INVENTORY MANAGEMENT TECHNIQUES AND PROCUREMENT PERFORMANCE OF PUBLIC HEALTH CENTRES IN MOMBASA CITY COUNTY, KENYA

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ABSTRACT

The purpose of this study was to determine the effect of inventory management techniques on procurement performance of public health centres in Mombasa city county, Kenya. The study adopted descriptive research design. The target population was 148 employees of 37 public health centers operating in Mombasa City County. The study adopted stratified random sampling technique to pick 108 respondents determined using Yamane's sample determination formula. The study used questionnaire as main tool to collect primary data. Data was presented in the form of tables. Descriptive analysis and inferential analysis was carried out using Statistical Package for Social Sciences (SPSS) version 26. The study findings revealed that inventory management techniques have a significant positive affect on procurement performance of public health centres in Mombasa city county, Kenya at p<0.05. This showed that upholding inventory management techniques would be essential in steering the procurement performance of public health centres in Mombasa city county Kenya. The regression model established that the R value was 0.754 while the R Square was 0.569 which indicated that the variability of the inventory management techniques on procurement performance of public health centres in Mombasa city county, Kenya could be explained by up to 56.9% of the model and the P-value was 0.000<0.05. This implied that the model was fit to determine the relationship between the inventory management techniques and procurement performance and therein make conclusions and recommendations. In the light of above findings, in order to have a full turn around in regard to performance of procurement function the study recommends that the management of public health centres need to ensure that effective inventory management systems, techniques and models are in place to achieve accurate inventory records so as to keep appropriate stock levels and avoid overstocking, stock out and rising inventory cost. The study also recommended the need to have automated inventory procedures and an effective inventory record management unit to ensure that the procuring entity has up to date inventory records.

Key Words: *ABC Technique, Vendor Managed Inventory, Bar Coding, Inventory Review*

INTRODUCTION

Inventories play a pivotal role in the success of the procurement and supply chain function of an organization. According to Teplicka & Senova, (2020) inventory is a current asset that represents the firm's value affecting its profit and financial results. Inventory management is replenishing stock inventory with the right quantity, of the right item in the right location and at the right time (Schreibfeder & Snawder, 2017). Inventory is unavoidable to any organization although there are various costs that accrue as a result of keeping inventory; therefore, it needs careful control so as to protect the regular and planned course of operations against the random disturbance of running out of materials or goods (Vessils, 2020). For an organization to meet requirements of customer there is need to ensuring avoiding shortages and monitoring costs of inventory. Therefore, inventory management is very vital to an enterprise since it is custom-made to reducing inventory costs or deteriorating performance while satisfying customer's demands by guaranteeing that the balance items of stock are sustained at the right quality, quantity and that are obtainable at the right time and in the right place (Jepchirchir & Noor, 2019).

Inventory management techniques have played a role in the business operations for many years in the global arena. For instance, inventory control practices in Canada have become popular in both private and public organizations (Liang, 2016). A study done by Tian, (2017) on inventory control framework audit done internally showed that inventory management processes, practices, procedures and controls had been put in place appropriately in Canada for the inventory management of election supplies held or supplied.

In Kenya, it has been the attempt of most organizations striving to achieve optimal inventory control while minimizing inventory costs. A study conducted by Swaleh & Were, (2014) on factors affecting effective implementation of inventory management systems in the Public Sector of Kenya revealed that to Kenyan organizations, the main aim of inventory control is holding the right quantity of inventory and containing inventory costs minimum. The study also revealed that most organizations are increasingly developing inventory control systems and adopting inventory control practices that can resolve the challenges currently faced in inventory management. Another study done by Gatari, Noor& Osoro, (2022) argued that upholding inventory management is essential in steering the sustainable performance of the state corporations in Kenya.

Procurement is the nerve center of performance in every institution whether public or private and thus needs a tight system to be followed and adopted (Munyimi, 2019). The Kenya's health system is one of the pillars of vision 2030. The key role being to maintain skilled manpower and providing affordable and quality health services. To achieve this pillar, the health sector has ensured that the procurement function has procured the required health products and provided with appropriate technology that facilitate efficient and effective service delivery (Makori and Muturi, 2019). A well performing procurement function is necessary for public hospitals to continue progress towards better health service delivery. Identifying actionable measures to improve the procurement activities of the public hospitals is critical to progress towards efficient and effective procurement. These measures include addressing issues such overstocking, understocking or delayed medical supplies delivery and non-medicine equipment and rising inventory holding costs (Korir et al., 2021).

According to Njoki & Kimiti, (2015) public health institutions in Kenya are ailing from shortage of drugs or holding on expired drugs. County health centres and dispensaries are hardly stocked with the recommended medicines. The shortages and high rate of expired drugs in dispensaries and other public hospitals indicate poor procurement performance and high wastage of public resources and this affects efficiency. County Procurement Assessment Report (CPAR) reveals substantial

inefficiency in public procurement and concludes that the principle of "value for money" is not achieved. An effective procurement ensures the availability of the right medical supplies in the right quantities, available at the right time for the right patient and at the right prices and at recognizable standards of quality (Tweneboah & Ndebugri, 2017). According to Lemayian and Moronge, (2018) public hospitals in Kenya are grappling as Kenyans especially the poor suffer from medical stock-out, medical wastage or lack of prescribed drug in public hospitals, which is a clear indication of poor procurement performance in public hospitals. For the success of any procurement function in the healthcare setting at any level, the availability, accessibility, quality and affordability of medical and non-medical supplies are critical. To ensure availability and acceptable lead times, inventory management techniques at all levels are required. Hence the need to examine the effect of inventory management techniques on procurement performance focusing on a target population of 37 public health centres operating in Mombasa city county, Kenya.

Statement of the Problem

Public health centres procure almost all supplies they use including medical supplies and non-medical supplies. A significant amount of hospitals' expenditure goes to purchasing of medical supplies and other non- medical supplies. 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 8% on maternal services (Office of the Controller of the Budget, 2018). However, public hospitals are far from meeting essential medicine supplies availability targets as a result of poor inventory management (Vohra &Thakur, 2022). Despite the significant contribution of procurement function to the public hospitals, diminishing procurement performance has been witnessed across different public hospitals in Kenya; this has been attributed to poor stock

quality, delays in supplies delivery and high inventory holding costs (Kihara & Ngugi, 2021). The cost of carrying stock in public health centres in counties in Kenya is now commonly agreed to be between 4% and 10% higher than the stock value (PPOA, 2020).

Kenya Health Federation, (2016) indicates that public hospitals in counties frequently have 15-30% more inventory than they need and poor service delivery levels. This lead to increasing in inventory holding cost up to 500,000 Kenya shillings in each county, labor cost for material handling increasing to 100,000-250,000 Kenya shillings in the county hospitals. Lack of inventory management techniques lead to 30% reductions in essential medicines and 10-20% increase in lead-time for medical deliveries. Karani & Osoro, (2020) believe that inventory management stands to be one of the critical aspects of procurement that plays a crucial role in improving the effectiveness of the processes and ability of organizations to meet the customer needs through availability of the right inventory and at the right time. Through effective inventory management concepts or techniques, the procurement function of the firm's structure is able to perform as required. Quality, delivery time and cost saving indicates the performance of the procurement function (Lagat & Kihara, 2017).

While local studies have been conducted to relate inventory management techniques with various aspects of organizational performance such as financial, economic and operational performance, most of such studies have only focused on manufacturing organizations, distribution stores and supply chain stores neglecting the health institutions and procurement performance. For instance, Muturi & Makori, (2019) established the effect of inventory management practices on supply chain performance in industries in Kenya, survey of selected soft drinks manufacturing firms in western Kenya. Onchoke and Wanyoike, (2016) study on inventory management practices and performance of agrichemical firms in Nakuru County revealed that computerized inventory control influenced firm

performance. Ngugi & Elijah, (2021) study on the effect Inventory management strategies and performance of commercial government entities in Kenya.

Based on the analyzed literature gap (Onchoke & Wanyoike, 2016; Ngugi & Elijah, 2021; Muturi & Makori, 2019), it is evident that there is knowledge gap between inventory management techniques and the procurement performance in the health based organizations like public hospitals. This formed a good basis for the study. Hence, the research determined the effect of activity based classification, vendor managed inventory, bar coding and periodic inventory review techniques on procurement performance of public health centres in Mombasa city county, Kenya.

Objectives of the Study

The general objective of the study was to determine the effect of inventory management techniques on procurement performance of public health centres in Mombasa city county, Kenya. The study was guided by the following specific objectives;

- To determine the effect of activity based classification technique on procurement performance of public health centres in Mombasa city county, Kenya.

- To determine the effect of vendor managed inventory technique on procurement performance of public health centres in Mombasa city county, Kenya.

- To explore the effect of bar coding inventory technique on procurement performance of public health centres in Mombasa city county, Kenya.

- To assess the effect of periodic inventory review technique on procurement performance of public health centres in Mombasa city county, Kenya.

LITERATURE REVIEW

Theoretical Framework

Theory of Constraints (TOC)

Theory of constraints was developed in mid 1980s by Goldratt. Theory of constraints has been widely known as a management philosophy aimed at initiating and implementing an improvement through focusing on a constraint that prevents a system from achieving higher level of performance. Theory of constraints has a wide application; manufacturing, inventory management, continuous process improvement and managerial decision-making (Ikezire et al., 2019). An organization can manage inventory through identifying the limiting factors constraining the process and systematically improving that constraint until it is no longer the limiting factor (Brigham and Gapenski, 2013).

Some of the limiting factors that may exist in the inventory management process include very long lead times, frequent stock outs, high level of unnecessary and obsolete inventories, wrong materials order, large number of emergency orders and expedition levels, absence of inventory control procedure and lack funds to implement inventory policies. Theoretical contexts of theory of constraint (TOC) is considered to be relevant for this study in order to understand the effect of ABC classification on procurement performance of public dispensaries and health centres in Mombasa city, county, Kenya, hence it gives a theoretical background for this study. TOC is considered to be relevant to illustrate the relationship between ABC inventory management techniques and the cost related to determine the procurement performance of public health centres.

Agency Theory

Agency theory is thought to be relevant for this study in understanding the effect of inventory management techniques on procurement performance of public health centres in Mombasa city county, Kenya; hence, it gives a theoretical background for this study. Agency theory is a management and economic theory that attempts to

explain the relationship and self-interest in business organizations (Schroeder et al, 2012). According to Jensen and Mackling (1976) an agency relationship is a contract under which one or more persons (principal) engage another person (the agent) to perform some service on their behalf, which involves delegating some decision-making authority to the agent.

In the context of inventory management techniques, this theory explains the effect of agency relationship between a vendor and a buying organization who are in contractual agreement through the application of vendor managed inventory (VMI) as a technique in inventory management. The agency theory is therefore useful in terms of providing concepts for determining the item categories that can be managed at the supplier's premise. Since the theory suggests that an organization can establish a working relationship with suppliers there must be mutual trust, shared interest, differing resources, two-way symmetrical communication, and cognitive ties, this theory supports the concept of vender managed inventory.

Resource Based View Theory

Resource based view theory as advanced by Grant (1991) and is thought to be grounded in the study. The theory states that the resources and capabilities of a firm are central when it comes to strategy formulation. Grant (2013) reveals that firms have within their possession, resources that can enable them to achieve competitive advantage by taking an inverted view of why companies succeed or fail. Wade and Hulland (2010) add that, resources are valuable and rare, the benefits of which can be utilised by the firm, to provide the firm with a temporary competitive advantage as well a long-term competitive advantage depending on the extent to which the firm is able to protect against resource imitation, transfer, or substitution. In the view of this RBV theory, Peteraf (2015) suggested electronic inventory management systems such as electronic data interchange, electronic point of sale, bar coding and radio

frequency identification are rare valuable internal resources which when harnessed well are capable of giving a firm competitive advantage through reduction of cost of operation, improved customer service and effective stock control. This theory has a link with the study as it makes sure that every organization shall have rare valuable internal resources hence the theory explains the relationship between bar coding and procurement performance of public health centres in Mombasa city county, Kenya.

Stock Diffusion Theory

Stock diffusion theory outlines a dynamic approach to inventory management used for non-stationery items with non-constant means and variance (Onchoke & Wanyoike, 2016). Braglia, Gabbrielli and Zammori (2013) founded stock Diffusion theory. It outlines the approaches used in controlling inventories in an organization. According to the theory, utilization of stock is modelled as a Markov process that has a diffusion term that is slow. Fokker Planck model is applicable when calculating the chances of dissemination of reordering time and stock utilization. Braglia et al., (2013) argued that it makes it possible to keep safety stock at minimum level of inventory management is disbursed in this way. Similarly, according to Eaton & Kortum, (1999) asserts that the theory makes sure that lower inventory levels are kept without interfering with the operational or internal organization.

Stock diffusion concept can also be applied in supply environment with random and controllable demand and continuous input flow with fixed uncontrollable rate under finite storage capacity (Kitaeva, 2014). To control inventory in such an uncertain environment, there is need to develop internal inventory control systems that allows direct and real time flow of information on materials; information flow between suppliers and the organization (Onchoke & Wanyoike, 2016). Organizations must develop internal structures, policies and procedures upon which all internal inventory control operations are based (Eaton,

1999). This theory has a link with the study as it makes sure that every organization shall develop internal structures, procedures and policies to control inventory hence the theory explains the relationship between periodic stock review and procurement performance of public health centres in Mombasa city county, Kenya.

Activity Based Classification Technique

Inventory in any organization can run in thousands of part numbers or classifications and millions of part numbers in quantity. Therefore, inventory is required to be classified with some logic to be able to manage the same. In most of the organizations inventory is categorized according to ABC classification method, which is based on Pareto principle. Here the inventory is classified based on the value of the units. The principle applied here is based on 80/20 principles. It is also known as the Pareto principle (Setiawan et al., 2018). The ABC stock control technique relies on that the decision a little bundle of the things may usually address the weight of money estimation of the total stock. It is used as a part of the era method, while a tremendous number of things may happen from a little part of the money estimation of stores. Accordingly, to manage stock control high regard things are more solidly controlled than low regard things (Atnafu, Balda & Liu, 2018).

Activity based classification is one of the most frequently used inventory management techniques where classification of items is carried out in three predefined and ordered classes to be specific: A – stock items which are of medium value and medium volume; B –stock items baring minimal value but are of great volume; C –stock items that are of high value and material to the organization but low volume (Al-Najjar et al., 2020). The ABC technique classify inventory items according to the money value to a firm where Class 'A' items normally range from 10% to 15% of all inventory items and account for between 70% and 75% of total annual consumption value. The class 'B' items normally range from 15% to 20% of all inventory items and account for 20% of total annual consumption value.

The Class 'C' items normally constitute 70% to 75% of all inventory items and account for 5% to 10% of total annual consumption value. ABC analysis is sound recognized categorization technique as far as the Pareto principle is concerned, whose main purpose is for establishing the items that should be prioritized in the management of an inventory (Nadkarni and Ghewari, 2020).

Vendor Managed Inventory Technique

Vendor Managed Inventory (VMI) or third party inventory management model is an inventory management technique where the supplier takes responsibility for an uninterrupted supply of their products to a buyer, so that the buyer will not run out of stock (Zhao, 2019). In this arrangement, buying organization authorize suppliers or vendors to generate orders based on the shared information provided by the customers or buyers such as forecast, point of sales data, and production schedule. Overall, VMI's goal is to establish a mutually beneficial partnership within the supply chain that balances the flow of goods, helps keep inventory amounts in balance, while reducing the risk for issues such as the bullwhip effect (Smith, 2020).

Bar Coding inventory Management Techniques

In modern business arena, information technology houses the success of every organization. Information technology is the application of technology to solve business or organizational problems on a broad scale (Kirsten, 2019). Technology has largely influenced inventory management positively, since its introduction; technology has exposed the positive impact on the day-to-day handling of inventory (Mnyaka, 2022). According to Narkhede, (2017) information technology enables information sharing and business transactions for the effective running of the business through application of computer networks that enables inventory managers to plan effectively to avoid stocks outs, overstocking hence cost reduction and bottlenecks for all the members of the chain. Purchasing, receiving, storing,

ordering, retrieving, delivering, and returning items are all part of the inventory system.

Periodic Review Inventory Technique

In practice stock control is one of the most important decisions taken by inventory managers which indirectly affects the performance of procurement function. Accordingly, centralizing inventory control decisions in the supply chain can improve the performance of the whole supply chain (Johari, 2020). Okwaro, Iravo & Berut, (2017) note that inventories represent more than 50% of total investment cost of an organization and it is a potential source of waste that needs to be reviewed regularly and closely through perpetual stock taking, periodic reviews also as well as internal and external auditing. Current inventory models, philosophies and systems enable an organization to effectively monitor inventory in store to avoid overstocking and under stocking which again may tie up working capital and may lead to deterioration of stock and obsolescence in the stores (Muhalia, Ngugi & Moronge, 2021).

Procurement Performance of Public Health Centres

Procurement performance has remained a burning issue for eras and it still is. As with some other professions like accounting and marketing, the procurement profession seeks to upsurge its responsibility in order to fortify its place at the board of directors (Munyimi, 2019). Many firms from global aspect are competitive in the market due to performance from flexibility, accuracy in order processing from requisition made by customers, cost minimization by reducing distribution channels and logistics bureaucracy, reduction of information search time and lead time responsiveness to any queries arising from stakeholders. Therefore, it is crucial for firms to implement a good procurement system that is enhanced by procurement best practices that will enhance procurement performance irrespective of procurement operations (Nyakundi, 2016).

Empirical Review

Researchers have also developed interest in relationship between inventory management techniques and procurement performance. For instance, Mukopi and Iravo, (2015) examined the effect of inventory management on performance of the procurement function of sugar manufacturing companies in the western sugar belt. Descriptive research design, specifically a survey study was employed in carrying out the research. The target population of the study consisted of a sample of procurement personnel of Mumias Sugar Company, West Kenya Sugar Company, Nzoia Sugar Company and Butali Sugar Mills which was 30 procurement personnel out of the total target population that was 100 procurement personnel. The research instrument was structured questionnaires that were self-administered to the respondents. The study findings revealed that there was strong relationship between ABC classification and performance of the procurement function of sugar manufacturing companies in the western sugar belt.

Achevi et. al., (2021) investigated the influence of inventory management techniques on performance of procurement function at Vihiga County Referral Hospital. The objective of the study was to find out the influence of Economic Order Quantities, Just in Time and ABC analysis on performance of procurement function at Vihiga County Referral Hospital. The study adopted a cross sectional study design. The unit of analysis for this study was 83 employees of the Vihiga County Referral Hospital. Stratified random sampling was used; primary data was used. The study made use of questionnaires to collect primary data. From multiple linear regression coefficients, just in time had greatest predictability regression power followed by economic order quantity and lastly, ABC analysis. The study therefore, concluded that inventory control techniques adopted at Vihiga County Referral Hospital significantly influenced performance of procurement function. The study also recommended that the hospital should use ABC

analysis technique to forecast the demand for products and manage the stock levels accordingly.

Nyamwaga & Otinga, (2021) investigated the influence of inventory management practices on procurement performance of judiciary; A case of Law Courts in Kakamega County. The specific objectives were; to determine the influence of Just in Time inventory management practices on procurement performance of Judiciary in Kenya; investigate the influence of vendor managed inventory management practices on procurement performance of Judiciary in Kenya and establish the influence of economic order quantity inventory management practices on procurement performance of Judiciary in Kenya. The study targeted 71 respondents from four law courts in Kakamega County; Butali, Butere, Mumias and Kakamega Law Courts. Census sampling techniques was adopted. The study concluded that Vendor managed inventory practice has significant influence on procurement performance of Judiciary in Kenya. Therefore, Vendor managed inventory management practice is a useful predicator of procurement performance of Judiciary in Kenya.

Cherotich & Musau, (2020), Investigated the Influence of Vendor Managed Inventory on Procurement Function of NCPB in Uasin Gishu County. The study adopted stratified sampling technique in establishing the sample for the study. The study utilized a sample size of 96 respondents. Questionnaires was used by the study to collect the data. The semi-structured questionnaire was self-administered in order to increase response rate. The study analyzed the results using the SPSS software version 24. Regression analysis was used to develop regression model expressing the hypothesized relationship between variables under study. The researcher regressed the variables at 5% significance level to determine the strength of the variables and direction of their relationship. The study found that vendor managed inventory has a positive and statistically significant effect on the procurement function at NCPB in Uasin Gishu.

Mwangangi & Ouma, (2018) conducted a study to examine the influence of inventory management systems on the performance of soft drinks manufacturing firms in Kenya. The specific objectives of the study were to assess the influence of Material Requirement Planning in firm's performance, determine the influence of Just in Time on firm`s performance and examine the influence of Vendor managed inventory on firm's performance and to explore the influence of bar coding on firm's performance. The research used descriptive research design. The target population for the study will be 455 employees in the soft drink manufacturing firms in Kenya. The study findings showed that the four variables had a significant influence on performance of the firms.

Achuora & Lusweti, (2020) conducted a study on the influence of e-inventory management systems on the performance of supermarkets in Nairobi County, Kenya. Specifically, the study sought to examine the effect of electronic data interchange, electronic point of sale, bar coding and radio frequency identification on performance of supermarkets in Nairobi County. The study established a positive significant relationship between e-inventory management systems and performance of supermarkets. The study therefore concludes that e-inventory systems significantly improve performance of supermarkets. Consequently, the study recommends that supermarkets in Kenya should implement e-inventory management systems in order to improve their performance through reduction of operation costs and improved inventory control.

Inventory review technique is a popular concept among accounting and inventory management practitioners (Onchoke & Wanyoike, 2016). According to Alim & Isnanto, (2023) inventory review ensures timely and adequate identification and evaluation of inventories, reduce inventory losses and ensure inventory accuracy and enables an organization evade risks associated with inventory such as; inadequate and inappropriate inventory, unnecessarily high inventory levels,

inaccurate and incomplete inventory records, poor inventory security and obsolete inventory.

Kitheka et al., (2019) conducted a study on the effect of inventory management techniques on procurement performance. The general objective was to determine the effect of inventory management techniques on procurement performance, the case of empirical evidence. Specially, the study focused on determining the effect of periodic review approach on procurement performance. The study sampled relevant research papers on the concept of inventory management. The study found out that periodic review technique significantly affects procurement performance. The study recommended the adoption of periodic technique for efficient procurement function in an organization.

METHODOLOGY

The study adopted a descriptive research design in designing the research method. The target population was considered from 37 public health centres operating within the Mombasa city county. The sampling frame consisted the unit of analysis consisting the 37 public health centres operating within Mombasa City County. The unit of observation consisted of officers attached with daily inventory management responsibilities and in one way or another affect procurement process that included procurement officers, inspection and dispatch officers, store officers and dispatch officers. From the target population of 148 officers of the 37 public health centres in Mombasa City County, the sample size of 108 was computed based on Yamane (1967).

The study used primary data which was mainly collected through self-administered questionnaires, which contained structured and non-structured questions for officers. The study used questionnaire as the main instrument for primary data collection. The study adopted quantitative analysis. According to Cooper and Schindler (2016), data analysis is the whole process, which starts immediately after data collection and ends at the point of interpretation and processing. Collected data was crosschecked and verified for errors, completeness and consistency. The data collected was analyzed by the use of SPSS version 26 software to generate inferential statistics such as regression and correlation analysis. In analyzing the data, tables that include frequencies, means and percentage and standard deviations were used as analytical tools. Quantitative explanations were made of quantitative data to give meaning to them as well as explain their implications. From these, appropriate conclusions and recommendations were made from the findings of the research. Analysis of Variance (ANOVA) was done. The resultant data presentation was tabulated and presented using tables and bar charts.

This study used multiple regression model to measure the effect of inventory management techniques on procurement performance of public health centres in Mombasa city county, Kenya. There were four independent variables in this study thus the multiple regression model was as follows

$Y= \beta_0+ \beta_1 X_1+\beta_2 X_2+ \beta_3 X_3+\beta_4 X_4+ \varepsilon$, Where:

Y= Procurement Performance of Public Health Centres in Mombasa City County, Kenya

β_0=constant (coefficient of intercept)

β_1, β_2, β_3 and β_4 are the coefficients of independent variables

X1 = ABC technique

X2 = Vendor Managed inventory technique

X3 = Bar coding inventory technique

X4 = Periodic Inventory Review technique

ε =error term

FINDINGS AND DISCUSSION

Table 1: Effect of Activity Based Classification (ABC) Technique on Procurement performance

Statement	SA		A		N		D		SD		M	Std dev.
	F	%	F	%	F	%	F	%	F	%		
ABC has ensured high inventory utilization increasing procurement efficiency hospital	40	48.2	19	22.9	4	4.8	4	4.8	16	19.3	**3.76**	**1.55**
Grouping the items on the level of importance has helped in distribution of medicine in our hospital	32	38.6	28	33.7	17	20.5	5	6.0	1	1.2	**4.02**	**0.97**
ABC has improved determination of drugs availability in stores before depletion of each category and levels of stock available	28	33.7	29	34.9	19	22.9	5	6.0	2	2.4	**3.92**	**1.01**
Our hospital establishes safety stock for each category using ABC technique	45	54.2	29	34.9	5	6.0	2	2.4	2	2.4	**4.36**	**0.89**
ABC analysis has helped our hospital to evaluate stock according to the amount of money spent on them.	32	38.6	38	45.8	6	7.2	4	4.8	3	3.6	**4.11**	**0.98**
ABC technique has improved inventory categorization under particular purchased lot for value purchases in our hospital	36	43.4	17	20.5	19	22.9	5	6.0	6	7.2	**3.87**	**1.24**
ABC has ensured effective resource allocation in our hospital	53	63.9	17	20.9	8	9.6	4	4.8	1	1.2	**4.41**	**0.93**
Average											**4.06**	**1.08**

The study sought to determine the effect of Activity based classification technique on procurement performance of public health centres in Mombasa city county, Kenya. The findings were presented in a five point Likert scale where SA=strongly agree, A=agree, N=neutral, D=disagree, SD=strongly disagree and M= Mean, Std dev= Standard deviation. The respondents were requested to indicate their level of agreement with the given statements that relate to the effects of Activity based classification on procurement performance public health centres in Mombasa city county, Kenya. On the statement, "ABC has ensured high inventory utilization increasing procurement efficiency in the hospital". From table 1 above, the distribution of findings showed that majority of the respondents 40 (48.2%) strongly agreed to the statement, 19 (22.9%) of the respondents agreed, 4 (4.8%) and of them were neutral, 4 (4.8%) of the disagreed while 16 (19.3%) of them strongly disagreed to the statement. The statement had a

mean and standard deviation of 3.76 and 1.55 respectively. The respondents were also asked to rate how much they agreed with the statement, "grouping the items on the level of importance has helped in distribution of medicine in our hospital". The results of the study showed that majority of them 32 (38.6%) strongly agreed that grouping the items on the level of importance has helped in distribution of medicine in the hospital, 28 (33.7%) of them agreed, 17 (20.5%) of them were neutral while only 5 (6.0%) and 1 (1.2%) of them disagreed and strongly disagreed respectively. The statement had a mean average of 4.02 and standard deviation of 0.97.The respondents were further asked to rate the level of agreement with the statement, "ABC has improved determination of drugs availability in our stores before depletion of each category and levels of stock available". The findings of the study showed that majority of the respondents 29 (34.9%) agreed to the statement, 28 (33.7%) strongly agreed, 19 (22.9%) of them were neutral while only

5 (6.0%) and 2 (2.4%) of the respondents disagreed and strongly disagreed respectively. The statement had a mean and standard deviation of 3.92 and 1.01 respectively. In relation to the statement "Our hospital establishes safety stock for each category using ABC technique", the results showed that majority of the respondents 45 (54.2%) strongly agreed to the statement, 29 (34.9%) of them agreed, 5 (6.0%) were neutral, 2 (2.4%) and 2 (2.4%) disagreed and strongly disagreed to the statement respectively. The statement had a mean and standard deviation of 4.36 and 0.89 respectively. The respondents were further asked to rate the level of agreement with the statement, "ABC analysis has helped our hospital to evaluate stock according to the amount of money spent on them". The findings of the study showed that majority of the respondents 38 (45.8%) agreed to the statement, 32 (38.6%) strongly agreed, 6 (7.2%) of them were neutral, 4 (4.8%) disagreed while 3 (3.6%) and strongly disagreed. The statement had a mean and standard deviation of 4.11 and 0.98 respectively. In relation to the statement "ABC technique has improved inventory categorization under a particular purchased lot for value purchases in our hospital", majority of the respondents, 36 (43.4%) strongly agreed with the statement, 17 (20.5%) agreed to the statement, 19 (22.5%) of them were neutral, 6 (7.2%) of them strongly disagreed and 5 (6.0%) of them disagreed to the statement respectively. The statement had a mean and standard deviation of 3.87 and 1.24 respectively. With regards to the statement, "ABC has ensured effective resource allocation in our hospital ", majority of the respondents 53 (63.9%) of them strongly agreed to the statement, 17(20.5%) of them agreed, 8 (9.6%) of them were neutral, 4 (4.8%) disagreed, while 1(1.2%) strongly disagreed respectively. The statement had a mean and standard deviation of 4.41and 0.93. ABC technique had an average mean and standard deviation of 4.06 and 1.08 respectively.

Table 2: Effect of Vendor Managed Inventory Technique on Procurement performance

Statement	SA		A		N		D		SD		M	Std Dev.
	F	%	F	%	F	%	F	%	F	%		
Vendor managed inventory technique in our hospital has improved collaboration with our suppliers	30	36.1	19	22.9	21	25.3	11	13.3	2	2.4	**3.77**	**1.14**
Vendor managed inventory technique in the hospital has minimized the holding and ordering costs annually thus leading reduction of stock out costs in our hospital	44	53.0	13	15.7	8	9.6	9	10.8	9	10.8	**3.89**	**1.42**
The VMI technique has ensured timely replenishment of inventory and lead time for the timely delivery of stock in hospital	39	47.0	35	42.2	5	6.0	2	2.4	2	2.4	**4.29**	**0.87**
The VMI technique has greatly ensured that there is optimal stock levels and reduced stock out costs in our hospital	38	45.8	32	38.6	6	7.2	4	4.8	3	3.6	**4.18**	**1.01**
Vendor managed inventory has significantly improved partnership between hospital and suppliers	19	22.9	23	27.7	26	31.3	10	12.0	5	6.0	**3.49**	**1.14**
Vendor Managed Inventory technique has greatly diminished the bullwhip effect that is linked up with incorrect forecast of demand in our hospital	53	63.9	17	20.5	8	9.6	5	6.0	0	0.0	**4.42**	**0.89**
Vendor Managed Inventory system has improved compliance among our vendors	43	51.8	26	31.3	6	7.2	4	4.8	4	4.8	**4.20**	**1.08**
Average											**4.03**	**1.08**

The study sought to determine the effect of vendor managed inventory (VMI) technique on procurement performance of public health centres in Mombasa city county, Kenya. The findings were presented in a five point Likert scale where SA=strongly agree, A=agree, N=neutral, D=disagree, SD=strongly disagree, M= Mean, Std Dev = standard deviation. The respondents were asked to rate the level of agreement to the statements relating to the effect of Vendor managed inventory on procurement performance of Public health centres in Mombasa city county, Kenya. On the statement, " vendor managed inventory technique in our hospital has improved collaboration with our suppliers ". From table 2 above, the distribution of findings showed that majority of the respondents 30 (36.1%) strongly agreed to the statement, 19 (22.9%) of the respondents agreed, 21(25.3%) of them were neutral, 11 (13.3%) of the disagreed while 2 (2.4%) of them strongly disagreed to the statement. The statement had a mean average and standard deviation of 3.77 and 1.14 respectively. The respondents were also asked to rate how much they agreed or disagreed with the statement, "vendor managed inventory technique in the hospital has minimized the total holding and ordering costs annually thus leading reduction of stock out costs in our hospital ". The results of the study showed that majority of them 44 (53.0%) strongly agreed that vendor managed inventory technique in the hospital has minimized the total holding and ordering costs annually thus leading reduction of stock out costs in the hospital, 13 (15.7%) of them agreed, 8 (9.6%) of them were neutral while only 9 (10.8%) and 9 (10.8%) of them disagreed and strongly disagreed respectively. The statement had a mean average and standard deviation of 3.89 and 1.42 respectively. The respondents were further asked to rate their level of agreement and with the statement, "the VMI technique has ensured timely replenishment of inventory and short lead time for the timely delivery of stock in our hospital ". The findings of the study showed that majority of the respondents 39 (47.0%) strongly agreed, 35 (42.2%) agreed, 5

(6.0%) of them were neutral while only 2 (2.4%) and 2 (2.4%) of the respondents disagreed and strongly disagreed to the statement respectively. The statement had a mean average and standard deviation of 4.29 and 0.87 respectively. In relation to the statement "the VMI technique has greatly ensured that there is optimal stock levels and reduced stock out costs in our hospital ", the results showed that majority of the respondents 38 (45.8%) strongly agreed to the statement, 32 (38.6%) of them agreed, 6 (7.2%) were neutral, 4 (4.8%) and 3 (3.6%) disagreed and strongly disagreed to the statement respectively. The statement had a mean average and standard deviation of 4.18 and 1.01 respectively. The respondents were further asked to rate their level of agreement with the statement, "vendor managed inventory has significantly improved partnership relationship between our hospital and its suppliers". The findings of the study showed that majority of the respondents 26 (31.3%) were neutral to the statement, 23 (27.7%) agreed, 19 (22.9%) of them strongly agreed, 10 (12.0%) disagreed while 5 (6.0%) and strongly disagreed. The statement had a mean average and standard deviation of 3.49 and 1.14 respectively. In relation to the statement "vendor Managed Inventory technique has greatly diminished the bullwhip effect that is linked up with incorrect forecast of demand in our hospital ", majority of the respondents, 53 (63.9%) strongly agreed with the statement, 17 (20.5%) agreed to the statement, 8 (9.6%) of them were neutral and 5 (6.0%) of them strongly disagreed to the statement respectively. None of the respondents strongly disagreed to the statement. The statement had a mean average and standard deviation of 4.42 and 0.89 respectively. With regards to the statement, "vendor Managed inventory system has improved compliance among our vendors ", majority of the respondents 43 (51.8%) of them strongly agreed to the statement, 26 (31.3%) of them agreed, 6 (7.2%) of them were neutral, 4 (4.8%) disagreed, while 4 (4.8%) strongly disagreed respectively. The statement had a mean average and standard deviation of 4.20 and 1.08 respectively. Vendor managed inventory technique

had a mean average and standard deviation of 4.03 and 1.08 respectively.

Effect of Bar Coding Inventory Technique on Procurement Performance

Table 3: Effect of bar coding inventory Technique on Procurement performance

Statement	SA		A		N		D		SD		M	Std Dev.
	F	%	F	%	F	%	F	%	F	%		
Bar coding has significantly reduced errors that occur due to manual inventory records handling in our hospital	34	41.0	23	27.7	19	22.9	7	8.4	0	0.0	**4.01**	**0.99**
Bar coding has greatly simplified and improved inventory tracking process in our hospitals	34	41.0	28	33.7	15	18.1	5	6.0	1	1.2	**4.07**	**0.97**
The use of bar coding technique has significantly reduced inventory loss through pilferage in our hospital	38	45.8	23	27.7	13	15.7	4	4.8	5	6.0	**4.02**	**1.16**
Bar coding has improved inventory information and data reports retrieval in our hospital	54	65.1	17	20.5	8	9.6	3	3.6	1	1.2	**4.45**	**0.90**
Our hospital uses bar coding in inventory management	49	59.0	21	25.3	6	7.2	4	4.8	3	3.6	**4.31**	**1.04**
Bar coding technique has greatly reduced stock take time in our hospital	34	41.0	21	25.3	15	18.1	9	10.8	4	4.8	**3.87**	**1.20**
Average											**4.12**	**1.04**

The study sought to explore the effect of bar coding inventory technique on procurement performance of public health centres in Mombasa city county, Kenya. The findings were presented in a five point Likert scale where SA=strongly agree, A=agree, N=neutral, D=disagree, SD=strongly disagree, M= Mean and std dev= standard deviation. The respondents were asked to rate the level of agreement to the statements relating to the effect of bar coding inventory technique on procurement performance of Public health centres in Mombasa city county, Kenya. On the statement, "bar coding has significantly reduced errors that occur due to manual inventory records handling in our hospital". From table 3 above, the distribution of findings showed that majority of the respondents 34 (41.0%) strongly agreed with the statement, 23 (27.7%) of the respondents agreed, 19 (22.9%) of them were neutral, 7 (8.4%) of the disagreed and none of them strongly disagreed to the statement. The statement

had a mean average and standard deviation of 4.01 and 0.99 respectively. The respondents were also asked to rate their level of agreement with the statement, "bar coding has greatly simplified and improved inventory tracking process in our hospitals". The results of the study showed that majority of them 34 (41.0%) strongly agreed to the statement, 28 (33.7%) of them agreed, 15 (18.1%) of them were neutral while only 5 (6.0%) and 1 (1.2%) of them disagreed and strongly disagreed respectively. The statement had a mean average and standard deviation of 4.07 and 0.97 respectively. The respondents were further asked to rate the level of agreement and disagreement with the statement, "the use of bar coding technique has significantly reduced inventory loss through pilferage in our hospital ". The findings of the study showed that majority of the respondents 38 (45.8%) strongly agreed, 23 (27.7%) agreed, 13 (15.7%) of them were neutral while only 4 (4.8%) and 5 (6.0%)

of the respondents disagreed and strongly disagreed to the statement respectively. The statement had a mean average and standard deviation of 4.02 and 1.16 respectively. In relation to the statement "bar coding has improved inventory information and data reports retrieval in our hospital ". The study results showed that majority of the respondents 54 (65.1%) strongly agreed to the statement, 17 (20.5%) of them agreed, 8 (9.6%) were neutral, 3 (3.6%) and 1 (1.2%) disagreed and strongly disagreed to the statement respectively. The statement had a mean average and standard deviation of 4.45 and 0.90 respectively. The respondents were further asked to rate their level of agreement with the statement, "Our hospital uses bar coding in inventory management". The findings of the study showed that majority of the respondents 49 (59.0%) strongly agreed to the statement, 21 (25.3%) agreed, 6 (7.2%) of them were neutral, 4 (4.8%) disagreed while 3 (3.6%) and strongly disagreed. The statement had a mean average and standard

deviation of 4.31 and 1.04 respectively. In relation to the statement "bar coding technique has greatly reduced stock take time in our hospital ", majority of the respondents, 34 (41.0%) strongly agreed with the statement, 21 (25.3%) agreed to the statement, 15 (18.1%) of them were neutral, 4 (4.8%) and 9 (10.8%) of them disagreed and strongly disagreed to the statement respectively. The statement had a mean average and standard deviation of 3.87 and 1.20 respectively. Bar coding inventory technique had an average mean and standard deviation of 4.12 and 1.04 respectively. The study findings are consistent with the findings by (Ngugi & Kihara, 2021), who noted that inventory management devices, such as barcode scanners and inventory management software drastically help in elimination of manual processes, keep track of products on hand or ordered and improve the effort of having to do an inventory recount to ensure records are accurate thus improving hospital efficiency and productivity.

Effect of Periodic inventory Review Technique on Procurement performance

Table 4: Effect of Periodic inventory Review Technique on Procurement performance

Statement	SA		A		N		D		SD		M	Std Dev.
	F	%	F	%	F	%	F	%	F	%		
Periodic inventory review has ensured timely and adequate replenishment of inventories in our hospital.	40	48.2	38	45.8	3	3.6	1	1.2	1	1.2	**4.39**	**0.73**
Periodic inventory review has greatly reduced stock out incidents in our hospital.	55	66.3	19	22.9	4	4.8	3	3.6	2	2.4	**4.47**	**0.92**
Periodic inventory review has ensured accurate and completed stock records in our hospital.	49	59.0	25	30.1	6	7.2	2	2.4	1	1.2	**4.43**	**0.82**
Periodic inventory review has enabled our hospital evade risks associated with stock such as unnecessarily high stock levels.	47	56.6	22	26.5	10	12.0	2	2.4	2	2.4	**4.33**	**0.95**
Average											**4.40**	**0.86**

The study sought to assess the effect of periodic inventory review technique on procurement performance of public health centres in Mombasa city county, Kenya. The findings were presented in a

five point Likert scale where SA=strongly agree, A=agree, N=neutral, D=disagree, SD=strongly disagree, M=Mean and std Dev = standard deviation. The respondents were requested to rate

the level of agreement to the statements relating to the effect of periodic inventory review on procurement performance of Public health centres in Mombasa city county, Kenya. On the statement, "periodic inventory review has ensured timely and adequate replenishment of inventories in our hospital ". From table 4 above, the distribution of findings showed that majority of the respondents 40 (48.2%) strongly agreed with the statement, 38 (45.8%) of the respondents agreed, 3 (3.6%) of them were neutral, 1(1.2%) of the disagreed and 1 (1.2%) of them strongly disagreed to the statement. The statement had a mean average and standard deviation of 4.39 and 0.73 respectively. The respondents were also asked to rate their level of agreement with the statement, "periodic inventory review has greatly reduced stock out incidents in our hospital". The results of the study showed that majority of them 55 (66.3%) strongly agreed to the statement, 19 (22.9%) of them agreed, 4 (4.8%) of them were neutral while only 3 (3.6%) and 2 (2.4%) of them disagreed and strongly disagreed respectively. The statement had a mean average and standard deviation of 4.47 and 0.92 respectively. The respondents were further asked to rate the level of agreement with the statement, "periodic inventory review has ensured accurate and completed stock records in our hospital". The

findings of the study showed that majority of the respondents 49 (59.0%) strongly agreed, 25 (30.1%) agreed, 6 (7.2%) of them were neutral while only 2 (2.4%) and 1 (1.2%) of the respondents disagreed and strongly disagreed to the statement respectively. The statement had a mean average and standard deviation of 4.43 and 0.82 respectively. The respondents were further asked to rate the level of agreement with the statement, "periodic inventory review has enabled our hospital evade risks associated with stock such as unnecessarily high stock levels ". The findings of the study showed that majority of the respondents 47 (56.6%) strongly agreed, 22 (26.5%) agreed, 10 (12.0%) of them were neutral while only 2 (2.4%) and 2 (2.4%) of the respondents disagreed and strongly disagreed to the statement respectively. The statement had a mean average and standard deviation of 4.33 and 0.95 respectively. Periodic review technique had an average mean and standard deviation of 4.40 and 0.86 respectively. The study results concur with (Barasa & Mukanzi, 2021) who found out that inventory audit enabled the hospitals evade risks associated with stock such as unnecessarily high stock levels and ensured compliance with organizational and sectorial standards, inventory audits reduced stock losses and ensured accurate and completed stock records

Table 5: Procurement performance

Statement	SA		A		N		D		SD		M	Std dev.
	F	%	F	%	F	%	F	%	F	%		
There is an improvement in the delivery time of medical and non-medical supplies in our hospital over the years	43	51.8	30	36.1	5	6.0	2	2.4	3	3.6	**4.30**	**0.95**
There is a reduction in inventory carrying cost of medical and non-medical supplies in our hospital over the years	45	54.2	32	38.6	5	6.0	1	1.2	0	0.0	**4.46**	**0.66**
Cases of equipment and medical supplies shortage have greatly reduced in our hospital over the years	32	38.6	38	45.8	6	7.2	6	7.2	1	1.2	**4.13**	**0.92**
There is an increase in inventory waste elimination in our hospital	54	65.1	15	18.1	8	9.6	4	4.8	2	2.4	**4.39**	**1.00**
The quality level of supplies in our hospital has improved over the years	49	59.0	22	26.5	5	6.0	4	4.8	3	3.6	**4.33**	**1.03**
Average											**4.32**	**0.91**

The study sought to determine the effect of inventory management techniques on procurement performance of public health centres in Mombasa city county, Kenya. The findings were presented in a five point Likert scale where SA=strongly agree, A=agree, N=neutral, D=disagree, SD=strongly disagree, M=Mean and std dev= standard deviation. The respondents were requested to rate the level of agreement to the statements relating to the effect of inventory management techniques on procurement performance of Public health centres in Mombasa city county, Kenya. On the statement whether, "there is an improvement in the delivery time of medical and non-medical supplies in the hospital over the years ". From table 5 above, the distribution of findings showed that majority of the respondents 43 (51.8%) strongly agreed that there is an improvement in the delivery time of medical and non-medical supplies in the hospital over the years, 30 (36.1%) of the respondents agreed, 5 (6.0%) of them were neutral, 2(2.4%) of the disagreed and 3 (3.6%) of them strongly disagreed to the statement. The statement had a mean average and standard deviation of 4.30 and 0.95 respectively. The respondents were also asked to rate their level of agreement with the statement, "there is a reduction in inventory carrying cost of medical and non-medical supplies in our hospital over the years ". The results of the study showed that majority of them 45 (54.2%) strongly agreed to the statement, 32 (38.6%) of them agreed, 5 (6.0%) of them were neutral while only 1 (1.2%) disagreed. None of the respondents strongly disagreed to the statement. The statement had a mean average and

standard deviation of 4.46 and 0.66 respectively. The respondents were further asked to rate the level of agreement with the statement, "cases of equipment and medical supplies shortage have greatly reduced in our hospital over the years ". The findings of the study showed that majority of the respondents 38 (45.8%) agreed to the statement, 32 (38.6%) strongly agreed, 6 (7.2%) of them were neutral while only 6 (7.2%) and 1 (1.2%) of the respondents disagreed and strongly disagreed to the statement respectively. The statement had a mean average and standard deviation of 4.13 and 0.92 respectively. The respondents were further asked to rate the level of agreement with the statement, "there is an increase in inventory waste elimination in our hospital". The findings of the study showed that majority of the respondents 54 (65.1%) strongly agreed, 15 (18.1%) agreed, 8 (9.6%) of them were neutral while only 4 (4.8%) and 2 (2.4%) of the respondents disagreed and strongly disagreed to the statement respectively. The statement had a mean average and standard deviation of 4.39 and 1.00 respectively. The respondents were further asked to rate the level of agreement with the statement, "the quality level of supplies in our hospital has improved over the years ". The findings of the study showed that majority of the respondents 49 (59.0%) strongly agreed, 22 (26.5%) agreed, 5 (6.0%) of them were neutral while only 4 (4.8%) and 3 (3.6%) of the respondents disagreed and strongly disagreed to the statement respectively. The statement had a mean average and standard deviation of 4.33 and 1.03 respectively.

Inferential Statistics

Pearson Correlation Analysis
Table 6: Correlations

		ABC	Vendor Managed Inventory	Bar Coding	Periodic Review	Procurement Performance
ABC Technique	Pearson Correlation	1	.306**	.419**	.300**	.511**
	Sig. (2-tailed)		.005	.000	.006	.000
	N		83	83	83	83
Vendor Managed Inventory	Pearson Correlation		1	.290**	.292**	.473**
	Sig. (2-tailed)			.008	.007	.000
	N			83	83	83
Bar Coding Technique	Pearson Correlation			1	.352**	.625**
	Sig. (2-tailed)				.001	.000
	N				83	83
Periodic Review Inventory Technique	Pearson Correlation				1	.411**
	Sig. (2-tailed)					.000
	N					83
Procurement Performance	Pearson Correlation					1
	Sig. (2-tailed)					
	N					83

*. Correlation is significant at the 0.05 level (2-tailed).

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

The study sought to establish the strength of the relationship between independent and dependent variables of the study. Pearson correlation coefficient was computed at 95 percent confidence interval (error margin of 0.05). Table 6 above illustrates the findings of the study. The study findings revealed that there is a positive relationship between ABC inventory technique and procurement performance. The correlation was significant as indicated by Pearson correlation value of 0.511 and significant value of 0.000. This implies that an increase in ABC inventory technique indicators such as inventory utilization, inventory categorization and resource allocation increases the procurement performance. The study findings are in line with the findings by (Ngugi & Kihara, 2021), who noted that material grouping into predefined categories ensure hospitals are always updated about quantities of components and specifications that make up hospital drugs store stock, and manage their reordering schedules as required.

Additionally, the study findings also revealed that there is significant positive relationship between vendor managed inventory technique and procurement performance. The correlation was significant as indicated by Pearson correlation value of 0.473 and significant value of 0.000 which is less than the significant level of 0.05, (p<0.05). The study findings are in consistent with study by (Mwangangi & Ouma, 2018), who noted that vendor management inventory systems elements have an impact in delivery where as a result of poor communication with suppliers results to quantity and time cost and also lack of supplier collaboration lead to quality costs which undermines

performance of the firm because of extra cost hence inability to save on purchases.

The study findings also revealed that there was a strong positive relationship between bar coding inventory technique and procurement performance with a correlation value of 0.625 and a significant value of 0.000 which is less than the significant level of 0.05, (p<0.05). The study findings are consistent with the findings by (Ngugi & Kihara, 2021), who noted that inventory management devices, such as barcode scanners and inventory management software drastically help in elimination of manual processes, keep track of products on hand or ordered and improve the effort of having to do an inventory recount to ensure records are accurate thus improving hospital efficiency and productivity. Further, as shown on Table 6 above, for periodic inventory review technique the Pearson Correlation coefficient was at 0.411 with significant p-value of

0.000 which is less than the significant level of 0.05, (p<0.05), which represented an average, positive relationship between periodic inventory review technique and procurement performance. According to Ketheka et. al, (2019) periodic review approach helps to avoid stock-outs with its costs and overstocking which again may tie-up working capital and may also lead to deterioration of stock and obsolescence in the stores and are very crucial in enhancing procurement performance of an organization. These findings concur with (Makori & Muturi, 2018) who found that inventory control systems has an effect on procurement performance.

Multiple Linear Regression
The study conducted multiple regression analysis to establish the effect of inventory management techniques on procurement performance of public health centres in Mombasa city county, Kenya.

Table 7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	Sig. F Change
1	.754[a]	.569	.547	.28856	.569	25.745	.000

a. Predictors: (Constant), ABC technique, vendor managed inventory, bar coding technique and periodic inventory review technique

b. Dependent variable: procurement performance of public health centres

The model summary results provided in table 7 above, shows R value of 0.754 and R Square value of 0.569, the R Square, which is the coefficient of determination that was used to measure the independent variables variations and their effect on the dependent variable. This value is between 0 and 1. Analytically, this shows that 56.9% of procurement performance of public health centres

in Mombasa City County was influenced by inventory management techniques (ABC Technique, Vendor managed inventory technique, Bar coding inventory technique and periodic inventory review technique) while the remaining 43.1 % is associated with factors that are not within the scope of this study.

Analysis of Variance

Table 8: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.575	4	2.144	25.745	.000[b]
	Residual	6.495	78	.083		
	Total	**15.070**	**82**			

a. Dependent variable: procurement performance of public health centres

b. Predictors: (Constant), ABC, VMI, Bar coding, periodic inventory review

Table 8 shows the Analysis of Variance (ANOVA), significance tests were conducted at 0.05 confidence level. The F-value was found to be 25.745 while p-value was 0.000 which is < 0.05. The significance value of 0.000 indicates that model was statistically significant at 5% significance level in predicting how inventory management techniques affect procurement performance of public health centres in Mombasa city county, Kenya.

Regression Coefficient

Table 9: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.490	.493		.993	.324
	ABC	.207	.079	.222	2.630	.010
	VMI	.293	.078	.295	3.752	.000
	Bar Coding	.349	.080	.379	4.359	.000
	Periodic Review	.163	.069	.192	2.373	.020

a. Dependent variable: procurement performance of public health centres
b. Predictors: (Constant), ABC, VMI, bar coding, periodic inventory review

Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable (procurement performance of Public Health Centres in Mombasa city county, Kenya) that is explained by the 4 independent variables (ABC inventory Technique, vendor managed inventory, bar coding inventory technique and periodic inventory review). From the Coefficients table 9 the regression model can be derived from the unstandardized coefficients as follows:

Y = 0.490 + 0.207X1 + 0.293X2 + 0.349X3 + 0.163X4 + ε

The results in table 9 indicated that all the independent variables have a significant positive effect on procurement performance of public health centres. The coefficient of bar coding inventory technique which is most influential variable was (β=0.349, p=0.000, <0.05) which shows statistically significant relationship between bar coding technique and procurement performance. The results implied that a unit increase in bar coding inventory technique when all other variables are held constant would result to an increase of 0.349 units in procurement performance of public health centres in Mombasa city county, Kenya. Tozay (2012) also emphasized that the extent of bar coding implementation is to determine the audit process as represented by management, is adequate and functioning in a manner which ensures that the inputs are appropriately identified and managed.

This was followed by vendor managed inventory technique with a coefficient (β=0.293, p=0.000, <0.05) this shows statistically significant relationship between vendor managed inventory and procurement performance of public health centres in Mombasa city county, Kenya. The results implied that a unit increase in vendor managed inventory when all other variables are held constant would result to an increase of 0.293 units in procurement performance of public health centres in Mombasa city, county. The results are tandem with the research done by Schmalensee (2013) who found out that vendor managed inventory is effective in utilization of operational activities in the organization and increases the performance of the firms. Consequently, Nyamwaga and Otinga (2021), in their study found out that vendor managed inventory management practice is a useful

predicator of procurement performance of Judiciary in Kenya.

The coefficient of ABC inventory technique was (β=0.207, p=0.010, <0.05) shows a statistically significant relationship between barcoding inventory and procurement performance of public health centres. The results implied that a unit increase in ABC inventory when all other variables are held constant would results to an increase of 0.207 units in procurement performance of the public health centres. The results are in consistent with the research done by Muturi et al. (2017), who found out that ABC inventory technique had a positive significant effect on the performance of the procurement function in the sugar manufacturing sector.

Finally, the coefficient of periodic inventory review technique was (β=0.163, p=0.020, <0.05) shows a statistically significant relationship between periodic inventory review technique and procurement performance of public health centres. The results implied that unit increase in periodic inventory review techniques when all other variables held constant would results to an increase of 0.163 units in procurement performance. The finding conforms to those of Saro et al. (2021), who found out that periodic inventory auditing had a significant influence on supply management. The study recommended that the universities had room for the elimination of shortages, losses and wastage through periodic inventory audits. According to this model when all the independent variables are held constant procurement performance will have a score of 0.490.

CONCLUSIONS AND RECOMMENDATIONS

The study sought to determine the effect of Inventory Management techniques on procurement performance of public health centres in Mombasa city county, Kenya. Data analysis results were presented using charts and tables. To achieve the objective, procurement performance and inventory management techniques indicators were computed from all the collected data. Multiple linear regression results have shown that four predictors (ABC technique, vendor managed inventory technique, bar coding inventory technique and periodic inventory review technique) can explain 56.9% of procurement performance of public health centres in Mombasa city county, Kenya, leaving 43.1 % to other factors that are not within the scope of this study.

Further, the study findings reveal that all the independent variables have a significant positive effect on procurement performance of public health centres in Mombasa city county, Kenya. The most influential variable of procurement performance of public health centres being bar coding with regression coefficient of (β=0.349, p=0.000, <0.05). The results implied that a unit increase in bar coding inventory systems would result to an increase in procurement performance. The extent of bar coding implementation is to ensure the audit process as represented by management, is adequate and functioning in a manner which ensures that the inputs are appropriately identified and managed. This was followed by vendor managed inventory technique with a coefficient (β=0.293, p=0.000, <0.05). The results implied that a unit increase in vendor managed inventory activities would result to an increase in units of procurement performance, then ABC Inventory technique with coefficient of (β=0.207, p=0.010, <0.05). The results implied that a unit increase in ABC inventory would results to an increase of 0.207 units in procurement performance of the public health centres and lastly periodic inventory review technique with coefficient of (β=0.163, p=0.020, <0.05). The results implied that an increase in units of periodic inventory review would lead to increase in units of procurement performance.

The study concluded that inventory management techniques positively and significantly affect the procurement performance of public health centres in Mombasa city county, Kenya. Inventory management inventory techniques were recognized to be essential tools for boosting performance of

procurement function. Therefore, enhancing suitability and competitiveness of the procurement function, effectiveness of inventory management system contributes to ability to maintain optimum stocks. The study concluded that activity based classification technique positively impacted procurement performance due to the extent of resource allocation, inventory categorization and utilization in determining which objects have to get priority in the management of a corporation's stock. ABC ensures strict control over such items, which have high investment, it releases working capital, which would otherwise have been locked up for a more profitable channel of investment, it reduces inventory carrying cost and also enables the relaxation of control for items and thus makes it possible for a sufficient buffer stock to be created hence improve procurement performance.

Further, the study concluded that vendor managed inventory affects the performance of procurement function of the public health centres. The study found that vendor managed inventory elements have an impact in performance of the procurement function as it improves collaboration, partnership relationships between vendors and buyers and improves compliance among vendors and also reduce bullwhip effect by improving communication with suppliers which resulted to reduced quality cost, time cost and overall inventory which is detrimental to procurement efficiency and effectiveness.

The study concludes that public health centres should adopt the barcoding inventory management techniques for tracking the inventories and tracing its path. These help drastically improve hospital efficiency and procurement function performance. This technique help eliminate manual processes so drug store officers can focus on other more important areas of the business. The bar coding inventory technique has real time and tangible benefits such as keeping track of which supplies public health centres have on hand or ordered and also streamline the effort of having to do an inventory recount to ensure stock records are

accurate. In addition, the study concluded that periodic inventory review positively affected procurement performance public health centres in Mombasa city county, Kenya. It is agreed Periodic inventory review ensured timely and adequate replenishment of inventories, enabled the hospitals evade risks associated with stock such as unnecessarily high stock levels and ensured compliance. In addition, inventory audits reduced stock losses, ensured accurate and completed stock records and allowed effective monitoring of stock flow hence improved procurement performance.

Though a lot of studies have been made in relation to inventory management techniques and procurement performance in Kenyan public hospitals, still there are couples of challenges which impede full implementations of these techniques. From the research findings it was concluded that there are some noticeable challenges which include, for the case of VMI; lack of demand sharing, lack of trust, communication and collaboration among hospital vendors and reluctance of the vendor to hold higher inventory. Further for Bar coding noticeable challenges revealed by the study included; incompatible and outdated bar coding systems, damaged or missing codes, lack of continuous training to equip workers with new skills and knowledge and new insights regarding changing technology. Additionally the study findings revealed that for periodic inventory review the challenges noticed were that lead time is inadequately followed whereby there is no order follow up from time to time leading to late and delayed deliveries of other goods or services which are offered by the hospitals, human error, poor demand forecasting. Insufficient storage facilities, lack of resources to meet inventory requirement, no real time data visibility and a lot of manual documentation were all evidenced challenges in ABC inventory technique. The study therefore, concluded that inventory officers or personnel involved should be trained and motivated, leverage lead times, building trust between hospital and its suppliers, dashboard collaboration, establishment

of long term partnership between supplier and hospital to allow full implementation of such techniques in public health centres.

In the light of above findings, in order to have a full turn around in regard to performance of procurement function the study recommends that the management of public health centres need to ensure that effective inventory management systems, techniques and models are in place to achieve accurate inventory records so as to keep appropriate stock levels and avoid overstocking, stock out and rising inventory cost. These techniques should be viewed as strategic tools for improving performance of the procurement function. The study also recommends the need to have automated inventory procedures and an effective inventory record management unit to ensure that the procuring entity has up to date inventory records. There is need to ensure keeping track of inventory in stock through regular stock taking, asset inspection and inventory review. The study further recommends that the hospital should introduce new more techniques of inventory management which was to provide upstream and downstream inventory visibility. Some of these techniques are; Material Requirement Planning, Just in Time and radio frequency identification.

Areas for Further Studies

The study sought to establish effect of inventory management techniques on procurement performance of public Health Centres with emphasis on Mombasa City County, Kenya. The study was limited to only four techniques; ABC inventory technique, Vendor Managed Inventory technique, bar cording Inventory technique and Periodic Review Inventory technique. The study recommends a further study on other inventory management techniques such as safety stock, batch tracking and JIT and their effect on procurement performance in other counties to validate the findings with their results and arrive at generalization of findings.

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