ASSESSING USERS' SATISFACTION OF MEDICAL LOGISTICS SUPPLY CHAIN SYSTEM IN GHANA- CASE OF SANDEMA DISTRICT HOSPITAL

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ABSTRACT: *The study is to investigate the satisfaction of users with medical logistics supply chain. The study focused on Sandema district hospital as the study site from which information was collected. The researcher adopted the mixed research approach. From the perspective of Creswell (2012) a mixed approach research design enables the researcher to use objective methods to measure the incidence of various opinions in a chosen sample. A mixed approach research design further enhances an in-depth and rich account of the constructs that are being investigated (Saunders, Lewis & Thornhil, 2007; Yin, 2003). Four research questions were formulated for the research. The researcher used quantitative survey approach to gather information from a large spectrum of patients of Sandema district hospital in his quest to ascertain their satisfaction with medical logistics at the hospital. The target population of this study included staff and patients of the Sandema hospital. The researcher chose a sample of two hundred (200) patients and ten (10) health personnel in order to organize appropriate data useful for the study. The purposive and convenience sampling technique were the most appropriate sampling techniques utilized by the researcher. The study revealed that health personnel of the Sandema Hospital had fore knowledge about medical logistics supply chain as all the activities that are involved in the procuring, management and the usage consumable and non-consumable materials of the hospital. Also, stores and the procurement unit of the Sandema District Hospital is the department or unit within the Sandema Hospital that is responsible for the procurement and the storage of medical logistics before these medical logistics get to the final consumer (patients/health personnel). Despite some challenges confronting the Sandema hospital with respect to medical logistics supply chain, the health personnel of the hospital are satisfied with the medical logistics supply chain as it enables them to perform their duties efficiently. Contrary to the above assertions, the study further revealed that majority of the patients is not satisfied with the hospitals ability to supply medical logistics for their treatment. Finally, the study revealed lack of funds in acquiring medical logistics, little knowledge of medical logistics supply chain, poor internal control, long and bureaucratic procedures in the medical logistics supply chain and delay in the payment of medical logistics.*

KEYWORDS: Procurement, Logistics Management, Supply Chain Management, Performance Impact, Material Management, Marketing Management

INTRODUCTION

In Ghana, both private and public sectors do provide health care for the citizenry of the country. However, the Ministry of health (MOH) is solely responsible for controlling the entire health system through policy formulation as well as monitoring and evaluation practices in order to achieve set targets. Under the public health system, service delivery is undertaken by the Ghana Health Service (GHS) and teaching hospitals since they constitute the bulk of the Ministry of Health (MOH) institutions. It is however important to note that, other quasi-

governmental and statutory bodies are also involved in the health service delivery in Ghana Adegoke et al., (2008).

Health care institutions in Ghana can be effective in the provision of health care to the Ghanaian populace if they are provided adequate medical logistics. In general terms, Sangeeta and Nadeem (2004) refer to logistics as the specific functions that need to be carried out by each of the supply chain partners such as selecting products, forecasting demand, ordering and procuring, warehousing and storing, managing inventory, transporting from one level to the next until the commodities reach the clients and managing data in the process. In this regard, the significance strategic logistics management in the Ghana Health Service System cannot be downplayed. According to Poulin (2007), medical logistics accounts for a sizeable portion of the hospital's operating budget - studies (Quaicoe, 2014; Whewell, 2012 and Heskett et al., 2010) confirm that 30% to 46% of hospital expenses are invested in various logistical activities and that almost half of the costs associated with supply chain processes could be eliminated through the use of best practices. Because of the importance of medical logistics in countries, health care institutions are looking for strategies to improve operational efficiencies in order to reduce cost without affecting patient care services Msimangira, (2010). Despite the efforts by countries to improve medical logistics efficiency through effective supply chain and operational procedures, in the case of Ghana, logistics systems for health facilities and institutions have been centralized Bates et al. (2000) cited in Bossert et al. (2003). Moreover, the major logistical functions namely planning, forecasting, procurement, warehousing and the distribution of medical devices, essential drugs, contraceptives and vaccines are performed by the central ministry offices. These systems have been extremely inefficient and in many cases incapable of providing adequate supplies on a timely basis. In order to improve upon the system, experts in logistics have developed new approaches to make these logistics systems more effective and efficient. However, most of these experts concentrate on initiatives that retain central control and focus on developing better skills and systems at the central level and assuring that standard methods are used throughout the system so as to ensure effective and efficient logistics management.

The inefficiency of the centralized medical logistics supply chain system in Ghana has dire consequences and implications on the efficiency and effectiveness of hospitals at the regional and district levels. It is therefore important to explore such consequences and implications through an empirical lens. For this study, the researcher focuses on evaluating users' satisfaction of the centralized medical logistics supply chain by using Sandema Hospital as a case study.

Problem Statement

In spite of the relevance of medical logistics supply chain in public health care delivery in Ghana, there is paucity of research to provide empirical evidence on its implications for district hospitals in Ghana. Gyimah et al., (2009) for instance, assert that, one major challenge of national medical logistics is the ability to ensure the uninterrupted supply of medical logistics that are safe and efficacious, physically and financially accessible and used nationally. Unfortunately, in some districts of northern Ghana, the medical supply systems are often unreliable and therefore do not guarantee regular supply of medical logistics to end users. Similarly, studies undertaken by Frimpong-Manso et al., (2013) point to poor procurement planning and budgeting, lack of financial resources for procurement, poor quantification and forecasting, delay in procurement process and order processing, and delay in receiving

insurance claims as some of the problems plaguing the medical logistics supply chain system of the Ghana Health Service.

In the case of the Sandema Hospital which is located in the Upper East Region of Ghana, the researcher observes that health care delivery to the indigenous people has been hampered by a number of teething problems. The administration of the hospital has been entangled with challenges such as shortage of medical devices, drugs, and vaccines which have thwarted its delivery of health care to patients to a large extent. Dwelling on the challenges confronting the hospital currently, the researcher seeks to explore the extent of users (health professionals and patients) satisfaction of the centralized medical logistics supply chain as well as its implications for health care delivery at the Sandema Hospital.

Research Questions

1. What is the perception of health professionals and patients on medical logistics supply chain system at Sandema Hospital?

2. How is medical logistics managed at Sandema Hospital?

3. What is the level of users' satisfaction of medical logistics supply chain system at Sandema Hospital?

4. What are the challenges encountered in medical logistics supply chain at Sandema Hospital?

LITERATURE REVIEW

The Concept of Supply Chain

Supply Chain Management is defined by Li et al. (2006) as a set of activities undertaken in an organization to promote effective management of its supply chains. From this definition one can conclude that components of SCM practices includes supply and material management issues, operations, information technology and sharing (ICT) and customer service (Tan et al. 2002). Other components such as technology, cost, inventory management, competitiveness and external regulations, according to McMullen (1996) needs to be managed effectively to achieve to business goals of each supply chain members. It also leads to value creation to end customer. Performance Impact of Supply Chain Management Practice Previous studies suggest that effective SCM practices have a direct impact on the overall financial and marketing performance of an organization (Shin et al. 2000; Prasad and Tata 2000). Indeed, SCM practices is expected to increase an organization's market share, return on investment and improve overall competitive positions. For instance, Tan et al. (1998) asserted that customer relations and purchasing practices impact the effectiveness of SCM strategy and lead to financial and market performance. Froehlich and Westbrook (2001) on the other hand suggested that companies with broader supply chain integrations with suppliers and customers showed the largest performance improvement in business achievements.

Medical Logistics Supply Chain

Medical logistics Supply Chain could be best described as the processed by which medical logistics passes from the producer to the final consumer which could be the Service Delivering Points or individuals who may require or consume such logistics. One of the components or

products of Medical Logistics is pharmaceutical products or medicines. According to Opare (2009), pharmaceutical supply chain is the means by which prescriptions medicines are delivered to patients. Thus according to Opare (2009), pharmaceuticals originate in manufacturing sites; are transferred to wholesale distributors; stocked at retail, mail-order and other types of pharmacies; subject to price negotiations and processed through quality and utilization management screens by pharmacy benefit companies (PBMs); dispensed by pharmacies; and ultimately delivered to and taken by patients.

Distribution of Medical Logistics in Low and Middle Income Economies

According to Dowling (2011), the distribution of drugs in Low and Middle Income Countries are distributed in three systems. The three systems according to Dowling (2011) are;

- Government/Public-run system

- Private not-for-profit

- Private Commercials

Public Sector

According to Dowling (2011), the main public sector supply model in Low and Middle Income Countries consist of a public body known as the Central Medical Stores (CMS) which is solely responsible for procurement and distribution of health supplies to public sector channels. However, in some Pacific countries, this role could be handled by pharmacy departments of ministries. Central Medical Stores differ in the level of sovereignty that they possess (Govindraj & Herbst, 2010). Some Central Medical Stores (for instance, Ghana and Malawi) are virtually complete public sector entities run as a sub-division of the Ministry of Health (MOH) while others have a huge degree of operational and financial independence, for example the Centrale a'Achats des Médicaments Essentiels Génériques et des Consommables Médicaux in Burkina Faso has independent management structures, although the government has representatives that sit on its board. Regardless of any commercial goals, CMS are expected to play a role in increasing access to medicines.

The role and responsibilities of Central Medical Stores also vary. From a traditional domain, the role of the Central Medical Store is to ensure that medicines are well stored and distributed to the various outlets at both the regional and district levels. However, it is important to note that, some of the Central Medical Stores do also operate as Regional Medical Stores which are responsible for storing and distributing medicines and other health products at the health facility level. According to Dwoling (2011) Malawi operates three Regional Medical Stores while Senegal operates as much as eight Regional Medical Stores. However, in other countries, it is the responsibility of the Regional Medical Stores to operate procurement of medical logistics for existing health facilities. Moreover, in countries such as Ghana and Malawi, a separate procurement entity exist under the jurisdiction of the Ministry of Health, thus procurement for medical logistics is partly decentralized. In a country such like Philippines, procurement is almost completely decentralized (Dowling, 2011).

Private—Not-for-Profit

According to Dowling (2011), there are a number of autonomous private not-for-profit medicine supply chains operating in Low and Middle Income Countries. These include systems

operated by faith-based organizations (religious organisations) and international or local development and humanitarian nongovernmental organizations (NGOs) such as Médecins sans Frontières (MSF), International Planned Parenthood affiliates, Save the Children, etc. In addition, social marketing entities (SMEs) may operate supply chains or employ commercial supply chains to dispense a limited range of medicines. In many countries, faith based or religious organisations have come together to operate cooperative supply chains, for example the Churches Health Associations of Malawi, Ghana, and Zambia. In Ghana, the Churches Health Association provides about 30 percent of healthcare in Ghana through a network of 152 institutions (Ballou-Aares 2008) and operates a central warehouse sourcing products locally from private distributors or from the Central Medical Store.

These not-for-profit organizations often purchase medicines from external sources through procurement agencies like the IDA Foundation or Mission Pharma. They most times depend on donor funds for medicine procurements or for in-kind donations (e.g., UNICEF, the U.N. Population Fund, and the U.S. Agency for International Development [USAID]). As donors move toward direct budget support to governments (e.g., sector wide approaches and basket funds), they are becoming increasingly more reliant on government resources or access to public sector medicines. They are usually reliant on cost recovery for some of their funding and attempt to maintain affordable prices. Access to finance for medical logistic purchases can be a major challenge, as recipients' buying power limits the sustainability of cost recovery. Faith Based Organisations facilities may be affiliated to the public sector (e.g., Malawi), NGOs may manage public sector facilities (e.g., Liberia), or SMEs may supply public facilities (e.g., the Philippines), further clouding the distinction between public and private channels. There are little data available as to how well these supply chains perform. International NGOs like MSF are known for their capacity in logistics, while national organizations like the Church Health Associations may suffer from resource limitations.

Private—Commercial

The structure and importance of commercial supply chains for medical logistics supply chain varies from country to country. However, purchasing power of the public limits their significance in all Low and Middle Income Countries. The following examples illustrate some of the diversity of commercial models found.

In Mali, the commercial market for pharmaceuticals is highly consolidated with two wholesalers controlling about 80 percent of the market (McCabe 2009). These two wholesalers supply about 400 independent pharmacies throughout the country, with daily direct delivery to pharmacies in the capital Bamako and independent distributors to the rest of the country. By contrast, the commercial market in Ghana is much more fragmented with about 60 importers and 166 wholesalers supplying around 700 pharmacies and over 11,000 chemical shops. In Malawi, there are 22 importers/wholesalers (Dowling, 2011). UNICEF distributes Anti-Retroviral drugs to public sector facilities using a commercial network; this system is operated by a freight company with UNICEF supplying pharmaceutical oversight.

In many countries, public sector facilities procure supplies from the commercial sector. In many instances, for example Malawi and Ghana, this is officially allowed only in the event that the Central Medical Stores is stocked out of the item in question; however, enforcement of this regulation is questionable. Also, public sector supply chains may also supply commercial or other private outlets.

Distribution Network and Medical Logistics transportation

The National Level Medical Stores (NLMS) or the Central Medical Stores (CMS), the Regional Level Medical Store (RLMS) and the District Level Medical Stores (DLMS) are the major tenets used for the procurement and distribution of medical logistics in most countries. According to Schöpperle (2013) there is the need for an effective management of ordering, receipt, storage, distribution and re-supply at each stage of distribution in order to enhance an effective medical logistics supply chain. One option is that a higher level distributes medical logistics to lower levels e.g. the Central Medical Stores is responsible for delivering medicine to the Regional Medical Stores. Burkina Faso has 1 National Level Medical Stores, 7 Regional Level Medical Stores and 63 District Level Medical Stores (Schopperle, 2013). This distribution network is becoming more complex due to additional 14 primary and 7 secondary storage entities set up from partner organizations with vertical supply chains (Yadav et al., 2011). In Burkina Faso the procurement and delivery of drugs and other medical logistics could take up to eight months (Saouadogo and Compaore, 2010).

Two different distribution network approaches are identified in research which includes the use of Intermediate tiers as a cross-dock facility as well as completely bypassing intermediate tiers. In the instance where the intermediate tiers is used as a cross-dock facility, the District Level Medical Stores play an integral role where already packed and fulfilled orders for health centres reduces administrative tasks at the District level because, medical logistics are distributed directly to individual health centres. The facility is used to store and transport medicine and to assemble data from the Health Centres. The latter one is using only two tiers and delivery and order fulfilment is done direct from NLMS to HCs (USAID, 2011a).

The private sector, with a network of importers, wholesalers, sub-wholesalers and pharmacies is more complex and links international manufacturers with local private pharmacies and Health Centres. There exist about 292 licensed medical importers in Nigeria, whereas 3-5 wholesale companies serve the entire market most OECD-countries (Yadav et al., 2011). Private providers of medical logistics use either the public distribution network or private warehouses and can have several tiers between warehouses and Health Centres (Federal Ministry of Health, 2010b). According to Yadav et al (2011), the Churches Health Association of Nigeria (CHAN) Medi-pharm, which is a Christian Organisation, is responsible for the distribution of drugs to about 1920 Health Centres such as hospitals and dispensaries in Nigeria. According to CHAN Medi-pharm (2010), this network dispenses essential medicine to 12 states in Nigerian which covers 46 communities in rural areas and gathers data from Health Centres. Some development partners e.g. NGOs or donors build their own parallel systems due to a weakness of governmental structures and lack of efficiency in the public supply system. Only 20-30% of procured medicines from partners are distributed through governmental structures. Thus, harmonization of vertical programs and governmental systems becomes vital (Federal Ministry of Health, 2010b and CHAN Medi-Pharm, 2010). For example, in Nigeria there is a complex and chaotic medicine supply chain system with registered and unregistered facilities, where the National Level Medical Stores purchase essential medicine and distributes to District Level Medical Stores. The Health Centres are responsible for collecting or organising deliveries from the Regional and the District levels. Most District Level Medical Stores have their own distribution system (80%) and some still deliver a monthly scheduled delivery to HC level, which abides by the push-system. However, for an effective delivery system the amount of vehicles is inadequate. So delivery of these medical logistics are subcontracted to private entities, which sometimes encounter issues such as a lack of proper

vehicles for cold supply chain, a lack of content and some store medical supplies to combine different deliveries and maximise earnings. This lack of the proper vehicles for the supplies of these logistics most often lead to late deliveries of supplies, shortages of supplies and deprivation of value. The system for the delivery of these logistics becomes intricate because a number of drugs need to be selected, procured, circulated and traced and each drug has a peculiar distribution limitations drugs that are to be stored cold and drugs that have relatively shorter life span.

Inventory management/warehouse infrastructure

A requisite inventory control system, that has sound and secure storage facilities, proper quantification and selection process improve the availability of medical logistics and minimizes the likelihood that some of these medical logistics will go waste. However according to Foster (1990), there exist some challenges. Right inventory management at the various stages of the supply chain is imperative for effective distribution of these medical logistics from the various storerooms. Most of the times, there exist several channels between National Level Medical Stores (NLMS) and Health Centres (HCs), which all hold inventory and handle orders from lower levels. The outcome of this is high stock levels, which involves intensive labour to process orders and leads to high inventory costs and numerous logistics tasks for health workers (HW) (USAID, 2011a). Consequently, funding constraints need to be equilibrated with the various channel of the distribution network (Yadav et.al, 2011).

Transaid (2010) reports that poor planning and forecasting, insufficient information about pulmonary tuberculosis and current inventory levels, funding and capacity restraints and a poor infrastructure are reasons for inappropriate stock levels in Nigeria. Public storerooms infrastructure for the storing of medicines in Nigeria consists of National Level Medical Stores (NLMS), District Level Medical Stores (DLMS) and the Health Centres (HCs), whereas difficulties with the delivery system increase further down the supply chain. Federal Ministry of Health (2010) reports that "in Nigeria there are eight NLMSs, which struggle with moisture, leaking ceilings, roofs, drains or taps, inappropriate cold storage capacity" and non-existent designated areas for receiving supplies, distribution and quarantined products. All the same, there are different venues for the storage of medicines that are hazardous and narcotic medicine, products requiring cold storage, possibilities to procure merchandise and stores are shaded from direct sunlight. Inventory management is performed manually with stock holding cards which is done along the first-expired-first-out (FE-FO) strategy (Federal Ministry of Health, 2010a). Burkina Faso and Nigeria have medical stores that are partly independent, which positively influence swiftness and flexibility due to management expertise (Yadav et al., 2011). According to the Ministry of Health of Nigeria, HCs are have good infrastructure for the storage of medicines, have good ventilation and security systems. According to the Health Ministry of Nigeria, majority of HCs lack temperature charts that could be used to control cold chains. According to the Ministry, up to 67% of stock-outs occur due to funding and management difficulties, inaccuracies in forecasts or modifications of Standard Treatment Guidelines (STG) (Federal Ministry of Health, 2010a and Habiyambere and Wertheimer, 1993).

A study conducted in Ghana and Guatemala evaluated inventory performance of a mostly centralized or decentralized warehouse management models. The outcomes of the study conducted in both Ghana and Guatemala indicate that the exercise of centralized guidelines and similar procedures such as SOPs and clear stock cards improved performance (Bossert et al., 2007).

Transport and Distribution

USAID (2010) reported that some of the transportation and distribution challenges in the medical logistics supply chain include limited funds for the purchase of vehicles that would be used in the transportation and distribution of the medical logistics, maintenance and repair of the vehicles, fuel and salaries for the people involved in the transportation and the distribution (USAID, 2011a). Yadav et al (2011) reported that 13% of the values of stock in Ghana of the needed medical logistics are made up of logistics costs. At that place are competing interests between low distribution costs and high service quality. Thus, if the frequency of distribution is high, transportation costs are high, but in a more reliable demand planning horizon with less strain-out situations (Yadav et al., 2011). Bossert et al (2007) reported that decentralized transportation systems in Guatemala results in a high performance as opposed to the centralised transportation.

Last mile distribution is usually on a collection basis, which means that Health Centres are required to pick up their orders at storerooms through bicycles, public transport or vehicles, of which most of these transport systems are often used for varied reasons and convey these supplies back to the health facilities where these medical logistics would be utilised. Collections of these medical logistics are most times in an ad hoc manner and Health Centres require extra funds for conveying these medical logistics to the Health Centres. However, collection of these medical logistics by the HCs could mean that the workers of the health centres need to travel long distances and close the Health Centres when there are not enough workers at the Health Centres due to a lack personnel. USAID (2008) reports that, in Zimbabwe, the DTTU arranges direct deliveries from NLMS to HCs and gathers information and consumption data from the HC when the when the delivery team is on-site for delivery of drugs. In the DTTU delivery system in Zimbabwe, the frequency at which logistics would be supplied to a Health Centre is dependent on the distance from the NLMS and the capacity at which the HC can store logistics. According to the USAID (2008), this approach of the distribution of medical logistics decreases channels and stock levels on the entire supply chain, but often increases transportation costs. According to USAID (2008a), this running cost of the DTTU is quite similar to old models that were utilized before in Zimbabwe, whereas stock-outs decreased and logistics performance benefited. Subcontracted distribution can be very effective but needs to be strictly managed and controlled as the cost involved could be escalated at times (USAID, 2008b). According to Transaid (2010), study in Nigeria reveals that 12-19% on the delivery cost was saved as a results of the subcontracting of such function, however, organisational and or political obstacles can exist when such a function in the medical logistics are subcontracted. For example, when the government in Gambia subcontracted their distribution of medical logistics to an NGO, which maintains a vehicle fleet and charges the government on a cost per kilometre basis, it was discovered that Private establishments often distribute medical logistics with mini-vans, public transport or via collection (Yadav et al., 2011).

In general distribution systems of medical logistics need to balance high initial investments, the capacity of personnel responsible for the delivery of medical logistics, reliability and stock-outs to improve the performance of transportation and distribution (USAID, 2011a). There may exist opportunities that could be employed to minimize the number of channels by combining different products with similar distribution characteristics which in effect could help minimize overall costs for Transport and Distribution. However, WHO (2006) reported that organisations that are responsible for medical logistics supply chain are fragmented and rival entities and

thus, co-operation among rival organisations could be a challenge. According to USAID (2008), vertical supply chains have advantages for ad hoc and irregular drug deliveries and for a lack of capacity within the public supply chains. USAID (2008) reported that, vertical approaches in the medical logistics supply chain could duplicate the need for specific services, which could increase total costs for transportation and distribution of medical logistics (USAID, 2008).

Medical Logistics Supply Chain in Ghana

Conceptual Framework for Medical Logistics Supply Chain in Ghana
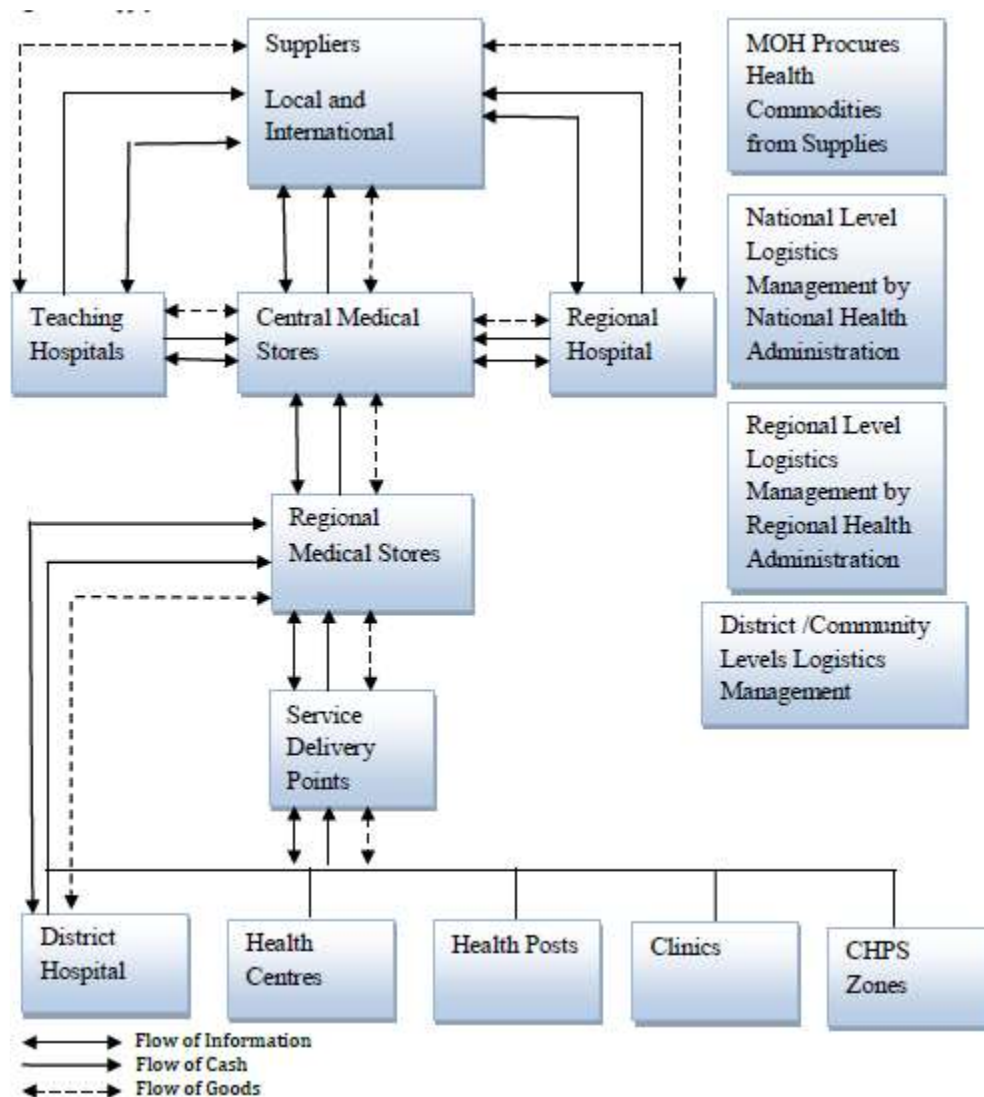
Source: Manso, Annan and Anane, (2013).

Overview of the Logistic Supply System

In Ghana, there exist three-tier systems in the management of medical logistics and health supplies. The Central Medical Stores (CMS), the Regional Medical Stores (RMS) and Service Delivery Points (SDP) together with the transportation and distribution network constitute the

pipeline for the medical logistics supply chain in the country. The Central Medical Store, which is a unit of the Procurement and Supply Directorate of the Ministry of Health, is the entity that is responsible for the procurement, receipt, storage, and distribution of all medical logistics that is procured by Ghana's Ministry of Health. The Regional Medical Stores in effect get their supplies from the Central Medical Stores and the Regional Medical Stores in turn deliver these supplies of the Service Delivery Points which are Health Centres. The Ministry of Health has in place a number of vertical public sector supply chain based on the type of medicines and health supplies (MOG, 2009). The Ministry of Health is currently working on an integration that will look at a more coherent way to continue the medical logistics supply chain necessary to support this has not yet evolved.

Currently, medical logistics are procured by the Central Medical Stores through international competitive bidding (ICB) and from local private suppliers and manufacturers. The Regional Medical Stores and the three teaching hospitals (Korle-Bu, Konfo-Anokye, and the Tamale teaching Hospitals) are expected to procure drugs through the Central Medical Store and from the local private sector (Ministry of Health, 2009). All the Service Delivery Points are required to procure from the Regional Medical Stores in their respective regions and are only allowed to procure outside the public system, except the cases of unavailability, studies have shown significant private sector purchases at all levels. All though integration in the medical logistics supply chain system in the country is on-going, there are still a number of district medical stores which procure from the Regional Medical Stores and the local private sector. The teaching and regional hospitals and the over 900 Service Delivery Points in the country are supplied by Regional Medical Stores, District Medical Stores and in many instances procure drugs through the local private sector.

Procurement

According to MOH (2009), Ghana has both a centralized and decentralized procurement system for the public health sector. At the central level, the procurement unit under the directorate of procurement and supplies of the Ministry of Health organized procurement activities. Here, larger volumes of essential medicines are purchased by tender processes which could be international as well as national or local. According to Ministry of Health (2009), procurements of medical logistics for the Ghana Health Service are carried out at the Procurement and Supply Directorate of the Ministry of Health. The Procurement and Supply Directorate of the Ministry of Health has three units namely: the Central Medical Store (CMS), the Procurement Unit and the Drug Policy Unit. Procurement of Medical Logistics of the Ministry of Health is coordinated by the Procurement Unit. Also, the Procurement Unit is responsible for the contract packages and procurement portfolios for the Ministry of Health. The Central Medical Stores formulates procurement plans which are then sent to the Procurement Unit through the Director of Procurement and Supply. The Procurement Unit of the Procurement and Supply Directorate then performs all the necessary functions with the procurement of needs.

According to World Health Organisation (2011) report, "in the event of non-availability of products within the public supply system, commodities can be procured from the open market, but through due process involving the issue and receipt of a certificate of non-availability in the Regional Medical Stores or Central Medical Store." In the procurement of drugs, WHO (2011) also reported that procurement through the public sector is narrow to medicines on the Essential Medicines List (EML). With regards to the list on the essential Medicine List (EML), there exist regulations for local preference in procurement through the public sector.

Ordering

According to WHO (2011), ordering of medical logistics is the responsibility of the Regional Medical Stores managers (pharmacists) and are supported by either other pharmacists or supply officers. WHO (2011) further asserts that the periods for the ordering of medical logistics were more demand driven than periodic, though the two systems may run at par with each other. Product which have been ordered were delivered by the supplier when the procurement is being done from the private sector; however, with authorisation from the Central Medical Stores, the Regional Medical Stores arrange their own means of transport which most often could be through their own transportation options (WHO, 2011)

Distribution of Medical Logistics

In Ghana, after the procurement of the medical logistics, the Central Medical Store is delivered the medical logistics. All Regional Medical Stores have their vehicles which coordinates the transport of Medical Logistics to the various Regional Medical Stores. After the Regional Medical Stores have received their orders from the Central Medical Store, drugs are housed at the Regional Medical Stores. The Service Delivery Points in turn pick their orders from the Regional Medical Stores. The Service Delivery Points thus use the logistics for the necessary actions

RESEARCH METHODOLOGY

For this study, the researcher adopted both quantitative and qualitative research approaches. Thus, in a nutshell, the researcher adopted the mixed research approach. From the perspective of Creswell (2012), a mixed approach research design enables the researcher to use objective methods to measure the incidence of various and opinions in a chosen sample. A mixed approach research design further enhances an in-depth and rich account of the constructs that are being investigated (Saunders, Lewis & Thornhil, 2007; Yin, 2003).

The researcher chose to use a quantitative survey approach to gather information from a large spectrum of patients of Sandema hospital in his quest to ascertain their satisfaction with medical logistics at the hospital. According to Zikmund (1999) survey is the most common method of generating primary data. Zikmund (1999) defines a survey as a research technique in which information is gathered from a sample of people through a questionnaire. Thus, the quantitative aspect of the research design was much appropriate because the researcher sought to gain an understanding of patients' satisfaction with medical logistics by gathering data from a larger sample size through a survey approach by administering questionnaires.

The qualitative aspect of the research design sought to gain an in-depth understanding of users' satisfaction on medical logistics by gathering data from the hospital staff through the use of in-depth interviews. Jalulah (2011) opines that qualitative research approach is conducted to find out what people do, think, know and feel about a particular phenomenon. Kothari (2004) further adds that, qualitative research is associated with face to face contact with people in their original settings, together with verbal data, observations, and uses techniques such as focus group interviews, projective techniques and in-depth interviews.

For this study therefore, the researcher chose a sample of two hundred (200) patients and ten (10) health personnel in order to organize appropriate data useful for the study. The purposive and convenience sampling technique were the most appropriate sampling techniques utilized by the researcher. The purposive sampling technique was used to gather information from hospital staff that had to be interviewed in order to gather the appropriate information/data from them. The convenience sampling technique on the other hand was used for the selection of patients in the hospital. This sampling approach was very useful because it gave the researcher the opportunity to select respondents based on their availability and willingness to participate in the study. Primary and secondary sources were used for this study. The primary sources of data comprised of information gathered from the staff of Sandema Hospital through interviews that will be conducted. On the other hand, secondary sources of data comprised of journals, books, articles and other electronic data utilized by the researcher for the study. Data collection was through the administration of questionnaires and also conducting interviews. The questionnaires and interviews were designed in line with the research objectives.

DISCUSSION OF RESULTS

PERCEPTION OF PATIENTS ABOUT MEDICAL LOGISTICS AT SANDEMA HOSPITAL

Table 1: How soon were you attended to when you arrived at this hospital?

Responses	Frequency	Percent %
In less than 15 minutes	18	9.1
In less than an hour	42	21.2
between 1-2 hours	66	33.3
After over 2 hours	72	36.4
Total	198	100.0

Source: Field data, 2015

Table 1 assessed how soon the patients (respondents) were attended to when they visited the hospital to seek health care. According to the table 9.1% and 21.2% indicated that they were attended to in less than 15 minutes and in less than an hour respectively. Also, 33.3% and 36.4% of the respondents indicated that they were attended to between 1-2 hours and after over 2 hours respectively. From the table above, it could be concluded that majority of the respondents were attended to after over 2 hours when they visited the hospital.

Table 2: In my opinion, the hospital is doing well in its ability to supply items needed for treatment

Responses	Frequency	Percent %
Strongly Disagree	60	30.3
Disagree	54	27.3
Agree	72	36.4
Strongly Agree	12	6.0
Total	198	100.0

Source: Field data, 2015

Table 2 assessed the opinions of the respondents on the statement 'In my opinion, the hospital is doing well in its ability to supply items need for treatment'. As per the table above, 30.3% and 27.3% of the respondents responded 'Strongly Disagree' and 'Disagree' respectively whiles 36.4% and 6.0% responded 'Agree' and 'Strongly Agree' respectively. As per table 4, majority of the respondents do not agree that the hospital is doing well in its ability to supply items needed for the treatment of its patients.

Table 3: From my point of view, the hospital needs to work on its logistics acquisition and supply chain system

Responses	Frequency	Percent %
Strongly Disagree	18	9.1
Disagree	18	9.1
Neither Agree Nor Disagree	24	12.1
Agree	90	45.5
Strongly Agree	48	24.2
Total	198	100.0

Source: Field data, 2015

Table 3 assessed the opinions of the respondents (patients) on the statement 'In my point of view, the hospital needs to work on its logistics acquisition and supply chain system'. As per table 4.2.3, 9.1% each of the respondents' indicated 'Strongly Disagree' and 'Disagree' respectively whiles 12.1% of the respondents neither agreed nor disagreed. Also, 45.5% and 24.25 of the respondents responded 'Agree' and 'Strongly Agree' respectively. Therefore according to table 5, the hospital needs to work on its logistics acquisition and medical logistics supply chain.

How Medical Logistics is managed at Sandema Hospital

Table 4: Based on my experience in this hospital, I am convinced that items used in the treatment of patients (medical logistics) are well managed.

Responses	Frequency	Percent %
Strongly Disagree	36	18.2
Disagree	66	33.3
Neither Agree Nor Disagree	24	12.1
Agree	60	30.3
Strongly Agree	12	6.1
Total	198	100.0

Source: Field data, 2015

Table 4 assessed the opinions of the respondents on the statement 'Based on my experience in this hospital, I am convinced that items used in the treatment of patients (medical logistics) are well managed'. As per the table, 18.2% and 33.3% of the respondents responded 'Strongly Disagree' and 'Disagree' respectively whiles 12.1% responded 'Neither Agree Nor Disagree'. Also, 30.3% and 6.1% of the respondents responded 'Agree' and 'Strongly Agree' respectively. As per table 6, it could be concluded that based on the experiences of the patients at the hospital, they are not convinced that the medical logistics used in the hospital are well managed.

Table 5: I am aware this hospital has a procurement department that manages its medical logistics

Responses	Frequency	Percent %
Yes	66	33.3
No	36	18.2
Not Sure	96	48.5
Total	198	100.0

Source: Field data, 2015

Table 5 assessed the responses of the respondents on the statement 'I am aware this hospital has a procurement department that manages its medical logistics.' According to the table, 33.3% responded 'Yes', 18.2% responded 'No' and the remaining 48.5% responded 'Not Sure'. Therefore, as per the table, majority of the respondents (patients) are not sure whether the hospital has a procurement department that manages its medical logistics supply chain.

Table 6: Health personnel in this Hospital are very efficient because items used for the treatment of patients (medical logistics) are readily available.

Responses	Frequency	Percent %
Strongly Disagree	24	12.1
Disagree	78	39.4
Neither Agree Nor Disagree	18	9.1
Agree	66	33.3
Strongly Agree	12	6.1
Total	198	100.0

Source: Field data, 2015

Table 6 assessed the responses of the respondents on the statement 'Health professional are very efficient because items used for the treatment of patients (medical logistics) are readily available.' From the table, 12.1% and 39.4% responded 'Strongly Disagree' and 'Disagree' respectively whiles 9.1% responded neither 'Neither Agree nor Disagree'. Also, 33.3% and 6.1% responded 'Agree' and 'Strongly Agree' respectively. Thus according to the responses of the patients, the health personnel of the hospital are not efficient because items used for the treatment of patients are not readily available.

USERS' SATISFACTION OF MEDICAL LOGISTICS SUPPLY CHAIN

Table 7: Users' Satisfaction of Medical Logistics Supply Chain

No	Item	Response	Percent (%)	
		Yes	No	Total
A	Bandage	12.1	87.9	**100**
B	Medicines (tablets and capsules)	75.8	24.2	**100**
C	Intravenous infusions (drips)	15.1	84.8	**100**
D	Injections	21.2	78.8	**100**

Source: Field data, 2015

Table 7 assessed the users' satisfaction of medical logistics supply chain in the hospital with respect to items which were used during the course of treatment of the patients (respondents). As per the table above, 12.1%, 75.8%, 15.1% and 21.2% of the respondents indicated that they were treated with bandage, medicines (tablets and capsules), intravenous infusions (drips) and injections respectively. However, it could be deduced that, the most prominent item used in the treatment of patients as identified by the respondents is medicines (tablets and capsules).

Table 8: Were all the materials provided by the hospital?

Response	Frequency	Percent %
Yes	102	51.5
No	90	45.5
Not Sure	6	3.0
Total	198	100.0

Source: Field data, 2015

Table 8 assessed whether all the items (medical logistics) used in treating the patients (respondents) were provided by the hospital in treating the patients. As per the table, 51.5% of the respondents responded 'Yes', 45.5% responded 'No' and 3.0% responded 'Not sure'. This gives the indication that, most of the materials used in the treatment of patients are provided by the hospital.

Table 9: If yes, how long did it take for the hospital to supply the items

Responses	Frequency	Percent %
Less than 15 minutes	12	6.0
Between 30 minutes and 1hour	66	33.4
Between 1-2 hours	60	30.3
Between 3-6 hours	60	30.3
Total	198	100.0

Source: Field data, 2015

Table 9 assessed the number of minutes it took the hospital to provide the items needed to treat the patients. As per the table, 6.0% and 33.4% indicated that it took less than 15 minutes and between 30 minutes and 1 hour respectively for the hospital to provide the items for the treatment of the patients. Also, 30.3% each of the respondents indicated that it took between 1-2 hours and 3-6 hours for the hospital to supply the items needed for the treatment of the patients. This gives the indication that, it takes the hospital a longer time to provide items used in the treatment of patients.

Table 10A: Did you pay for any of these materials?

Responses	Frequency	Percent %
Yes	84	42.4
No	114	57.6
Total	198	100.0

Source: Field data, 20I5

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Table 10A assessed whether the patients (respondents) were made to pay for any of the materials used in treating them. According to the table, 42.4% indicated that they were made to pay for some of the material whiles 57.6% indicated that they were not made to pay for any of the items. The table therefore indicates that majority of the respondents were not made to pay for any materials used in treating them.

Table 11B: Items Patients Paid for

No	Item	Response Yes	Percent No	% Total
A	Bandage	9.1	90.9	100
B	Medicines (tablets and capsules)	18.2	81.8	100
C	Intravenous infusions (drips)	9.1	90.9	100
D	Injections	15.2	84.8	100

Source: Field data, 2015

Table 11B assessed the items that the patients were asked to pay for. As per the table, 9.1%, 18.2%, 9.1% and 15.2% of the respondents indicated that they were asked to pay for bandage, medicines (tablets and capsules), intravenous infusions and injections respectively. This gives the indication that, the prominent items being paid for by patients include medicines (tablets and capsules) and injections.

Table 12: How satisfied are you with the hospital's ability to supply the items needed for your treatment?

Responses	Frequency	Percent %
Below Satisfactory	78	39.4
Fairly Satisfactory	36	18.2
Average	42	21.2
Satisfactory	42	21.2
Total	198	100.0

Source: Field data, 2015

Table 12 assessed how satisfied the patients (respondents) were satisfied with the hospital's ability to supply the items that are needed for their treatment. As per the table, 39.4% and 18.2% of the respondents responded 'Below Satisfactory' and 'Fairly Satisfactory' respectively whiles 21.4% each of the respondents responded 'Average' and 'Satisfactory'. As per the table, majority of the respondents are not very satisfied with the hospital's ability to supply the items needed for the treatment of patients.

PATIENTS' PERSPECTIVE OF CHALLENGES ECOUNTERED IN MEDICAL LOGISTICS SUPPLIES CHAIN AT SANDEMA HOSPITAL.

The table below summarizes challenges encountered in medical logistics supply chain at Sandema Hospital from the patients' perspective.

 Challenges encountered in medical logistics supply chain at Sandema Hospital

- Drugs are too expensive to be afforded by the hospital.

- Government and the National Health Insurance Scheme (NHIS) are not supplying drugs regularly.

- Government budget allocation does not come early which makes difficult it difficult to get the needed items for the hospital.

- Hospital is not generating enough money to pay for the drugs

- Some health workers direct patients to go to specific stores to purchase some drugs in which they may benefit from those acts

- The hospital prefer to admit patient with cash to patients with NHIS card

- the hospital workers want cash and carry for them to make more money

- The NHIS does not cover some of the drugs

- Whenever they order for supply, it does not come early

Source: Field Data, 2015

Recommendations to the Hospital to improve its logistics supply chain

- NHIS should try to help hospitals in terms of full payment of funds

- A system should be put in place to check deviant health personnel

- Drugs should be supplied on regular basis

- Government should provide money to hospitals to pay health service providers

- Government should provide enough support to the NHIS

- Government should subsidise certain drugs and instruct NHIS to make prompt payments

- Non-Governmental Organizations (NGOs) should support the hospital in terms of funds

- Health administration should always request logistics on time from the Regional Health Directorate

- NHIS should intensively more education on the media to educate people about the uses of the NHIS card and make prompt payments

Source: Field Data, 2015

PERCEPTION OF HEALTH PROFESSIONAL ABOUT MEDICAL LOGISTICS SUPPLY CHAIN AT SANDEMA HOSPITAL

How health professionals understand medical logistics supply chain

> - Medical logistics supply chain consists of processes used in purchasing consumable and non-consumable materials for the hospital.
>
> - Medical logistics supply chains involve the processes involved in purchasing and supplying essential medicines and other medical supplies for the hospital.

Source: Field Data, 2015

Table 13: From your point of view, how would you rate the medical logistics supply chain of Sandema Hospital in terms of its efficiency

Response	Frequency	Percent %
Moderately Efficient	4	40.0
Efficient	4	40.0
Very Efficient	2	20.0
Total	10	100.0

Source: Field data, 2015

Table 13 assessed from the point of view of the respondents (health personnel) how they would rate the medical logistics supply chain of Sandema Hospital in terms of its efficiency. According to the table, 40% of the respondents indicated that it's 'Moderately Efficient' and 'Efficient' respectively. However, 20% also indicated that the medical logistics supply chain at the Sandema Hospital is 'Very Efficient'. It could be concluded that the Medical Logistics Supply Chain at the Sandema Hospital is efficient from the perspective of health professionals.

Among some of the reasons given by the health personnel for their responses in table 17 above are as follows:

i. Because the logistics to work with are always available in time for use or essential to health service providers

ii. Because medical logistics are essential to health service delivery and it contributes about 90% in terms of health care

iii. Because the Sandema hospital is one of the best in the region it means that the medical logistics are available

iv. We are supplied most of the logistics we need to work with upon request.

However, a section of the health personnel also indicated that medical logistics supply chain in the hospital is not regular and also supply not getting to the hospital on time.

HOW MEDICAL LOGISTICS IS MANAGED AT SANDEMA HOSPITAL

Table 14:   Which Department is responsible for the management of Medical logistics supply chain

Responses	Frequency	Percent %
Administration staff	2	20.0
Stores	3	30.0
Stores and Procurement unit	4	40.0
Supply chain management unit	1	10.0
Total	10	100.0

Source: Field data, 2015

Table 14 assessed from the respondents the department responsible for the management of Medical Supply Chain at the Sandema Hospital. As per the table, 20% and 30% of the respondents indicated that Administration Staff and Stores manages Medical logistics Supply Chain at the Sandema hospital whiles 40% and 10% of the respondents also indicated that the department responsible for the management of Medical Logistics Supply Chain is the Stores and Procurement unit and the Supply Chain Management unit respectively. Thus it could be deduced that health professional are aware that the Stores and Procurement unit is the department in charge of Medical Logistics supply chain at Sandema Hospital.

To what extent will you say that the department responsible for managing medical logistics supply chain is performing its function well?

- All requests made by the various departments are delivered

- It performs its functions well because there is 99% availability of medical logistics to the hospital

- Management are always on course

- There has been regular supply of logistics for service

- There is always regular supply of logistics for the work

- They are doing well but there is more room for improvement

- To extent that logistics are not lacking the hospital to use or management always on course

- We do not experience logistics shortage and we get what we want most times

USERS' SATISFACTION WITH MEDICAL LOGISTICS SUPPLY CHAIN

Table 15: In your Opinion, are you able to perform your duties efficiently because of the available of medical logistics in your hospital?

Responses	Frequency	Percent %
Yes	10	100.0
No	0	0
Total	10	100

Source: Field data, 2015

Table 15 assessed in the opinions of the respondents (health personnel), whether they are able to perform their duties efficiently because of the availability of medical logistics in their hospital. Unanimously, all the respondents consented which indicates that they are able to perform their duties efficiently because of the availability of medical logistics in Sandema Hospital.

How does the provision of medical logistics enhance your efficiency as a health professional?

- It helps in effecting control among staff within the hospital

- It helps work to go on without delay

- It strengthens the health service delivery in the hospital

- It helps to render health care without any difficulties

Source: Field Data, 2015

Table 17: In general, to what extent are you satisfied with medical logistics supply chain at Sandema Hospital

Responses	Frequency	Percent %
Very Satisfied	5	50
Somehow Satisfied	3	30
Not Satisfied	2	20
Total	10	100

Source: Field Data 2015

According to table 17, majority of the respondents constituting 50% attested that they were very satisfied with medical logistics supply chain at Sandema Hospital while 30% of the health professional asserted that they were somehow satisfied with medical logistics supply chain at Sandema Hospital. However, 20% of the respondents attested that they were not satisfied with medical logistics supply chain at Sandema Hospital. This give the indication to a very appreciable extent, health professional at Sandema Hospital are satisfied with medical logistics supply chain at Sandema Hospital.

CHALLENGES ENCOUNTERED IN MEDICAL LOGISTICS AT SANDEMA HOSPITAL

Below outlines challenges encountered in medical logistics supply chain at Sandema Hospital

- Lack of funds in accessing medical logistics

- Little knowledge of medical logistics and poor internal controls

- Long procedure before items are gotten

- There is delay in payment of medical logistics

- There is delay in procurement process

- Long chain of command in medical logistics supply chain

Recommendations from health professionals as to how challenges in Medical Logistics supply chain can be curtailed.

According to the respondents, the following measures when put in place can help curtail some of the challenges encountered by the Sandema Hospital in its Medical Logistics Supply Chain.

1. There should be availability of funds at all times

2. There should be the effective use of the following: Maximum stock level, minimum stock level, reorders level, emergency stock level.

3. Staff should be employed with much knowledge in medical logistics who can streamline strategies to strengthen internal controls

4. In emergency cares items can be released before later requisition made to regularised procedure

5. There should be timely release of insurance claims.

RECOMMENDATIONS FOR THE STUDY

Based on the findings of the study, the following are recommended by the researcher:

1. The National Health Insurance Authority and the government of Ghana should try and help the Sandema Hospital in terms of full payment of funds to enable the hospital to procure other medical logistics that they may not be provided by the Central Medical Store and also procure medical logistics in emergency cases.

2. There should also be prompt payment of National Health Insurance Scheme claims to the Sandema Hospital to enable the hospital acquire or procure medical logistics and on time.

3. The administration of the Sandema Hospital should always request medical logistics on time from the Regional Medical Store from which it takes it stock of medical logistics.

4. The study recommends the effective use of maximum stock level, minimum stock level, reorder stock level and emergency stock level to ensure that medical logistics are always in stock to enhance the efficiency of health delivery in the Sandema hospital.

5. The appropriate authority should investigate and any worker found culpable should be dealt with to serve as a deterrent to others.

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