International Journal of Economics, Commerce and Management
United Kingdom ISSN 2348 0386 Vol. IX, Issue 10, Oct 2021

http://ijecm.co.uk/

INVENTORY CONTROL TECHNIQUES AND PERFORMANCE OF PROCUREMENT FUNCTION AT VIHIGA COUNTY REFERRAL HOSPITAL, KENYA

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Abstract

This study aimed at establishing the influence of inventory control 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 be used; primary was used. The study made use of questionnaires to collect primary data. A pilot test was conducted to test the reliability and validity of the data collection instruments. SPSS software program version 22 was used to facilitate data processing and analysis. Descriptive and inferential statistics was used to analyze quantitative 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 influence performance of procurement function. The study recommends that management of Vihiga County Referral Hospital should use Just in Time

inventory control technique to only store what is being required in the production process. The study recommended that the Hospital management should adopt Economic Order Quantity in order to know the quantity of stock to order at any given time. The study also recommended that the hospital should use ABC analysis technique to forecast the demand for products beforehand and manage the stock levels accordingly.

Keyword: Inventory control techniques, Economic Order Quantities, Just in Time, ABC analysis, performance of procurement function

INTRODUCTION

According to Getachew (2014) inventories are known as the stock of raw materials, work in progress, finished goods and supplies held by a business organization to facilitate operations in the production process. Posazhennikova (2012) stated that inventory control techniques coordinates all activities with the purpose of getting the right inventory in the right place at the right time and in the right quantity which is directly linked to performance of stock keeping in any firm. According to Rajangam (2013) effective inventory management allows a distributor to meet or exceed customers' expectations from the product availability with the amount of each item that would maximize their company's net profit or minimize its total inventory investment. A company that fails to manage its inventory efficiently is likely to face profitability problems. Therefore, the goal of inventory management is to provide the inventories or the materials required to sustain operationalization at minimum costs (Oballah 2015).

Heizer and Render (2014) inventory control refers to the process whereby the investment in materials and parts carried in stock is regulated within predetermined limits set in accordance with inventory policy established by management and the activities of inventory control thus include: determination of limits of inventories to be held, determination of inventory policies, setting out of investments pattern and its regulation as per individual and collective requirements, follow-up to examine the working of the inventory policy and effecting changes as and when needed.

Sporta (2018) stated that inventory control refers to the process whereby the investment in materials and parts carried in stock is regulated within predetermined limits set in accordance with inventory policy established by management. Getachew (2014) argued that Inventory control is the coordinating of materials availability, controlling, utilization and procuring of materials and on the other hand, inventories are known as the stock of raw materials, work in progress, finished goods and supplies held by a business organization to facilitate operations in the production process. Serdarasan (2013) claims that inventory control techniques coordinates

all activities with the purpose of getting the right inventory in the right place at the right time and in the right quantity which is directly linked to performance of stock keeping in any firm.

According to Rajangam (2013) a company that fails to manage its inventory efficiently is likely to face profitability problems and therefore the goal of inventory management is to provide the inventories or the materials required to sustain operationalization at minimum costs. According to Miller (2010) inventory management involves all activities put in place to ensure that customers have the needed product or service. It coordinates the purchasing, manufacturing and distribution functions to meet the marketing needs and organizational needs of availing the product to the customers.

Onchoke and Wanyoike (2016) studied the influence of Inventory Control Practices on Procurement Performance of Agrochemicals Distributors in Nakuru Central Sub-County, Kenya and the findings of the study revealed that Internal Inventory Security Procedural Practices, Inventory Auditing and Computerized Inventory Control both individually and collectively have significant positive influence on Procurement Performance. The study recommends that further study should be conducted to assess how internal inventory security procedural practices can be adopted by public institutions and whether such practices can be incorporated in the public procurement regulations.

Auma, Muturi and Atambo (2017) studied the effect of inventory control methods on the performance of procurement function in sugar manufacturing firms in Western Kenya and the study concluded that adoption the of the inventory control methods in the sugar companies have a positive impact on the productive and a recommendation made that the modern technology be adopted in the inventory management in the sugar manufacturing sector in Kenya. Mwachiru and Datche (2015) studied the effects of Inventory Management System on Organizational Performance: Case Study of Grain Bulk Handlers Limited and the findings revealed that inventory management system is positively related and is significant for organizational performance in Grain Bulk. Three of the four attributes of inventory management system were found to be positively related to organizational performance.

Mwangangi and Senelwa (2018) studied the influence of Inventory Control Techniques on Service Delivery in Parastatals in Kenya: A Case Study of Kenya Medical Supplies Authority and the results indicated that there was a positive and significant correlation between inventory control techniques and service delivery in parastatals. Furthermore, the study indicated that economic order quantity influences service delivery positively. The study recommends mismanaged inventory can lead to an unnecessary increase in the working capital. Effective inventory control techniques would lead to low storage costs, reduction of wastage and obsolescence which will in turn lead to an increase in the company’s profits.

Onchoke and Wanyoike (2016) analyzed the influence that inventory control practices used Agrichemical distributors operating in Nakuru Central Sub-county have on their procurement performance. The study used self–administered questionnaires that were dropped and picked.

Regression analysis results revealed that inventory auditing, inventory security practices, and computerized inventory control positively and significantly influenced procurement performance. Mwangi and Nyambura (2015) examined the role inventory management plays in the performance of companies engaged in food processing. Using the descriptive research design and multiple regression analysis, the study identified production maintenance, cost control, record reduced loss, and continuous supply as key elements of inventory management that play an important role in the performance of the food processing companies.

Wangari and Kagiri (2015) investigated the influence of practices used in inventory management at Safaricom Kenya Ltd on its competitiveness. Data was collected using drop and pick questionnaires. Regression analysis results revealed that inventory investment, inventory shrinkage and inventory turnover were significant predictors of competitiveness in Safaricom Ltd and by extension on organizational competitiveness. On the other hand, Ngei and Kihara (2017) sought to find out how inventory management systems used in firms that manufacture Gas in Nairobi City County influence performance of those firms. The study used both primary and secondary data, and was analyzed using multiple regressions. Results revealed that Vendor Managed Inventory (VMI), Enterprise Resource Planning (ERP), Radio Frequency Identification (RFID) and e-procurement significantly predicted performance of gas firms.

Mukopi and Iravo (2015) analyzed effects of inventory management on performance from a sugar sector perspective. The study used 30 procurement personnel drawn from a target population of 100 personnel in Sugar firms in Western Kenya. Using ANOVA the study established that strategic supplier partnership; learn inventory systems; legal policies; and information technology related strongly with inventory management and hence firm performance.

Statement of the Problem

In a study done by Kolias (2011), in order to test inventory-performance link using construction firms listed in Bursa Malaysia, it was found that there is a positive correlation between inventory turnover and capital intensity as a result of the nature of investments. Another study suggesting a positive relationship between inventory management and

performance was Eroglu and Hofer (2011), which used the Empirical Leanness Indicator (ELI) as a measurement for inventory management. Idris and Solomon (2017) studied the effect of Inventory Management Practices on Financial Performance in Nigeria and the findings of study for hypothesis 1 showed that there was a significant relationship.

Mwangangi and Senelwa (2018) studied the influence of Inventory Control Techniques on Service Delivery in Parastatals in Kenya and the results indicated that there was a positive and significant correlation. According to Karimi and Namusonge (2014) effective inventory management in health care supply chains is one of the key factors for success. The challenge in managing inventory is to balance the supply of inventory with demand. Kontus (2014) stated that an organization would ideally want to have enough inventories to satisfy the demands of its customers and not to loss customers due to inventory stock-outs. On the other hand, the organization does not want to have too much inventory staying on hand because of the cost of carrying inventory. Enough but not too much is the ultimate objective according to Office of the Auditor General (2012) states that although the Hospital has established re-order levels for all types of drugs that it stocks, it occasionally experiences shortages of vital and essential drugs For example an analysis of the stock of drugs maintained at the pharmacy that serves the Accident and Emergency Centre indicated that the pharmacy did not have in store some vital and essential drugs for several periods lasting up to three months. Likewise, Ward 4B which caters for cardiac patients did not have in stock critical drugs (such as those used for blood thinning) for a period of three months.

Zipkin (2016) argued that despite the establishment of re-order levels order; quantities are still determined somewhat based on past usage. Yet, there is no specific policy to facilitate the determination of the quantities to be ordered, meaning that orders are placed based on the staff's familiarity of the process. Improper quantities ordered occasionally leads to unexpected situations of stock out and overstocking. According to Oballah and Waiganjo (2015) shortage of medicines are occasionally attributed to long procurement procedures, occasional shortages of vital drugs in the market, lack of sufficient funds with which to purchase new supplies, unwillingness of suppliers to supply hospitals due to delayed payments, inadequately trained staff in the inventory management section and the inadequacies of the Hospital's stock management system.

According to Ogbo and Onekanma (2014) problems are likely to raise when inventory is not tracked properly, inefficiency and additional costs mount. Supplies get lost, shrinkage can go unchecked, stock-outs occur, critical equipment locations are uncertain, billing is inefficient since supplies are used without being associated to patient's record, and on-hand inventory can balloon unnecessarily. All of this leads to inefficiency and additional costs.

Objectives of the Study

i) To find out the influence of Economic Order Quantities technique on performance of procurement function at Vihiga County Referral Hospital.
ii) To examine the influence of Just in Time on performance of procurement function at Vihiga County Referral Hospital.
iii) To establish the influence of ABC analysis on performance of procurement function at Vihiga County Referral Hospital.

Research hypotheses

Ho1: Economic Order Quantities technique has no significant influence on performance of procurement function at Vihiga County Referral Hospital

Ho2: Just in Time has no significant influence on the performance of procurement function at Vihiga County Referral Hospital.

Ho3: ABC has no significant influence on performance of procurement function at Vihiga County Referral Hospital

LITERATURE REVIEW

Theoretical Framework

This study was guided by The Stock Diffusion Theory, Resource dependence theory and Economic Order Quantity theory.

Economic Order Quantity Theory

Blackburn (2010) is among authors who agree that EOQ is one of the models widely used to manage inventory in many industries. EOQ model was developed by F.W.Haris in 1913 and is also known as Wilson EOQ model, who critically analyzed the model in detailed, that is according to Arsham (2006). According to Onchoke and Wanyoike (2016) the use of the model has shown increase in some costs as other costs decline, an example of ordering costs decline with the inventory holdings, while holding costs rise and the total inventory associated costs curve have a minimum point. It is also known as the point where total inventory costs are minimized. EOQ is the level of inventory that minimizes the total of inventory holding costs and ordering costs. Ogbo (2011) define the model as one that order quantities which minimize the balance of cost between inventories holding costs and re-order costs. Ogbo (2011) describes the basic EOQ, assumptions that are necessary to calculate EOQ as follows: That stock holding costs are known, and constant; there is a known, constant ordering costs; the rate of demand are known and constant; lead time cycle is known and constant; the price per unit constant; the

replenishment is made instantaneously, the whole batch is delivered at once and no stock-outs are allowed.

Stock Diffusion Theory

According to Heizer and Render (2014) Stock diffusion theory outlines a dynamic approach to inventory management used for non-stationary items with non-constant means and variance. According to Kontus (2014) stock diffusion theory, stock consumption is modeled as a Markov process with a slow diffusion term and Fokker Planck equation is used to derive the probability distribution of stock consumption and reorder time. Management of the inventory distributed in this manner makes it possible to keep safety stock at minimum levels (Braglia, 2013). Similarly, it ensures the inventory costs are kept at minimal levels without interrupting the internal operations of the organization (Eaton, 1999). Ogbo and Onekanma (2014) stated that this theory also takes into account the fluctuations in market. The market environment is dynamic and hence the nature of distribution of items. When fluctuations occur in supply market, the outcome is directly experienced by the product buyers and users (Angel, 2005). '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). According to the Office of the Auditor General, (2012) 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. Organizations must develop internal structures, policies and procedures upon which all internal inventory control operations are based (Eaton, 1999).

Resource Dependency Theory

According to resource dependency theory, firms seek to reduce uncertainty and manage dependence by purposely structuring their exchange relationship, establishing formal and semi-formal relationship with other firms' (Mito, 2015). Heizer and Render (2014) argued that through the developed linkages and relationships, organizations can reduce inconveniences that come as a result of market dynamics hence this theory can be applied in internal inventory control. Organizations can form strategic, long term relationships with suppliers and product users to ensure smooth and timely delivery of materials (Angel, 2005). With long term supplier-customer relationship, the organization is able to buffer itself from internal and external organizational and environmental changes and achieve optimal inventory control (Kitaeva, 2014).

According to Wangari and Kagiri (2015) resource dependency theory is based on six assumptions; firstly, organizations depend on resources for their internal operations. The

second assumption is that the resources originate from outside the organization; they are bought from other organizations. Thirdly, the resources are scarce and competitive and therefore require strategic decisions to be made about what to buy, in what quantity and at what times. Lastly, resource dependency is directly linked to the organization's power which is rational, situational and mutual. Swaleh (2014) resource dependency theory looks at how the resources outside the organization determine internal operations of the organization. Procurement activities of the organization and control of procured materials is key in sourcing and control of resources used within the organization.

Conceptual Review

Omondi and Namusonge (2015) defines "Conceptual framework as a network, or "a plane," of interlinked concepts that together provide a comprehensive understanding of a phenomenon or phenomena". Figure 1 highlights the relationship between the independent and dependent variables.

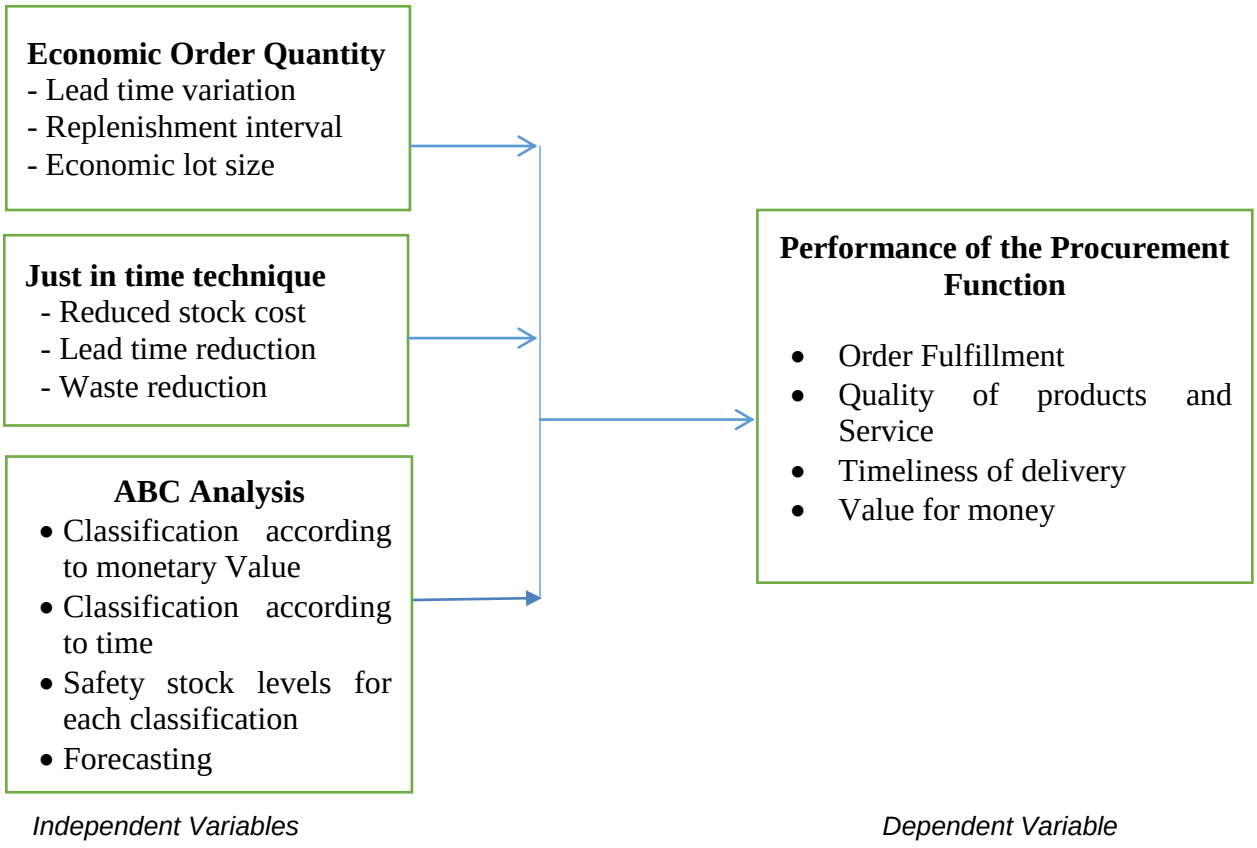

Figure 1: Conceptual Framework

Economic Order Quantity Technique of Inventory Control

According to Mwangangi and Senelwa (2018) economic order quantity is the quality of inventory that should be ordered at once. The quantity of inventory ordered at once affects inventory ordering and holding costs and will ultimately have a bearing on profitability. Put differently, EOQ is the optimum size of the order that minimizes the cost of ordering and holding cost. Sporta (2018) states that Economic order quantity is used to determine the optimal number of units of the product to order so as to minimize the total cost associated with the purchase, delivery and storage of the product. Noe et al., (2010) explain that the cost of minimizing order-quantity is called the Economic Order Quantity (EOQ). it posit that one of the advantages often explored to cushion the burden of net inventory cost and to enjoy substantial savings is the benefit from procuring large enough quantity that reduces the unit price of the item. This results to reduction of aggregate costs which enhances performance of the firm. It discussed that EOQ model was determined by minimizing the total annual cost incurred by the company by virtue of its ordering cost and carrying cost.

Just In Time

According to Sporta (2018) the model relates to the role of Just in Time on performance of the retail chain stores in Kenya. It is a Japanese management philosophy which has been applied in practice since the early 1970s in many Japanese manufacturing organizations. Wangari, K.L., Kagiri, A.W. (2015). It was first developed and perfected within the Toyota manufacturing plants by Taiichi Ohno as a means of meeting consumer demands with minimum delays. Taiichi Ohno is frequently referred to as the father of JIT. Toyota was able to meet the increasing challenges for survival through an approach that focused on people, plants and systems. Yin, (2014) posits that JIT manufacturing has the capacity, when properly adapted to the organization, to strengthen the organization's competitiveness in the marketplace substantially by reducing wastes and improving product quality and efficiency of production. When first developed in Japan in the 1970s, the idea of just-in-time (JIT) marked a radical new approach to the manufacturing process. It cut waste by supplying parts only as and when the process required them.

ABC Inventory Control Technique

According to Kobia (2018) the ABC is the selective approach popularly known as Always (A) Better (B) Control (C). The ABC analysis goes by its name. It always controls the best, then better and lastly good. Its importance lies in the determination of priority, which enables the

management to exercise control over the managed subjects according to priority fixed for a purpose or selective basis. 'A' items call for more careful attention as compared to items in (B) or (C) which may require less careful attention on behalf of Material Managers. The purpose of the ABC inventory classification is to be able to assess the status of every item kept in inventory in addition to determining what specific attention is required by each group of inventory (Ravinder & Misra, 2014).

Empirical Review

Kobia (2018) sought to establish the effect of IMP on operational performance in government hospitals in Kenya. The study findings indicated that the inventory management practices had been implemented in government hospitals to a moderate extent. The results indicated that adoption of IMP specifically ABC affects operational performance positively in government hospitals in Kenya. Kinyua (2016) sought to establish the inventory management practices and performance of consumer goods manufacturing firms in Kenya. The research study found out that: an increase in one unit of ABC leads to an increase in operational performance of consumer goods manufacturing firms by a factor of 0.11. The research concluded that inventory management practices impact significantly the operational performances of consumer goods manufacturing firms in Kenya.

Gitau (2016) sought to investigate inventory management practices and organizational productivity in Parastatals in Kenya. This study established that a unit increase in ABC Inventory Model would lead to 0.642 increase in the organizational productivity in Parastatals in Kenya. Kinyanjui (2016) sought to establish the effect of inventory management practices on performance of WFP partners in Kenya.. From the multiple regression analysis, it was established that the most significant IMP in influencing performance of World Food Programme partners in Kenya is ABC analysis. Okello (2011) focused on establishing the impact of inventory management practices on performance of Non-Governmental Organizations. According to the analysis of the data via descriptive statistics, the study recognized that a unit in ABC Analysis would lead to an increase in operational performance of Non-Governmental Organizations by a factor of 0.683.

Kumar, Anzil, Ashik, Ashwin and Ashok (2017) sought to investigate the effect of the inventory management practices through the selective inventory control models. The study focused on the ABC inventory control models and analysis. Through the survey of the manufacturing firms operating in India, the analysis of the results established that the ABC inventory control models were the most effective selective control models in the manufacturing. The ABC inventory control models lead to the reduction of the obsolesce

items in the organization, reduction of the inventory costs through elimination of the inventory which were not valuable in the organization and contributed to the optimal level of the inventory in the organization.

MATERIAL AND METHODS

The study adopted a descriptive case study design to justify the relationship between the independent and dependent variables. The design was to help the researcher to obtain information concerning the current status of the problem under study and describe it with respect to the dependent and independent variables. The study targeted 104 respondents from Vihiga County Referral Hospital. The sampling frame comprised of Hospital Administrators, Procurement officers, Procurement clerks, Public Health Officers, Hospital matron, Hospital Maintenance officers and Warehouse Staff. Therefore a sample size was calculated as per Taro Yamane's formula shown below;

$n= N/(1+ (e)^{2})$

Where,

n = Sample size; N = population under study; e = margin error (0.05); I = constant

Therefore;

$n=104/ (1+104 (0.05)^{2)}$

n= 82.53 rounded off to 83

The study used stratified random sampling to select 83 respondents from the target population. Stratified random sampling was a probability sampling method that gave chance of selecting each unit within particular strata in a population (Mugenda & Mugenda, 2013).

Table 1: Sample Frame and Sample Size Distribution

Level Population	Size	Percentage
Hospital Administrators	9	7
Procurement officers	12	10
Procurement clerks	46	37
Public Health Officers	11	9
Hospital matron	1	1
Hospital Maintenance officers	6	5
Warehouse Staff	19	14
Total	**104**	**83**

In this study, the researcher used questionnaire which was self-designed. A 5 point Likert scale of 1-5 was used to measure respondent's response where 5 stood for strongly disagree and 5 (five) stood for strongly agree. The pilot test was conducted to ensure that there was validity and reliability while conducting the research in order to obtain data that was consistent with the main objective. The tests were conducted to test the reliability and validity of the questionnaires and entailed picking five respondents from each stratum and issuing them with the questionnaires. The study used content validity to ensure that the questions measured what they were intended to measure, whether the wording is clear, whether the questions provided response and whether there was research bias by consulting the supervisors and other lecturers in the area of concern. The statistical method for this study was descriptive and inferential statistics. After the fieldwork, the data was coded and tabulated by use of tables. Data analysis was done using Statistical Package for Social Sciences computer software (SPSS version 20.0) for windows. Descriptive statistics such as mean, percentage and standard deviation was used to present the various characteristics for the data sets. The study adopted the following multiple regression model;

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X\,2 + \beta_3 X_3 + \varepsilon$

Where;

Y = Performance of procurement function at Vihiga County Referral Hospital; X_1 = Economic Order Quantity; X_2 = Just in Time and X_3 = ABC technique

RESULTS AND DISCUSSION

Preliminaries Results

Eighty three (83) questionnaires were distributed to respondents, Seventy one (71) were received which represented 85.5% response rate and twelve (12) questionnaires were not received this accounted for 14.5% of the total questionnaires distributed. Content validity was used to test instrument validity; all aspects of the questionnaire were pre-tested to check for question content, wording, sequence, form and layout, question difficulty and instructions. The questionnaires were confirmed to be well written and no respondent had problems with them during the pilot study since the questions were clear and well understood by respondents in the pilot study. For reliability tests Cronbach alpha was applied for each variable which had a range 0.764 to 0.887 thus for this, Cronbach alpha statistic with a value of 0.7 or more was considered reliable. The test items were retained and used in this study hence considered reliable as shown in the Table 2.

Table 2: Reliability Tests

Variables (Constructs)	Number of items	Cronbach Alpha	Remarks
Economic order quantity inventory Control Technique	6	0.814	Accepted
Just in Time inventory Control Technique	6	0.755	Accepted
ABC inventory Control Technique	5	0.814	Accepted
Procurement Performance	7	0.880	Accepted

Descriptive Statistics

Descriptive analysis included an assessment of the performance of procurement function at Vihiga County Referral Hospital. Performance of procurement function at Vihiga County Referral Hospital in this study was used as dependent variable. It was measured using Order Fulfillment, Quality of products and Service, Timeliness of delivery and Value for money. The pertinent results are presented in Table 3.

Table 3: Descriptive Results for Performance of procurement function at Vihiga County Referral Hospital

No.	Performance of procurement function	SA (%)	A (%)	U (%)	D (%)	SD (%)	Mean	SDV
1	Inventory control technique has resulted to reduction in wastes	12 (16.9)	20 (28.2)	24 (33.8)	7 (9.9)	8 (11.3)	3.30	1.20
2	The quality of products and services procured has improved as a result of proper inventory control technique	20 (28.2)	27 (38)	11 (15.5)	10 (14.1)	3 (4.2)	3.72	1.15
3	Inventory control technique has led to timely delivery of products and services	21 (29.6)	34 (47.9)	10 (14.1)	2 (2.8)	4 (5.6)	3.93	1.03
4	inventory control technique has ensured services and products are acquired at right price	17 (23.9)	11 (15.5)	33 (46.5)	7 (9.9)	3 (4.2)	3.45	1.09
5	Due to inventory control technique, right quantity of products and services are procured.	16 (22.5)	28 (39.4)	15 (21.1)	8 (11.3)	4 (5.6)	3.62	1.13
6	Inventory control technique has ensured reduction in procurement process cost	8 (11.3)	30 (42.3)	21 (29.6)	6 (8.5)	6 (8.5)	3.39	1.08
7	Inventory control technique has resulted to order fulfillment thereby enhancing end user satisfaction	29 (40.8)	10 (14.1)	6 (8.5)	23 (32.4)	3 (4.2)	3.55	1.04
	Overall Mean						**3.57**	**1.15**

From Table 3, the results indicated 16.9% of the respondents strongly agreed that inventory control technique has resulted to reduction in wastes and additional 28.2% agreed with a mean of 3.30 and standard deviation 1.20. This implies that there is some deviation from the mean. The results further revealed that 38.0% and 28.2% of the respondents agreed and strongly agree respectively that the quality of products and services procured has improved as a result of proper inventory control technique. A mean of 3.72 and standard deviation of 1.15 implies that there is deviation from the mean. In regard to timely delivery, 47.9% of the sampled respondents agreed that inventory control technique has led to timely delivery of products and services and additional 29.6 strongly agreed with a mean of 3.93 and standard deviation of 1.03. The results also revealed that 15.5% and 23.9% of the sampled respondents agreed and strongly agree respectively that inventory control technique has ensured services and products are acquired at right price. However, with a mean of 3.45, 46.5% of the respondents were undecided.

As far as right quantity is concerned, 39.4% of the sampled respondents agreed that due to inventory control technique, right quantity of products and services are procured and additional 22.5% strongly agreed with a mean of 3.62 and standard deviation of 1.13. The results further revealed that 11.3% and 42.3% of the respondents strongly agreed and agreed respectively that inventory control technique has ensured reduction in procurement process cost. Lastly, majority of the respondents confirmed that inventory control technique has resulted to order fulfillment thereby enhancing end user satisfaction as indicated by a mean of 3.55 and standard deviation of 1.04. This was further supported by 40.8% of the respondents who strongly agreed and 14.1%

Inferential Statistics

Inferential statistics are used to make inferences about the population based on the survey results. The findings would be more generalizable to the population if the sample is more representative. To generalize from the study to the population, hypothesis testing techniques are used. Inferential statistics is a term used to describe this form of analysis (Mugenda & Mugenda, 2003).

In this study, inferential statistics consisted of multiple correlations and multiple linear regressions.

Correlations Analysis

Table 4: Correlations Analysis

		EOQ	JIT	ABC	Procurement Performance
	Pearson Correlation	1	.492**	.061	.534**
EOQ	Sig. (2-tailed)		.000	.613	.000
	N	71	71	71	71
	Pearson Correlation	.492**	1	.427**	.664**
JIT	Sig. (2-tailed)	.000		.000	.000
	N	71	71	71	71
	Pearson Correlation	.061	.427**	1	.478**
ABC	Sig. (2-tailed)	.613	.000		.000
	N	71	71	71	71
Procurement	Pearson Correlation	.534**	.664**	.478**	1
Function	Sig. (2-tailed)	.000	.000	.000	
Performance	N	71	71	71	71

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

The results indicated that the relationship between economic order quantity and performance of procurement function is positive and significant (r = .534**). These findings are in agreement with 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. There was strong relationship between just in time and performance of the procurement function of sugar manufacturing companies in the western sugar belt. Similarly, the relationship between just in time and performance of procurement function is positive and significant (r =664**) and the relationship between ABC and performance of procurement function is positive and significant (r =.478**). This implies that inventory control techniques have positive and significant influence on and Performance of procurement function at Vihiga County Referral Hospital. Njoroge (2015) sought to determine the inventory management practices used by Public hospitals in Kenya. The correlational results concluded that inventory management practices specifically economic order quantity were positively related to performance of public hospitals in Nairobi and former Central province.

Multiple Linear Regression Analysis

Multiple Linear Regression analysis for inventory control technique on performance of procurement function was done so as to find out the effect of inventory control technique jointly on the performance of procurement function at Vihiga County Referral Hospital. This aided in coming up with the coefficients of the study model as well as R square of the study. The results are as shown in Table 5.

Table 5: Regression Analysis of Independent Variables and Performance of procurement function

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.754[a]	.568	.549	.90536	.568	29.353	3	67	.000

a. Predictors: (Constant), ABC, Economic Order Quantity, Just in Time

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	72.180	3	24.060	29.353	.000[b]
	Residual	54.918	67	.820		
	Total	127.099	70			

a. Dependent Variable: Procurement Function Performance

b. Predictors: (Constant), ABC, Economic Order Quantity, Just in Time

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.808	.519		-1.557	.124
	Economic Order Quantity	.423	.120	.332	3.531	.001
	Just in Time	.540	.150	.374	3.607	.001
	ABC	.375	.114	.298	3.295	.002

a. Dependent Variable: Procurement Function Performance

In Table 5, the findings further established that the linear relationship between performance of procurement function and the three predictor variables; the Economic Order Quantities technique and Just in Time are positive and linear. The coefficient of correlation was 0.754, (r=0.754). The coefficient of determination (r^2) was 0.568, and this shows that 56.8% of the variations in the performance of procurement function can be explained by the three

predictor variables in the study and the remaining 43.2% of the variations in performance of procurement function is explained by other factors not captured in the model.

From the ANOVA results the F test gave a value of F (3, 67) =29.353, $p < .01$, which was large enough to support the goodness of fit of the model in explaining the variation in the dependent variables. It also means inventory control technique is a useful predictor of performance of procurement function at Vihiga County Referral Hospital

From table 5, Economic Order Quantities technique, Just in Time and previous credit balance carried positive and significant predictive power (P<0.05). If Inventory control technique is held at zero or it is absent, the performance of procurement function will be -0.808, p>0.05. This implies that though procurement performance will be negative but it will be insignificant.

When Just in Time and ABC are controlled, Economic Order Quantities technique with a beta of 0.423 is at statistically significant level and is a good predictor of performance of procurement function implying that an increase in Economic Order Quantities technique by one percent will result to significant increase in performance by 42.3%. The effect of Economic Order Quantities technique was more than 3 times the effect that attributed to the error, this was indicated by the t-test value = 3.532. These findings are in agreement with Njoroge (2015) who sought to determine the inventory management practices used by Public hospitals in Kenya. The regression results concluded that inventory management practices specifically economic order quantity were positively related to performance of public hospitals in Nairobi and former Central province. Shiferaw (2015) sought to examine the effects of inventory management practices on organizations operational performances: the case of Ethiopian Airlines. While there are different inventory management practices, the findings of this research study establish that Ethiopian Airlines more likely to benefit from Economic Order Quantity model.

When ABC and Economic Order Quantities technique are controlled, Just in Time with a beta of 0.540 is at statistically significant level implying that an increase in Just in Time by one percent will result to significant increase in performance by 54.0%. The effect of Just in Time was more than 3 times the effect that attributed to the error, this was indicated by the t-test value = 3.607. From existing empirical studies, some of the study's findings were supported by current findings. The results are supported by the work of Mukopi and Iravo (2015) examined the effect of inventory management on performance of the procurement function. There was strong relationship between just in time and performance of the procurement function of sugar manufacturing companies in the western sugar belt. Ontita (2016) also concluded that there was a strong positive correlation between the just in time and operational performance of the textile manufacturing firms. This was arrived at after adopting descriptive cross sectional design was to examine inventory management approaches in textile manufacturing firms in Kenya.

Lastly, when Just in Time and Economic Order Quantities technique are controlled, ABC with a beta of 0.375 is at statistically significant level implying that an increase in ABC by one percent will result to significant increase in performance by 37.5%. The influence of ABC was more than 3 times the effect that attributed to the error, this was indicated by the t-test value = 3.295.

These results are in agreement with previous studies. For instance, Kobia (2018) sought to establish the effect of IMP on operational performance in government hospitals in Kenya. The results indicated that adoption of IMP specifically ABC affects operational performance positively in government hospitals in Kenya. Kinyua (2016) sought to establish the inventory management practices and performance of consumer goods manufacturing firms in Kenya. . The research study found out that: an increase in one unit of ABC leads to an increase in operational performance of consumer goods manufacturing firms by a factor of 0.11.

A regression of the three predictor variables against performance of procurement function established the multiple linear regression model as below as indicated in Table 5.0:

Performance of procurement function =-0.808+0.423$\mathbf{X_1}$+0.540$\mathbf{X_2}$+ 0.375$\mathbf{X_3}$

X1 = Economic Order Quantity

X2 = Just in Time

X3 = ABC technique

From multiple linear regression and simple linear regression, several deduction can be made, first the coefficient of determination herein referred to as R square shows that multiple linear regression accounted for more variation 56.8% as compared to individual variable in the model 22.9% (ABC), 44.1% (Just in Time) and 28.5% (Economic Order Quantities technique). This implies that combination of these three variables would have greater impact than individual rating in isolation.

CONCLUSION AND RECOMMENDATIONS

Based on the findings of the study, the following conclusions were arrived at: The study concluded that Economic Order Quantity technique significantly influenced performance of procurement function at Vihiga County Referral Hospital. This implies that increase in Economic Order Quantities technique would result to improvement of performance of procurement function at Vihiga County Referral Hospital. Economic Order Quantity technique helped in minimizing the cost of ordering and holding cost and also minimizes the total cost associated with the purchase, delivery and storage of the product. Wastage of materials and evaporation is reduced through the use of Economic order quantity.

The study concluded that there exists a positive and significant relationship between Just in Time rating and performance of procurement function at Vihiga County Referral Hospital. This means that when Vihiga County Referral Hospital increases the use of just in time, performance of procurement function increases. This is achieved through identifying; repurposing or removing obsolete inventory the volume of inventory on hand would decrease s well as ordering a smaller volume of inventory, more frequently is beneficial for the company to manage cash flow and also inventory reduction.

Lastly, the study concluded that there exists a positive and significant relationship between ABC inventory control and performance of procurement function at Vihiga County Referral Hospital. This implies that increase in the application of ABC would result to increase in performance of procurement function at Vihiga County Referral Hospital. The study established that ABC helped in determining availability of stocks before depletion of each category and the management of inventory on the levels of stock availability. The organization also used ABC analysis practices to determine the specific attention required by each group of stocks.

The study recommends the following as derived from the study conclusions. The study recommends that management of Vihiga County Referral Hospital should use Just in Time inventory control technique to only store what is being required in the production process. Further, the inventory systems are interlinked with those of suppliers to ensure goods and services are available when is needed. To avoid carrying of excess inventory that might be a risk to the hospital, accurate forecast, should be in place. This will help in reducing stock outs/lost sales and carrying of excess inventory and associated risks.

The study recommended that the Hospital management should adopt Economic Order Quantity in order to know the quantity of stock to order at any given time. Further, reliable communication practices should be adopted among the suppliers and the Hospital management so as to curb costs from quantity and product deviations through the use of economic Order quantity. This will also allow the hospital to minimize the cost of ordering and holding cost and also minimizes the total cost associated with the purchase, delivery and storage of the product.

The study also recommended that the hospital should use ABC analysis technique to forecast the demand for products beforehand and manage the stock levels accordingly. This would ensure that the hospital management to regulate the expenditures of the inventory through the adoption of the ABC practice. Further, the hospital procurement department would be able determine the availability of stocks before depletion of each category and the management of inventory on the levels of stock availability.

LIMITATIONS AND FURTHER STUDIES

The study examined three inventory control practices, the findings indicated that the three inventory control techniques did not contribute 100% variance in performance of procurement function; therefore, future studies should consider to examine other inventory control techniques such as warehouse management system, LIFO/FIFO.

There is need to replicate the study to other county's hospital across the country other than Vihiga County Referral Hospital to know the extent of implementation of inventory control techniques and performance of procurement function. This will create a platform to make a comparison on the findings upon which reliable conclusion can be made based on solid facts. Further, a study should be conducted focusing on factors affecting the choice of specific inventory control techniques. This would help establish why organizations choose different inventory control techniques.

REFERENCES

Auma, Muturi and Atambo (2017)effect of inventory control methods on the performance of procurement function in sugar manufacturing firms in western Kenya. *International Journal of social sciences and information technology. Vol III Issue II, May 2017 ISSN 2412-0294*

Benjamin Nyariki Onchoke, Daniel M. Wanyoike (2016) Influence of Inventory Control Practices on Procurement Performance of Agrochemicals Distributors in Nakuru Central Sub-County, Kenya. *International Journal of Economics, Finance and Management Sciences. Vol. 4, No. 3, 2016, pp. 117-126. doi: 10.11648/j.ijefm.20160403.14*

Blackburn .J. (2010)"Fundamentals of Purchasing and Inventory Control for Certified Pharmacy Technicians "Texas Tech University, Health Sciences Center, School Of Pharmacy. *Available at http://www.jdeducation.com*

Choi, T. (2012). *Handbook of EOQ inventory problems – Stochastic and deterministic models and applications.* New York, Heidelberg, Dordrecht, London: Springer

Daniel Atnafu & Assefa Balda | (2018) The impact of inventory management practice on firms' competitiveness and organizational performance: *Empirical evidence from micro and small enterprises in Ethiopia, Cogent Business & Management, 5:1, 1503219*

Deveshwar, A., & Dhawal, M. (2013). Inventory management delivering profits through stock management. World Trade Centre, Dubai: Ram University of Science and Technology

Elections Canada. (2010). *Internal Audit; Audit of the Inventory Control Framework*. Canada: Elections Canada Idris and Solomon (2017) Effect of Inventory Management Practices on Performance of procurement function of Larfage Wapco Plc. Nigeria. *European Journal of Business and Management*, *Vol.9, No.8, 2017*

Fred O. Sporta (2018) Effect of Inventory Control Techniques on Organization's Performance at Kenya Medical Supplies Agencies. *The International Journal Of Business & Management (ISSN 2321–8916) www.theijbm.com*

Idris, Emmanuel, Solomon and Catherine (2017) Effect of Inventory Management Practices on Performance of procurement function of Larfage Wapco Plc. Nigeria. *European Journal of Business and Management*, *Vol.9, No.8, 017 113*

Jilani, E. S., & Gichinga, L. (2014). Effects of strategic management practices on operational environment: A case study of Kenya Marine and Fisheries Research Institute. *International Academic Journal of Information Sciences and Project Management*, *1*(3), 135-146.

Karimi, E. & Rafiee, M. (2014).Analyzing the Impact of Supply Chain Management Practices on Organizational Performance through Competitive Priorities (*Case Study: Iran Pumps Company*)

Kitaeva, A. S. (2014). *Diffusion Approximation in Inventory Management with Examoles of Application.* Tomsk: National Research Tomsk Polytechnic University.

Kontus, E. (2014).Management of inventory in a company. *International Journal of Sales, Retailing and Marketing,* 1(3),245-256.

Kothari, C. (2008). *Research Methodology: Methods and Techniques.* New Delhi: New Age International Publishers.

.Lysons, K., & Farrington, B. (2012). *Purchasing and supply chain management.* Essex: Pearson Education.

Miller, R. (2010). *Inventors Control: Theory and Practice*. New Jersey: Prentice Hall.

Mito, C. I. (2015). An Analysis of the Effects of Inventory Management on the Performance of the Procurement Function of Sugar Manufacturing Companies in the Western Kenya S(H., 2005) (H., 2005)ugar Belt. *International Journal of Scientific and Research Publications, 5(5), 1-14.*

Mugenda, M. O. (2003). *Research methods: Quantitative and Qualitative approaches*. Nairobi: African Centre For Technology Studies (ACTs) Press.

Mugenda, M.O. and Mugenda, A (2014). *Research methods qualitative and quantitative* approaches Nairobi, Act press.

Mwachiru and Datche (2015) Effects of Inventory Management System on Organizational Performance: Case Study of Grain Bulk Handlers Limited. *International Journal of Sciences: Basic and Applied Research (IJSBAR) (2015) Volume 20, No 2, pp 215-232*

Mwangangi and Senelwa (2018) Influence of Inventory Control Techniques on Service Delivery in Parastatals in Kenya: A Case Study of Kenya Medical Supplies Authority. *International Journal of Science and Research (IJSR) ISSN (Online): 2319-7064 Index Copernicus Value (2016): 79.57 | Impact Factor (2017): 7.296 Volume 7 Issue 5, May 2018*

Mwangi, W., & Nyambura, M.T. (2015). The role of inventory management on performance of food processing companies: a case study of Crown Foods Limited Kenya. *European Journal of Business and Social Sciences,* 4(04), 64-78.

Naliaka, V. W., & Namusonge, G. S. (2015). Role of inventory management on competitive advantage among manufacturing firms in Kenya: A case study of Unga Group Limited. *International Journal of Academic Research in Business and Social Sciences, 5(5), 87–104.*

Oballah, D. W. (2015). Effect of Inventory Management Practices on Organizational Performance in Public Health Indtitutions in Kenya: A case of Kenyatta National Hospital. *International Journal of Education and Research, 3(3), 703-714.*

Ogbo, A. (2011). Production and operations management. Supply Chain Management: An *International Journal. Enugu: De-verge Agencies Ltd. 12(4), 284–296. (2007).*

Ogbo, A. I & Onekanma I.V. (2014) "The Impact of Effective Inventory Control Management on Organizational Performance": Mediterranean *Journal of Social Sciences, MCSER Publishing, Rome-Italy, Vol. 5 No 10 June 2014*

Omondi, D., & Namusonge G. (*2015).*The Role of Supply Chain Leadership in Retail Institutions" Performance: The Case of Nakumatt Holdings Limited, Kenya *International Journal of Humanities and Social Science, (*5), 2, 135-142.

Onchoke, B. N., & Wanyoike, D. M. (2016).Influence of Inventory Control Practices on Procurement Performance of Agrochemicals Distributors in Nakuru Central Sub-County, Kenya. *International Journal of Economics, Finance and Management Sciences*,4 (3), 117- 126.

Owuoth, G. M. (2015). Effect of Public Procurement Regulations on Procurement Performance in Public Sector Procurement Performance in Knya. A Case of Rural Electrification Authority. *International Journal of Social Sciences Management and Entrepreneurship, 2(1): 171-184.*

Posazhennikova, V. a. (2012). Optimization of total finished goods inventory management in decentralized organisation: A Case Study on Atlas Copco Secoroc AB. Jonkoping: *Jonkoping International Business School.*

Resia, V. K. (2014). Effect of Inventory Management on the Supply Chain Effectiveness in the Manufacturing industries in Kenya: A Case of Tata Chemicals. *International Journal of Social Sciences Management and Entrepreneurship, 1(2); 189- 202.*

Salawati, S., Tinggi, M., and Kadri, N. (2012). Inventory Management in Malasyian Construcion Firms: Impact on Performance. *SIU Journal management, 2, 59-60. 74.*

Salehi, Alipourand Ramazani3 (2010) Impact Of JIT On Firms' Performance of procurement function Some Iranian *Evidence Global Journal of Management and Business Research Vol. 10 Issue 4 (Ver 1.0) June 2010 P a g e | 21 GJMBR Classification (FOR) L25,L2,1150202,L22,150312*

Silvestro, R., & Lustrato P. (2014). Integrating financial and physical supply chains: the role of banks in enabling supply chain integration. *International Journal of Operations & Production Management Jarrett,* 34(3), 298-324.

Swaleh, L. A. (2014). Factors Affecting Effective Implementation of Inventory Management Systems in the Public Sector: A Case of National AIDS Control Council. *International Journal of Social Sciences Management and Entrepreneurship, 1(2): 17-32.*

Wangari, K.L., Kagiri, A.W. (2015). Influence of Inventory Management Practices on Organizational Competitiveness: A Case of Safaricom Kenya Ltd. *International Academic Journal of Procurement and Supply Chain Management,* 1(5), 72-98.

Waithaka, S.T., Mburu, T.M., Koror, J., & Muathe, S. (2012). Environmental Factors that influence Supply Chain Management Implementation in the Manufacturing Industries in Kenya: A Case of Manufacturing Industries in Nairobi, Kenya. *ABC Journal of Advanced Research*,1 (2),1-8.

Zipkin, P.H. (2016) *Foundation of Inventory Management*, New York; Irwin IMCG ISBN 9780070340039