EdinBurg Peer Reviewed Journals and Books Publishers
Journal of Procurement and Supply Chain
Vol. 2, No. 1, pp. 21-37: ISSN 2789-3405
Email: info@edinburgjournals.org

Determinants of Inventory Management in Public Hospitals in Mombasa County, Kenya

[1*]Simon Wandera Odanga & [2]Dr. Elizabeth Wachiuri (PhD)
[12]Procurement and Contract Management, Jomo Kenyatta University of Agriculture and Technology
*Corresponding author e-mail: sodanga4@gmail.com

How to cite this article: Odanga, S.W., & Wachiuri, E. (2022). Determinants of Inventory Management in Public Hospitals in Mombasa County, Kenya. *Journal of Procurement and Supply Chain, 2*(1), 21-37.

Abstract

Sound inventory control and management facilitate several actions and desired results that would increase the performance level of an organization to great heights. This study sought to investigate the determinants of effective inventory management in public hospitals in Mombasa County, Kenya. The specific objectives were to determine the effects of information technology, material handling, staff competencies, and storage facilities on inventory management. The study was guided by Resource Based View Theory. The study adopted a descriptive survey design. The sample size for the study was 41 members of staff from Public Hospitals. The study established that increase in the staff competencies and storage facility results in an increase in effective inventory management. Further, increase in information technology and materials handling results in a decrease in effective inventory management. The study recommended that public hospitals should consider both academic qualification and experience in hiring its staff, automating material handling techniques to enhance the safety of materials, and must ensure maximum security and safety of stores and hospitals at large. Top management in public hospitals must embrace and attain the required standards of knowledge on matters of inventory control and management. The hospital management and leadership must and should embrace the use of technology to enhance most effective and efficient delivery of services to the public.

Keywords: *Inventory management, information technology, material handling, staff competencies, storage facilities*

1.0 Introduction

Globally, inventories are very essential for keeping the production wheels moving. The global supply chain has been a vital issue for decades. Minimizing the cost in the supply chain system while satisfying the demand is one of the main focuses in practice of inventory management in the global arena. In the global supply chain system, suppliers, manufacturers, and distributors are all integrated to manufacture and distribute the optimal quantity to the determined customers at the right time, price, and quality (Barker, 2018). Well-established, healthy, rich businesses and public organizations around the globe depend on inventories for their greatness and endeavors. All business organizations strive hard to safeguard their inventories.

In Africa, inventory management receives scant attention. The study by Pietersen (2012), evaluated the inventory management practices of small and medium-scale enterprises in Ghana

and found that 56.3% of SMEs prepare their inventory level monthly, while 39.7% never keep records of the inventory levels. Another study by Abanis, Sunday, Buran, and Eliabu (2012) investigated inventory management of practices of 386 SMEs in Uganda. The researchers found that the majority did not review their inventory levels monthly. Results also indicated that most of these enterprises did not review their monthly budgets and inventory turnover regularly. In addition, there was no proper authorization of inventory purchase amongst these entities (Journals.Univ-danubius.ro, 2016).

Locally, inventory plays a big part in manufacturing firms as it accounts for more than 50% of the annual turnover. The long-term success of an organization depends entirely on how well the organization manages the costs associated with inventories. Inventory management practices positively affect the productivity of firms in Kenya. Effective inventory management has become a critical issue for a firm's productivity. Large firms have saved millions of dollars in costs and decreased inventories while improving efficiency and customer satisfaction through inventory management practices. Inventory management has resulted in integration of better production methods to minimize costs and wastage (Ngumi, 2015).

Problem Statement

Required level of inventories within an organization is a key indicator of success of the organization since inventories have got either positive or negative effects on performance of the firm. A shortage of inventory when and where it's needed can be extremely detrimental (Hayes, 2019). The company must have enough inventories to satisfy the demands of its customers.

The organization ensures that there is no stoppage of activities due to inventory stock-outs and on the other hand, the company does not want to hold too much inventory because of the cost involved. Therefore, the malady that faces most public organizations including public hospitals which are grounded on the principles of service delivery maximization, is supply chain complexity, lack of proper control systems, poor materials handling practices, manual documentation, and inadequate skills as far as inventory management is concerned.

According to 2017 county government budget implementation review report, 48% of total health budgetary allocation focused on construction of hospitals, 32% on buying health supplies, drugs, and equipment, 12% renovation of hospitals, and 4% on maternal services (Office of the Controller of the Budget, 2018). Therefore, there is a need to take care of and maintain health inventories since they consume sizeable public funds. According to (Nicasio, 2019), inventory management is crucial for retail businesses. It can make or break your bottom line. Without effective inventory management techniques in place, you make business more susceptible to costly stock out and related issues.

In the words of (Protiviti, 2019), leading companies automate all inventory control functions and maintain strong relationships with their vendors to keep inventory flowing smoothly. Inventories are crucial and foundation base of economic prosperity of every organization due to its dependability and the stake they hold in an organization. Inventory management as an art becomes an enabler to economic growth and development of an organization at large which eventually translates to a country's economic growth and development with a bigger eye. Therefore, inventories are an important and necessary subset of an economic and macro pillar of vision 2030 and a precursor of manufacturing pillar of big four agenda and must be properly managed to leverage growth of the organization.

Every year organizations prepare a budget whereby a large sum of money is spent on acquisition of materials. According to (Public procurement and Asset Disposal Regulation,

2018), inventories, assets, and stores management and distribution should be acquired, managed, and handled in accordance with laid down procedures in public procurement and asset disposal act 2015. Failure to the observation of these laws and procedures leads to many lapses in procurement and inventory management systems.

Most local studies such as (Gitau, Inventory Management Practices and Organizational Productivity, 2016), (Kithae, 2017) (Kyalo, 2019) and (Musau, 2017) focused on inventory management and organizational performance. No known study has specifically addressed the determinants of inventory management among public organizations or sectors in Kenya. It is against this background that this research intends to bridge the knowledge gap and explore the determinants of inventory management in public sector organizations in Kenya with specific reference to public hospitals in Mombasa County.

Study Objectives

1. To determine the effects of information technology as a determinant of inventory management in public hospitals in Mombasa County.
2. To establish the effects of material handling as a determinant of inventory management in public hospitals in Mombasa County.
3. To examine the effects of staff competencies as a determinant of inventory management in public hospitals in Mombasa County.
4. To determine the effects of storage facilities as a determinant of inventory management in public hospitals in Mombasa County.

2.0 Literature Review

Theoretical Review

Resource Based View Theory (RBV) is a managerial model put forward by Jay Barney in 1991 and is used to determine the strategic resources a firm can use to obtain a competitive advantage. The RBV theory posits that a firm's internal processes create a resource bundle that can become the means of creating and sustaining a competitive advantage. The theory considers a firm as a collection of heterogeneous resources, or factors of production, or as bundles of resources including all inputs that allow a firm to operate and implement its strategies (Barney, 1991).

A company achieves a competitive advantage when it has key resources (these can be physical resources, human resources, or organizational resources) that its competitors do not have (Jay, Barney, 1991). Developing and maintaining this competitive advantage depends on whether the firm can identify, develop, deploy, and protect the internal resources (Barney, 1991). The RBV resource approach assumes that the success of the organization lies within the organization itself or to be exact in its valuable, intangible, and not perfectly imitable resources (inventories, staff competencies, management, and leadership) allowing it to achieve a sustainable competitive advantage (Smetek, 2019).

The theory is based on two principles that are resources and capabilities are heterogeneously distributed among firms; and resources and capabilities are imperfectly mobile, scarce, rare, and non-substitutable which makes firms' differences remain stable over time (Barney 1991). Resource-based view analyses and interprets resources of the organizations to understand how organizations achieve sustainable competitive advantage (Smetek, 2019).

Every firm is different from other firms in terms of resources and capabilities. The sustainability of any competitive advantage depends on the extent to which resources are given

superior role in achieving higher organizational performance (Smetek, 2019). Therefore, a great deal of managerial effort must be invested in identifying, understanding, and classifying core competencies and inventories. In addition, management must invest in organizational learning to develop, nurture and maintain key resources and competencies in the organization.

Empirical Review

Information Technology

In modern business arena, information technology houses the success of every organization. The term "technology" is the use of science in industry, and engineering, to invent useful things or to solve problems (Learners, 2016). Technology can be defined as machinery that enables recording, processing, retrieving, and transmission of information or data (Idisemi Apulu & Ann Lathan, 2011). Information technology is the application of technology to solve business or organizational problems on a broad scale (Kirsten, 2019). In the words of Rouse (2019), I.T is the use of any computer, storage, networking, and other physical devices, infrastructure, and processes to create, process, store, secure, and exchange all forms of electronic data.

According to (Narkhede, 2017) , I.T enables information sharing and business transactions for the effective running of the business through application of electronic data interchange (EDI) that enables supply chain partners to plan effectively to avoid safety stocks hence cost reduction and bottlenecks for all the members of the chain. In the words of (Veridian, 2020), supply chain leaders need to leverage technology to understand inventory flows. The types of technology range from RFID – connected sensors through GPS- enabled systems. As supply chain leaders gain the ability to track granular details and data, such information can be processed with advanced analytics capabilities to understand how inventory moves within and outside of your warehouse. Information technology propels the success of modern business organizations and public organizations when adopted and applied effectively.

Staff Competency

Competency is a series of knowledge, abilities, skills, experiences, and behaviors, which leads to the effective performance of an individual's activities. Competency is measurable and could be developed through training (Maaleki, 2018). According to (National Medical Supplies Fund Sudan, 2017), competencies are the abilities people possess to do their jobs or to fulfill their functions and required knowledge, but focus is on what people can do. They also include qualities, skills, attributes, and traits that help people to be successful.

Competent staff is better acquainted with the intricacies of their job and will require less supervision, allowing employers to redirect time and effort in other areas. Properly trained and experienced staff is not only more capable but less likely to cause accidents or make costly mistakes. With a perfectly performing inventory system, operated by competent staff the result will be quickly evident; increased inventory turnover, reduced operational costs, and ultimately greater profitability (Melanie, 2019).

Material handling and Inventory management

Material handling is the movement, protection, storage, and control of materials and products throughout manufacturing, warehousing, distribution, consumption, and disposal (Bowles, 2019). According to (Reb, 2015), Material handling encompasses a range of components to keep the supply chain running, including a variety of equipment types (manual, semi-automated and automated and systems (single-level storage, multi-level storage, conveyors).

Proper material handling practices gives birth to proper inventory management practices which in turn help to define organizational effectiveness and efficiencies. Keeping too much inventory

for too long is usually not a good proposition because of inventory storage costs, as well as risk that the inventory will be obsolete, spoiled, or both. Too little inventory, on the other hand, creates the risk that the company might lose potential sales as well as its market share. Therefore, inventory management is based on proper forecasts that include strategies like just-in-time that in turn enable sound and robust material handling techniques. Beyond inventory management, effective material handling can also increase employees' morale. Well-designed systems and processes help employees complete work faster (Bowles, 2019).

3.0 Methodology

The study adopted a descriptive survey design. The sample size for the study was 41 members of staff from Public Hospitals. A stratified proportionate random sampling technique was used in selection of individual respondents where the number of staff in each hospital was determined in relation to the size of population. The study depended on primary data obtained from staff concerned with inventory management. This was occasioned by self-administered questionnaires. Data was then analyzed using descriptive statistics such as frequency counts, percentages, mean, and standard deviation. Multiple regression analysis and t-test statistics was also used to determine the relationship between predictor variables (determinants) and the dependent variable (inventory management).

4.0 Results and Discussion

Information Technology

The study sought to determine the perception of the respondents regarding the use of IT in the public hospital in Mombasa County. This was determined using various descriptive statistics including the frequency distributions, means, and standard deviations of various statements and results presented in Table 1.

Table 1: Descriptive statistics for use of IT

	1	2	3	4	5	Mean	Std Dev
	%						
Hospital performs	15	1	3	8	7		
online procurement	45.5%	3.0%	6.1%	24.2%	21.2%	2.73	1.719
Hospital has ERP system	22	6	1	1	3		
	66.7%	18.2%	3.0%	3.0%	9.1%	1.70	1.262
The hospital maintains suppliers	18	5	3	4	3		
database electronically	54.5%	15.2%	9.1%	12.1%	9.1%	2.06	1.413
We do an appraisal of our	13	19	0	1	0		
suppliers online	39.4%	57.6%		3.0%		1.67	0.645

The frequency distributions were a result of various views of the respondents on the different statements in regard to the use of IT in public hospitals in Mombasa County. These were scored as 5=strongly agree, 4= agree, 3 = neither agree nor disagree, 2 =disagree, and 1 =strongly disagree.

When asked whether the hospitals perform online procurement, the respondents had various views that is 45.5% and 3.0% tended to strongly disagree and disagree respectively. 6.1% tended to neither agree nor disagree. 24.2% and 21.2% of the respondents strongly agreed and agree that indeed public hospitals in Mombasa County perform online procurement more so when procuring medicines from different suppliers.

Half of the respondents (54.5%) strongly disagreed that hospital maintains the supplier's database electronically. 15.2% of the respondents disagreed about maintaining the supplier's database electronically. On the other hand, 9.1% of the respondents neither agreed nor disagreed, they were very neutral. 12.1% and 9.1% respectively agreed and strongly agreed that indeed the public hospitals store and maintain suppliers' databases electronically.

When asked whether public hospitals do an appraisal of suppliers online, 39.4% of respondents strongly disagree and 57.6% disagreed. On the other hand, only 3.0% agreed that public hospitals indeed perform online supplier appraisals. On the question regarding ERP system, 66.7% of the respondents strongly disagreed that public hospitals have no enterprise resource planning system. 18.2% disagreed that hospitals have ERP systems in place. On the opposite side, 3.0% of the respondents remained neutral. 3.0% and 9.1% agreed that public hospitals indeed have enterprise resource planning systems.

The study examined the average perception of the respondents on the use of IT in public hospitals in Mombasa County. In this context, the mean scores for the different statements of the use of IT matrix were generated. The distribution of the responses around the mean was also examined with the standard deviations showing the level of consensus on a given statement.

The mean scores were interpreted as a strong tendency to disagree for mean scores of between 1.0 and 2.49 and a tendency to agree for mean scores of between 2.5 and 3.0. The standard deviations were interpreted as there was disagreement for standard deviations of 1 and above, moderate disagreement for standard deviations between 0.50 and 0.99, and high disagreement for standard deviations between 0 and 0.49.

The mean scores and standard deviations were 2.73 and 1.72 for we perform online procurement, 1.70 and 1.26 for the hospital has ERP system in place, 2.06 and 1.41 for maintaining a database of suppliers through our IT system, 1.67 and 0.65 for doing online suppliers' appraisals.

In the context of standard deviation, there was moderate and high disagreement (standard deviations between 0.5 and 0.99 and 0 to 0.49) amongst respondents that, they perform online supplier appraisal and inventory management records is computerized.

Staff competency

The study sought to determine the perception of the respondents regarding staff competencies in the public hospitals in Mombasa County. This was determined using various descriptive statistics including the frequency distributions, means, and standard deviations of various statements. The results are presented in Table 2.

EdinBurg Peer Reviewed Journals and Books Publishers
Journal of Procurement and Supply Chain
Vol. 2, No. 1, pp. 21-37: ISSN 2789-3405
Email: info@edinburgjournals.org

Table 2: Descriptive statistics for staff competency

	1	2	3	4	5	Mean	Std Dev
				%			
The hospital consider experience in recruitment and selection of procurement staff	1 3.0%	2 6.1%	2 6.1%	22 66.7%	6 18.2%	3.91	0.879
The new procurement staff taken through induction training	3 9.1%	1 3.0%	3 9.1%	22 66.7%	4 12.1%	3.70	1.045
The procurement staff often allowed to attend procurement seminars	2 6.1%	3 9.1%	6 18.2%	20 60.6%	2 6.1%	3.52	0.972
Procurement department allow its staff to pursue higher academic qualifications	2 6.1%	3 9.1%	5 15.2%	17 51.5%	6 18.2%	3.67	1.080
Educational Qualification is a major consideration for all hospital staff	0 0.0%	0 0.0%	0 0.0%	18 54.5%	15 45.5%	4.45	0.506
The hospital management organizes for regular in house training	0 0.0%	0 0.0%	0 0.0%	17 51.5%	16 48.5%	4.48	0.508
My hospital sponsors its staff for outside training	0 0.0%	0 0.0%	9 27.3%	13 39.4%	11 33.3%	4.06	0.788

The frequency distributions were a result of various views of the respondents on the different statements with regard to staff competencies in the public hospitals in Mombasa County. These were scored as 5=strongly agree, 4= Agree, 3 = neither agree nor disagree, 2 =disagree, and 1 =strongly disagree. When asked whether the hospitals consider experience during recruitment and selection of the procurement staff, slightly above half of the respondents (66.7%) tended to agree that staff with experience in procurement have been recruited by public hospitals. This was supported by 18.2% of the respondents who strongly agreed with the statement. However, 6.1% of the respondents neither agreed nor disagreed with the statement, while 6.1% and 3.0% of the respondents disagreed and strongly disagreed, respectively, that staff with experience have been recruited by the public hospitals in Mombasa County.

A good number of the respondents 66.7% tended to agree when asked whether the new procurement staff was taken through induction training. This was supported by 12.1% who strongly agreed that indeed new procurement employees are taken through induction. However, 9.1% of the respondents were very neutral with their views concerning induction training. 3.0% and 9.1% disagreed and strongly disagreed, respectively, that new entrants in procurement department are taken through induction training.

The procurement staff is allowed to attend procurement seminars often as perceived by a cumulative 66.7% of the respondents (60.6%=agree and 6.1%= strongly agree). On the other hand, 9.1% and 6.1% of the respondents disagreed and strongly disagreed that the public hospital does not allow procurement staff to attend procurement seminars, respectively. 18.2% of the respondents neither agreed nor disagreed that the procurement staff is allowed to attend procurement seminars by the hospital management. Half of the respondents (51.5%) tended to

agree that the procurement department allows their staff time to pursue higher education qualifications, and 18.2 % strongly agreed with the same statement. However, 15.2% of the respondents neither agreed nor disagreed when asked whether the procurement department allows their staff to pursue higher academic qualifications. 6.1% and 9.1% of the respondents respectively strongly disagreed and disagreed that the procurement department allows its staff to pursue higher academic and professional qualifications.

Educational qualification is a major consideration for all hospital staff as perceived by cumulatively 100% of the respondents (54.5%=agree and 45.5%= strongly agree). When asked whether the public hospitals organize in-house training, 51.5% and 48.5% strongly agreed and agreed respectively. None of the respondents disagreed in totality or was neutral on the same. On the question concerning whether the hospital sponsor outside training for its staff, respondents had different reactions and views. 27.3% of the respondents neither agree nor disagree, while 39.4% and 33.3% of the respondents agreed and strongly agreed that public hospitals in Mombasa County frequently sponsor outside training for its staff.

The average perception of the respondents regarding staff competencies in the public hospitals in Mombasa County was examined. In this context, the mean scores for the different statements of the staff competencies matrix were generated. The distribution of the responses around the mean was also examined with the standard deviations showing the level of consensus on a given statement. The mean scores were interpreted as a strong tendency to agree for mean scores of between 4.0 and 4.5, tendency to agree on average for mean scores between 3.5 and 3.9, tendency to be neutral on average for mean scores between 3.0 and 3.49. The standard deviations were interpreted as no consensus for standard deviations of 1 and above, and moderate and high consensus for standard deviations between 0.50 and 0.99.

The mean scores and standard deviations were 3.91 and 0.88 for the hospital considering experience in recruitment and selection of procurement staff, 3.70 and 1.05 for the new procurement staff taken through induction training, 3.52 and 0.97 for procurement staff often allowed to attend procurement seminars, and 3.67 and 1. 08 for procurement department allow its staff to pursue higher academic qualification, 4.45 and 0.51 for the educational qualifications is a major consideration for all hospital staff, 4.48 and 0.51 for the hospital management organizes regularly in house training, 4.06 and 0.79 for the hospital sponsor its staff for outside training.

All the mean scores for the different statements of the staff competencies matrix were between 3.5 and 4.49 which implies that the respondents on average tended to agree with each of the statements. The standard deviations for the different statements of the staff competencies matrix except for the standard deviation for five statements were between 0.50 and 0.99 which means that responses were moderately distributed around the mean implying there was moderate consensus on the various statements.

The standard deviation for new procurement staff taken through intensive induction training was 1.045 and 1.08 for procurement department allowing its staff to pursue higher academic qualifications, respectively, which was above one implying there was no consensus amongst respondents on this statement. Therefore, there was disagreement, and respondents on average tended to agree that new procurement staff is taken through intensive induction training and procurement department allow its staff to pursue higher academic qualification.

There was moderate consensus amongst respondents and on average respondents tended to agree (mean=3.91; std. dev=0.87) that public hospitals consider the level of experience of staff during recruitment in procurement. These findings contradicted those by (Kiage, 2013) in a

study to assess the factors Affecting Procurement Performance: A Case of Ministry of Energy in Kenya. The study found that only 34% of the staff were in agreement that the procurement staff had the necessary skills and experience to carry out procurements effectively and that the staff competencies influence procurement performance to a large extent.

The respondents had moderate consensus amongst themselves and on average tended to agree that the procurement department organizes regular in-house training (mean=4.48; std. dev=0.51), that the hospital staff is sponsored for training outside the hospital (mean=4.06; std. dev=0.79), and that staff in procurement department often attend seminars addressing current issues in procurement (mean=3.52; std. dev=0.97). This was consistent with (Ngetich, 2017) who realized that to sustain economic growth and effective performance, it is important to optimize the contribution of employees to the aims and goals of the organizations. Technological developments and organizational change have gradually led some employers to the realization that success relies on the skills and abilities of their employees, and this means considerable and continuous investment in training and development.

Material Handling

The study sought to examine the perception of the respondents regarding materials handling in public hospitals in Mombasa County. This was determined using various descriptive statistics including the frequency distributions, means, and standard deviations of various statements. The results are presented in Table 3.

Table 3: Descriptive statistics for Material Handling

	1	2	3	4	5	Mean %	Std Dev
The hospital still uses manual material handling technique	0 0.0%	0 0.0%	1 3.0%	10 30.3%	22 66.7%	4.64	0.549
My hospital has a crane and forklift for heavy stores or equipment	1 3.0%	32 97.0%	0 0.0%	0 0.0%	0 0.0%	1.97	0.174
We offer training to staff Concerned on matters regarding material handling	0 0.0%	6 18.2%	1 3.0%	15 45.5%	11 33.3%	3.94	1.059
The hospital has qualified staff in matters materials Handling	0 0.0%	3 9.1%	0 0.0%	13 39.4%	17 51.5%	4.33	0.89
The hospital has no plans to automate the material handling technique	4 12.1%	23 69.7%	1 3.0%	4 12.1%	1 3.0%	2.24	0.936
My hospital considers experience when hiring material handling staff	8 24.2%	10 30.3%	0 0.0%	13 39.4%	2 6.1%	2.73	1.376

The frequency distributions were a result of various views of the respondents on the different statements with regard to materials handling in the public hospitals in Mombasa County. These were scored as 5=strongly agree, 4= Agree, 3 = neither agree nor disagree, 2 =disagree, and 1 = strongly disagree. The respondents were asked whether the hospitals still use manual material

handling techniques, and over half of the respondents (66.7%) tended to strongly agree that manual material handling is still used by public hospitals. This was supported by 30.3% of the respondents who agreed with the statement. However, only 3.0% of the respondents neither agreed nor disagreed with the statement.

The whole population of the respondents strongly disagreed and disagreed (3.0% and 97.0%) that public hospitals have cranes and forklifts for carrying heavy stores or items. On matters of training of material handling staff by the hospital, respondents had different views 45.5% and 33.3% agreed and strongly agreed while 18.2% disagreed that hospitals do offer not any training to material handling staff. 3.0 of respondents appeared to be very neutral with neither agreeing nor disagreeing with the statement.

The hospital has qualified staff on matters of materials handling as perceived by a cumulative 90.9% of the respondents (39.4%=agree and 51.5%= strongly agree). On the other hand, 9.1% of the respondents disagreed that the public hospitals do not have qualified staff dealing with materials handling in a wholesome. 12.1% and 69.7% of the respondents in totality disagreed that public hospitals have no plans to automate materials handling techniques.3.0% neither agreed nor disagreed while 12.1 % and 3.0% respectively agreed and strongly agreed that public hospitals in Mombasa County have no plan whatsoever to automate material handling techniques.

When asked whether the hospitals consider experience when hiring materials handling staff, 24.2% and 30.3% of the respondents strongly disagreed and disagreed with the statement and on the other hand, 39.4% and 6.1% were consistence with the statement that public hospitals also consider experience when hiring staffs concerned with materials handling.

The average perception of the respondents regarding materials handling in public hospitals in Mombasa County was examined. In this context, the mean scores for the different statements of the material handling matrix were generated. The distribution of the responses around the mean was also examined with the standard deviations showing the level of consensus on a given statement. The mean scores were interpreted as a strong tendency to agree for mean scores of between 4.0 and 4.5, tendency to agree on average for mean scores between 3.5 and 3.9, a tendency to be neutral on average for mean scores between 3.0 and 3.49, and tendency to disagree on average for mean scores between 1.5 and 3.0. The standard deviations were interpreted as no consensus for standard deviations of 1 and above, and moderate and high consensus for standard deviations below and between 0.50 and 0.99.

The mean scores and standard deviations were 4.64 and 0.55 for the hospital still using manual material handling technique, 1.97 and 0.17 for the hospitals that have cranes and forklifts for heavy stores, 3.94 and 1.059 for the hospitals that offer training to staff concerned with matters regarding materials handling, 4.33 and 0.89 for the hospitals have qualified staff in matters materials handling, 2.24 and 0.94 for the hospitals have no plans to automate material handling techniques and 2.73 and 1.38 for the hospital management consider experience when hiring material handling staff.

There was moderate consensus amongst respondents and on average respondents tended to disagree (mean= 2.24; std. dev=0.94) that the hospitals have no plans to automate the materials handling technique. These findings contradicted those of (Kathurima, 2016), in a study to assess the effects of materials handling systems on performance of cement manufacturing firms in Machakos County. The study found automating materials handling systems help in improving the performance of cement manufacturing firms. The firms should therefore be stiff to improve on their automated material handling system.

EdinBurg Peer Reviewed Journals and Books Publishers
Journal of Procurement and Supply Chain
Vol. 2, No. 1, pp. 21-37: ISSN 2789-3405
Email: info@edinburgjournals.org

Storage Facility

The study sought to assess the views of the respondents regarding storage facilities in public hospitals in Mombasa County. This was determined using various descriptive statistics including the frequency distributions, means, and standard deviations of various statements.

The results are presented in Table 4.

Table 4: Storage Facility

	1	2	3	4	5	Mean	Std Dev
The hospital has qualified stores personnel	3 9.1%	0 0.0%	0 0.0%	11 33.3%	19 57.6%	4.48	0.667
Items are mostly stored on racks and pallets	1 3.0%	0 0.0%	2 6.1%	11 33.3%	19 57.6	4.42	0.867
The storehouse has enough light	0 0.0%	0 0.0%	1 3.0%	9 27.3%	23 69.7%	4.67	0.540
The storehouse is well organize to handle most fragile equipment.	2 6.1%	1 6.1%	13 3.0%	15 39.4%	54.5%	4.12	1.139
The racks are well labeled to ease stores identification	3 9.1%	0 0.0%	2 6.1%	20 60.6%	8 24.2%	3.91	1.071

The frequency distributions were a result of various views of the respondents on the different statements with regard to a storage facility in the public hospitals in Mombasa County. These were scored as 5=strongly agree, 4= Agree, 3 = neither agree nor disagree, 2 =disagree, and 1 = strongly disagree. When asked whether the hospitals have qualified store personnel, cumulatively agreed in totality 90.9% that is (33.3% = agree and 57.6% = strongly agree). However, 9.1% of the respondents strongly disagreed.

A higher percentage of the respondents (90.9%) tended to agree when asked whether items are stored on racks and pallets. 6.1% of respondents were neutral while 3.0% of respondents strongly disagreed. On the question concerning enough light in the storehouse, 27.3% and 69.7%greed and strongly agreed that storehouses have enough light. 3.0% of respondents neither agreed nor disagreed.

When asked how well the hospital storehouse is organized to handle most fragile items, 6.1% of the respondents strongly disagreed, 6.1% of the respondents disagreed and 3.0% were neutral. On the other hand, 39.4% and 54.5% of the respondents agreed and strongly agreed that indeed public hospital storehouses are well organized to accommodate and handle fragile equipment. A higher percentage of respondents cumulatively 84.8% that is (60.6% = agree and 24.2% = strongly agree) in totality agreed that racks within the storehouses are well labeled to ease identification of items. On the opposite side, 9.1% of the respondents strongly disagreed insinuating that racks are not labeled and 6.1% of the respondents neither agreed nor disagreed with the statement.

The average perception of the respondents regarding storage facilities in public hospitals in Mombasa County was examined. In this context, the mean scores for the different statements of the storage facility matrix were generated. The distribution of the responses around the mean was also examined with the standard deviations showing the level of consensus on a given statement. The mean scores were interpreted as a strong tendency to agree for mean scores of

between 4.0 and 4.5, tendency to agree on average for mean scores between 3.5 and 3.9, a tendency to be neutral on average for mean scores between 3.0 and 3.49, a tendency to disagree on average for mean scores between 1.5 and 2.99. The standard deviations were interpreted as no consensus for standard deviations of 1 and above, and moderate and high consensus for standard deviations between 0.50 and 0.99.

The mean scores and standard deviations were 4.48 and 0.67 for the hospital has qualified store personnel, 4.42 and 0.87 for the items are mostly stored on racks and pallets,4.67 and 0.54 for the storehouse has enough light, 4.12 and 1. 14 for the storehouse is well organized to handle most fragile equipment and 3.91 and 1.07 for the storehouse has well-labeled racks to ease identification of items.

The standard deviation of 1.139 for storehouse is well organized to handle most fragile equipment, and 1.071 for the has well-labeled racks to ease identification of items, respectively, which was above one implying there was no consensus amongst respondents on this statement. Therefore, there was disagreement, and respondents on average tended to agree the storage facility is well organized to handle most fragile equipment and the storehouse has well-labeled racks to ease identification of items.

There was high consensus amongst respondents and on average respondents tended to strongly agree (mean= 4.42; std. dev= 0.867) that the items are stored on racks and pallets. This was consistence with the study (Odhiambo, 2017)in the study to determine the effect of storage systems on organizational performance: the study of holdings within Kisumu city. The study found that when goods are stored well, their value is maintained.

Inventory management

The study sought to determine the views of the respondents regarding effective inventory management in public hospitals in Mombasa County. This was determined using various descriptive statistics including the frequency distributions, means, and standard deviations of various statements. The results are presented in Table 5.

Table 5: Inventory Management

	1	2	3	4	5	Mean	Std
				%			Dev
Stock taking is frequently carried out either to detect discrepancy, deficit, or surplus	1 3.0%	0 0.0%	1 3.0%	20 60.6%	11 33.3%	4.21	0.781
The hospital carries out Inspection frequently to Separate expired stock From usage	1 3.0%	0 0.0%	0 0.0%	14 41.2%	18 52.9%	4.45	0.794
The hospital ensures that it Maintains optimal levels of Inventories	0 0.0%	0 0.0%	0 0.0%	19 55.9%	14 41.2%	4.42	0.502
The hospital categorizes Inventories to enable Identification and storage	0 0.0%	0 0.0%	3 8.8%	14 41.2%	16 47.1%	4.39	0.659

The frequency distributions were a result of various views of the respondents on the different statements with regard to effective inventory management in the public hospitals in Mombasa County. These were scored as 5=strongly agree, 4= Agree, 3 = neither agree nor disagree, 2 = disagree, and 1 = strongly disagree. The respondents were asked whether stocktaking is frequently carried out either to detect discrepancy, deficit, or surplus.60.6% and 33.3% agreed and strongly agreed with the statement. 3.0% of the respondents neither agreed nor disagreed. 3.0% strongly disagreed that stocktaking is not performed frequently.

A higher percentage of respondents that's 97.0% unanimously agreed and strongly agreed when asked if inspection is frequently performed to separate expired items from the usage. 3.0% of the respondents strongly disagreed with the statement. When asked whether public hospitals maintain optimal level of inventories, all respondents (55.9% = agreed and 41.2% = strongly agreed) cumulatively agreed that optimal level of inventories is maintained. On whether the public hospitals categorize the inventories, 8.8% of the respondents remained neutral and 41.2% and 47.1% of the respondents' greed and strongly agreed respectively.

The average perception of the respondents regarding effective inventory management in the public hospitals in Mombasa County was examined. In this context, the mean scores for the different statements of the inventory management matrix were generated. The distribution of the responses around the mean was also examined with the standard deviations showing the level of consensus on a given statement. The mean scores were interpreted as a strong tendency to agree for mean scores of between 4.0 and 4.5, tendency to agree on average for mean scores between 3.5 and 3.9, a tendency to be neutral on average for mean scores between 3.0 and 3.49, a tendency to disagree on average for mean scores between 1.5 and 2.99. The standard deviations were interpreted as no consensus for standard deviations of 1 and above, and moderate and high consensus for standard deviations between 0.50 and 0.99.

The mean scores and standard deviations were 4.21 and 0.78 for the stocktaking is frequently carried out either to detect discrepancy, deficit, or surplus, 4.45 and 0.79 for the inspection is frequently performed to separate expired stores from usage, 4.42 and 0.50 for the public hospitals maintain optimal level of inventories, and 4.39 and 0.65 for the hospitals categorize inventories to enable identification and storage.

There was high consensus amongst respondents and on average respondents tended to strongly agree (mean= 4.21; std. dev= 0.78) that the stocktaking is frequently carried out either to detect discrepancy, (mean = 4.45; std dev= 0.79) that the hospitals carry out inspections frequently to separate expired stock from the usage, (mean=4.42; std dev = 0.50) that the hospitals maintain optimal levels of inventories and (mean =4.39; std dev =0.659) that the hospitals categorize inventories to enable identification and storage. This was consistence with the study by (Gitau, 2016) the study was to determine the inventory management practices and organizational productivity in parastatals in Kenya. The study revealed that inventory management practices boost employee work morale, enhance continuous production, and reduce resource wastage, likewise, respondents agreed that inventory management practices minimize scrap and reject. The respondents agreed that inventory management practices reduce production costs and reduce delivery lead time. Finally, the respondent agreed that inventory management practices prevent shortages and stock-out costs and minimize machine downtime.

Regression Analysis

The study sought to know the relationship between staff competencies, storage facility, materials handling and information technology (independent variable), and inventory management (dependent variable). In this context, effective inventory management was

regressed against staff competencies, information technology, storage facility, and material handling and the correlation results are presented in table 6.

Table 6: Model Summary for Staff Competencies, storage facility, materials handling, and information technology

Model	R	R square	Adjusted R Square	Std.Error of the Estimate
1	.490	.240	.131	.25316

a. Predictors: (Constant), SF, MH, IT, SC
b. Dependent Variable: Effective inventory management

There was a positive correlation between effective inventory management and staff competency, information technology, storage facility, and materials handling as the correlation coefficient, expressed as R, was 0.490. The coefficient of determination gave the amount of explained variance in the dependent variable (expressed as R^2) as a result of the independent variables. The coefficient of determination was valued at 0.240 which implied that 24% of the variance in effective inventory management was a result of the staff competencies, storage facility, materials handling, and information technology in public hospitals in Mombasa County. This value showed that there was a very small variance in the dependent variable which is explained by the independent variables. This implies that independent variables have to be accompanied by other factors which are not in this model for them to have higher variability in the dependent variable.

The ANOVA was used to determine whether the simple linear regression with inventory management as the dependent variable and the staff competencies, information technology, storage facility and materials handling in public hospitals in Mombasa County as the independent variable was reliable. In this context, the p-value was used to determine this with the minimum requirement for the reliability of the model is a p-value less than 0.05 ($p<0.05$). The results are presented in Table 7.

Table 7: ANOVA

Model		Sum of squares	Df	Mean Square	F	Sig
1.	Regression	.566	4	.141	2.207	.094[b]
	Residue	1.795	28	.064		
	Total	2.360	32			

a. Dependent Variable: IM
b. Predictors: (Constant), SF, MH, IT, SC

This linear regression with inventory management (dependent variable) and staff competencies, information technology, materials handling, and storage facility (independent variable) gave a p-value of 0.094. This p-value was more than 0.05 ($p>0.05$) thus the model was deemed not reliable.

Table 8: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig
	B	Std Error	Beta		
1(constant)	3.583	0.619		5.788	.000
IT	-.175	.093	-.348	-1.877	0.071
SC	.041	.116	.077	.348	.730
MH	-.024	.048	-.092	-.505	.618
SF	.172	.156	.232	1.107	.278

a. Dependent Variable: IM

The p-value was 0.730 for staff competencies, 0.071 for use of IT, 0.618 for material handling, and 0.278 for a storage facility. The p-values for all the independent variables in this regression model were more than 0.05 which implied that the model was not reliable.

The multiple linear regression analysis also helped to understand how much the dependent variable would change when there was a change in the independent variables. The regression coefficient was used to determine the expected increase or decrease when there is a unit increase in an independent variable (staff competencies, storage facility, IT, and materials handling).

Effective inventory management = 3.583 + -0.175 (information technology) + 0.041 (staff competency) + -0.024 (materials handling) + 0.172 (storage facility)

This, therefore, implies that for every unit increase in staff competencies, the performance of inventory management in public hospitals in Mombasa County increases by 0.041 (B= 0.041), when other factors are held constant. Additionally, for every unit increase in use of information technology, the performance of inventory management in public hospitals in Mombasa County decreases by -0.175 (B= -0.175), when other factors are held constant. Similarly, for every unit increase in materials handling, the performance of inventory management in public hospitals in Mombasa County decreases by -0.024 (B= -0.024), when other factors are held constant, and for every unit increase in storage facility, the performance of inventory management in Public Hospitals in Mombasa County increases by 0.172 (B= 0.172), when other factors are held constant. In order of influence of the independent variables on the dependent variable, storage facility had greater influence on the effective inventory management in Public Hospitals in Mombasa County. This was followed by staff competency, materials handling, and finally the use of information technology in the public hospitals in Mombasa County.

5.0 Conclusion

In the establishment of the influence of staff competencies, the study concluded that staff competencies have a significant influence on inventory management in public hospitals in Mombasa County. The study also concluded that every unit increase in staff competencies results in an increase in performance of inventory management in public hospitals in Mombasa County.

In the examination of the effect of use of information technology, the study concluded that the use of information technology has a significant influence on effective inventory management in public hospitals. The study concluded that a unit increase in the use of information

technology results in a decrease in performance of inventory management in public hospitals in Mombasa County.

In the assessment of the influence of materials handling, the study concluded that the materials handling practices have a significant influence on effective inventory management in public hospitals in Mombasa County. The study also concluded that a unit increase in material handling on its results in a decrease in effective inventory management performance.

Finally, in the examination of the influence of storage facility, the study concluded that storage facility has a significant influence on effective inventory management in Public Hospitals in Mombasa County. A unit increase in a storage facility on its increases effective inventory management.

6.0 Recommendations

In the context of staff competencies, the study recommends that the hospital should consider both academic qualifications and experience while hiring its staff in all departments. Emphasis is placed on only hiring staff with procurement qualifications, materials management skills, and store accounting background for the procuring department. This will enhance efficiency in procurement department and hospital at large.

In the context of information technology, the study recommends that Public Hospitals in Mombasa County should encourage and invest in use of information technology in their daily mode of operations by ensuring that suppliers' database is electronically stored, online procurement is performed to kill any economic vices associated with manual procurement techniques and enterprise resource planning is installed to monitor all activities and transactions of the hospitals. This will enhance transparency and accountability within the hospital working environment and promote efficiency.

Within the context of Materials handling, the research recommends that the public Hospitals in Mombasa County put a requirement for every staff to be a professional store accountant or contain materials management proficiency. This will serve to enhance the skills of the staff as well as keep them up to date with emerging trends in materials handling which improves the effective inventory management within Public Hospitals. In addition, the study recommends that Hospitals should consider automating material handling techniques to enhance the safety of materials. The hospitals should encourage use of forklifts in transfer or carrying of heavy stores to avoid human injuries that come with handling heavy stores.

Finally, in the context of storage facilities, the research recommends that every storage facility must be secure enough to enhance the security and safety of stores. The public hospitals must ensure that the hospitals are well-fenced with concrete walls, install CCTV cameras within the storehouses and around the hospital at large, and have watchmen available on daily basis. This will guarantee the security of stores and hospitals at large.

References

Barker. (2018). global supply chain inventory control and management. *Conference paper*.

Barney. (1991). *Firms Resources and Sustained Advantage.*

Bowles, R. (2019). Material handling. *Supply Chain optimization*.

Gitau. (2016). *Inventory Management practices and organizational productivity in parastatals.* Nairobi.

Hayes. (2019). Inventory management. *Business Essentials*.

Kathurima, R. I., Ombul, K. & Iravo, M. A. (2016). Effects of materials handling systems on performance. *Procurement and Supply chain management*.

Kiage. (2013). Factors Affecting Procurement Performance. *International Journal of Business and Commerce*.

Kirsten. (2019, 2 25). *rasmussen.edu.com*. Retrieved 2 15, 2020, from www.rasmussen.edu.com.

Kithae. (2017). Influence of Inventory Management on Performance of the Private Commercial Banks. *Cari Journals*.

Kyalo, N. C. (2019). Effects of stock control management on inventory management performance in government. *International Journal of Business Management and Finance*.

Learners, M. W. (2016, 11 7). *Wikipedia.com*. Retrieved 2 14, 2020, from Www.wikipedia.com.

Maaleki, A. (2018). The ARZESH Competency Model. *Appraisal & Development Managers Competency Model*. Retrieved from www.wikipedia.org.

Melanie. (2019, 11 18). *Unleashedsoftware.com*. Retrieved 2 15, 2020, from www.unleashedsoftware.com.

Musau. (2017). Effect of inventory management on Organizational Performance among Textile Manufacturing Firms in Kenya. *International Journal of Academic Research in Business and Social Sciences*.

Narkhede. (2017). Role of I.T and inventory management tools in supply chain management. *Journal of Advance in Science and Technology*.

Ngumi. (2015). Inventory Management Practices and Productivity of Large Manufacturing Firms in Kenya. *Research Thesis*.

Nicasio, F. (2019). Inventory management best practices for Retailers. *Inventory Management*.

Odhiambo. (2017). Effects of storage systems on organizational performance.

Protiviti. (2019). Best practices of Inventory management. *Knowledge Leader*.

Reb. (2015). Material handling. *Storage systems International*.

Rouse, M. (2019, 2 13). *.latacenter.techtarget.com*. Retrieved 2 13, 2020, from www.latacenter.techtarget.com.

Smetek, W. (2019, 2 4). *Intechopen.com*. Retrieved 2 14, 2020, from www.intechopen.com.

Veridian. (2020). Inventory Management Best practices & the Role of Technology. *Inventory Management Best practices & the Role of Technology*.