficiency that are implemented within the supply chain should ultimately result in a deviation that provides a "value for money" outcome, from which a benefit could be the establishment of an enabling environment for the supply chain to thrive and expand. Regrettably, there are inadequacies within the stockpile system that result in limited availability and high costs of essential medications.

The Ghanaian healthcare sector operates on a three-tier structure for the management of healthcare services and supply. According to Adusei and Awunyo-Vitor (2015), the Central Medical Stores (CMS), Regional Medical Stores (RMS), and Administration Conveyance Focuses (SDP) are an integral part of the store network pipeline, along with the transportation network. The Focal Clinical Stores, a division of the Procurement and Supply Directorate of the Ministry of Health, is responsible for the acquisition, storage, and distribution of all goods procured by the Ministry of Health. At lower levels, supplies are obtained from the Focal Clinical Stores via the "pull" or "request" paradigm (Toku, 2015). In 2012, the Service of Wellbeing fostered a Production network End-all strategy which focused on basically carrying a productivity to the administration of wellbeing items the nation over. The arrangement additionally pointed toward further developing accessibility of clinical supplies through superior capacity to gauge functional interest, opportune obtaining, decreased regulatory time and expanded administration productivity, among others.

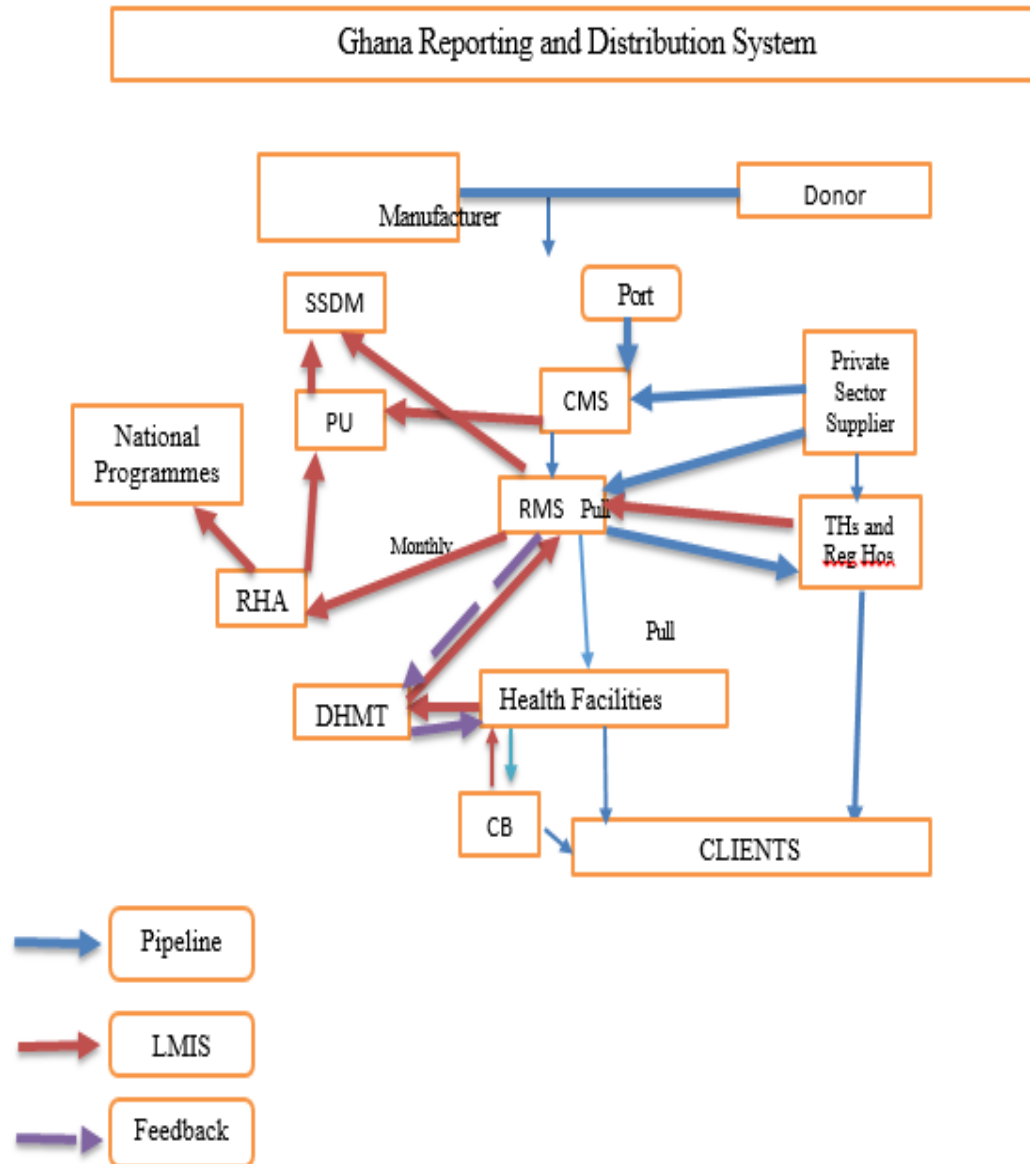


As of now, the Health Ministry of Ghana (MoH) in organization with the US Office for Worldwide Turn of events (USAID) and the Worldwide Asset has sent off the Ghana Coordinated Planned Operations. The executives Data Framework (GhiLMIS) to further develop Ghana's wellbeing production network. The GhiLMIS by and by typifies all operations and inventory network exercises of the Ghana Wellbeing Administration. The new data framework is a web based global positioning framework that gathers and investigations information to empower government to decrease squander coming about because of lapsed wares recognize fake items and guarantee that quality products are accessible to wellbeing offices. The GhiLMIS is a cross country end deceivability drive that empowers chiefs at all levels to pursue educated and opportune choices, guarantees information honesty, low stock tasks costs, increment the executives efficiencies, exact measurement and request arranging.

The execution of the GhiLMIS is one of the new key change drives set out upon by the Service of Wellbeing with help from the Worldwide Asset to battle Tuberculosis, Helps and Jungle fever, and furthermore to guarantee product security which remembers getting the right medications and supplies for great shape at whatever point they are required, reinforcing wellbeing framework and further developing administration direction. The GhiLMIS once it is completely functional, would likewise empower wellbeing laborers work with suitable wanting to guarantee a consistent stockpile of life-saving meds for clients and give constant data to directors across all levels to follow the accessibility of all wellbeing products. It is the desire for all partners that the GhiLMIS would aid quality medical care conveyance on account of its productivity in clinical stock, as it would guarantee that prescriptions are made accessible in the right amounts, at the perfect locations, and with flawless timing.

On acquisition of wellbeing wares, drugs are as yet being obtained by the Central Medical Stores (CMS) through global cutthroat offering (ICB), Open Competitive Tendering (OPC) as well as some other acquisition strategy which is suitable from both worldwide and neighborhood providers and producers. The Regional Medical Stores (RMS) and the showing emergency clinics are supposed to secure medications through the Focal Clinical Stores and from the nearby confidential area. All wellbeing Administration Conveyance Focuses are thus expected to get from the Provincial Clinical Stores in their particular local stores. Despite the fact that it is the approach of the Service of Wellbeing for offices to get through the public framework, besides in instances of inaccessibility, studies have shown that, most wellbeing offices across various levels actually buy their clinical supplies from the confidential area.

With the GhiLMIS set up by and by, all regions clinical stores and SDP obtain from the RMS no sweat, and just get from the neighborhood private area in cases where clinical supplies are inaccessible at the RMS. The educating and provincial emergency clinics and the more than 6,815 SDP are provided by a RMS, DMS and in many cases secure medications through the neighborhood private area. In any case, transportation framework for dissemination of fundamental medications is one key store network action which the GhiLMIS neglects to address satisfactorily. The figure on the following page is a construction of the drug and wellbeing supplies coordinated factors framework as upheld by Gyimah et al.



**Figure 2.1: Structure of the Pharmaceutical and Health Supplies Logistics System**

Source: Gyimah et al (2009)

## **2.4 Theoretical Review**

As per Mentzer (2008), a decent examination is grounded in principle). Hypothesis is basic to the advancement of any field of examination. In order for an area of inquiry to go beyond the pre-paradigmatic phase and attain the status of a mature discipline, it must undergo certain developments and be recognized as an established field of study, it should utilize and foster hypothesis (Kuhn, 1962). The development of a systemized structure that is both capable of explaining and predicting a phenomenon necessitates theory in order to advance scientific comprehension (Hunt, 1991). From writing looked into, two key speculations in particular the exchange cost financial matters (TCE) hypothesis and asset based view (RBV) hypothesis are incorporated to help and make sense of the review.

As per Mentzer (2008), a decent examination is grounded in principle). Hypothesis is basic to the advancement of any field of examination. For a discipline to advance past the pre-paradigmatic stage and be viewed as an experienced discipline, it should utilize and foster hypothesis (Kuhn, 1962). The development of a systemized structure that is both capable of explaining and predicting a phenomenon necessitates theory in order to advance scientific comprehension (Hunt, 1991). From writing audited, two key speculations to be specific the Frameworks hypothesis, Possibility hypothesis and asset-based view (RBV) hypothesis are incorporated to help and make sense of the review.

### **2.4.1 Systems Theory**

According to Martinelli (2001), this theory posits that an event is seen holistically rather than as a constituent of its subsystems. According to Steele (2003), a framework consists of sub frameworks that exhibit interrelationships and mutual dependencies, ultimately contributing to the equilibrium



of a larger framework. The focus is directed towards the interplay of subsystems in order to facilitate the identification of an element's correlation, functioning, and outcomes. It additionally sees the association as reliant upon the climate it works in which includes different gatherings which incorporate specialists, investors and different elements past the association control (Artisan, 2007). The idea of systems integration incorporates several aspects inside production networks, which then shape a broader system for companies within the network (Fowler, 2000). It also aids in revealing the extent of interdependence between components of the system and enhancing knowledge of the dynamics of the supply chain, hence improving the planning, implementation, and collaboration of manufacturing company activities.

#### **2.4.2 Psychological Contract Theory**

The hypothesis gives a comprehension of how the reconciliation of the production network is characterized by long haul affiliations like vital associations (Menon, 2012). The theory is built on trust between players in the supply chain that is reciprocated. Like pharmaceutical suppliers and hospitals, long-term relationships are marked by mutual dependence, which can lead to gains or success for both parties if well managed.

#### **2.4.3 Resource Dependency Theory**

This hypothesis was at first proposed by Pfeffer and Salancik in 1978. The hypothesis expresses that association's change and must likewise found a sense of peace with their outside climate to get assets they need to support themselves. Adams et al., 2014 utilized this hypothesis to investigate production network partnerships. In this hypothesis entertainers lacking assets go into relationship with those with the assets to set the assets that they need up to get by. This is caused

by the diverse distribution of capabilities and resources among various organizations, necessitating the formation of connections in order to acquire essential resources (Kim & Choi, 2015).

#### **2.4.4 Contingency Theory**

The hypothesis posits that different configurations may exhibit substantial outcomes under diverse situations (Antal, 2010). Instead of adhering to conventional administrative norms, the hypothesis aims to demonstrate that altered circumstances need distinct organizational structures and frameworks (Baranyi, 2001). Associations have limitations imposed by several factors, such as the size of the company, the prevailing atmosphere, and the level of information technology use. These options are designed to promote the specific designs and components of an organization. Robin and Barwell (2007) expressed that to work on the functional limit with regards to delivering inventive items, an organization should change its hierarchical elements and coordinate its critical variables to frame a vigorous and adaptable inventory network (Lee 2001).

#### **2.4.5 Resource Based View (RBV) Theory**

As indicated by Beam et al (2004), there is developing measure of observational writing that upholds the use of Resource Based-View (RBV) hypothesis on the general execution of an association. The RBV hypothesis looks at the effect of association assets and capacities on upper hand that prompts by and large authoritative execution. In view of Beam et al's. (2004) study, the assets and abilities that are not molded into supporting exercises and business cycles won't emphatically affect a hierarchical exhibition.

The Resource-Based View (RBV) theory identifies the assets held by a corporation, which are characterized by their significance, rarity, imitability, and lack of substitutes, as the primary source of the company's sustainable competitive advantage. Several theoretical advancements have been

made to enhance the hypothesis, such as the information-based viewpoint on the company (Award, 1996), the concept of core competence (Prahalad and Hamel, 1990), the capabilities theory (Helfat and Peteraf, 2003), and the dynamic capabilities view (Teece et al., 1997). The Resource-Based View (RBV) hypothesis examines the impact of an association's assets and capabilities on its competitive advantage, which in turn influences its overall organizational performance. The premise of the asset-based view (RBV) argues that companies own a range of assets, some of which enable them to attain a competitive advantage, and a subset of these assets contribute to superior long-term performance. Assets that possess significance and captivation have the potential to stimulate the generation of competitive advantage, hence leading to superior performance. The aforementioned advantage may be sustained over extended periods of time, contingent upon the firm's ability to mitigate the risks associated with asset imitation, transfer, or substitution (Barney, 1991). The hypothesis posits that different configurations may exhibit important outcomes under diverse situations (Antal, 2010). Instead of adhering to conventional administrative norms, the hypothesis aims to demonstrate that altered circumstances need distinct organizational structures and frameworks (Baranyi, 2001). Associations are subject to several constraints, such as the size of the company, the prevailing environment, and the level of information technology use. These possibilities are aimed at promoting the specific designs and components of an organization. Company's assets are those unmistakable and elusive resources that tie semi forever to the firm at a given time. The unmistakable assets incorporate talented staff, proficient techniques, apparatus, and capital, etc. The elusive assets incorporate among others innovative know-hows, exchange contacts, and restrictive advancements. Past these three speculations, different hypotheses utilized in the investigations of planned operations and production network the executives incorporate the Doorman's structure, exchange cost financial



matters, and asset reliance hypothesis. The specific capability of a retail network may play a crucial role in facilitating the creation of utilities related to time, location, quantity, framework, and property inside and between enterprises and individuals via effective management, framework the executives and asset the board determined to make items and administrations that eventually fulfill the client through the achievement of significant worth. From the above conversation, the concentrate subsequently embraced the RBV as the basic hypothesis.

## **2.5 Empirical Review**

A review of related writing provides a justification for any investigation. Following are the available related assessments embraced in the space of creation network the board. The stock organization composing has seen both sensible and accurate responsibilities. Creating multifaceted nature in the current store network undertakings and growing earnestness has made firms to look for key execution markers. In their study, Lai et al. (2002) examined the efficacy of coordinated activities in the transportation sector and endeavored to build an estimate tool for a comparable context. The Supply Chain Operations Reference (SCOR) model was used as the foundational framework for the examination. Subsequently, he developed a mechanism to enhance the efficiency of the Supply Chain Performance (SCP) via transportation coordination. In their study, Chong et al. (2011) developed an assessment tool to ascertain the effects of supply chain management practices, operational performance, and innovation on the performance of manufacturing and service organizations. The findings indicated that supply chain management (SCM) methods had a significant impact on organizational performance when compared to a comprehensive performance model. The disclosed information also demonstrated that organizations used supply chain management (SCM) methods in their operations, hence



confirming the widespread application of SCM principles across the industry. Srinivasan et al. (2011) conducted a study to investigate the correlation between supplier-buyer collaboration, quality, and supply chain performance in the context of minimal demand, supply, and environmental unpredictability. The disclosed information demonstrates a favorable correlation. The study also indicated that this positive correlation is primarily driven by demand-side betting and general vulnerability, underscoring the importance for supply chain managers to cultivate strong relationships with their suppliers based on mutual trust and transparency. This approach will help mitigate demand-side betting and enhance preparedness for potential disruptions arising from the environment.

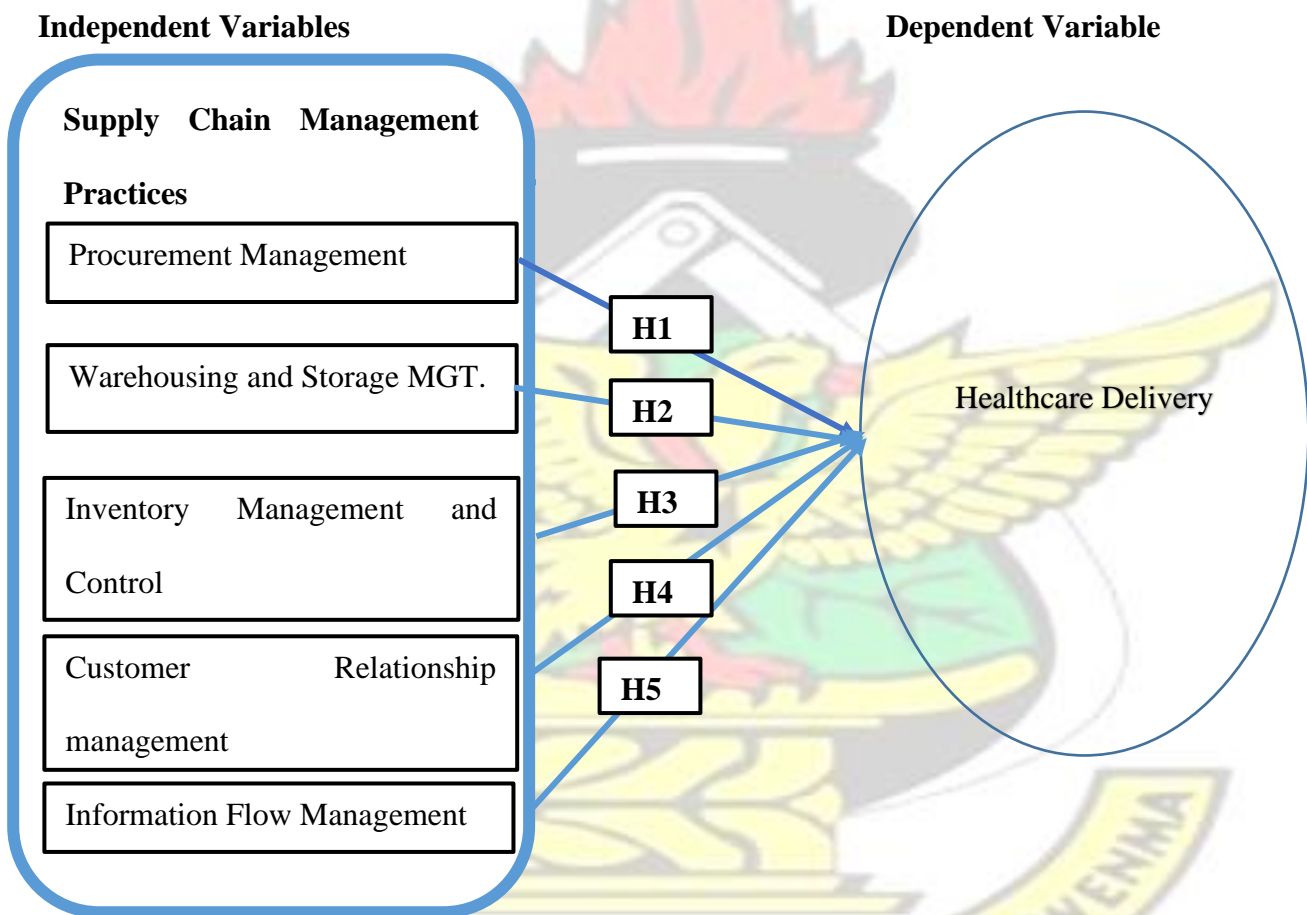
The composing review above has shown different methodologies the board hypotheses that have been used in before assessments. Wiger, 2018 study, which zeroed in on coordinated factors the board operationalization in a medical services setting, is the nearest observational concentrate in the wellbeing area. The ongoing survey looked at the inspirations to be sure about care having the choice to be conveyed with more restricted lead times, at lower cost, and with higher assistance to patients through store network the chiefs' practices. Further, the assessment in this composition pushed on the meaning of creation network the chiefs' research in a clinical consideration setting and empowers move of data on capable creation network the board to this area.

### **2.5.1 Conceptual Framework**

Supply chain management practices served as the independent variable in this study, and healthcare delivery served as the dependent variable. Medical services conveyance was estimated by production network the executives' practices, for example, obtainment, warehousing and

stockpiling, stock administration and control, client relationship the board and data stream the board.

The format of the review was derived from the critical concepts and literature that were examined. The data was analysed using the created conceptual framework. The primary objective of this study was to examine the effects of supply chain management practices on healthcare delivery. The following section presents an outline of the suggested analytical framework for the review.



**Figure 2.2: Theoretical Model of the Study**

**Source: Researcher's Construct (2021)**

Based on the conceptual structure, the provision of healthcare is influenced by supply chain management methods, which are regarded as the dependent variable. The review aimed to elucidate the extent of dependence. The analyst holds the belief that there has been inadequate research conducted to assess the correlation between supply chain management techniques and healthcare delivery.

Figure 2.2 illustrates the theoretical framework that has been put out in this research, drawing upon the preceding discussion. The present study establishes a correlation between supply chain management practice and healthcare delivery via a systematic analysis. The conceptual model posits a strong interconnection between medical procedures and the management of supply chains methods, resulting in a beneficial impact on healthcare delivery. The assertion is supported by the research conducted by Fernandes et al. (2018) and Yadav (2015), wherein they established that the implementation of an efficient logistics management system yields extensive advantages for enterprises, such as mitigating stock-outs, minimizing inventory levels, and enhancing customer service effectiveness. The following section below presents the intricacies of the conjectures made throughout the review.

## **2.6 Supply Chain Management Practices and Healthcare Delivery**

In order to evaluate the correlation between methods for managing supply chains and the provision of healthcare, a conceptual structure has been expounded upon, including the following five assumptions. The following section provides the theoretical foundation for each hypothesis.

### **2.6.1 Relationship Between Procurement Management and Healthcare Delivery**

The framework for medication acquisition has a crucial role in determining both the accessibility and overall prices of pharmaceuticals. In the majority of developing countries, expenditures on pharmaceutical purchases constitute the largest healthcare expenditure behind educational expenses. An effective procurement procedure ensures the availability of appropriate pharmaceuticals in appropriate quantities, at reasonable prices, and in accordance with recognized quality standards. A country has the ability to acquire drugs via several means, such as purchasing them, receiving them as gifts, or producing them within its own vicinity. According to Mustaffa and Potter (2009), the acquisition activities associated with pharmaceutical products have the potential to impact the quality of care provided to patients. The argument posits that effective management of procurement capabilities may ensure the achievement of both service level and cost objectives. Furthermore, Kumar et al. (2008) posited that the use of acquisition practices has an impact on stock levels and, therefore, on the quality of service provided to customers or patients in a hospital setting. Undoubtedly, there are several aspects of procurement that have both negative and positive impacts on healthcare delivery. Based on the above dialogue, the following conjecture is put forth: *H1: procurement management and healthcare delivery have a positive relationship.*

### **2.6.2 Relationship Between Warehousing and Storage and Healthcare Delivery**

Warehousing is the putting away of completed merchandise until they are sold. It assumes an essential part in coordinated factors tasks of each and every organization. The right decision regarding warehousing is crucial to an organization's marketing effectiveness. Legitimate natural controls like appropriate temperature, light, and humidity, states of disinfection, ventilation and isolation should be kept up with any place medications and supplies are put away. The job of stock



administration is to keep up with the ideal stock degree of specific items or things. The product, the customer, and the procedure that makes the product available need to be the foundation for the inventory management and planning systems. A viable and committed extra room gives the right climate to the capacity of prescriptions and wares and helps the proficient progression of provisions. As per Frazelle (2002), warehousing is an exceptionally critical piece of contemporary store network and has extraordinary effect on the achievement or in any case of current organizations because of the job they play in these organizations. As a result of worldwide contest among associations, combined with the presentation of production network speculations, warehousing has turned into a critical action in the store network for organizations to overwhelm to beat their rivals in functional regions, for example, cost, lead-times and client support (De Koster, 1998). Besides, as per Faber (2012), warehousing has an exceptionally huge impact between elements in a store network and thus lessens the expense of the production network too the administrations. Accordingly, this study proposed the accompanying as speculation two;

*H2: warehousing and storage management and healthcare delivery have a positive relationship.*

### **2.6.3 Relationship Between Inventory Management and Control and Healthcare Delivery**

A reasonable stock control framework, great and secure storage spaces, a legitimate measurement and determination process further develops medication accessibility and diminish deterioration. Efficient transmission from multiple storage areas necessitates the use of effective inventory management practices across all tiers of the supply chain. In a study conducted by Eroglu and Hofer (2011), it was shown that there exists a favorable correlation between stock management and performance. The argument posits that stock leanness is the most effective approach to stock management. The concept of lean production regards stock as a kind of waste that should be

minimized and has been closely associated with effective inventory management. As indicated by Eroglu and Hofer (2011), associations that are less fatty than the business normal for the most part see positive re-visitations of leanness. From the above conversation, this study proposed the accompanying as another hypothesis;

*H3: inventory management and control and healthcare delivery have a positive relationship.*

#### **2.6.4 Relationship Between Customer Relationship Management and Healthcare Delivery**

Customer Relationship Management (CRM) is a significant part of inventory network the board. A company's client relationship practices can create the hierarchical progress in store network the executives rehearses endeavors as well as its presentation thinking about that client relationship the board should be visible as the steady authoritative action underutilization of coordinated selling, promoting and administration technique. According to the findings of Bearnon (2014), enhancing customer connections has the potential to enhance demand analytics, hence facilitating the effective allocation of supplies, assets, and operational planning. It will likewise prompt outcome in their general production network the executives' endeavors. A firm that keeps areas of strength for its clients acquires a benefit over its opponents by building a boundary to pad them against contest.

Therefore, this study proposed the following as hypothesis two;

*H4: customer relationship management and operational performance have a positive relationship.*

#### **2.6.5 Relationship Between Information Flow Management and Healthcare Delivery**

As indicated by Bowersox et al. (2002), data stream distinguishes explicit areas inside a calculated framework that have necessities. Data additionally coordinates generally working regions inside individual strategies regions, different development necessities exist regarding size of request,

accessibility of stock, and criticalness of development. Information flow management's primary goal is to reconcile these disparities in order to boost supply chain performance as a whole. As per Azevedo et al. (2007), while the calculated framework changes over materials into items, through the production of significant worth for clients, the data and correspondence frameworks convert information into data, to work with administrative direction. Data is an asset to be utilized for dynamic that consequently improves strategic viability, productivity, and adaptability. Companies may, in turn, become more competitive as a result of these factors.

Powerful coordinated factors the executives in an association depends basically on the progression of data, that ought to happen as without a hitch and rapidly as could really be expected, to furnish directors with complete information (Snort and Nowakowska, 2007). The use of PCs, web and data correspondence frameworks should be visible in essentially activity of any kind in the coordinated operations industry, for example, transportation, warehousing, request handling, materials the board, and acquirement. It can assist organizations to accomplish upper hands by giving clients predominant administrations (Adebambo and Toyin, 2011). The enhancement of coordinating among the participants in a chain of custody is contingent upon the caliber of information communicated (Vosooghidizaji et al., 2019; Marinagi et al., 2015).

From a perspective that emphasizes coordinated activities, several data streams, such as client orders, billing, inventory levels, and even information about clients, are intricately linked to channel performance. The computerized exchange of data between organizations known as electronic data interchange (EDI) is one method by which information can be shared and managed between organizations (Kotler et al., 2005). Thusly, the review proposes the accompanying as a hypothesis:

*H5: information flow management and healthcare delivery have a positive relationship.*



## CHAPTER THREE

### RESEARCH METHODOLOGY AND ORGANIZATIONAL PROFILE

#### 3.1 Introduction

The primary objective of this chapter is to provide a comprehensive analysis of the research methods used in the present study. The chapter discussed the research design used for the investigation of the study issue. The study primarily focused on the demographic composition and the specific attributes of the selected sample. In addition, the methodology used for data collection, including the process and measurement device, was thoroughly examined. Additionally, the statistical methods utilized for data acquisition, analysis, and presentation were also addressed. Finally, the chapter also contains the profile of the case institutions, i.e. the Northern Regional Government Hospital and the Tamale West Hospital.

#### 3.2 Research Design

A research design is defined as a comprehensive framework outlining the researcher's intended method to addressing the research questions. According to Saunders et al. (2007) and Cooper and Schindler (2006), the exploration configuration is a visual representation used for the purpose of selecting, measuring, and analyzing data. There are three main types of examination designs, namely descriptive, exploratory, and analytical. This review adopts examination strategies that are enlightening and instructive. The analyst used a systematic research design in conjunction with visual representations to comprehend various points of interest. Furthermore, the use of an illustrative plan was employed to elucidate the correlation between supply chain management and healthcare delivery. Finally, the informative examination strategy, also known as the casual exploration configuration, aims to establish connections between various aspects. This strategy is



used to establish links between two or more aspects of interest. An illustrative analysis is conducted to explore the interconnections between events and the importance of these connections by identifying patterns associated with a certain phenomenon, as well as the relationships that define this phenomenon. The selection of an explanatory design was made due to the absence of definitive data pertaining to the correlation between supply chain management techniques and the delivery of healthcare services by healthcare institutions.

### **3.3 Population of the Study**

As stated by Burns and Grove (1993), the term "population" encompasses any entities (such as humans, objects, and events) that satisfy the requirements for inclusion in a research sample. The population under investigation include all the individuals or entities who are eligible to participate in the research. The individuals and/or instances that the researcher aims to generalize about are as follows. The population of this research is therefore the procurement officers, supply chain practitioners and logisticians (100 staff in total) of the Northern Regional Hospital, Tamale West Hospital and staff in other health institutions within the middle and higher management level of all hospitals surveyed.

### **3.4 Sample Size and Sampling Technique**

An example is alluded to as the rate or part of the populace that responds to the examination question (Neuman, 2007). One might say that the purposes behind endeavor overviews is to empower the analyst to sum up from the example taken from the review populace. It is vital to add that, how respondents are chosen for a review is very basic for the achievement or in any case of the review. The review embraced the advantageous inspecting procedure to gather field information from staff considered fit to give the right data to the review. This inspecting strategy

permitted the specialist to advantageously gather information from inventory network experts who were accessible and available.

The size of test for a review should nor be exorbitantly huge, nor excessively little, yet rather an ideal one. As per Kothari (2004), an ideal example is one which satisfies the prerequisites of effectiveness, representativeness, unwavering quality and adaptability. The example size of this study was one hundred (100) key coordinated factors and production network staff inside the center and higher administration level of all wellbeing offices overviewed. The selection of a size was justified by the need to guarantee the accuracy of the data. The review pointed toward studying the Northern Provincial Medical clinic, the Tamale West Medical clinic and other wellbeing offices situated inside the Tamale metropolitan region. With the sporadic number of planned operations and store network the board staff in the wellbeing offices as relates in the Ghana wellbeing administration, all strategies staff from the wellbeing offices overviewed were regulated with the poll. This was to ensure the quality and accuracy of the data.

### **3.5 Data Collection Method**

As per Pizam (1999), there are three different ways of gathering information; observation and direct communication, such as through questionnaires and interviews. Direct communication was one of the two categories used by the researcher (primary data). With the immediate correspondence, information were assembled through a 5-point Likert Scale poll. As indicated by Subedi (2016), Likert-type data is often used in assessing attitudes, providing a range of responses to a specific question or statement. The field was originally presented to a method for taking measurements of attitudes in a 1932 publication. The things on the survey that was utilized to gauge the builds were painstakingly adjusted from existing writing.

An early on letter was taken from the KNUST Division of Store network and Data Frameworks to help the specialist in the information assortment process. The participants were provided with information on the objectives of the study and the methodology that would be used for conducting the review. The analyst exercised control over the polls via the use of drop and pick tactics. Similarly, they facilitated the establishment of appropriate and legitimate responses to sensitive matters. The surveys provided the expert with an opportunity to collect data that was not readily available, so enhancing the quality of replies and improving the potential outcomes of the study. Achieving optimal collaboration and ensuring accurate data collection for a research project has always been a significant challenge, particularly with regards to obtaining error-free responses and maximizing the number of returned and completed questionnaires. In order to mitigate this issue, the analyst effectively supervised the polling process among the personnel of the evaluated emergency clinic.

### **3.6 Data Analysis Method**

The analysis and interpretation of data are essential elements in every research endeavor. The characterization of the scientific process is essential for each research methodology (Amaratunga et al., 2002). According to Sullivan (2001), the analysis of material may be both challenging and intriguing in the context of research. Data analysis may be defined as the process of interpreting and comprehending the significance of the data that has been collected in a research study. The purpose of analyzing the data obtained from the test questions is to consolidate the material in order to address both the research questions posed and the research objectives. The raw data was collected using the Statistical Package for the Social Sciences (SPSS), and afterwards, descriptive and inferential statistics such as frequency distribution tables and percentages were used to display



and evaluate the data. The analyst used these procedures since they provided enhanced elucidation of the collected data in a concise manner. Various metrics were used to represent different attributes. The statistical measures of mean and standard deviation were used to characterize various dimensions of supply chain management methods, while frequencies and percentages were utilized to examine overall information pertaining to the respondents. Inferential factual investigation, for example, connection and different straight relapse examination were utilized to decide the connection between the autonomous variable (store network the executives practices) and ward variable (medical services conveyance); what's more, to test the impact of supply the executives rehearses on medical care conveyance individually. A relapse investigation was likewise finished for the different factors. The primary objective of regression examination is to predict or estimate the average or median value of a variable that is dependent, which is a variable of interest, based on the known or fixed values of one or more explanatory variables. This estimation or prediction is conducted in order to gain insights into the relationship between the variables under consideration.

The numerous relapse investigation was utilized to decide the connection between production networks the board practices and medical care conveyance. The review takes the five determinant factors as free factors and medical care conveyance as the reliant variable in the relapse model. The review utilized the accompanying various relapse model to lay out the factual meaning of the free factors on the reliant variable.

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \Sigma$$

Where; Y = Healthcare delivery

X1 = Procurement Management



X2 = Warehouse and Storage Management

X3 = Inventory Management and Control

X4 = Customer Relationship Management

X5 = Information flow management

In the presented model,  $\beta_0$  is denoted as the constant term, while  $\beta_1$  to  $\beta_4$  represent the regression coefficients. These coefficients signify the average alteration in the dependent variable when the independent variable experiences a unitary change, while keeping the other independent variables in the model unchanged. Additionally, the symbol  $\Sigma$  represents the error term, which encompasses the unaccounted variability within the model.

### **3.7 Reliability and Validity Tests**

**Reliability:** The degree to which the methods of data collection or analysis yield consistent results. Unwavering quality shows the consistency of measures, that is to say, the capacity of an estimation instrument to gauge exactly the same thing at whatever point it is utilized. There are three significant variables engaged with estimating dependability, the first being steadiness, which involves finding out if an action is steady over the long run so specialists can be certain that results connecting with the action for an example of respondents won't change. The second connects with inward unwavering quality, which looks to gauge whether the markers that make up the scale or file are reliable. As per Singh, (2007) between onlooker consistency is another key component, which might emerge because of the contribution of more than one spectator in exercises like recording of perception or interpretation of information into classes.

Validity then again surveys whether a proportion of an idea truly gauges that idea, that is to say, the degree to which the idea estimates what it was intended to quantify. Hence, for an exploration study to be exact, it is basic that the discoveries are both solid and legitimate (Singh, 2007). To work on the nature of the review, a few stages were taken. On account of inquiries of legitimacy, thought was given to the writing audit of the review. The vast majority of the actions for the separate develops were adjusted from past investigations. The Likert scale was used to measure the items to reduce the likelihood of bias in the method. Likewise, the created instrument was painstakingly investigated with the assistance of the manager of the review. To really take a look at the legitimacy of the instrument prior to assessing the proposed model, an unwavering quality test was directed to figure out the Cronbach alpha worth of the things used to quantify every one of the develops. Hair and co. 2005) expressed that the Cronbach alpha incentive for an unwavering quality test should be 0.7 or more to affirm the legitimacy of the things in the develops. George and Mallery (2003) likewise expressed that for polls with Likert scale, it is considered dependable assuming the measurable Alpha is equivalent to or more noteworthy than half. Consequently, every one of the things were properly tried and the untrustworthy things were erased from the develops.

### **3.8 Ethical Considerations of the Study**

Key to the successful conduct of any research work is the respect of ethical concerns of the study population within which the study is being undertaken. To ensure that the study did not breach any of such ethical issues of the Hospital, the following measures were taken:

The research questions were structured such that, participants in the research suffered no inconvenience and embarrassment in their resolve to help in the findings as reported in this study.

The staff and management of the health institution were guaranteed of their utmost confidentiality

with regards to information they provided. Moreover, those who took part in the study did it under no duress but did so in their own volition. Their consent was sought throughout the survey period. To the best of the researcher's ability, optimum circumspection and objectivity was exercised throughout the study period.

### **3.8 Profile of the Study Institution**

This research assessed the effect of management practices of supply chain on the healthcare delivery of health institutions in Ghana in the Tamale Metropolitan district. The facilities surveyed include the Northern Regional Hospital and Tamale West Government hospitals as well as Polyclinics, Public Health Centers, Clinics, and CHPS zones. Brief profile of the two main health facilities which the study focused on is provided.

### **3.9 Profile of the Northern Regional Hospital**

The Northern Regional Hospital, sometimes referred to as the Tamale Central Hospital, was founded in 1928 and remained in operation until its closure in 1974. The reopening of the establishment occurred in 2005, marking a span of 31 years since its closure. Upon its return, the structure bore a striking resemblance to what had been described on the board. The Ghana Health Service Directorate and the regional headquarters of the Public Works Department are located in close proximity to Tamale Central Hospital, situated inside the Central Business District of Tamale. The hospital is situated next to the Ghana Health Service Directorate. The hospital offers a range of services including short-term patient care, crisis intervention, dental services, family planning, pediatrics, laboratory testing, X-ray imaging, surgical procedures, internal medicine, and obstetrics and gynecology. The medical clinic experiences an annual short-term participation of 65,000 individuals and 10,500 affirmations, necessitating the acquisition of more labor and



resources to facilitate the delivery of high-quality medical services. Based on the findings of the Ghana Population Census 2000, the Metropolis now accommodates a projected populace of 293,879 individuals, with a notable surge in population growth. This escalating demographic trend has engendered several challenges pertaining to sanitation, environmental concerns, and socio-economic factors within the region.

The Tamale Central Hospital employs around 138 individuals, including 70 nurses, 3 physicians, 5 medical assistants, and 60 paramedical staff members. The Tamale Focal Medical clinic operates as a Regional Medical clinic and serves as a central hub for many healthcare facilities in the Northern Region. The clinic maintains a diverse inventory of pharmaceuticals, non-pharmaceutical consumables, and other items sourced from either the Provincial Clinical Stores or the local market. The organizational structure of the medical clinic's drug shop operates autonomously from non-pharmaceutical establishments. Following this, the concept of a central shop and smaller stores that operate inside certain departments/wards exist in the Clinic, focusing on direct customer connection and delivery. The Tamale Focal Emergency clinic is equipped with a Substance Delicate Advisory Panel responsible for overseeing the procurement process for all sorts of purchases made inside the facility. Moreover, there are well-defined norms for procuring items from these establishments. The most deplorable aspects of the hospital are inadequate designs, lack of clinical equipment, and unkempt surroundings with dusty streets in the yard.

### **3.10 Profile of the Tamale West Government Hospital**

The Tamale West Hospital was established in April 1998, initially functioning as a polyclinic. The crisis involving a nearby medical facility was concurrently escalated. Currently, it serves as a referral clinic for the health centers in the Tamale Metro sub-region and provides support to district

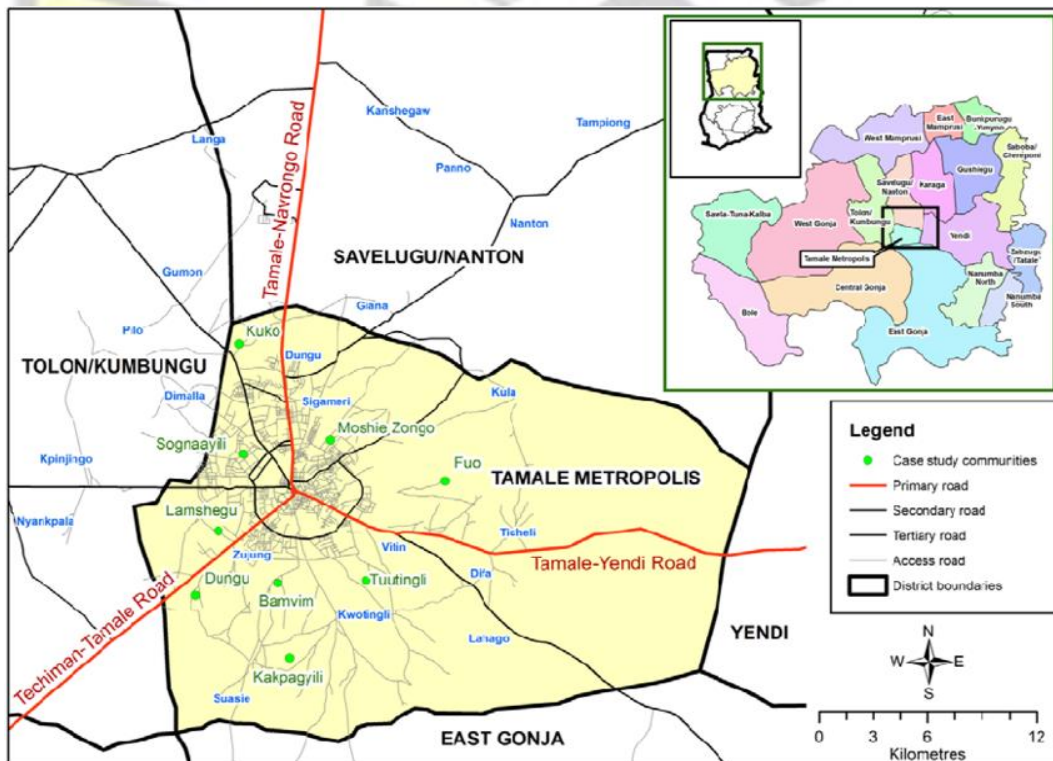


hospitals. The medical center provides round-the-clock services including several areas such as short-term patient care, crisis intervention, dental services, family planning, paediatrics, laboratory testing, radiography, surgical procedures, internal medicine, and obstetrics and gynaecology. The hospitals are supplied with a range of drug- and non-drug-related consumables and other things either via the Regional Medical Stores or the open market. In the vast majority of instances, the organizational structure of the hospital's pharmacy operates autonomously from non-pharmacy entities. Following this, the concept of a central shop and smaller satellite stores that operate inside certain departments/wards are present in the Clinic, with the primary purpose of facilitating direct customer connection and delivery. The Tamale West Emergency clinic is equipped with a Substance Delicate Board responsible for overseeing the procurement process of all purchases made inside the facility. Moreover, there are well-defined norms for procuring items from these establishments.

### **3.11 Study Location**

The evaluation was conducted at Tamale, a municipality situated in the Northern Region of Ghana. The location of this area is centrally positioned inside the Locale, and it shares boundaries with the Sagnarigu Civil to the west and north, Mion Area to the east, East Gonja to the south, and Focal Gonja to the southwest. The city has a population of 248,914 individuals, consisting of 125,033 female inhabitants and 123,881 male residents. The average family size in the urban area is 5.2 individuals. According to the findings of the Ghana Statistical Service in 2013 (GSS, 2013a, 2013b, 2013c), the Tamale Metropolitan District (TAMA) has been identified as the second most rapidly expanding city in Ghana, behind Kumasi.

Tamale is home to both private and public healthcare facilities, catering to the needs of the local population in terms of general well-being services. The healthcare facilities include, but are not limited to, hospitals, clinics, and Community-based Health Planning and Services (CHPS) Zones. Examples of healthcare facilities in the area include the following: Tamale Teaching Hospital (TTH), Tamale Central Hospital (TCH), Tamale West Hospital (TWH), Kabsad Scientific Clinic, Tamale S.D.A Clinic, New Life Facility, Vitting Reproductive and Child Health Center, Choggu Health Center, Bilpiela Health Center, Fulera Maternity Home, Jisonayili Suglo Maternity Home, Bagabaga Community-based Health Planning and Services (CHPS) Zone, Zuo CHPS Compound, and so on. Tamale offers a range of healthcare services, including primary, secondary, and tertiary levels of treatment. Please refer to the Tamale Map provided below.



**Figure 3.1: Map of the Tamale Metropolitan Area**

Source: Ghana Statistical Service (2013)

## CHAPTER FOUR

### DATA PRESENTATION, ANALYSIS AND DISCUSSION

#### 4.1 Introduction

The objective of this chapter is to provide a concise overview of the research results obtained in the study. Additionally, the chapter provides an exposition of the outcomes derived from the analysis of the data, the subsequent interpretation of these outcomes, and a comprehensive discussion of the findings. The data collected from the participants was compiled and subjected to analysis in order to derive meaningful interpretations that might be of use to the stakeholders involved in this research. The data were inputted into SPSS version 25, and thereafter, a number of tests were conducted. This chapter provides an overview of the descriptive data pertaining to the Supply Chain Management methods observed in the chosen health facilities included in the research, as well as the degree of healthcare delivery shown by the health institutions under investigation. In this section, a reliability test analysis is provided to validate the reliability of the indicators used for assessing the constructions of the research. In this chapter, an analysis is provided on the correlation and regression findings pertaining to the association between supply chain management techniques and healthcare delivery. Moreover, in order to mitigate the voluminous nature of the data, only the data that were deemed pertinent to the research questions and goals of this study were selected for presentation and analysis.

#### 4.2 Response Rate

According to Johnson and Owens (2008), response rates are often regarded as the most frequently used metric for evaluating the efficacy of surveys. Frohlich (2001) provides a formal definition of response rate as the ratio of completed questionnaires to the total number of eligible sample



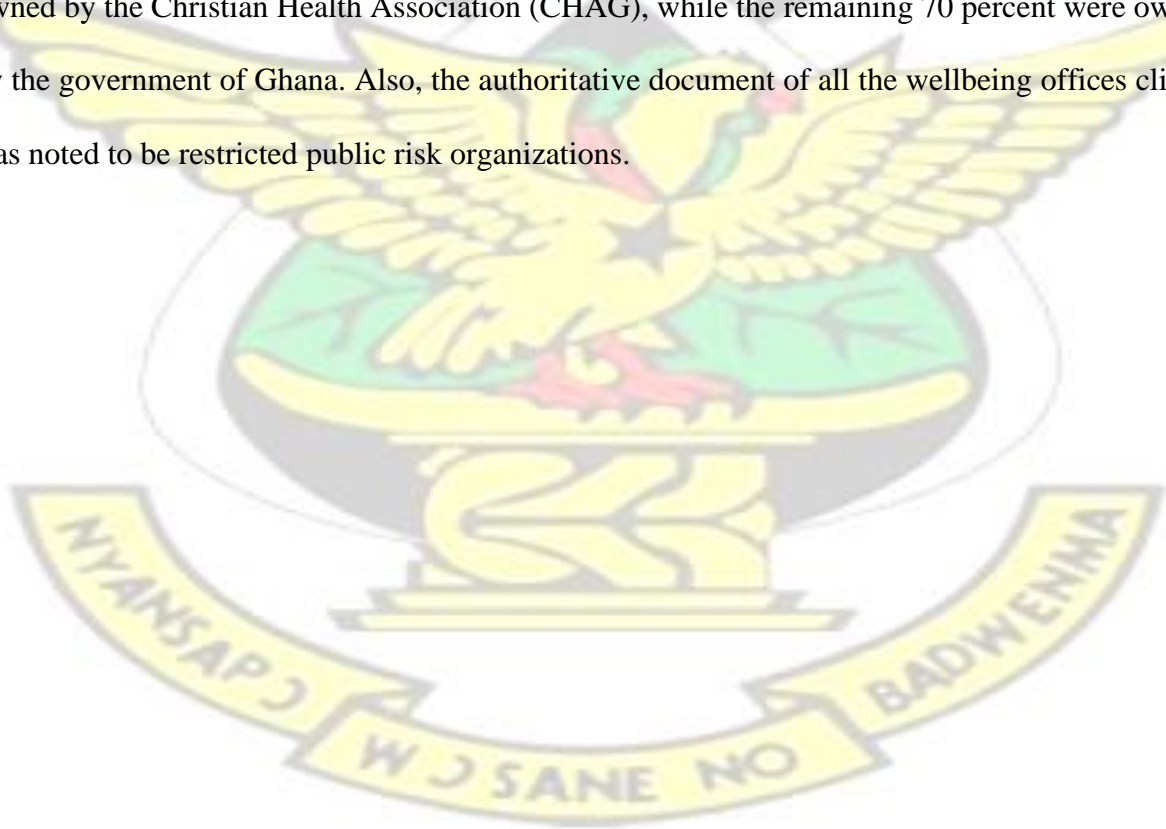
members. The objective of this research was to gather data from a sample of 100 employees working in healthcare facilities located in Tamale, namely the two largest government hospitals, namely The Northern Regional Hospital and Tamale West Hospital. Seventy-one questionnaires were collected out of the total of 100 questionnaires sent to the staff members of hospitals, health centers, and Community-based Health Planning and Services (CHPS) facilities. This figure corresponds to a response rate of 71%. Babbie (2004) asserts that a response rate of 60% may be considered satisfactory, while a response rate of 70% can be deemed very commendable. Hence, the study's response rate of 71% was deemed commendable, surpassing the conventional rule of thumb for response rates.

#### **4.3 Demographics of Respondents**

The demographic information of respondents in this study are portrayed concerning orientation, time of respondents, circulation of units that respondents work, and length of period respondents have worked in the medical clinics under study among others. Out of the 71 respondents examined for this exploration, greater part of respondents (53) addressing 75% were male while (18) respondents addressing 25% were female. This outcome intends that there is an orientation irregularity for guys in the various divisions. The temporal data provided by the respondents offers insight into whether the participants in this research were still in their economically active years and could significantly contribute to their daily schedules. The information introduced in Table 4.1 contained consequences of the age of the review members. The information shows that larger part of respondents (39) addressing (55%) of the respondents were inside the age scope of 31 - 40 years; eight (11) respondents addressing 15% were matured between 21 - 30, while eighteen (14) respondents addressing 20% were inside the scope of 41 - 50 years. Likewise, fourteen (7)



respondents addressing 10% were matured over 51 years. This age conveyance recommends that greater part of the respondents were somewhat youthful. Additionally, the review results show that 32% of the members have worked in the Emergency clinics for the time of 1 - 4 years. In addition, the majority of respondents, 51 percent, had worked in hospitals for five to ten years, while 17 percent had worked there for more than ten years. The staff's academic credentials were the final demographic information examined in the study. From the review, that's what we found, 38 respondents addressing 54% hold Higher Public Recognition and Confirmation endorsements while 21 respondents addressing 29% hold Degrees, and 5 respondents who structure 7% additionally were found to have bosses' capability, though 7 respondents addressing 10% hold different types of testaments. According to the study, 30 percent of the hospitals surveyed were owned by the Christian Health Association (CHAG), while the remaining 70 percent were owned by the government of Ghana. Also, the authoritative document of all the wellbeing offices clinics was noted to be restricted public risk organizations.



**Table 4.1: Demographics of Respondents**

Measures	Categories	Frequency	Percentage (%)
Respondent's Gender	Male	53	75
	Female	18	25
Respondent's Age	21 – 30	11	15
	31 - 40	39	55
	41 - 50	14	20
	>=51	7	10
Respondent's Experience	Work 1 - 4 Years	23	32
	5 - 10 Years	36	51
	10 Years an above	12	17
Respondent's Education	Level of Diploma/HND	38	54
	Degree	21	29
	Masters	5	7
	Others	7	10
Ownership of Health Facility	Government of Ghana	50	70
	CHAG	21	30

Source: Field survey, 2023

### 4.3 Reliability Analysis

Upon completion of the questionnaire, the researcher proceeded to get the supervisor's clearance for the instrument. Gay (1996) asserts that the establishment of questionnaire validity is accomplished via the use of the expert judgment approach. In order to establish content validity, a thorough examination of the questionnaires was conducted to assess the extent to which the questions aligned with the variables and goals of the research. In order to ensure the reliability and validity of the measurement tools, a significant portion of the questionnaires used in this study were derived from prior research studies. In order to guarantee content validity, the questions included in the questionnaires were intentionally diverse and comprehensive. This approach aimed to effectively gather information from both top-level management and staff members inside the relevant departments of the issue being investigated.

According to Mugenda & Mugenda (2003), research dependability may be defined as the extent to which a research instrument consistently produces similar findings when used again. In other terms, it may be elucidated as the degree of reliability shown by a measurement instrument in accurately assessing the construct it was designed to assess.

According to Drost (2011), dependability may be defined as the degree to which measurements exhibit consistency when conducted by various individuals on separate times, under varying circumstances, using ostensibly distinct instruments that measure the same construct. Reliability refers to the degree of consistency or stability shown by a measurement across diverse settings, whereby one would expect to receive essentially similar outcomes.

Cronbach's coefficient alpha is widely regarded as the predominant approach for evaluating internal consistency within the field of behavioral sciences. The Cronbach's alpha reliability coefficient typically falls within the range of 0 to 1. According to Gliem & Gliem (2003), the

following guidelines are offered: According to the above criteria, if the value of  $\alpha$  is more than 0.9, it can be classified as excellent. Similarly, if  $\alpha$  is greater than 0.8, it can be categorized as good. If  $\alpha$  exceeds 0.7, it can be considered acceptable. In the case where  $\alpha$  surpasses 0.6, it can be deemed questionable. If  $\alpha$  exceeds 0.5, it can be classified as poor. Conversely, if  $\alpha$  is less than 0.5, it can be categorized as unacceptable.

The Cronbach alpha coefficient was calculated and afterwards compared to the predetermined threshold value of 0.7. A coefficient of internal consistency, namely 0.797, was obtained, indicating a substantial degree of internal consistency across the study constructs. The findings pertaining to each construct are shown in Table 4.2 provided below.

**Table 4.2: Cronbach's Alpha Reliability Test**

No.	Construct	No. of Items	Cronbach's Alpha	Reliability Range
1	Procurement Management	3	.764	Acceptable
2	Warehouse and Storage Management	5	.730	Acceptable
3	Inventory Management and Control	3	.769	Acceptable
4	Customer Relationship Management	5	.735	Acceptable
5	Information Sharing Management	5	.817	Good
7	Healthcare Delivery	6	.872	Good
	<b>Total</b>	<b>27</b>	<b>.797</b>	<b>Acceptable</b>

Source: Researcher (2023)



Based on the range of Cronbach's alpha values shown in Table 4.2 above, it may be inferred that the measuring instrument demonstrates satisfactory levels of measurement reliability across all constructs. The reason for this is because the lowest alpha score inside the specified range is .730, which comfortably exceeds the suggested minimum threshold of .7. This suggests that the items used for assessing each component were consistent.

Moreover, to ensure reliability, the researcher tried as much as possible to reduce causes of measurement error such as data collector bias. This was made possible because, the questionnaire was given by the researcher, who maintained an official demeanor throughout the data collection session. In order to safeguard the privacy, well-being, and confidentiality of the study participants, the researcher took measures to create a favorable physical and psychological setting for data collection. Once again, the researcher instructed the participants to abstain from including their names on the questionnaires in order to safeguard their identities and maintain confidentiality.

#### **4.4 Descriptive Statistics of Study Variables**

An analysis was conducted on the variables used to measure each of the constructs. The provided metrics included the mean score and standard deviation for each of the items. The separate measurements also provided the minimum score and the maximum score for each item. This study was conducted to determine the extent to which the items reflect the current state of practices among the selected healthcare institutions. A five-point Likert Scale was used in order to assess the degree to which the participants agreed with the items offered in the questionnaire. The scale used a rating system where 1 corresponded to "Strongly Disagree," 2 to "Disagree," 3 to "Neutral," 4 to "Agree," and 5 to "Strongly Agree." The summary statistics for the answers of the important constructs in this investigation are shown in Table 4.3.

**Table 4.3: Descriptive Statistics of Study Variables**

Variables	Minimum	Maximum	Mean	Standard Deviation
Procurement Management	3.00	5.00	4.12	.333
Warehouse Management and Storage	3.00	5.00	3.88	.395
Inventory Management and Control	2.67	5.00	3.79	.515
Customer Relationship Management	3.00	5.00	3.89	.463
Information Sharing Management	2.75	5.00	3.61	.389
Healthcare Delivery	3.25	5.00	4.28	.393

**Source: Field survey, 2023**

Table 4.3 summarizes the key components of supply chain management, including procurement, warehousing, storage, inventory, customer interaction, information exchange, and healthcare delivery (dependent variable). Procurement management, customer relationship management, warehouse management and storage, inventory management and control, and information sharing management all averaged 4.12 (S.D. = 0.333), 3.88 (S.D. = 0.463), 3.89 (S.D. = 0.395), 3.79 (S.D. = 0.515), and 3.61 (S.D. = .389), respectively. The table shows that procurement management was

the highest ranked, followed by customer relationship management, and finally information sharing management. Since hospitals and other medical facilities often handle the procurement and management of medical supplies, this result was not surprising. Although most respondents agreed with the comments provided in the section on supply chain management methods (mean = 4.12, standard deviation = 0.33), there was some disagreement between them. Purchasing and supply, often termed procurement, is one of the primary aspects of a supply chain and, as such, may have a considerable impact on the overall performance of a business, as shown in a research by Rushton (2010). With a mean score of 3.89, the comments under customer relationship management suggest widespread consensus of approval. In addition, the results demonstrate that the surveyed healthcare facilities use CRM to efficiently handle client complaints and guarantee continued patronage. So that they may make their customers happier. In line with these results, Kaluki (2015) found that Humanitarian Organizations use CRM to keep in touch with their donors and supporters. Thogori and Gathenya's (2014) research concurs with the mean score for inventory management and control. The results of the survey showed that organizations are serious about inventory management as a means to save costs, improve service quality and product availability, and, ultimately, guarantee customer pleasure. As shown in the second chapter of this research, the mean result concerning information sharing management techniques across the surveyed health institutions is consistent with the literature review. According to Grunt and Nowakowska (2007), supply chain management in an organization relies on a steady stream of data that must be sent as fast and accurately as possible to managers. All of the Ghana Health Service's logistical operations are now conducted with the use of computers, the internet, and information communication networks thanks to the implementation of GhiLMIS. Finally, the average score for healthcare



delivery was 4.28, indicating a very high standard of care in the hospitals and clinics that were evaluated.

#### **4.4.1 Operational Factors of Supply Chain Management of Health Commodities**

The respondents provided an explanation of the procurement procedure used for replenishing stock in hospitals, which is one of the operational aspects utilized in supply chain management. The analysis revealed that there exist established procedures that facilities follow in order to carry out procurement activities. The first phase of the procedure is the yearly assessment conducted by procurement officials, whereby they use consumption trends observed inside quarterly intervals. The approval of quantities and amounts of predictions is granted by the Entity Tender Committee and the Public Procurement Authority prior to implementation. As per the statements made by the Procurement Officer responsible for the Tamale West Hospital,

*'I normally make yearly estimates utilizing consumption data from the hospital's different departments. This is usually done towards the conclusion of the current year's fourth quarter for the next year. Only once the entity tender committee and the public procurement authority have authorized the proposal will it be operative.'*

The research revealed that although quarterly projections are conducted, purchases are often made on a monthly basis or on an as-needed basis, rather than following a quarterly schedule. During the interview with the Procurement Officer, it was discovered that the payment amount for quarterly quantities may exceed the facility's threshold. Additionally, the procedures involved in obtaining approval for such amounts from the regional tender review board were found to be sometimes burdensome. In addition, the storage capacity inside hospitals is insufficient to accommodate substantial volumes of inventory.



According to the interview with administrators, it was revealed that all medical commodities, including both pharmaceutical and non-pharmaceutical items, are required to be procured from the Temporary Central Medical Stores through the Regional Medical Stores. Hospitals are permitted to get supplies from open market vendors only in cases when the desired item is unavailable at regional medical shops. The aforementioned process occurs subsequent to the issuance of a certificate of non-availability by the Regional Medical Stores to the institution engaging in procurement. According to an administrator:

*The hospital must get a non-availability certificate before it is permitted to acquire from the open market. Despite the resulting delays caused by this arrangement, we are compelled to comply due to its duty under the Public Procurement Act. The legislation further mandates that all public entities are required to only engage with suppliers who have completed the registration process. on times of emergency, it is possible to get items from providers on the open market.*

In the assessment of suppliers, a crucial component of the procurement process, feedback from Medical Superintendents revealed the establishment of an evaluation panel, constituted as an ad hoc committee. This panel is responsible for appraising samples and price quotes provided by suppliers, with the objective of selecting the most suitable provider. Typically, the composition of this committee consists of the administrator and the heads of user departments, individuals who possess technical expertise. The selection of a certain supplier to be awarded the contract is contingent upon many variables, including the quality of the goods, the supplier's historical performance, the proposed payment terms, and the price offered.

According to a Medical Superintendent,

*'An evaluation panel is a group of technical officials that are put together to analyze bids. This committee chooses the winning suppliers and recommends them to the Entity Tender Committee for approval. Their selection criteria are based on the quality of items offered, past performance, payment conditions, and pricing. Price is often the least important factor to consider, since the lowest cost item(s) may not be of high quality. The payment arrangements of the provider with the lowest pricing may not be favorable. Furthermore, the supplier may not have a solid history or track record of delivering items on schedule or delivering goods other than what was supplied as samples.*

The Procurement Officers' responses revealed that, subsequent to review and approval, the supplier whose offer has been approved receives an award notice. It is anticipated that the supplier will react to express their acceptance or rejection of the contract. Subsequently, a purchase order is generated and sent to the supplier. The purchase order is regarded as a legally binding contractual agreement between the facility and the supplier. Once the procurement procedures have been fulfilled, the items are supplied or delivered to the shops together with a way bill. However, before to the formal receipt of the goods at the stores, a verification process is conducted by a receiving team including a Supply Officer, an Internal Auditor, and an Account staff member.

#### **4.4.2 Measure of Relationships**

The research aimed to investigate the impact of supply chain management methods on healthcare delivery as its secondary goal. In order to do this, a correlation analysis was conducted. A correlation study was conducted to assess the associations between the constructs, while a regression analysis was performed to examine the impact of the constructs on other components.

### 4.4.3 Correlation Results

A correlation analysis was conducted to examine the associations between the variables involved in the research, with the aim of assessing the existence of convergence and confirming the predicted correlations among the variables, before to proceeding with the use of the regression model. The elements included inside the matrix are the Pearson correlation coefficients (r) that quantify the degree of linear association between each pair of variables under investigation. The greatest bivariate correlation coefficients reported in this study are  $r = .594$  and  $r = .496$ .

**Table 4.4: Correlation Results**

Variables		1	2	3	4	5	6
1. Procurement Management	Pearson Correlation	1					
	Sig. (2-tailed)						
2. Warehouse Management and Storage	Pearson Correlation	.010	1				
	Sig. (2-tailed)	.932					
3. Inventory Management and Control	Pearson Correlation	.011	.488*	1			
	Sig. (2-tailed)	.930	.000				
4. Customer Relationship Management	Pearson Correlation	.041	.463*	.408	1		
	Sig. (2-tailed)	.737	.000	.000			
5. Information Sharing Management	Pearson Correlation	.037	.497*	.427	.595	1	
	Sig. (2-tailed)	.757	.000	.000	.000		
6. Healthcare Delivery	Pearson Correlation	-	.328*	.239	.373	.310	.029
	Sig. (2-tailed)	.062	.005	.045	.001	.008	.808

\*\* . Correlation is significant at the 0.01 level (2-tailed)

Source: Field Survey, 2023



A correlation analysis was conducted to examine the associations between the variables in the research, with the aim of assessing the existence of multi-collinearity and confirming the predicted correlations among the variables, before to proceeding with the regression model. The elements inside the matrix are the Pearson correlation coefficients ( $r$ ) that quantify the degree of linear association between each pair of variables examined in the research. The highest reported bivariate correlation coefficients are  $r = .595$  and  $r = .497$ .

The results of the correlation tests indicate that there is a weak negative correlation ( $r = -.062$ ) between healthcare delivery and procurement management. However, this correlation is not statistically significant at the conventional significance threshold of 0.05, since the p-value is 0.606. The findings suggest that there is a lack of meaningful statistical association between healthcare delivery and the procurement management methods of health facilities. This suggests a negative correlation between procurement management and healthcare delivery, indicating that an increase in procurement management is associated with a decline in healthcare delivery.

Furthermore, the findings of the study revealed a positive correlation ( $r = 0.328$ ) between the practice of warehouse and storage management and healthcare delivery. This correlation was found to be statistically significant at a significance level of 0.005. As a result, there exists a robust correlation between the two variables. The findings of the study reveal a positive correlation ( $r = 0.239$ ) between inventory management and control practice and healthcare delivery. This correlation is statistically significant at a level of 0.045, suggesting a weak association between the two variables. Additionally, the findings of the study revealed a statistically significant positive correlation ( $r = 0.373$ ,  $p < 0.001$ ) between the implementation of customer relationship management methods and the quality of healthcare service. Based on the findings, there is a



positive correlation ( $r= 0.310$ ) between the practice of information sharing management and healthcare delivery. This correlation is statistically significant at a significance level of 0.008, indicating a strong relationship between the two variables. This observation aligns with the correlation magnitude proposed by Evans in 1996.

The results of the correlation study indicate a favorable association between supply chain management methods and healthcare delivery within the Ghana health sector. Moreover, in the majority of cases, the connections exhibit statistical significance. The results presented in this study align with the findings of Tabeni (2006), whose research shown that any enhancements made to inbound logistics contribute to the improvement of service delivery at institutions. The results are also in line with research conducted by Fernandes et al. (2018), which shown that the implementation of an effective logistics management system yields many advantages for a business, including the prevention of stock-outs, reduced inventory levels, and improved customer service efficiency.

The other pairs of variables exhibit a good degree of correlation and align with the predicted patterns, particularly between the predictors and the dependent variables. Therefore, we may conclude that the assumption of normological validity has been met. Furthermore, given the absence of significant correlations among any of the pairings, it can be concluded that there is no presence of multi-collinearity among the variables.

## **4.5 Regression Analysis**

### **4.5.1 The Relationship between Supply Chain Management Practices and Healthcare Delivery**

The association between supply chain management methods and healthcare delivery in health institutions in the Tamale Metropolitan region was one of the primary focuses of this research. A regression analysis was conducted to determine the impact of the independent variable (supply chain management) on the outcome (healthcare delivery). To analyze how many factors affected the outcome, a multiple regression analysis was used. The overall model fit (variance explained) and the individual predictors' contributions to that fit are both calculated using multiple regressions.

### **4.5.2 Model Summary**

As seen in Table 4.5 of the model summary, the column labeled "R" denotes the multiple correlation coefficient, denoted as R. The R value of 0.816 suggests a robust connection between healthcare delivery and the five independent variables, indicating a high degree of predictive capability. The column labeled "R Square" represents the  $R^2$  value, sometimes referred to as the coefficient of determination. This number indicates the amount of variation seen in the dependent variable that can be accounted for by the independent variables. According to the data shown in the table, the  $R^2$  value of 0.6654 indicates that about 66.54% of the variability in healthcare delivery across health institutions of the Ghana Health Service can be accounted for by the supply chain management techniques, which are the independent variables included in the model. The findings are shown below:

**Table 4.5: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.8157 <sup>a</sup>	0.6654	0.6433	0.124438

- a. Predictors: (Constant), Procurement Management, Warehousing and Storage Management Inventory Management and Control, Customer Relationship Management, Information Sharing
- b. Dependent Variable: Healthcare Delivery management

**Source: Field survey, 2023**

#### **4.5.3 ANOVA Model Fit**

Table 4.6 displays the ANOVA findings, which assess the adequacy of the overall regression model in terms of its fit to the data. The results shown in the table indicate that the independent factors have a statistically significant predictive effect on the dependent variable, as evidenced by the obtained F-value of 16.778, with a p-value of less than .001. This means that procurement management, warehousing and storage management inventory management and control, customer relationship management, information sharing management are good predictors of healthcare delivery of the Ghana Health Service.

**Table 4.6: ANOVA model fit**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	63.603	5	12.751	16.777	.000
	Residual	0.448	33	0.014		
	Total	64.153	38			

**Source: Field survey, 2023**

#### **4.5.4 Regression Coefficients**

The individualized coefficient in this study represents the magnitude of change in the dependent variable that can be attributed to a one-unit change in the variable that is independent of it. The multiple regression model used in the research, as described in chapter three, was utilized to determine the statistically significant value of the variables that were independent in relation to the dependent variable in question.

1.  $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \Sigma$
2. Where; Y = Healthcare delivery
3. X1 = Procurement management practices
4. X2 = Warehousing and storage management practices
5. X3 = Inventory management and control practices
6. X4 = Customer Relationship management practices
7. X5 = Information Sharing management practices

In the proposed model,  $\beta_0$  represents a constant value, while  $\beta_1$  to  $\beta_5$  are regression coefficients that signify the average alteration in the dependent variable for each unit of change in the



independent variable, while keeping the other independent variables in the model constant. Additionally, the symbol  $\Sigma$  denotes the error term, which accounts for the unexplained variability within the model.

$$Y = 3.073 + -.091X_1 + .093X_2 + .544X_3 + .850X_4 + .940X_5 + \Sigma$$

**Table 4.7: Regression Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.073	.462		3.913	.000
Procurement Management	-.091	.041	-.062	1.706	.606
Warehousing & Storage Management	.093	.037	.174	2.511	.005
Inventory Management & Control	.544	.072	.686	7.594	.045
Customer Relationship Management	.850	.095	.780	8.900	.001
Information Sharing Management	.940	.063	.064	4.885	.008

**Source: Field survey, 2023**

From the table above, procurement management does not have a significant positive relationship with healthcare delivery ( $\beta = -0.091$ ;  $t < 1.645$ ;  $p > 05$ ). This implies that a unit increment in procurement management does not significantly correspond to an increase in healthcare delivery.

This result therefore does not support the hypothesis that **H1**: “*procurement management has a significant positive effect on healthcare delivery*”.

However, warehousing and storage management has a significant positive relationship with healthcare delivery ( $\beta = 0.093$ ;  $t > 1.645$ ;  $p < 05$ ). This implies that a unit increment in warehousing and storage management significantly correspond to an increase in healthcare delivery. This result therefore supports the hypothesis that **H2**: “*warehousing and storage management has a significant positive effect on healthcare delivery*”.

Moreover, inventory management and control have a significant positive relationship with healthcare delivery ( $\beta = 0.544$ ;  $t > 1.645$ ;  $p < 05$ ). This implies that a unit increment in inventory management and control significantly correspond to an increase in healthcare delivery. This result therefore supports the hypothesis that **H3**: “*inventory management and control have a significant positive effect on healthcare delivery*”.

Additionally, customer relationship management has a significant positive relationship with healthcare delivery ( $\beta = 0.850$ ;  $t > 1.645$ ;  $p < 05$ ). This implies that a unit increment in customer relationship management significantly correspond to an increase in healthcare delivery. This result therefore supports the hypothesis that **H4**: “*customer relationship management has a significant positive effect on healthcare delivery*”.

Finally, information sharing management has a significant positive relationship with healthcare delivery ( $\beta = 0.940$ ;  $t > 1.645$ ;  $p < 05$ ). This implies that a unit increment in information sharing management significantly correspond to an increase in healthcare delivery. This result therefore

supports the hypothesis that **H5**: “*information sharing management has a significant positive effect on healthcare delivery.*”

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#### **4.6 Discussion of Findings**

In this section, the study discusses the empirical findings in line with its objectives and same compared with findings of other related studies in existing literature.

##### **4.6.1 The Relationship between Supply Chain Management Practices and Healthcare Delivery**

The critical objective of the survey was to take a gander at the relationship that exists between supply the board practices and clinical consideration movement. The audit was conceptualized with two critical creates: creation network the board practices and clinical consideration transport. Key creation network the chiefs viewpoints the survey looked at were acquisition the board, client relationship the board, warehousing and accumulating the board, stock organization and control, and information sharing organization. Five hypotheses (H1 - H5) were used to test the association between every part of stock organization the board and clinical consideration transport.

Besides, on the stock the board viewpoints, the survey showed that clinical consideration movement has a negative relationship with acquisition the leaders and truly unimportant. It recommends that as the obtaining the leaders fabricates, the idea of clinical consideration transport furthermore lessens. In addition, the results demonstrated that stockroom the board practice is inextricably linked to the delivery of medical services, highlighting potential synergies between the two. The survey results furthermore showed that stock organization and control practice is

vehemently associated and quantifiably basic with clinical benefits movement. In addition, the findings demonstrated that the executives' practice of client relationship management has significant areas of strength for the delivery of medical services, as their connection is substantial and positive. From the results, the association between's information sharing organization practice and clinical consideration movement is positive and truly basic.

#### **4.6.2 Challenges Faced in Managing Health Commodities**

Undoubtedly, the management of health commodities presents several obstacles. The third aim of this research was to investigate the obstacles encountered by health institutions in the management of health commodities. The issues encountered were characterized by their multifaceted and diversified nature, with each institution confronting distinct sets of obstacles. Several significant challenges were identified, including insufficient availability and accessibility of health commodities, suboptimal procurement practices, compromised distribution systems, irrational utilization of resources, prevalence of counterfeit and substandard commodities, delays in the approval process for health commodities, transportation issues, inadequate storage facilities, shortage of skilled labor, internal bureaucratic hurdles, and insufficient funding, among other obstacles.

#### **4.6.3 Hypothesis Confirmation**

Before conducting data collection and analysis, five hypotheses were formulated for this investigation, drawing upon a comprehensive evaluation of existing literature. The analysis was conducted in order to validate or disprove these ideas. Table 4.8 presents a comprehensive summary of the Hypotheses, including the regression weight, significant level, and notes pertaining to the results.



**Table 4.8: Hypotheses Confirmation**

<b>Hypothesis</b>	<b>Prediction</b>	<b>Significance</b>	<b>Evaluation</b>
H1: Procurement management positively influences healthcare delivery	(+)	(-) Significant	Not Supported
H2: Warehousing management positively influences healthcare delivery	(+)	(+) Significant	Supported
H3: Inventory management positively influences healthcare delivery	(+)	(+) Significant	Supported
H4: Transportation management positively influences healthcare delivery	(+)	(+) Significant	Supported
H5: Information sharing management positively influences healthcare delivery	(+)	(+) Significant	Supported

**Source: Field survey, 2023**

## CHAPTER FIVE

### SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

#### 5.1 Introduction

This section provides an overview of the findings pertaining to the research objectives, outcomes, and recommendations, as well as suggestions for further investigation. The preceding section included the findings and implications of the field review, as well as the discussion around the results. This section now provides an overview of the findings. The conclusion of the review is also included in this section.

The purpose of the study was to establish the correlation between supply chain management methods and healthcare delivery within the Ghana Health Service. This study examined the effects of supply chain management practices, especially acquisition management, warehouse and storage management, inventory management and control, customer relationship management, and information sharing management, on healthcare delivery.

#### 5.2 Summary of Findings

Based on these specific objectives, the study set out to accomplish three specific goals: research conjectures were formed for testing accordingly. The particular discoveries comparative with the review targets are summed up in the accompanying segments. This study looked to analyze wellbeing wares the executives rehearses in these chose wellbeing offices and how they help to further develop administration conveyance in these wellbeing offices. This study's input came from responses obtained through the administration of a questionnaire and interviews with core and supporting staff of health facilities in the Tamale metropolitan district. These perceptions were

made in the wake of completing the examination. From the examination, it was seen that the degree of information on wellbeing products the board was agreeable in the acquirement and stores divisions; it was not in any way shape or form agreeable in different divisions. Other staff in different divisions in these emergency clinics showed an absence of essential information on wellbeing wares the board. It was additionally seen that advantages of compelling wellbeing wares the executives in wellbeing administration conveyance were huge. The provision of inexpensive and high-quality health goods to all Ghanaians, irrespective of their geographical location, has led to enhanced service delivery, notably via cost reduction and a decline in death rates. Explicit discoveries on the connection between store networks the board builds and medical care conveyance is made sense of underneath.

### **5.2.1 Relationship Between Procurement Management and Healthcare Delivery**

This target was formulated based on the theoretical proposition that there exists a positive relationship between procurement management and healthcare delivery, and that procurement management substantially impacts healthcare delivery. The research result rejected the hypothesis that claims that; healthcare delivery and procurement management methods are positively and substantially associated.

### **5.2.2 Relationship Between Warehousing and Storage and Healthcare Delivery**

The purpose of this research is based on the hypothesis that there exists a favorable relationship between warehouse and storage management and healthcare delivery. The finding of the study indicated that indeed warehousing and storage management practice is positively as well as significantly correlated with healthcare delivery. Consequently, the relationship between the two variables was found to be strong.

### **5.2.3 Relationship Between Inventory Management and Control, and Healthcare Delivery**

The purpose of this research was based on the hypothesis that there is a beneficial relationship between inventory management and control and healthcare delivery. The findings of the study provide evidence supporting a positive correlation between inventory management practice and healthcare delivery. This correlation is statistically significant at a p-value of 0.000, indicating a robust association between these two variables. The hypothesis suggesting a beneficial relationship between inventory management and control and healthcare delivery was therefore accepted.

### **5.2.4 Relationship Between Customer Relationship Management and Healthcare Delivery**

The foundation of this aim is based on the theoretical proposition that there exists a favorable correlation between customer relationship management and healthcare delivery. The study's results supported the acceptance of the null hypothesis, indicating that there was a considerable beneficial impact of transport management on healthcare delivery. This research so concluded that enhanced customer relationship management leads to improved logistical efficiency, timely delivery of medical supplies, and enhanced service quality. Consequently, these factors contribute to the overall enhancement of healthcare delivery within the Ghana Health Service.

### **5.2.5 Relationship Between Information Sharing Management and Healthcare Delivery**

The purpose of this research is based on the overarching hypothesis that there is a positive correlation between data sharing management and healthcare delivery. The study's findings validated the null hypothesis and demonstrated a statistically significant and favorable association between the management of information sharing and the delivery of healthcare services. Based on



this discovery, it can be inferred that enhancing the mean index of information flow management would lead to a proportional rise in healthcare delivery.

The findings of the research provide support for the many hypotheses proposed for the development of the five supply chain management models, which have also been identified in literature as major factors for enhancing healthcare delivery. The provision of medical supplies at accessible costs to customers visiting healthcare facilities has been seen to contribute to enhanced service delivery, namely via cost reduction and a decrease in mortality rates, which may be attributed to the management of medical logistics. The observation was made that the effective management of health-oriented initiatives at these hospitals was found to contribute to the provision of high-quality healthcare services.

### **5.3 Conclusion**

This research provided evidence that the management of procurement, warehouse and storage, inventory management and control, and customer relationship management had a significant influence on the healthcare delivery of the Ghana Health Service. In essence, the findings of the research indicate a good correlation between supply chain management methods and healthcare delivery within the Ghana Health Service. This was deemed to be in line with the prevailing literature.

The study revealed that, on the whole, the implementation of store network management practices had a significant positive influence on the healthcare delivery of the Ghana Health Service. The statement posits that, overall, the management of supply chains has an influence on the delivery of healthcare.

In addition to the examples unveiled by this research, it is evident that proficient management of health supply chains plays a substantial role in enhancing the efficiency and effectiveness of healthcare service delivery inside hospitals in this nation. The continuous development of this business has great relevance, and guaranteeing effective management of safety operations is crucial for the future of enhanced service delivery. It is important to acknowledge that the delivery of health services greatly benefits from the use of supply chain management principles specifically pertaining to the management of health commodities.

#### **5.4 Recommendations**

This examination contributes by furnishing the Ghana Wellbeing Administration with better experiences into store network the board and its significance to medical care conveyance. Additionally, this study demonstrates the significance of supply chain management for improved healthcare service delivery by connecting these issues to service delivery. Besides, chiefs of the wellbeing establishments ought to see the advantages of production network the board rehearses as a way to improve their administration conveyance. In this way, the analyst suggests that administration of wellbeing associations ought to put resources into compelling production network the executives. Improved and quality medical care can be one of the long terms and key advantages of undertaking store network the executives rehearses actually. This likewise implies that administrators of wellbeing establishments ought to attempt to change the way of life and ecological conditions so representatives can without much of a stretch take on, backing, and utilize planned operations the executives rehearses in endeavour their exercises. Likewise, one more finding of the review is that, a positive relationship exists among ICT and medical care

conveyance. The researcher advises health facilities to take advantage of every opportunity for information technology.

### **5.5 Limitations and Recommendation for Further Research**

However, the examination work gives huge outcomes on information assembled for the review and reveals insight into the effect of planned operations the board on medical services conveyance, the review has a few limitations in effective degree and geological inclusion. Furthermore, the study was unable to identify any endogenous limitations. In addition, there was limit of the example size on which the review's proposed model was broke down. In this review, an overview was picked and a sum of 71 respondents were utilized for the review. In order to obtain reliable findings on the logistics management practices of the Ghana Health Service as a whole, subsequent studies should choose to study a larger sample size and numerous health facilities. The study should be replicated in subsequent studies, and additional strategic elements that may increase the model's explanatory power should be taken into consideration.

## REFERENCES

- Abdelsalam Hamid and Siddig Balal Ibrahim (2014). Supply Chain Management Practices and Supply Chain Performance Effectiveness. *International Journal of Science and Research (IJSR)* 3(8)
- Adebambo, S. and Toyin, A. (2011) Analysis of Information and Communication Technologies (ICT) Usage on Logistics Activities of Manufacturing Companies in Southwestern Nigeria. *Journal of Emerging Trends in Economics and Management Sciences* Vol. 2(1), pp.66-72.
- Adu-Poku, Asamoah and Abor (2011) Users' perspective of medical logistics supply chain system in Ghana: The case of Adansi South District Health Directorate.
- Adusei and Awunyo-Victor (2015). Implementation Challenges of the Public Procurement Act by Selected Metropolitan, Municipal and District Assemblies in the Ashanti Region, Ghana.
- Alvarado, U. Y., & Kotzab, H. (2001). Supply chain management: The integration of logistics in marketing *Industrial Marketing Management*, 30, 183-198.
- Appohwood Vilbert Mcobrein and Makafui R. A. Ackah (2019). Assessing the Challenges in Supply Chain of Health Commodities in the Health Industry
- Abel Dzuke, Micheline J.A. Naude (2015). Procurement challenges in the Zimbabwean public sector: A preliminary study
- Azevedo, G.S., Ferreira, J. & Leitao, J. (2007) The Role of Logistics' Information and Communication Technologies in Promoting Competitive Advantages of the Firm. University of Beira Interior.
- Bearnon, B. (2014). Supply chain design and analysis: models and methods. *International Journal of Production Economics* 55 (3), 281-294.
- Bowersox, J.D., Closs, J.D. and Cooper, B.M. (2002) Supply chain logistics management. New York, McGraw-Hill Higher Education.
- Chong, A. Y. L., Chan, F. T. S., Ooi, K. B., & Sim, J. J. (2010). Can Malaysian firms improve organizational/innovation performance via SCM? *Industrial Management & Data Systems*, 111(3), 410-431.
- Donlon, J.P. (1996). Maximizing value in the supply chain. *Chief Executive*, 117, 54-63.
- Economic Planning Unit (2010). The Tenth Malaysia Plan 2011-2015. Malaysia. Available at <http://www.epu.gov.my/rmkesepuluh>



- Drost, A.E (2011) Validity and Reliability in Social Science Research. *Education Research and Perspectives*, Vol. 38 (1).
- Eroglu, C. and C. Hofer (2011). Lean, Leaner, Too Lean? The Inventory-Performance Link Revisited, *Journal of Operations Management* 29, 356–369.
- Ellram, L. M., Tate, W. L., & Billington, C. (2007). Services supply management: The next frontier for improved organizational performance. *California Management Review*, 49(4), 44-65.
- Fernandes, D.W., Moori, R.G. and Filho, V.A.V. (2018). “Logistic service quality as a mediator between logistics capabilities and customer satisfaction”, *Revista de Gest~ao*, Vol. 25 No. 4, pp. 358-372.
- Gammerlgaard, B., & Mentzer, J.T. (2005). Logistics Innovation; A customer value oriented social process: *Journal of Business Logistics*, 7(1), 440-452
- Gyimah E. P., Yellu D. F., Andrews-Annan E., Gyansa-Lutterodt M. and Koduah A., (2009). Ghana: Assessment of Medicine Procurement and Supply Management Systems in the Public Health Sector: Ministry of Health (MoH), Ghana National Drug Programme (GNDP) Ghana. Available on: <http://apps.who.int/medicinedocs/documents/s18017en/s18017en.pdf> (Accessed, 15th August 2022)
- Grunt, N.J. and Nowakowska, A. (2006) Selected tools of information flow management in logistics. Czestochowa University of Technology.
- Malin Wiger (2018) Logistics management operationalized in a healthcare context -Understanding care chain Effectiveness through logistics management theories and systems theory. *Linköping Studies in Science and Technology, Dissertations*, No 1928
- Mentzer, J.T., Stank, T.P. and Esper, T.L. (2008). “Supply chain management and its relationship to logistics”, *Marketing, Production, and Operations Management, Journal of Business Logistics*, Vol. 29 No. 1, pp. 31-46.
- Marinagi, C., Trivellas, P., & Sakas, D. (2014). The impact of Information Technology on the development of Supply Chain Competitive Advantage. *Procedia - Social and Behavioral Sciences*, 147, 586–591. doi: 10.1016/j.sbsp

- Mwangangi, Patrick Wathe (2016) Influence of logistics management on performance of manufacturing firms in Kenya. Unpublished PhD Thesis, Jomo Kenyatta University of Agriculture and Technology, Nairobi, Kenya.
- Mustaffa. N.H & Potter. A. (2009) Healthcare supply chain management in Malaysia: a case study”. *Supply Chain Management: An International Journal*.14/3 (2009) 234–243.
- Mugenda & Mugenda, (2003) *Research Methods: Acts Press*, Nairobi.
- Koh, S. C. L., Demirbag, M., Bayraktar, E., Tatoglu, E., & Zaim, S. (2007). The impact of supply chain management practices on performance of SMEs. *Industrial Management & Data Systems*, 107(1), 103-124.
- Kothari, C.R. (2004). *Research Methodology: Methods and Techniques*. 2nd Edition, New Age International Publishers, New Delhi.
- Kim, M. and Chai, S. (2017). “The impact of supplier innovativeness, information sharing and strategic sourcing on improving supply chain agility: global supply chain perspective”, *International Journal of Production Economics*, Vol. 187, pp. 42-52.
- Kotler, P., Wong, V., Saunders, J. and Armstrong, G. (2005) *Principles of Marketing*. 4th edn. Spain: Pearson/Prentice Hall.
- Kumar,S., DeGroot, R. A., and Choe, D (2008) ‘The impact of package design within US hospital supply chain’. *International Journal of Physical Distribution & Logistics Management*, Vol. 38 (8), pp. 601-615
- Rushton, Alan, Phil Croucher, & Peter Baker (2010). *The Handbook of Logistics*
- Subedi, P.B. (2016) Using Likert Type Data in Social Science Research: Confusion, Issues and Challenges. *International Journal of Contemporary Applied Sciences*, Vol. 3 (2).
- Singh, K. (2007) *Quantitative Social Research Methods*. SAGE, New Delhi. <https://doi.org/10.4135/9789351507741>
- Tabeni, M. (2006). The impact of inbound logistics activities on the operational performance of the postal services organization in South Africa. Master’s thesis. Rhodes University.
- Tsegaye Habitye (2018) *The Effect of Logistics Management Practices on Organizational Performance: A Case of Ethio Telecom*. An Unpublished MA thesis, *Department of Logistics and Supply Chain Management*, Addis Ababa University, Addis Ababa, Ethiopia.

- Thogori M. and Gathenya, J. (2014). Role of Inventory Management on Customer Satisfaction among the Manufacturing Firms in Kenya: A Case Study of Delmonte Kenya. *International Journal of Academic Research in Business and Social Sciences*, Vol. 4 (1).
- Toku, L. I. (2015). Exploring the Operational Challenges that Confront Procurement Practitioners in Ghanaian Polytechnics.
- World Health Organization (2012). *The Global Burden of Disease*, Geneva.
- World Health Organization (2009). *World Health Statistics 2009*, Geneva.
- Yadav, P. (2015). “Health product supply chains in developing countries: diagnosis of the root causes of underperformance and an agenda for reform”, *Health Systems & Reform*, Vol. 1 No. 2, pp. 142-154.
- Zaffran et al (2013) *Retinoids and Cardiac Development*
- Zhang, S., Dan, B. and Zhou, M. (2019). “After-sale service deployment and information sharing in a supply chain under demand uncertainty”, *European Journal of Operational Research*, doi: 10.1016/j.ejor.2019.05.014.



## APPENDICES

### Appendix 1

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**SCHOOL OF BUSINESS**

**DEPT. OF SUPPLY CHAIN AND INFORMATION SYSTEMS [SCIS]**

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### QUESTIONNAIRE

**Target group:** Procurement Officers, Supply Chain Practitioners and Logisticians

*Dear respondent,*

Thank you for your willingness to participate in this study. The study focuses on *An Assessment of Supply Chain Management of Health Commodities in the Public Health Sector. A Case Study of Health Facilities in the Northern Region*. Your responses to this instrument will only be used for academic purposes. It is kindly requested that you provide responses that truly reflect the operations of your Facility to help improve the quality of the study.

If you have any challenges concerning any item on the instrument, you can talk to the fieldworker for clarification.

**Please** write in ink in the box which corresponds to the statement, which in your opinion is the most appropriate answer to the related question. For the following questions, kindly select by checking (✓) all that apply.



Thank you once again.

**SECTION A: DEMOGRAPHICS OF RESPONDENTS**

1. Gender Male  Female
2. What is your age? Less than 20  20-30 years  31-40 years  41-50 years  51 and above
3. Marital Status Never married  Married  Divorced  Separated  Widowed
4. What is your level of education? JHS/SHS  HND/Equivalents  1<sup>st</sup> Degree  Master's degree  O/A Level cert.  other, please specify.....
5. Which department of the Hospital do you work? Procurement unit  Stores  Accounts  Estate and Works unit  Other, please specify .....
6. When was the Hospital incorporated in Ghana.....
7. Ownership of the Hospital  Solely Ghanaian Owned  CHAG  Foreign Owned  Joint Venture Other (specify) \_\_\_\_\_
8. Legal form of the institution  Sole Proprietorship  Limited Liability  Partnership;  Public Limited Liability Other (specify) \_\_\_\_\_
9. Please indicate your current position in this hospital  Senior staff  Executive  Manager  Junior Staff
10. Please indicate the number of years that you have held your current position in this Hospital.....

**SECTION B: SUPPLY CHAIN MANAGEMENT PRACTICES**

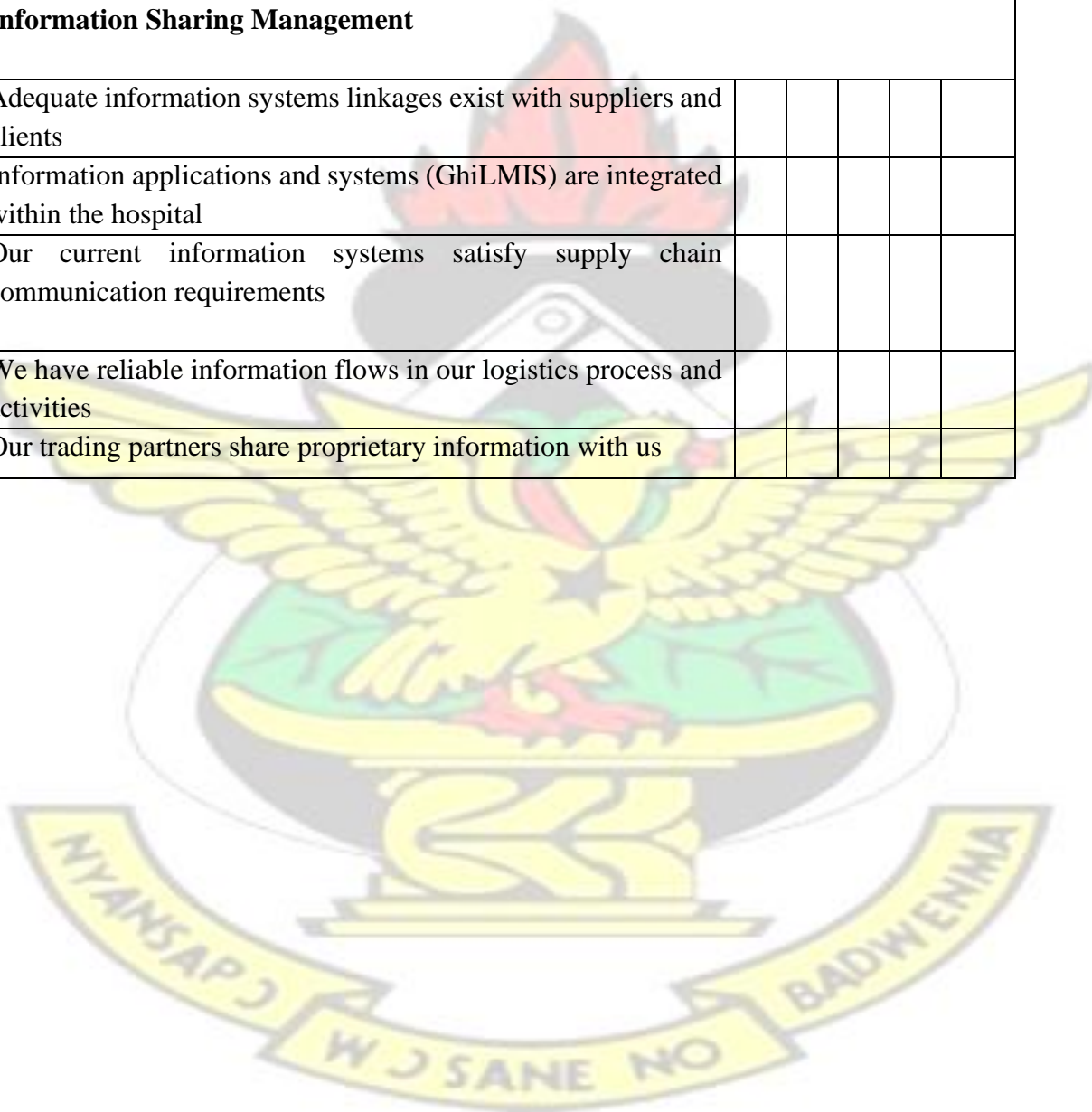
11. Please using a scale of **1=strongly disagree; to 5=strongly agree**, how you would rate your

Hospital’s logistics management practices along the items shown in the table below:

**Scale: (1 = Strongly Disagree 2 = Disagree 3 = Indifferent 4 = Agree 5 = Strongly Agree)**

Supply Chain Management Practices	Scale				
	1	2	3	4	5
<b>Procurement Management</b>					
We do appropriate need identification					
We have strategic relationships with suppliers					
We do regular supplier performance evaluation					
<b>Warehouse and Storage Management</b>					
We have a proper material receipt system					
We optimize our storage space					
We do accurate order picking					
We apply warehouse safety standards					
We have adequate warehouse infrastructure for the safe storage of the hospital’s medical supplies					
<b>Inventory Management and Control Management</b>					
We do automated stock recording					
We do Cycle counting of stock an inventory					
We do periodic inventory counting (stock taking)					
<b>Customer Relationship Management</b>					

We frequently interact with customers to set reliability, responsiveness, and other standards for us					
We frequently measure and evaluate customer satisfaction					
We frequently determine future customer expectations					
We facilitate customers' ability to seek assistance from us					
We periodically evaluate the importance of our relationship with our customers					
<b>Information Sharing Management</b>					
Adequate information systems linkages exist with suppliers and clients					
Information applications and systems (GhiLMIS) are integrated within the hospital					
Our current information systems satisfy supply chain communication requirements					
We have reliable information flows in our logistics process and activities					
Our trading partners share proprietary information with us					



**SECTION C: HEALTHCARE DELIVERY**

12. Please using a scale of **1=strongly disagree; to 5=strongly agree**, how you would rate the following healthcare delivery measurements metrics along the items shown in the table below:

**Scale: (1 = Strongly Disagree 2 = Disagree 3 = Indifferent 4 = Agree 5 = Strongly Agree)**

Statement	Scale				
	1	2	3	4	5
We offer affordable healthcare services (Payment)					
We Deliver timely healthcare services (Accessibility)					
We provide reliable healthcare services (24-hour service and full complement of Medical Staff)					
Our customers/clients are generally satisfied with care because of reduced stockouts of health commodities					
The hospital is profitable in recent past					
We have superior quality of service compared to our competitors					
External failure costs (i.e., complaints, returns, warranty claims, liability, and lost sales) have reduced					



13. Do you have any suggestions with regards to how health logistics could be managed effectively and efficiently in the GHS?

.....

.....

.....

*Thank you for your assistance in answering these questions, GOD BLESS YOU!*



## Appendix II

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY**

SCHOOL OF BUSINESS

DEPT. OF SUPPLY CHAIN AND INFORMATION SYSTEMS [SCIS]

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### INTERVIEW GUIDE

**Target group:** Heads of Health Facility BMCs, Procurement and Supply Chain Officers & Senior Managers

*Dear respondent,*

Thank you for your willingness to participate in this study. The study focuses on *An Assessment of Supply Chain Management of Health Commodities in the Public Health Sector. A Case Study of Health Facilities in the Northern Region*. Your responses to this instrument will only be used for academic purposes. It is kindly requested that you provide responses that truly reflect the operations of your Facility to help improve the quality of the study.

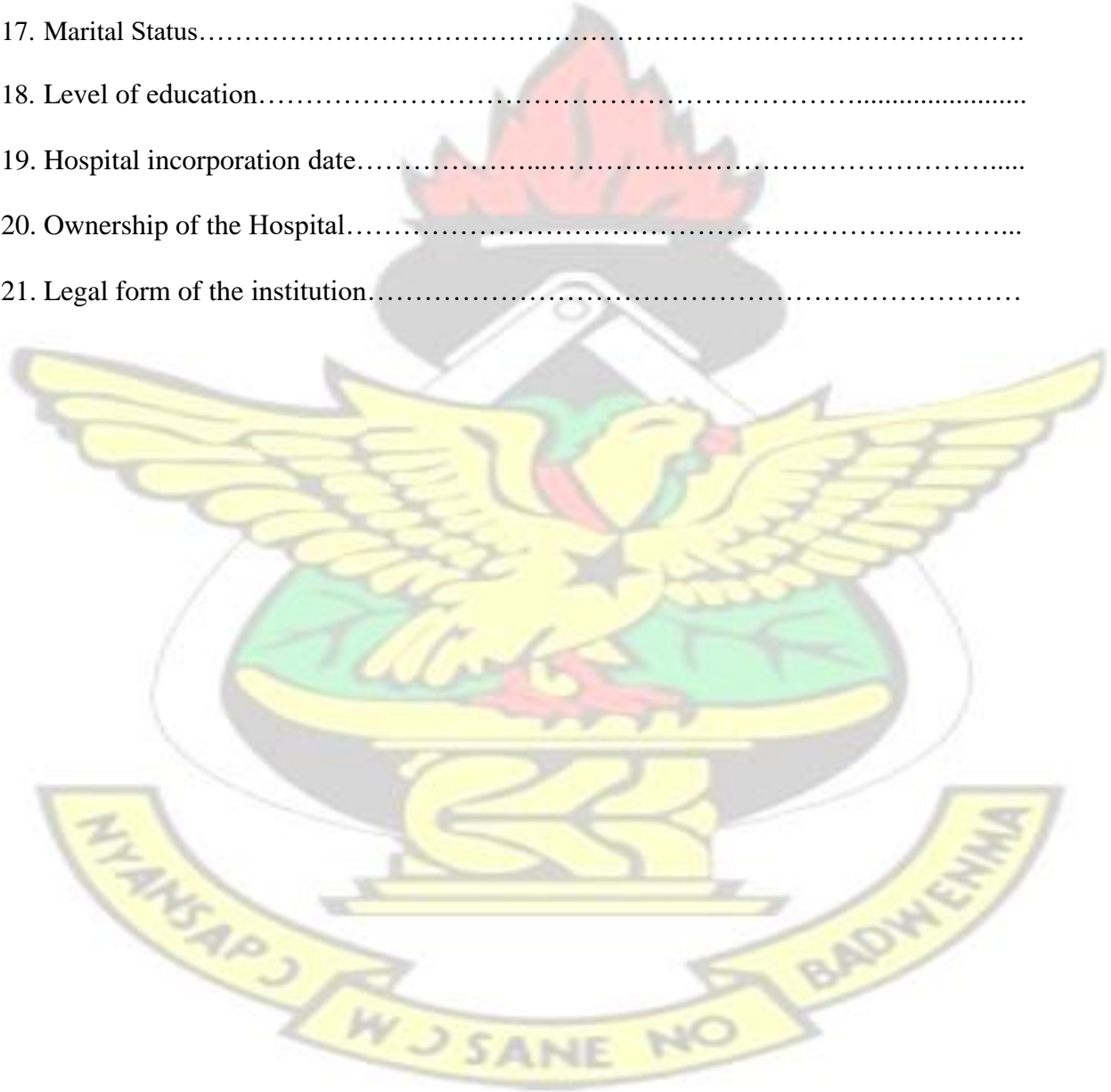
If you have any challenges concerning any item on the instrument, you can talk to the fieldworker for clarification.

**Please** write in ink in the box which corresponds to the statement, which in your opinion is the most appropriate answer to the related question. For the following questions, kindly select by checking (✓) all that apply.

Thank you once again.

**SECTION A: DEMOGRAPHICS OF RESPONDENTS**

- 14. Name of hospital.....
- 15. Gender.....
- 16. Age.....
- 17. Marital Status.....
- 18. Level of education.....
- 19. Hospital incorporation date.....
- 20. Ownership of the Hospital.....
- 21. Legal form of the institution.....



CATEGORY OF RESPONDENTS	INTERVIEW GUIDE
BMC HEADS	<ul style="list-style-type: none"> <li>• Processes involved in getting items from the stores</li> <li>• personnel involved in the procurement process</li> <li>• Sharing of information among departmental heads and the procurement officer regarding stock levels</li> <li>• Availability of goods</li> </ul>
PROCUREMENT OFFICERS/SUPPLY CHAIN OFFICERS	<ul style="list-style-type: none"> <li>• Please explain the term, Supply Chain Management.</li> <li>• Mention the processes involved in Supply Chain Management in the facility.</li> <li>• Please describe the operational factors of SCM in the facility.</li> <li>• Do you think the factors affect supply of goods? Please Explain.</li> <li>• Sharing of information among departments on Supply Chain Management</li> <li>• Delays in supply of goods</li> <li>• Number of times purchases are done in a year</li> <li>• The operational challenges of SCM</li> </ul>



OTHER SENIOR MANAGERS	<ul style="list-style-type: none"> <li>• Operational factors of S C M</li> <li>• Payment of suppliers</li> <li>• Factor that accounts for ad-hoc purchases</li> <li>• Causes of shortages of goods</li> <li>• Sharing of information among core managers and</li> <li>• Departmental heads on SCM</li> </ul>
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*Thank you for your assistance in answering these questions, GOD BLESS YOU!*

