
The Effect of Inventory Management Practices on Service Delivery: A Study of Sawula General Hospital, Southern Ethiopia

Daniel Dikire (PI)¹, Gedeno Gemedo (CI)^{2*}

^{1,2*}Arba Minch University Sawula Campus Department of Logistics and Supply Chain Management Sawula, Ethiopia.

Corresponding Email: ^{2*}gedemangm@gmail.com

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Abstract: *The purpose of this study was to assess the effect of inventory management practices on service delivery of Sawula General Hospital. The study employed both descriptive and explanatory research designs to conduct this research. It contained a qualitative and quantitative component that enables the researcher to assess the study easily. The total population of this study was 459 and the researcher takes 293 as sample size from staff's members, Health department experts and patients. The sampling technique of the study was stratified sampling technique. Primary data were mainly collected using self-administered questionnaires consisting of closed ended questions with 5-point Likert Scale. Data were also collected through questionnaires and interview. The collected data were quantitatively analyzed using SPSS to produce descriptive and inferential statistics and regression analysis. The key findings from the study revealed that there is gap on Sawula General Hospital was relation to applying poor inventory management practice which caused dissatisfaction of the patient/client with the service delivery. Moreover, the finding shows that the inventory management practice was also challenged by shortage of budget and lack of training on inventory management, bureaucratic process and lack of computerized system to manage the inventory. Based on the major findings, the study recommends that applying the scientific concepts of inventory management practices and implementing awareness creation mechanisms to develop patients' perception of service delivery to increase proper inventory management which realize improved customer service and inventory management by responsible bodies. Moreover, it was also recommended that, the hospital should create ways in solving the critical challenges by allocating enough budgets, avoiding bureaucratic process in procurement, filling knowledge gaps through different trainings.*

Keywords: *Inventory Management, Practices and Service Delivery.*

1. INTRODUCTION

1.1 Background of the Study

The hospital is one of the most significant organizations that offers community healthcare. To satisfy patients' expectations, hospitals should maintain the greatest caliber of care (Goren & Dagdeviren, 2017). The primary goal of research on healthcare supply chains and hospital inventory management is to increase the productivity and efficiency of the healthcare system while lowering healthcare costs without compromising patient care (Rachmania & Basri, 2013). One can use the terms "stock" and "inventory" interchangeably. Inventory is defined by Coyle et al. (2003) as the supplies, finished goods, work-in-progress, and raw materials needed to create a company's goods and services.

Gudum (2002) asserts that unpredictable and variable time and content of the flow of goods and information results in uncertain planning, higher expenses, stock outs, and delays. As a result, actions must be taken, particularly with regard to inventories, to address dynamics and uncertainties at the operational level of company. To be effective, this calls for tactics to be used at the tactical and strategic levels of businesses in order to guide their supply chain strategy toward excellence and competitive strategy. Inventory control is an essential component of the supply chain network that protects healthcare delivery against disruptions of any kind.

Inventory management, according to the American Production and Inventory Control Society (APICS), is the area of corporate management that deals with planning and managing inventories. For most businesses, even large and medium-sized ones, inventory management is a crucial management concern. "Rough material, work-in-progress, finished goods, and supply required for creation of a company's goods and services" are all referred to as inventory (Coyle, 2003).

Furthermore, appropriate inventory management aims to minimize the expenses related to the inventory, considering the overall worth of the products as well as the tax liability resulting from the inventory's cumulative value (Agus, 2010).

Inventory management is critical to businesses because it helps them maintain accurate demand forecasting, properly manage stock and assets, and prevent unforeseen procurement procedures. This will help the company implement procurement procedures that successfully balance supply and demand (Brigham, 2013). Effective stock management is critical to the operation of any business, and hospitals are no exception. Without sufficient inventory, patient care will be completely suspended. For most organizations, stock is the single largest asset investment. Employees in the majority of organizations have grown accustomed to the high availability of commodities, which has led to increasing stock holding levels (Chopra, 2007).

With regard to inventory management, there are two primary issues. Having the appropriate products in adequate numbers, at the appropriate location, and at the appropriate time is the first aspect of inventory management that pertains to the quality of customer service. The expense of purchasing and maintaining inventory is the second issue (Stevenson, 2009).

The total effectiveness of the supply chain is significantly impacted by inventory management and control (Rachmania and Basri, 2013). A patient's condition may worsen due to a delay in treatment, they may even die if life-saving medications are out of stock, and they may lose faith in the facility's ability to provide quality medical care because inventory control is a challenging task in many nations (management Science for health 2012).



Ethiopia has a national drug strategy that gives the government the primary responsibility to ensuring an adequate supply of medications needed for the treatment of disorders affecting the majority of the country's population Muligeta Fentie, et al. (2014). In order to accomplish this, the nation created a national list of essential medications, which serves as a decision-making tool for all healthcare providers in terms of identifying and obtaining the most important medications at all times at a reasonable cost at every stage of the healthcare system (Muligeta Fentie, et.al.2014).

Drawing from the aforementioned discourse, it is evident that public hospitals, serving as the primary healthcare provider, play a significant role in Ethiopia's economic development. With regard to their inventory management protocols, public hospitals must elevate their service standards to a higher value chain. In order to achieve this, this service requires an organized approach to inventory management techniques that can improve service (inventory management) performance and ultimately result in the provision of high-quality healthcare.

According to Buffa & Salin (1987), there are a number of justifications for maintaining inventory. Having too much inventory can lead to financial strain, higher holding costs, material deterioration, non-moving or obsolescent commodities, theft, and pilfering. Conversely, a lack of materials may lead to bad customer relations, service interruptions, and underutilization of the labor force. The impact of inventory management practices on Sawula General Hospital service delivery was evaluated in this study.

1.2. Statement of the Problem

The goal of inventory management is to maintain stocks at the lowest possible cost while ensuring a steady supply of goods for expanding operations. When determining the cost of keeping inventory, the cost of delivering stock, and the expenses resulting from low inventories, its management must find a trade-off between the various cost components (Callahan, 2009). Information integration, transportation, purchase, inspection, material handling, warehousing, packaging, supply control, and inventory security are all key to inventory management, according to Silver (2008).

Health facilities must maintain stockpiles of specific pharmaceutical goods in order to offer comprehensive medical care, including the provision of appropriate essential medication. Inadequate stock controls can cause pharmaceutical items to be overstocked or understocked, which can cause vital medications to expire or run out, respectively. Therefore, effective management of the medication supply is necessary to avoid both shortages and various forms of waste, such as overstocking, theft, and expiration. As a result of this waste, patients receive lower-quality healthcare because there are fewer medications available to them (Kagashe & Massawe, 2012).

Studies on the availability of essential medications and inventory management techniques in primary public health facilities in Ethiopia have revealed that, despite generally good essential medication availability, there were lengthy periods of time when essential medication stocks ran out and drug waste as a result of subpar inventory management techniques (Mulugeta, et.al, 2015). However, research on how inventory management essentially affects service delivery is still in its infancy and needs more attention. In support of this, Azeb (2018) proposed that hospital departments' inventory management practices undermine their obligation to deliver high-quality healthcare services that satisfy patients. As a result, this study thoroughly



examines how efficient inventory management affects organizational performance and service delivery. Furthermore, the researcher's ongoing observations of Sawula General Hospital and examination of the hospital's financial reports for the years 2018 and 2019 revealed issues with inventory management, including: A significant shortage and unavailability of medications. Because of this, patients are compelled to purchase it from a private pharmacy, which raises hospital expenses.

To the best of the researcher's knowledge, nevertheless, no prior studies have examined how Sawula General Hospital's inventory management procedures affect the provision of patient care. This is why the author of this report believed there was a gap in the hospital that needed in-depth research. Therefore, the researcher was motivated to look at the existing impact of inventory management techniques on service delivery at Sawula General Hospital in order to close the gap.

1.3. Research Question

This Study Intended to Answer the Following Sub-Research Questions:

1. What are the inventory management practices in Sawula General Hospital?
2. To what extent is health care service delivery of Sawula General Hospital satisfying the patient.
3. What are the challenges towards implementing inventory management practices?

1.4. Objectives of the Study

1.4.1. General Objective of the Study

The general objective of this study is to assess the effect of inventory management practices on service delivery in the case of Sawula General Hospital.

1.4.2. Specific Objectives of the Study

This Study Has the Following Specific Objectives:

- To determine Sawula General Hospital's inventory management procedure.
- To assess patient satisfaction with Sawula General Hospital's level of healthcare service delivery.
- To identify obstacles to Sawula General Hospital's inventory management practice implementation.

2. RELATED WORK

Numerous scholars have examined various inventory management techniques; as a result, a vast body of knowledge regarding the impact of inventory management strategies on service delivery has been gathered. Thus, further research is needed in order to find a solution. It makes sense that managers looking to regulate their stores to obtain a competitive edge would find valuable resources in the seemingly endless inventory theories associated research. On the other hand, others have argued that managers who rely on inventory theory research can perceive it to be unimportant (Krautter, 2009) or that it doesn't really improve store procedures (Wagner, 2016).

Azeb (2017) conducted a study at Zewditu Memorial Hospital in Ethiopia to assess inventory management practices and challenges. The study found that the main challenges faced when managing pharmaceutical products were low staffing levels, a weak management system, inadequate training for inventory management, a lack of funds for procurement, and a lack of technology in inventory management. These factors could have resulted in a high level of stock out, which could have caused disruptions to hospital services. Research also showed that one major issue facing healthcare facilities is a shortage of storage facilities and inadequate storage conditions (Gizat & Samson, 2014&Adzimah et al 2014).

According to a study done in Ghana by Hamza et al. (2015), inventory management practices of small and medium-sized businesses in the Northern Region have an impact on their financial performance. For this reason, managers of small and medium-sized businesses must adopt effective stock management techniques as a tactic to boost their bottom lines and endure in the unpredictable business climate.

Another study on Addis Abeba inventory management practices for pharmaceutical items at health facilities revealed that the main challenges faced by almost all facilities were running out of essential medicine stock and expiration as a result of poor inventory control. These challenges included not having enough storage space to store all the products needed, lacking technology in inventory control, and inadequate training for supply chain and inventory management personnel (Ermias, 2018).

The literature analysis indicates that health facilities must implement efficient inventory management procedures in order to fulfill their founding goals, which include serving the community's health needs.

2.1. Conceptual framework of the study

Independents variables



Source: Researcher's Own Construct, 2020

3. RESEARCH METHODOLOGY

3.1 Research Design

The study employed both explanatory and descriptive research designs. The explanatory research method served to clarify the goal of the study and was utilized to quantify the impact of inventory management practices on service delivery, while the descriptive research design described the inventory management characteristics of public institutions.

3.2 Research Approach

Both qualitative and quantitative methods were used in this investigation. When applying the qualitative approach, the researcher assigned variables that cannot be sufficiently assessed with numbers and statistics, which resulted in the use of more descriptive data.

3.3. Target Population of the Study

A population, according to Burns and Grove (2012), is made up of all the elements (people, things, and events) that fit the sample requirements to be included in a study. There were 459 participants in the study overall, however the researcher only used 293 as a sample size.

3.4. Sample Size and Sampling Techniques

According to the 2019 annual report of patient/client Carvalho et al. (2006), 200, a sample determination table at 95% level of confidence of sample was picked at small level of sample size from a population of 54966 in order to obtain a reasonable sample size. Lastly, a straightforward random sampling procedure was used to choose the sample of patients or clients.

Table 3.1: Carvalho's Sample Size Determination

Population Size	Small	Medium	Large
51-90	5	13	20
91-150	8	20	32
151-280	13	32	50
281-500	20	50	80
501-1,200	32	80	125
1,201-3,200	50	125	200
3,201-10,000	80	200	315
10,001-35,000	125	315	500
35,001-150,000	200	500	200

Source: (Carvalho, 1984)

Thus, stratified random sampling was used to choose sample employees. Stratified random sampling is a helpful technique for data collecting if the population is varied, as Yamane (1967) explains. As previously mentioned in the population section, stratified random sampling was the best technique to obtain a representative sample because the target population in this study was heterogeneous.

As previously mentioned, 459 people made up the entire study population. The target population was stratified, and the proper sample size was then determined using the Yamane formula.

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

Where n is the sample size, N is the population size, and e is the level of precision as 95% confidence and 5% precision level. That is:

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

$$n = \frac{459}{1 + 459 * 0.05^2}$$

$$n=293$$

Where:

n= Sample size

N= The total number of population in the study

e= Error (0.05)

Table 3.3: The target population, samples and sampling techniques of the study

No	Respondents	Population (N)	Sample(n)	%	Sampling techniques
1	Staff members	254	155	61%	Stratified random sampling
2	Gofs Zone health department experts	5	5	100%	Availability sampling technique
3	Patients(clients)	200	133	66%	Simple random sampling
	Total	459	293	63%	

3.5. Data Type and Source

3.5.1. Primary Data

As stated in the research objectives, the researcher used questionnaires to gather primary data and data that she collected on her own for a specific purpose.

3.5.2. Secondary Data

Documentary forms of secondary data were employed, which were gathered from written sources such research papers, journal articles, and literature reference books. Secondary data serves to aid in problem formulation, literature review, and questionnaire creation.

3.6. Data Collection Instruments

The nature, goal, and scope of the investigation, as well as the time and resource availability, are the primary determinants of the data collection method. In order to gather information on how inventory management practices affect patient care at Sawula General Hospital, data was collected through staff, patient, and top management questionnaire responses as well as interviews with Gofa zone health department specialists.

3.7. Data Analysis

In order to extract meaning from data, quantitative data analysis uses statistical techniques for data collection, classification, analysis, and summarization. As previously mentioned, the author used questionnaires in field study to gather data from Sawula General Hospital. Data reduction was done after the data was collected in order to choose, organize, clean up,

concentrate, and condense the data for further analysis. There are various ways to analyze data. The gathered data was changing into a format suitable for handling and examination. To guarantee correctness, consistency, and completeness, the questionnaire data was modified. Version 20 of the Statistical Package for Social Sciences (SPSS) is used to collect and analyze data with frequencies and percentages are useful analytical tools for examining the data. Quantitative data were given meaning and their implications were explained through quantitative explanations. In order to determine whether three or more groups (categories) should differ, analysis of variance (ANOVA) was employed. These led to the formulation of relevant conclusions and suggestions based on the research's findings.

In this investigation, the multiple regression formula was utilized to ascertain the correlation between the independent and dependent variables. The following model illustrates how the regression model is made up of independent variables that challenge the dependent variable (service delivery Sawula General Hospitals) and include inventory management practices and healthcare. The following is the multiple regression formula:

$$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + e$$

Where:

Y = service delivery

a = Y intercept the model

b₁, b₂, b₃ and b₄ = Regression weights attached to the variables

X₁...X_n = Coefficients

e- is error

The statistical significance of predicting the impact of inventory management methods on dependent variables related to service delivery was assessed using an analysis of variance. Correlation coefficient testing was used to determine significance, with R square serving as a proxy for significance. A typical indicator of a presumed linear relationship between variables is the coefficient. An indicator of a strong link and, consequently, a significant variable influencing the trend of the dependent variable is a coefficient of value of at least (+ve) 0.5 and (-ve) 0.5.

4. RESULTS AND DISCUSSION

4.1. Relationship between Inventory Management Practices on Service Delivery

4.1.1. Pearson's Correlation

To determine the statistical significance of the inventory management strategies' dependent variables' impact on service delivery, an analysis of variance was employed. The correlation coefficient, or R square as a measure of significance, was used as the test of significance. A standard measurement of an assumed linear relationship between variables is called a coefficient. A strong correlation and, thus, a significant variable influencing the trend of the dependent variable is indicated by a coefficient of value between (+ve) 0.5 and (-ve) 0.5 or higher.

According to Robert B. and Richard A. (2008), the Pearson's correlation coefficient, represented by the symbol r , is restricted by design such that $-1 \leq r \leq 1$. According to the decision rule, the test is significant if $p \leq 0.05$ and not significant if $p \geq 0.05$. In addition, a value of 0 indicates no linear correlation, while positive values indicate positive linear correlation and

negative values indicate negative linear correlation. The strength of the linear association increases with the value's proximity to 1 or -1.

Table 4.7, Correlation between variables. Correlation

		inventory management practices	health care	challenging	Service delivery
inventory management practices	Pearson Correlation	1	.681**	.752**	.460
	Sig. (2-tailed)		.000	.000	.000
	N	281	281	281	281
health care	Pearson Correlation	.681**	1	.932**	.472*
	Sig. (2-tailed)	.000		.000	.000
	N	281	281	281	281
Challenging	Pearson Correlation	.752**	.932**	1	.560*
	Sig. (2-tailed)	.000	.000		.000
	N	281	281	281	281
Service delivery	Pearson Correlation	.460**	.472**	.560**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	281	281	281	281
**. Correlation is significant at the 0.01 level (2-tailed).					
*. Correlation is significant at the 0.05 level (2-tailed)					

Source: (SPSS Output, 2020)

All of the independent variables (practices for inventory management) have a positive association with service delivery, as table 4.7 demonstrates. This link demonstrates how, to varied degrees, service delivery evolves in tandem with changes in inventory management strategies. Based on the premise of Pearson's correlation, there is a strong positive association between service delivery and all of the consequences of inventory management, including difficult, effective inventory management methods, and healthcare service delivery.

4.2. Regression Analysis

Table 4.9, Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.703 ^a	.663	.637	.28702
a. Predictors: (Constant), challenging, inventory management practices, health care service delivery				
b. Dependent Variable: Service delivery				

Source: (SPSS Output, 2020)

Table 4.9 illustrates that the independent variables in the model, namely inventory management techniques, challenge, and healthcare service delivery, with a model correlation of .663, can account for approximately 66.3% of the variance in the dependent variable, service delivery. Accordingly, changes in independent variables account for 66.3% of the variation in the dependent variable, service delivery, while other factors account for 33.7% of the variation. A deviation of 0.28702 is seen on average between the hospital service delivery level and the projected regression line, according to the standard error of estimate (Std). As a result, the outcome demonstrates that the factors found in this study had a significant impact on service delivery. (Hair and others, 2010)

4.6. ANOVA Results

The purpose of the table below is to assess the model's fitness in estimating the effects of independent variables on Sawla General Hospital service delivery. A two-way ANOVA was performed, and the results showed that the model was significantly used to predict the effects of independent variables on Sawla General Hospital service delivery ($F = 33.514$, $p\text{-value} = 0.000$).

Table 4.10 ANOVA results

ANOVA						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.340	3	7.113	33.514	.000 ^b
	Residual	5.849	71	.092		
	Total	29.189	74			
a. Dependent Variable: Service delivery						
b. Predictors: (Constant), challenging, inventory management practices, health care service delivery.						

Source: (SPSS Output, 2020)

Table 4.11, Coefficient determination

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.564	.985		7.680	.000
	inventory management practices	0.568	.276	.818	5.678	.000
	health care	0.080	.193	.109	2.416	.000
	Challenging	1.527	.199	.773	2.650	.000
a. Dependent Variable: Service delivery						

Source: (SPSS Output, 2020)



The model demonstrates a robust and statistically significant positive correlation between health care ($\beta=0.080$, $t=2.416$, $p=0.00$), inventory management strategies ($\beta=.568$, $t=5.678$, $p=0.000$), and challenging ($\beta=1.527$, $t=2.650$, $p=0.000$) with service delivery. The positive coefficients for difficult, inventory management techniques, and healthcare service delivery suggest that, as these particular inventory management effects grow, they will inevitably lead to higher service delivery. Overall, the regression results' congruence with the chosen inventory management strategies indicates that these variables, albeit to varying degrees, are significant determinants of service delivery.

All the independent variables were significant predictors of service delivery since their significant value was less than 0.05 ($p<0.05$). Additionally, the results show that multicollinearity did not pose a problem in the study since all variables met the criteria of tolerance should be >0.1 or VIF (variance inflation factor) should be >1 and <3 . The predictable model developed by study is:-

$$Y=7.564+, .568X_1+.080X_2+1.527X_3+e$$

Where; Y - is service delivery

X₁- is inventory management practices

X₂- is healthcare and

X₃-challenges

E-error term

5. SUMMARY OF MAJOR FINDING, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

This chapter includes a summary of the study's key findings, a conclusion based on those findings, and recommendations that are meant to be practical in order to address the issue. In order to accomplish the study's goal, the following fundamental inquiries were developed.

The results show that, with $r=.460$, there is a favorable correlation between inventory management practices and service delivery.

Additionally, the correlation between healthcare and service delivery ($r=.472$) indicates a positive association. Inventory challenges are the final variable, and they positively correlate with service delivery ($r=.560$).

The results of the difficulties faced in Sawla General Hospital's inventory control management practice are evident, as there were numerous difficulties that impeded the hospital's ability to manage its various types of inventory effectively and efficiently. According to the study, a few of these issues include inadequate funding, cumbersome procurement procedures, ignorance of inventory management techniques, inadequate storage in hospitals, shoddy management systems, etc. These issues were classified as either sporadic issues, significant issues, or risks to the adoption of efficient inventory control procedures.

Furthermore, an analysis of the data was conducted to ascertain the correlation between Sawula General Hospital's health care service delivery and its inventory management practices. The results showed that inventory management and service delivery had a substantial relationship.



5.2 Conclusions

Based on the major findings, the following conclusions were drawn.

The research's conclusions were that the majority of responders were older, female store owners with little to no experience in their current roles. Ineffectiveness in the practice is caused by the engagement of a greater number of elderly and female store employees who have limited capacity to hold and relocate stocks.

The results also showed that good inventory management practices are not being applied correctly. The best course of action is to determine the ideal amount of inventory that an organization should keep in order to minimize total inventory costs. Good inventory management will assist the hospital's finances by increasing profitability and enhancing its reputation. It will make it possible for the hospital to complete projects on schedule and provide high-quality care. The study concludes that inventory management has not been implemented at Sawla General Hospital. Nonetheless, there were certain issues with its efficacy and the degree to which management and employees followed those procedures. Therefore, to guarantee effective and efficient inventory control in healthcare facilities, practical steps should be taken to reduce such difficulties.

Inventory control guarantees the provision of high-quality services. It was evident that the respondents agreed that Sawla General Hospital's medical service was greatly enhanced by inventory control measures. It was discovered that nearly every item the researcher used to gauge patients' perceptions of the quality of the services they received received higher positive answers. Patients were, however, largely delighted with several aspects of the program, such as the effective inventory management that led to better customer service and a significant improvement in the quality of healthcare services.

The results make it evident that Sawla General Hospital had significant difficulties in the practice of inventory control management, difficulties that impede the hospital's ability to manage its various types of inventory effectively and efficiently. According to the study, a few of these issues include inadequate funding, cumbersome procurement procedures, ignorance of inventory management techniques, inadequate storage in hospitals, shoddy management systems, etc. These issues were classified as either sporadic issues, significant issues, or risks to the adoption of efficient inventory control procedures. It is possible to draw the conclusion that the hospital's practices were impacted by the difficulties with inventory management.

Additionally, the results indicate a connection between Sawula General Hospital's health care service delivery and its inventory management practices. The results showed that inventory management and service delivery had a substantial relationship. Therefore, it is possible to draw the conclusion that patients and clients would be satisfied with the quality of care provided if the hospital had a high level of inventory practice.

5.3 Recommendations

The researcher made the following suggestions to enhance Sawula General Hospital's inventory management procedures and healthcare service delivery in light of the study's findings.

The study advises using scientific concepts for inventory management techniques, such as economic order quantity, VEN (vital and non-essential analysis), and ABC analysis, in order to reduce overall inventory costs, categorize products, and guarantee their availability in order



to create inventory control that works effectively and efficiently in the delivery of healthcare. Additionally, the candidate's age and experience should be taken into account while hiring a storekeeper.

According to the report, the relevant authorities should put awareness-raising strategies into place to change how patients view the services they receive in order to improve inventory control and customer service.

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