



Assessing Factors Affecting Pharmaceutical Management Practices in Zanzibar Public Health Institutions: A case study of Mnazi Mmoja Hospital (MMH)

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Abstract

The study aimed to assess variables that affect pharmaceutical management practices in Zanzibar public health institutions, using Mnazi Mmoja Hospital (MMH) as a case study. Specifically, the research assessed how inventory management techniques, staff inventory control abilities, budgetary restrictions, and the regulatory environment that supports pharmaceutical management techniques all affected management practices. 150 respondents were selected using a purposive sampling technique, the study adopted a descriptive research design to establish the relationship between the studied variables. The quantitative data were descriptively analyzed and the results indicated that pharmaceutical inventory management practice scores were both positively related to regulatory framework budget constraints and inventory control systems. Pharmaceutical inventory management practice was influenced strongly by 0.965 in the presence of regulations and very lowly influenced by 0.047 and 0.028 for budget constraints and Inventory control systems. There was a negative low influence on pharmaceutical inventory management practice by 0.030 in inventory control skills. The study found that manual inventory control systems were used. There was dissatisfaction among users on the procured pharmaceutical products. The study concludes that a pharmaceutical inventory management system needs to be streamlined by introducing modern inventory control systems like barcode scanners and Radio Frequency Identification..

Keywords: Pharmaceutical management, Inventory control, Inventory Management Practices, resources constraints, Regulatory framework.

1. Introduction

1.1 Background of the Study

The procurement departments of healthcare organizations are responsible for providing all clients with essential goods, services, and personnel by keeping stock levels at the lowest possible costs. Customers occasionally worry that public and private health institutions lack the necessary levels of patient

services. The effectiveness of an institution's internal stock control directly reflects how well it serves clients (Anane *et al.*, 2019). Some suppliers are unable to fulfill their commitments related to distribution, which leads to supply chain unpredictability and poor performance in terms of procurement. Thus, it is crucial to increase awareness of inventory management techniques, as well as their acceptance and benefits for healthcare organizations. The management practices that have

been identified as the underlying reasons why medical professionals practice and prescribe irrationally and in the ways that they do must be discovered through these investigations. This study will evaluate such factors to determine suitable strategies needed to adopt effective legislative and regulatory reforms. Such strategies are crucial for improving procurement plans in the world of medicine as they affects the lives of all citizens.

Despite Tanzania Food, Drugs and Cosmetics Regulations, 2018, and The Tanzania Medicines and Medical Devices Act, Cap 219 of 2019, which provide for the effective and thorough regulation and control of medicines, medical devices, herbal drugs, and poisons, provide for the mode of pharmaceutical operations, control of the profession of Pharmacy, and matters relating to those professions, the problem still exists (Kamuhabwa and Kisoma, 2015). Inadequate raw material and pharmaceutical inventories are typically a challenge for MMH. These shortages frequently result in interruptions in service delivery, manufacturing schedules, and low capacity utilization, which poses a barrier to the efficient provision of healthcare services. All practicing pharmacists are required by the 2018 Tanzania Food, Drugs, and Cosmetics Regulations, to make sure that the level of care they provide to each patient is appropriate. the phrase "good pharmacy practice" to make this commitment clear and to fulfill it. If there is good pharmaceutical management practice, GPP can be made possible. In this respect, pharmaceutical management entails having enough supplies, personnel, and training to ensure effective service delivery. Inventory management is crucial to an organization's capacity to provide services and satisfy customers (Ondari and Muturi, 2016). There is no

denying that inventory management improves the operations of many healthcare facilities. A wide range of services can be provided by health facilities with large inventory levels, and customers can receive speedy healthcare delivery from their backyards. The majority of firms have acknowledged the importance of maintaining effective inventory management and worker capabilities to continue meeting client demand. Businesses can lower inventory costs, shorten lead times, and deliver goods and services on schedule by managing their inventories properly (Ondari and Muturi, 2016; Ahmad, 2015). Accordingly, businesses with effective inventory control are more likely to complete service production on schedule. Inventory management control, according to (Njoroge, 2015), is a component of inventory control that ensures a steady supply of raw materials, helping to maintain the continuity of industrial activities. Many public healthcare facilities in low- and middle-income countries (LMICs) lack adequate resources, according to (Abuga *et al.*, 2019), nough necessary medications on hand. These same facilities also store an excessive amount of other pharmaceuticals, which causes them to become outdated. This indicates bad inventory management. The basis of the pharmaceutical system is consequently inventory management, and poor management led to the waste of financial resources, shortages of essential medications, and average availability of others, which resulted in the deadline and expiration for providing high-quality healthcare (Ondari and Muturi, 2016). The procurement department of public hospitals in Zanzibar, such as Mnazi Mmoja Hospital, is in charge of acquiring commodities, services, and labor for the hospitals in order to provide high-quality medical care and satisfy patients. To ensure that

pharmaceutical facilities and equipment are supplied and delivered at the appropriate times, they use inventory management systems. Given this situation, this study used the Mnazi Mmoja Hospital in Zanzibar as a case study to evaluate variables influencing pharmaceutical management practices in public health institutions.

1.2 Research Objectives

Generally, the study aimed to assess factors affecting pharmaceutical Management Practices in healthcare facilities using the Mnazi Mmoja Hospital in Zanzibar as a case study. Specifically, the study addressed the following objectives:

- i. To examine the effect of inventory control systems on the management practices of Mnazi Mmoja Hospital
- ii. To examine the effect of staff inventory control skills on management practices at Mnazi Mmoja Hospital
- iii. To assess the effects of budget constraints on pharmaceutical management practices at Mnazi Mmoja Hospital
- iv. To examine the regulatory framework supporting pharmaceutical management practices at Mnazi Mmoja Hospital

2. Literature Review

The study was theoretically guided by the Soft Budget Constraint Theory and the Mathematical Theory of Inventory. The creation and implementation of effective production and inventory systems that will minimize institutional costs are topics covered by the Mathematical Theory of Inventory. The theory

investigates logistics, the supply chain, warehousing, manufacturing, and production (Mukuna and Osoro, 2018). In order to establish a successful inventory management system, institutions should develop a mathematical model that describes the behavior of inventory; design and adopt an optimal inventory policy with respect to the firm's mathematical model; develop a computerized information processing system that provides information on the current inventory levels; use the current inventory levels information to apply the optimal inventory policy and to replenish existing inventory levels (Mukuna and Osoro, 2018; Ahmad, 2015).

Moreover, Ondari and Muturi (2016) described the behaviour of inventory using knowledge of inventory levels, to determine the best policy strategies for inventory management. This idea is thought to be pertinent to this study in order to understand how inventory management affects the provision of services in healthcare institutions. The theory appropriately serves as a foundation for the examination's conceptual analysis. When a funding source, like a bank or government, finds it difficult to hold an enterprise to a fixed budget, it can obtain a larger loan or subsidy ex post than would have been considered efficient ex ante, according to the second theory, the soft budget-constraint theory (Kornai et al., 2003). In contrast, the more decentralized economies of the West, though they are by no means immune, have seemed to be much less prone to the syndrome (Kornai et al., 1994). In reality, budget restrictions apply to businesses. According to the general equilibrium theory, each consumer has a limited amount of money. Budget constraints, which are one of the pharmaceutical management practices, are

significant to the study as it has a significant impact to the performance of the department.

2.1 Empirical Literature Reviews

Some studies found factors such as inventory accuracy, lean inventory, and stock availability has positive and significant impact on performance of organisations while, capacity utilization doesn't seem to affect efficiency (Khan and Siddiqui, 2019; Khalid and Lim, 2018). Hence, main indicator of inventory control comes out to be inventory accuracy which allows having an effective control of the outputs of the different goods (Khan and Siddiqui, 2019). Mbirizi *et al.*, (2018) conducted a study by analyzing literature on Systems for Improved Access to Pharmaceutical and Services (SIAPS) and its precursor projects. These papers included assessment and technical reports relevant to Namibia's national antiretroviral therapy (ART) program. They also examined data and reports from the Pharmaceutical Management Information Dashboard in order to summarize usual reporting rates and trends. Namibia has integrated all of its pharmaceutical information technologies successfully, according to their analysis (Mbirizi *et al.*, 2018). More than 85% of all ART venues may provide Namibia with patient dispensing information and more than 90% of commodities within 15 days of the request.

In another study, Pezzola and Sweet (2016) examined the implementation of an integrated pharmaceutical management information system for antiretrovirals and other medicines in Namibia. In their study, they analysed assessment and technical reports relevant to Namibia's national antiretroviral therapy (ART) program. They also examined data and reports from the Pharmaceutical

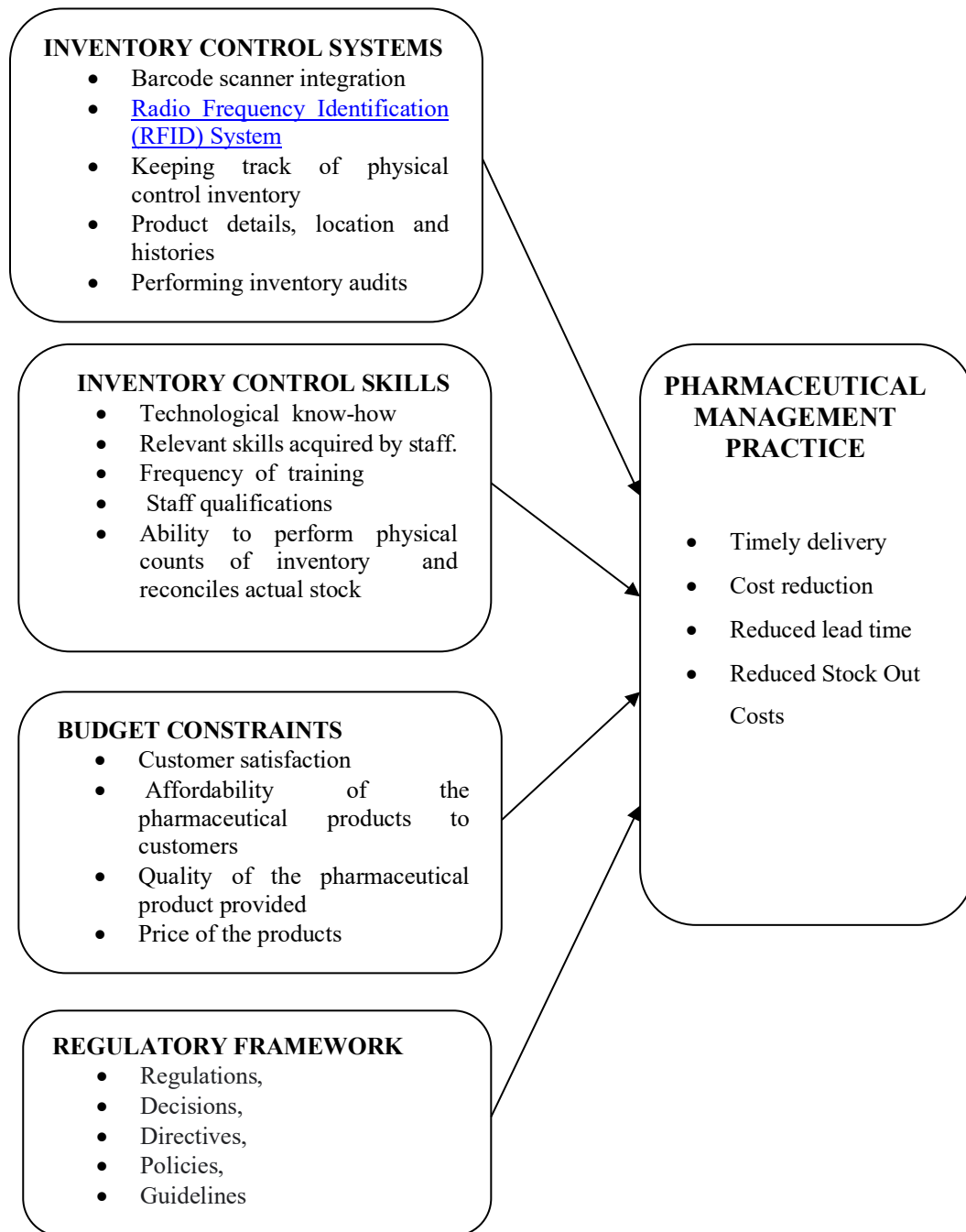
Management Information Dashboard in order to summarize usual reporting rates and trends. It was found that, Namibia has integrated all of its pharmaceutical information technologies successfully (Pezzola and Sweet, 2016). More than 85% of all ART venues may provide Namibia with patient dispensing information and more than 90% of commodities within 15 days of the request. Leaders in developing international standards do not seem to have influenced their neighbors' development of local norms.

A scoping research with no time constraints was conducted in Medline for the study by Additionally, Borges dos Santos *et al.*, (2019), examined Factors Influencing Pharmaceutical Pricing and found that there is insufficient research on the effects of discounts/rebates, profits, and price transparency, as well as the implications of financing schemes, market liberalization, online trading, and biosimilars on pharmaceutical pricing. Their findings reveal a lack of enough research on factors affecting pharmaceutical pricing include impacts of financing schemes, market liberalization, internet trading and biosimilars on prices, with insufficient discussion identified for the effects of discounts/rebates, profits and price transparency. Their findings are similar to Tanzanian where literature is scarce on the subject (See for example Belardi *et al.*, 2023; Gabriel, 2020). Therefore, this study focused on bridging this gap by assessing the influence the pharmaceutical management procedures in Tanzanian public hospitals.

2.2 Conceptual framework

The factors included in this study on pharmaceutical management practices are connected in the way that is shown below.

Figure 2.1: Conceptual Framework



Source: Researchers' Construct, (2022)

3. Methodology

3.1 Research Design and Data Collection

The study has used a descriptive and case study research design. According to Tourangeau (1999), a descriptive design is used to collect primary data from members of a population in order to determine the population's current status with regard to one or more factors is known as a survey. Thus, the ability of a descriptive design to accommodate various data collection techniques was the primary justification for its choice in the current study. Furthermore, in order to describe, observe, and record phenomena that occurred from the experience of the surveyed sample, a descriptive research method was also applied (Dulock, 1993). Following Kothari's (2004), assertion that descriptive research studies are designed to obtain relevant and precise information concerning the current status of a problem or phenomenon and whenever possible to draw valid general conclusions from the facts discovered.

A case study approach was adopted at Mnazi Mmoja Hospital in Unguja, in the Tanzanian Island of Zanzibar in order to conduct an in-depth exploration of the intricate phenomena on inventory management in pharmaceutical departments (Rashid et al., 2019). The case was selected primarily because it the largest public hospital in the region and thus is required to observe and

adhere to the government procurement regulations (URT, 2016).

3.2 Sample Size and Sampling Technique

The field pilot survey established that there were 240 staff employed at the Mnazi Mmoja Hospital staff, who composed of the study's target population (field survey data, 2022.) A sample of 150 respondents, all of whom worked for the Institution, were then chosen using a sample size calculation formula established by Saunders et al., (2011). Thus, the sample size was arrived based on the following calculations:

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

Where;

n = sample size,

N = Population size =240

e = Level of precision = 5%

$$n = \frac{240}{1 + 240(0.05)^2}$$

$$n = 150$$

As shown in table 3.1 below, a sample frame for choosing the 150 respondents was non-randomly used to ensure a justifiable sample size was used.

Table 3.1 sample size.

Committee/Department/Unit (Respondents)	Population	Sample size	% of sample
Nurses services	20	10	50
Clinical services	30	20	67
Engineering department	20	10	50
Operation and Administration department	20	10	50
Procurement unit	20	10	50
Training and research	20	10	50
Pharmacy department	70	60	86
Planning and finance	20	10	50
Suppliers	20	10	50
Total	240	150	

To choose the respondents, purposive sampling and random sampling techniques were both used. By drawing lots, Customers/suppliers and some operational staff, such as doctors, nurses, and pharmacists, had an equal opportunity to be chosen. However, because each organization only has a set number of members in each of these categories, purposive sampling was employed to choose the executive director, department heads, and head of the procurement management unit (PMU) employees. According to Bailey (1994), the decision to choose these organs was made since they were the ones who initiate, approve, and oversee the acquisition of pharmaceutical products as well as the administration

of inventory control. The study used primary using a primary set of closed and open-ended questionnaires.

3.3 Research Analysis

The gathered information was changed into a format suitable for manipulation and analysis. Editing was done to the collected data to ensure accuracy, consistency, and comprehensiveness. For the descriptive analysis, the Statistical Package for Social Science (SPSS) version 20 was utilized and presented using tables and figures with frequencies and percentages, respectively, for conclusions. Additionally, the study used regression analysis to determine the relationships between the variables in the research objectives.

3.4 Regression Model

To assess the factors affecting pharmaceutical management practices at MMH in Zanzibar, multiple linear regression analysis was used. The study was guided by the following econometric model specification of matrix notation as follows:

$$y = b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5$$

Notation:

y is the Dependent Variable

x_i are Independent Variables (predictor variables)

a is the *y* intercept, where the regression line crosses the *y* axis

b₁ is the partial slope for *x₁* on *y*

b₁ indicates the change in *y*, for one unit change in *x₁*, while controlling for *x₂*, *x₃* & *x₄*

b₂ is the partial slope for *x₂* on *y*

b₂ indicates the change in *y*, for one unit change in *x₂*, for controlling for *x₁*, *x₃* & *x₄*

The economic model specification of the variables is as follows.

$$y_i = f(x_1 \dots x_n)$$

Where:

y_i = Pharmaceutical management practices

3.5 Study Validity and Reliability

Questions concerning the senior management officials and their staff's understanding of inventory control and its effects on MMH's pharmaceutical management practice were included in the questionnaire. To achieve content validity, the data collection tools were tested during the pilot study. The validity of an instrument is determined by how well it accomplishes its intended

purpose (Taherdoost, 2019). Cronbach's alpha was used to test the reliability of the questionnaires' responses using SPSS software. The Alpha test was run on the variables on questionnaires. The critical point for Cronbach's alpha is 0.7 ((Taherdoost, 2019); and in this case, the average score for all variables was found to be 0.8 from the test, one can safely conclude that the results are reliable and stable.

4. Findings and discussions

4.1 Data Analysis

The study examined factors affecting pharmaceutical management practices at MMH. Specifically, the study focused on only one of the factors affecting pharmaceutical management practice. This was the inventory control system in pharmaceutical management practice. To establish the effect, the variable was divided into various sub-variables namely the use of barcode scanner integration, Radio Frequency Identification System, and tracking of physical inventory. Respondents were requested to provide their responses by ticking the most appropriate option ranging from 1=very small extent, 2= to a small extent, 3= to a moderate extent, 4= to a Large extent, and 5= to a very large extent. Respondents specified their perception towards three items in the questionnaire as shown below. The scale of mean score interpretation was as follows: Based on the mean values, mean scores of 1 to 1.8 represent Very Small Extent, 1.81 To 2.60 represent small extent, 2.61 To 3.40 represent moderate extent, 3.41 To 4.20 represent Large extent and 4.21 To 5.00 represent very large extent.

4.2 Descriptive Statistics

Table 4.2: the effect of inventory control systems on pharmaceutical management practice

Construct	N	Mean	Std. Deviation	Interpretation
Barcode scanner	150	1.5178	.62693	Very Small Extent
Radio frequency Identification	150	2.5400	.86412	Small Extent
Tracking of physical inventory	150	3.5889	.62917	Large Extent

Source: Field Survey (2022).

As reflected in Table 4.1, the mean score differed from one item to another. This shows that respondents had different opinions about the effect of inventory control systems on Pharmaceutical Management Practice in public institution institutions. Explicitly, respondents asserted that barcode scanner integration and Radio Frequency Identification System affected or influenced pharmaceutical inventory management to a small extent with the mean score (M=1.52 and S.D= 0.63) and (M=2.54 and S.D=0.86) respectively. Additionally, it was found that tracking of physical control inventory was conducted by the organization to a large extent. This was portrayed by a mean score (M=3.5889 and S.D= 0.62917). This indicates that at MMH there are predetermined methods of counting the goods, which is the requirement of the public procurement laws that whenever there is delivery of goods, goods must be ascertained to ensure conformity to specifications and requirements.

4.3 Regression Analysis and Discussion of the Findings

Findings generated from statistical analysis demonstrated that barcode scanners were lowly used at MMH as indicated by a mean score (M=1.52), the use of a Radio Frequency Identification System was also very minimal by mean score (M=2.54) while tracking of physical inventory was largely applied by a mean of (M=3.59). These findings portray that inventory control systems at MMH are mostly handled manually. However, the Hospital practices a predetermined method to count the goods, while only 8% of respondents supported that the Hospital does not practice a predetermined method to count the goods and the MMH scheduled a physical inventory count at the end of a reporting period as indicated by a mean score of 3.59. In this case, the findings depict that to a large extent, the hospital schedules the physical inventory count at the end of the reporting period. The outcomes in this case demonstrate how significantly the hospital schedules the physical inventory count for the end of the

reporting period. These results matched those of other researchers who studied inventory control systems. For instance, Mbirizi *et al.* (2018) found that Namibia's integrated pharmaceutical management information system allowed it to gather more than 90% of commodities and more than 85% of patient dispensing data. According to Kamuhabwa and Kisoma (2015), the primary sources of prescription information for medical professionals were textbooks and the internet. The results, however, were also in line with those of (Muzerwa and Ndolo, 2021), who hypothesized that efficient by reducing waste associated with excess inventory, eliminating unneeded inventory, and improving the planning and scheduling of activities, inventory management solutions increased the quality of services provided.

Wabwire and Clive (2021) have shown that a significant amount of hospitals' expenditure goes to purchasing pharmaceutical and non-pharmaceutical purposes such as food items and cleaning agents. Nonetheless, their findings showed that poor inventory control leads to

loss, misuse, and lack of accountability. Accordingly, statistical analysis in the current study has shown that the majority of respondents agreed with the following assumptions: training improves inventory management; training on inventory control is routinely conducted at MMH; knowledge of pharmaceutical inventory control enhances pharmaceutical inventory practices; and training on inventory control is always conducted. These results were corroborated by (Musyimi *et al.*, 2018), who discovered that the staff's skills had a favorable, significant impact on the management of drug security in hospitals. Abuga *et al.*, (2019) made the same argument, arguing that unorthodox medication disposal methods, unhealthy competition, and task shifting and delegation are features of pharmaceutical services' regular practices. The pharmaceutical management practice, they continued is plagued by issues such as a lack of skilled labor, hazy practice limitations, and inadequate inter-professional coordination, necessitating corrective regulatory measures to prevent inconsistencies between policy and practice.

Table 4.2: Regression Model coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.131	.083		-1.579	.117
	INVENSYS	.043	.031	.028	1.390	.167
	INVESKIL	-.035	.024	-.030	-1.503	.135
	BUDGCONT	.050	.019	.047	2.683	.008
	REGFRAME	.977	.017	.965	57.304	.000

Source: Field Survey (2022)

The table 4.2 above explains the variables included in the model contributed to the prediction of the dependent variable. This is perceived by observing in the column labeled Beta under Standardised Coefficients. In this circumstance, we are comparing the contribution of each independent variable. The Beta value for the inventory control systems (INVENSYS) variable is 0.028, which indicates that the variable has a significant influence on pharmaceutical management inventory at MMH. Also, the P-value (column marked Sig.) tells whether this variable is making a statistically significant unique contribution to the equation. If the P (Sig.) value is less than .05 (.01, .0001, etc.), then the variable is making a significant unique contribution to the prediction of the dependent variable. If greater than .05, then we conclude that the variable is not making a significant unique contribution to the prediction of the dependent variable (Ondari and Muturi, 2016). With other variables/factors held constant, Pharmaceutical Inventory management practice scores were both positively related to Inventory control systems (table 4.2), the results showed that Pharmaceutical inventory management practice was influenced strongly by 0.028 in Inventory control systems.

The findings are closely related to a study by Mbugi and Lutege (2022), who noted that an inventory control management system using principles of Economic order quantity [EOQ] affects organizational performance in terms of cost reduction, production efficiency, flexibility, and profitability. They further recommended the implementation of new practices/models such as Vendor Managed Inventory (VMI) in the company's inventory control management

5. Conclusions and Recommendations

5.1 Summary of the Study

The study made a thorough review of both theoretical and empirical literature on pharmaceutical inventory management in appraising the specific objectives. The Mathematical theory of inventory and production and Soft budget-constraint theory according to Mukuna and Osoro, (2018) and Kornai (1979), respectively were adopted to explain the variables but also understand the study concepts. A survey research design was used to facilitate the achievement of specific objectives. 150 respondents guided the findings of the study of which 150 respondents were reached. The study utilized both, random sampling procedure and purposive sampling to select a sample for this study. It also utilized a questionnaire for data collection.

The quantitative data were descriptively analyzed to get percentages and frequencies. The results were presented in tables, pie charts, and bar graphs. The findings of the study were then presented and discussed under specific objectives.

5.2 Conclusion

According to the first objective, there was a relative use of the Radio Frequency Identification System, inventory control systems were mostly handled manually. It was also found that the Hospital practices a predetermined method to count the goods and the Hospital schedules a physical inventory count at the end of a reporting period. In this case, the findings portray that to a large extent, the hospital schedules the physical inventory count at the end of the reporting period.

However, the Hospital was found not using an automatic tracing of stock.

In the second objective, the findings showed that 61% of respondents agreed with the argument that the inventory control skills of staff affect pharmaceutical inventory practices. It was further statistically analyzed that respondents strongly agreed with the assumed propositions that training improves inventory management, training on inventory control is done regularly training on inventory control is always done at MMH and knowledge of pharmaceutical inventory control improved pharmaceutical inventory practices.

The third objective revealed that 45% of respondents perceived budget constraints' impact on pharmaceutical management practices. The findings indicated that the budget for pharmaceutical inventory is sufficient by 62.67%, implying that pharmaceutical inventory management is not affected by budget constraints as the budget for pharmaceutical inventory is adequate. The quality of the procured pharmaceutical products at MMH indicated that 37.4% of the pharmaceutical products acquired were of low quality. Furthermore, it was found that pharmaceutical products at MMH are unreliable meaning that they are not available in the required time as it was vindicated by 40.6% that there are problems with unreliable products. This perhaps is because of the budget constraints at MMH. There was a low rate of satisfaction of users on pharmaceutical inventory by 47.3 prices provided by suppliers of pharmaceutical products are affordable 58% of respondents indicated that prices provided by suppliers of pharmaceutical products are affordable. The findings denoted 37% of the qualities of the pharmaceutical products acquired at MMH were

high. This implies that most of the pharmaceutical products' quality was questionable which may lead to poor delivery of services.

The fourth objective portrayed that the policies and regulatory frameworks guiding pharmaceutical practices are known to some individuals while others are not aware of them, also pharmaceutical inventory is managed following the rules and procedures stipulated in legislation, However, procedures for making regulations are not clear with people and there is a low engagement of stakeholders in making regulations and laws about pharmaceutical inventory management at MMH, although there guidelines that the government provides to health facilities to manage pharmaceutical activities.

Based on the findings, the study concludes that pharmaceutical inventory management systems need to be streamlined. The results in this instance show that the hospital schedules the physical inventory count to a great extent; thus, current inventory management systems, such as barcode scanners and radio frequency identification, should be installed. The majority of inventory control systems were manual. Thus, electronic systems like barcode scanning, RFID, and other similar technologies, and inventory management systems must be improved. MMH should invest in and train the personnel on electronic inventory control mechanisms even if there is routine training of the workforce on maintaining inventories.

5.3 Recommendations

It was noticed that due to the unreliability of the suppliers, pharmaceutical supplies at MMH are not available when needed. However, MMH is facing a pharmaceutical budget shortfall, which makes users unhappy with the pharmaceutical inventory. Hence, the government and hospitals should think about updating and raising the budget. A study of the processes utilized to obtain pharmaceutical goods is necessary because it was found that the medicinal products bought at MMH were of poor quality. However, there should be a competent method of selecting suppliers to reduce the issues of stock shortages. Policymakers must take into account each of these factors to find realistic solutions for enhancing inventory management operations.

5.4 Policy Implications

The study investigated on effect of inventory control systems on management practice, inventory control skills of staff on pharmaceutical inventory practice, budget constraints on pharmaceutical management practice, and policies and regulatory frameworks guiding pharmaceutical practices. The study made several recommendations regarding the use of mechanized inventory control systems. It has also recommended improving the skills and knowledge of staff involved in inventory controls. Additionally, it has articulated framework regulation supporting pharmaceutical inventory management. With regards to these, the study is of the view that it has provided room for the government to incorporate in the Public Procurement Act and regulations the automated inventory control systems and Supply part as these are not included in the current

Public Procurement Act and Regulations. Thus, the government should set effective policies regarding inventory control and management as these aspects are essential to be noted by policymakers for them to identify plausible ways of improving inventory management activities.

5.5 Suggestions for Further Research

The completion of this study is not an end in itself; it provides a way for other studies to learn more about pharmaceutical inventory control systems and practices. It would be worth doing an in-depth qualitative study on the factors influencing pharmaceutical management practices. Another proposed study could be conducted on the factors affecting the performance of pharmaceutical control systems in privately owned hospitals and possibly make a comparison with public hospitals to determine whether the issues are the same or to establish best practices for the sector that is not doing well.

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