

**VARIETY REDUCTION PRACTICES AND MATERIALS CONTROL IN
LEVEL 4-6 HOSPITALS IN NORTH RIFT REGION OF KENYA**

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NOVEMBER 2023

DECLARATION PAGE

Student

I affirm that this research project is my original work and never has it been submitted for any award in any learning institution.

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DEDICATION

I dedicate this work to my parents, brothers and sisters for their encouragement and support.

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ABBREVIATION & ACRONYMS

GOK:	Government of Kenya
HMIS:	Health Management information system
HSRS:	Health Sector Reform Secretariat
KEMSA:	Kenya Medical Supplies agency
KMC:	Kenya Meat Commission
MOH:	Ministry of Health
MRC:	Ministerial Reform Committee
RDT:	Resource Dependency Theory
SCT:	Strategic Choice Theory
TCT:	Transaction cost theory

ABSTRACT

Organizations are focused on satisfying their customers, suppliers, and units by providing them with a variety of products to choose from, thus ignoring the aspect of variety reduction. Consequently, due to a lack of variety reduction practices, many organizations suffer from several costs, including storage, handling, quality, and dead stocks. These include sections in the hospital such as; clinics, wards, surgical theatres, and pharmaceutical departments. Material control in these sections has not been effective due to overstocking and idle equipment. The objectives were: to establish the extent of implementation of variety reduction practices, to test the significance of the difference in variety reduction practices on material controls between levels 4-6 private and public Hospitals and to determine the effect of variety reduction practices on material control among level 4-6 Hospitals in the North Rift Region of Kenya. The resource dependency theory (RDT) was the primary theory, which was supported by two other theories, transaction cost theory (TCT) and strategic choice theory (SCT). The study's design was guided by the descriptive cross-sectional design, where a census of 26 heads of procurement and supply officers from the 26 level 4-6 hospitals (private and public) in the North Rift region was done. The study did obtain primary data using structured questionnaires issued to the study respondents. The coded data was then analyzed using descriptive and inferential statistics. Descriptive findings revealed that variety reduction practices are not widely used in hospitals. The inferential statistics show that there is no significant difference in material control between public and private hospitals either performing or not performing standardization of the products, and variety reduction practices have a positive predictive effect on material control. The study concludes that variety reduction practices such as reduction of the types of materials, product resizing, merging of products, and standardization of the products and materials were found to benefit the hospitals material control. The study provides insightful contribution to academicians and policymakers in developing strategic procurement and supply procedures and decisions that factor in variety reduction as part of their studies and practices. Future studies need to be conducted in other organizations especially manufacturing and industrial sectors to fill the current limitations of the current study.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Globally, organizations require strategic decisions and choices in the management of the available resources. Organizations that hold different types, sizes, and grades of products that serve the same functionality, have duplicates of items, unnecessary material costs, have not economized their storage space, and have a percentage of avoidable materials tied as capital, according to Yerpude and Singhal (2018). Sbai and Berrado (2018) argue that many organizations are focused on satisfying their customers, suppliers and units by providing them a variety of products to choose upon thus ignoring the aspect of variety reduction. Consequently due to lack of variety reduction practices, many organizations suffer from several costs including storage, mishandling, low quality and dead stocks.

The resource dependence theory (RDT), the Transaction cost theory (TCT) and strategic choice theory formed the theories of the study. The three theories agree on effective ways of managing resources through effective decisions. Interactively, they are used in the study to explain the effectiveness of variety reduction practices as a cost effective decision in organizations. Pfeffer and Salancik (1978) provided the Resource Dependency Theory (RDT), which states that those in management need to make viable decisions to avoid being exposed to the risks emanating from the external environment. Transaction cost theory (TCT) by Williamson (1979: 1986) opines that certain decisions are important in reducing unnecessary costs in organizations. Strategic choice theory by John Child (1972) opines that managers need to make suitable decisions that meet their organizations' needs. All the three theories are in agreement that managers in

organizations need to make suitable variety reduction choices to avoid unnecessary costs.

The element of cost has become a key operative function in many health management establishments. Sibanyoni (2021) opines that health facilities have faced several unnecessary costs as a result of acquisition of medical supplies and equipments. This then lead to increased cost of health facilities, idle equipment's and excessive medical supplies. With increasing number of varieties the hospitals face cost related challenges, lack efficiency and suffer from competitiveness in the industry. Hospitals in North Rift have been increasing in number the last 10 years while others have faced challenges and closed this is according to the Ministry of Health report 2021. According to the report, these hospitals are faced with high costs of operations. Kihara and Ngugi (2018) observe that managerial choices on variety reduction will be useful in ensuring inventory, equipment's and medical supplies are provided in an efficient and effective manner to the various users.

1.1.1 Variety Reduction Practices

Different authors have provided the definition of variety reduction. According to Galizia, ElMaraghy, Bortolini and Mora (2020), dvariety reduction is a practice of ensuring the quantity, grade and size of an inventory or equipment is stored or purchased. On the other hand, Trattner (2019) variety reduction as the depletion of items purchased or stored as an opportunity to enhance profit by minimizing the cost of materials and equipment. Lastly, Hong and Misra (2021) is a strategy used in organizations to save on inventory- related costs by minimizing the number of materials that serve the same functionality. This definition states that variety reduction practices are ways or methods that involve

minimizing on costs by ensuring that the right number, grade and size of supplies is provided to meet the user's needs.

Several authors have provided ways in which variety-reduction practices can be identified in organizations. Andersen, Haug, and Hvam (2020) opine that variety reduction practices are observed when the organization reduces the number of a given variety or standardizes some of the materials. They stated that variety reduction practices in hospitals entail reducing the number of surgical equipment that perform the same functions. On the other hand, Trattner (2019) points out that variety reduction in industrial firms entails the use of sub-assemblies, standardization, and reducing the size of the materials. Therefore, in this study, variety reduction practices will include size reduction, minimizing the number of items with the same functionality, standardization and sub-assemblies.

1.1.2. Material Control

Material control is a critical component in organization operations. Especially, in hospitals where the material control department is required provide necessary support. Different authors have defined material control Sibanyoni (2021) provides a broad definition, as the process of overseeing processes of acquiring, storage and issuance of useful materials, and including disposal and preservation of scraps and waste materials. Misahuaman, Daza and Zavaleta (2021) define it as the process in which items are distributed to the user department via stores section. Adram (2021) describes material control as the process ensuring quality, cost-effectiveness, and best delivery performance in the issuance and storage of materials.

Damola (2018) argues that material control contributes to effective performance in an organization. Several authors have outlined the different types of material control used in organizations. Bulkot (2019) outlines different types of material controls used in organizations such as scholastic inventory planning, stock management, and stock issuance techniques. While Misahuaman, Daza, and Zavaleta (2021) mention that material controls include quality control, maximum stock, minimum security stock, and re-order point. According to these authors, these aspects of material management can be categorized into five elements: cost, quality, speed, timeliness, and reliability in material provisions. In this study, material control will be measured using cost management, delivery performance, and quality management.

1.1.3 Level 4-6 Private and Public Hospitals in North Rift Region

The Kenya Health Policy Framework (KHPF) a primary framework for guiding health operations in Kenya was approved by the Government of Kenya (GOK) in the year 1994. The framework spells the short and long term strategies needed to develop Kenya's Health sector to desirable levels (MOH, 2020). MOH further developed an operationalization layout (Action plan) to ensure that Health Policy Framework implementation takes place under the Ministerial Reform Committee (MRC) in 1997 to spearhead and oversee the implementation process. Several reforms were introduced to ensure effective service delivery in the health sector. Health officials were given the autonomy to develop strategies that would enable the quality of service to be provided in their hospital. The Ministerial Reform Committee (MRC) recommended effective mechanisms for managing hospital equipment, tools, and drugs.

In the country there are more than 4700 health facilities that geographically located to serve the needs of the citizens with 51% representing public sponsored health facilities (MOH, 2021). According to the Ministry of Health (MOH), Health Management Information System (HMIS) (2021), in the North Rift, there are eight county referral hospitals, more than 18 level (4-6) hospitals, more than 86 level 3 hospitals, and more than 200 level 1 & 2 hospitals. Material control was one of the managerial decisions of the hospital staff after the reforms of 1996. Being a devolved function, some of the public health facilities and private entities are reported to have inadequate processes for managing their materials as compared to private hospitals. Some of the challenges that these entities are facing are capital costs held on stocks and fixed assets.

1.2 Research Problem

Previous experiences showed that many of the procurement staff did not give material control keen considerations. Overstocking was dominant in many organizations as a way of ensuring there were no stock outs. But recent strategic thinking has made many organizations to embrace material controls (Lenerd, 2005). Competitiveness in many of the industry has prompted 70% of the managers to adapt material control as a way of reducing costs and offer quality services (Bassin, 2014). Most organizations are unable to control increasing large number of parts, and increasing costs associated with this increase. These organizations are unable to allow large number of product types or range while maintaining profitability as this contradicts the realization of effective materials control as it leads to reduction of effectiveness (Lenerd, 2005).

Hence the result is losses realized (Sbai & Berrado, 2018). Hospitals and health facilities in North Rift region find it common practice to duplicate similar materials, parts or

products in various departments making costs incurred on a singular item higher. Moreover, there is the challenge of not being able to meet customer demands without reducing the number of part types while continuously adapting to customer demands (Sunil et al., 2008). Stock shortages are a headache for most of the regional hospitals according to Githendu, Nyamwange and Akelo (2008). This has led to complains among the various users of low performance and poor quality of services provided. The manual system adopted by much organization did not have the scholastic ability to estimate the required demand and consumption levels. Low performance standards were prevalent as replenishment of materials were done hurriedly and lack the required professionalism. This was characteristics of inadequate material control systems in organizations.

Material control is one of the methods that organizations can utilize to minimize costs and maximize revenues (Sibanyoni, 2021). Therefore, organizations are adopting strategies that ensure there is a reduction of items purchased or stored with similar functionalities. Hong and Misra (2021) outline the challenges resulting from low storage space, stock holding costs, and tied up capital, prompting organizations to identify ways to ensure the number of types, sizes, and grades of products are not duplicated during the purchasing process. However this is not achieved in health organizations because majority of them have not recognized the need to embrace techniques of reducing variety in material control.

A study by Githendu et al., (2008) showed that firms with unified centralized systems have an effective material control of stock by procuring stocks sufficient for its subsidiaries thus reducing duplication and idle stocks. The author further notes that other organizations do not consider the specific needs of their subsidiaries and therefore buy in

bulk resulting to idle stocks. This has led to more capital being tied up in stocks. The gap in this study is that it did not address variety reduction practices although it showed that it enables stocks are distributed based on time, quality and place thus meeting customer demands.

Several global and regional studies have pointed out methodological and contextual gaps. A methodological gap was observed in a correlational research study conducted by Adram (2021). Findings revealed that variety reduction processes had a significant effect on materials control. Likewise, Kihara and Ngugi (2018) found that inventory management practices such as variety reduction contribute to the performance of health facilities. The study employed qualitative data. A conceptual gap was pointed in the study by Wang, Wu, Zhao, and Zhu (2019) which found that variety reduction does not have any influence on materials management along the supply chain in hospitality industry. However, a study by Haug, and Hvam (2020) established a significant effect between variety management and supply chain in public entities.

In the case of a hospital, as cited by Sbai et al., (2018) gives examples of departments that are affected by variety reduction practices to include; wards, clinics, admission, and specialty theatres. These sections are expected to provide quality of services to their users and this means materials management is a critical component or decision through the concerned procurement and stores sections. The authors opined that material control in these departments have not been effective due to overstocking and idle equipment. Above all, literature is lacking especially in Kenya that link variety reduction to material control. Based on these knowledge gaps, the following research question was answered: influence

of variety reduction practices on material controls in level 4-6 Hospitals in North Rift Region of Kenya?

1.3 Objectives of the Study

The specific objectives were answered:

- i. To establish the extent of implementation of variety reduction practices on material control among level 4-6 Hospitals in North Rift Region of Kenya.
- ii. To test the difference of variety reduction practices on material control between levels 4-6 private and public Hospitals in North Rift Region of Kenya.
- iii. To determine the effect of variety reduction practices on material control among level 4-6 Hospitals in North Rift Region of Kenya.

1.4 Value of the Study

The study is expected to provide insightful contributions to many individuals and institutions. The findings are likely to be useful in policymaking, managerial decisions, and academic fields. Future policies can be formulated on material control and variety reduction to be part of ways that organizations in the health sector and others can benefit from reducing costs and maximizing profits.

Likewise, the findings of the study would be significant to those in authority and administration. They will use a variety of reduction practices to facilitate organization efficiency, increase productivity and material control. Procurement and supplies staff would find the study relevant in providing information that would enable them to manage, maintain, and handle cost-effective inventories to meet organization's needs.

The information would be useful in formulating daily operational procedures in purchasing and supply sections in organizations.

In academia, the findings would be useful in providing secondary data that serves several purposes. Researchers can use the findings in their literature review to identify gaps that they would fill with their studies. This is mainly for researchers with an interest in variety reduction and material control areas in procurement management. On the other hand, learners or scholars in procurement courses or units will find the content from the study useful as part of their learning reference articles.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of the literature relevant to the study. The chapter outlines theories anchoring the study, explanation of the study variables, empirical literature review; a summary of the literature; knowledge gaps and the chapter ends with the conceptual framework of the study.

2.2 Theoretical Framework

The resource dependence theory (RDT) was the primary theory. This was supported by other two theories which are transaction cost theory (TCT), and strategic choice theory (SCT). The resource dependence theory seeks to explain the importance of making strategic decisions on resources in organization. The transaction cost theory explains the various costs accruing from business transaction while strategic choice theory describes the better choices made by business transactions. These theories are discussed in detail next.

2.2.1 Resource Dependence Theory

The Resource Dependency Theory explains how resources sourced outside the organizations affect their behavior. The theory was advanced by Pfeffer and Salancik (1978). According to the theory, managers can make strategic decisions to reduce the effects of environmental uncertainties and avoid depending on them. The authors advocate "executive succession." This refers to a strategic response to environmental contingencies facing organizational performance. This means that decisions need to be independent from external influences from the environment. Lack of this strategic decision negatively affects the organization's performance.

The study benefits from the applicability of the study by describing how the procurement and supply managers in hospitals are expected to make resource strategic decisions to avoid uncertainties or dependencies from the environment. Ansmann, Vennedey, Hillen, Stock, Kuntz, Pfaff and Hower (2021) argue that this strategic decision entails employing primary ways of minimizing unnecessary costs of buying a variety of materials that serve the same purpose. Jones (2022) points out that variety reduction provides a strategic decision that those in material management can use to avoid resource dependency syndrome from externalities. By doing so, hospital managers are able to reduce risks and costs associated with an uncertain environment. Despite its strengths, the limitation of this theory is that it focuses on physical resources and not the human resources in its contributions to theoretical knowledge.

2.2.2 Transaction Cost Theory

The Transaction Cost Theory (TCT) was posited by Williamson (1979: 1986) as a economical explanation theory. The theory stipulates that the cost of transaction is minimized by having an optimum economic efficient organization structure. According to the proposer, any procurement activity constitutes several costs, including costs for controlling, monitoring, and maintaining inventories. According to Williamson (1979:86), these costs are different from production costs due to the nature in which managers can avoid them in their decision-making process. Transaction costs, including tied up capital and inventory-related costs can be eliminated by making strategic choices and decisions.

The Transaction Cost Theory is applicable in this study in providing a strategic choice for managing unnecessary costs. Hospitals can manage transactional costs by applying a

variety of reduction practices in control of their inventories or materials. Cuypers, Hennart, Silverman, and Ertug (2021) state that by performing this act, they are able to reduce stock holding costs, minimize risks, and avoid tied up capital. This, in the long run, improves their performance significantly. Chedrawi, Atallah, and Osta (2020) argue that a limitation of the theory is that it does not factor in the complexity of the market conditions in the management of inventories. Sometimes changes in market conditions might provide opportunities for improved inventories, which the theory ignores.

2.2.3 Strategic Choice Theory

Child (1972) made a contribution in strategic management by advancing the Strategic Choice Theory (SCT). The theory posits that individuals with organizational authority and power to make decisions need to make valuable strategic choices that will enhance their competitive edge. Strategic choices provide avenues for future changes and positions in organizations. According to the theory, managers need to select the most suitable strategic choices that meet the organization's needs. These decisions are subject to a number of factors affecting them directly or indirectly. These factors include environmental constraints, organizational values, time constraints, competition and internal management power relationships.

Deciding on the use of variety reduction in material controls, especially in hospitals, is a strategic choice (Mwale, 2021). Gaps exist in the use of variety reduction in hospitals, and therefore it requires those in authority to embrace it. Therefore, variety reduction would provide a valuable strategic choice for hospital managerial units. But such strategic decisions are subject to several factors and constraints pointed out by the theory.

Strategic choice theory poses a primary limitation of the sense that it entirely depends on other externalities for it to theoretically function.

2.3 Variety Reduction Practices

Variety reduction is the process of minimizing the purchased product in respect to their sizes, types, and grades. Mwale (2021) argues that organizations are focused on management of inventory to ensure efficiency and effectiveness is achieved. Variety reduction is an example of management of inventory in organizations. A number of studies have outlined some of the common types of variety reduction processes that are employed in organizations. Damola (2018) pointed product minimization, on the other hand Brun and Pero (2012) mentioned reduction of product size and merging functionality, while Hong and Misra (2021) outlined standardization and sub-assemblies. These variety reduction practices are discussed next.

Product Minimization involves reducing the number of items or materials into a few amounts. In industrial or manufacturing undertaking the product minimization involves reducing frequency of materials or items into the number that the organization can hold or store. Product minimization is important in ensuring that cost associated with materials is managed at a minimum by not holding too many stocks. A study by Brun and Pero (2012) shows that product minimization is important in ensuring organizations remain efficient in its management of inventories. Therefore, it is imperative that organizations minimize some of the products or inventories that are being held.

Reduction of product size involves resizing the product from a larger physical appearance to a smaller one. Some of the products or materials are so large that they occupy a substantial storage space and in an ideal scenario, this can be substituted by having

products with smaller sizes. Damola (2018) agrees that it is not the physical size of the item that matters but the quality of the content that is useful. Therefore, procurement managers should focus on buying materials of high quality and not emphasizing its size. Reduction of physical product size is an important element of variety reduction that an organization should employ in their inventory management operations.

The process of merging product functionality involves combining or unifying or blending two or more materials or products into one that serves a general functionality (Hong & Misra, 2021). Industrial firms merge several products that have similarity of functionality into one product aimed at improving its efficiency of operations. According to the authors merging of product functionality enables the organization to leverage on the product performance by merging several products that serve or blend together in functionality. Hong et al, (2021) showed that product merging enables the organization to reduce quantity and value of stocks currently available in the stores.

Product standardization involves the process in which an organization ensures uniformity of specifications of the products bought or stored (Damola, 2018). Standardization is a quality measure in production that ensures the products manufactured have similar features or characteristics that meet customer needs. The author states that standardization is an important aspect in variety reduction because it ensures that uniform products are bought thus avoiding holding more products with differing characteristics serving similar functions. A study conducted by Sbai and Berrado (2018) shows that standardization is an effective method in management of inventory in organization.

2.4 Material Control

The term material control is widely used in business organizations that are concerned with production of goods and services. Sibanyoni (2021) states that material control involves the procedure of ensuring that equipment's, inputs and tools are sourced stored and issued in an effective manner that ensures that there is no wastages. These activities are essentials in management of inventory required as inputs in producing viable outputs in firms. Different studies have further pointed out the components that are involved in a material control process.

Damola (2018) mentions that material control consists of quality maintenance practices that ensure organizations comply with international and national standards. According to the author, organizations focus on material control to ensure that desired results or outputs meet the needs of the users. Quality in service delivery is important in ensuring that satisfying output is achieved in organizations. Those engaged with sourcing inputs for organizations are required to formulate quality standards to ensure that other operations are not affected.

On the other hand, Bulkot (2019) states that material control consists of delivery of performance which entails providing materials, items and equipment that ensure effective and efficient delivery of services and products in organizations. Employing qualified staff contributes directly to delivery of performance. Organizations are focused on providing the necessary technical outputs and materials that will not affect the outcomes of other processes in the organization.

Misahuaman, Daza, and Zavaleta (2021) add on the elements of material control by stating that it consists of activities that are aimed at reducing costs associated with holding inventory or stocks in organizations. Products are directly affected by the pricing and therefore many organizations are focused on managing costs to ensure that they are affordable to its customers. Inventory costs are regarded as one of the costs that can be avoided by the organizations through proper planning and management.

2.5 Empirical Literature Review

The topic provides local, regional and global studies on the association existing between variety reduction and material control. A study conducted by Adram (2021) sought to establish the effect of variety reduction on effective material control. The study methodology was a case study and was conducted at Vocational Education and Training Authority (VETA), Malaysia. The vocational institutions were selected where procurement staffs were the respondents of the study. Descriptive analysis findings showed that many of the vocational institutions have a wide product variety basket for their customers aimed at accommodating customer requirements. But this is not the case, because they are faced with increased costs, poor delivery performance, and quality problems. The study further identified lack of knowledge as the hindrance to the use of variety reduction in material controls. The study recommended that variety reduction need to be employed in organizations in management of inventory. The study utilized few respondents this is a limitation in the generalization of results.

Surgical equipment's supplies and instruments management is a concern of many hospital administrators. This is according to a census study conducted by Ahmadi, Masel, Metcalf and Schuller (2019) among German hospitals in Koln. The study objective was

to establish the various inventory management techniques employed by German Hospitals in Koln. The study methodology involved the use of a descriptive research design, census study and descriptive analysis of data where 78 hospital administrators were sampled. According to the study, the findings showed that many of the supplies and instruments remain unused and idle for a longer period of time. This is attributed to poor inventory management techniques employed by hospitals, which have led to high costs, low quality, and poor delivery performance. Therefore, the study recommended that hospitals apply variety reduction as part of their inventory management techniques. Limitation of the study is that it sampled hospital administrators rather than procurement staff or both.

A local study was conducted in Kenya by Aminazahra and Chege (2020), which focused on establishing the effect of material control practices on financial performance. The objective was to establish the type of material control practices that are employed by KMC and how they affect financial performance. Correlational research design was employed by the study where simple random method was used to select samples, and questionnaire used to collect data. Data was further analyzed using inferential and descriptive statistics. The study findings showed that KMC is using variety reduction when it is dealing with specific meat stocks. This was enhancing quality and delivery performance. Inferential findings showed a positive significant effect exists between financial management and material control practices. Some of the policy implications is that organizations should adopt material control practices, especially variety reduction. A few numbers of respondents were used by the study representing the limitation.

A study was conducted in Russia among several grocery stores by Argouslidis, Skarmas, Kühn and Mavrommatis (2018). The study did seek to find out the influence of consumer reactions to a variety of grocery reductions. The study utilized survey research design, targeted customers, used survey tools and analyzed data using descriptive statistics. According to the findings, customers complain about a lack of their favorite choice. But they would be content with a good alternative offered to them by the grocery sellers. On the other hand, grocery sellers agree that variety reduction has enabled them to minimize costs and enhance quality in the delivery of the products to consumers. The study recommends suitable product variety reduction choices that suit consumer needs. The study gaps is that it focused on the customers rather than the sellers practicing variety reduction.

A research was conducted to assess the various classifications of barriers to product variety reduction among supermarkets. Battistello, Haug, Trattner, and Hvam (2021) used a case study, purposive sampling techniques and questionnaires to collect data. Respondents of the manufacturing firm in China were selected by the study in its methodology. The study established in its findings that, due to global competitive pressure, the manufacturing firm used product diversification as a strategic weapon to control its market share. Product diversification entailed having several brands of products. But this led to cash-related problems as more of its capital was tied to materials and the quality of the main brands declined significantly in the market. The research suggested that the company need to adopt an adaptive manufacturing strategy of variety reduction.

A study was conducted by Brun and Pero (2012) with the objective of measuring variety reduction along the supply chain. The descriptive research was the methodology used as a design, use of questionnaires and data analysis techniques. The study findings showed that organizations widen their product ranges but suffer from operational inefficiencies. Among some sampled groceries in Jakarta, India, the study found that variety reduction is not part of their daily managerial decisions. Variety reduction lacks in product development, distribution, and storage, which are along the supply chain. Therefore, a lack of variety has made the business of stock variety, leading to more capital held in stocks. Brun et al. (2012) recommend that business organizations should embrace variety reduction along the supply chain.

Danso, et al. (2021) conducted a study in South Africa at the Hospitality Management Department of Takoradi Technical University. One of the research objectives was to conduct an assessment of inventory management practices performed by the department. A descriptive research design was conducted; simple random sampling technique and data analyzed using descriptive statistics. Descriptive findings showed that the department was holding a variety of product ingredients and equipment. These have occupied shelves, baskets, and cupboards. Some of the ingredients have been used halfway. The respondents of the study stated that there are other ingredients serving the same roles and functionality. The study recommends that the department is not utilizing effective inventory techniques, especially variety reduction, when purchasing the ingredients to be used in the department.

Trattner (2019) conducted a study at a tertiary academic hospital across the four highest-volume surgical services. The assessment of the product variety practices in these

hospitals was the research objective. Descriptive research design was employed by the study and sampled hospitals in Denmark as its methodology. The study findings showed that majority of these hospitals in Denmark practice material controls. Findings revealing organizations have reduced the total and size of their inventories at 37% and 18% respectively. This enable the firms to save more than 1333 per annum time and \$39,995 labour costs in their operations. Consequently, more staff of these firms were satisfied with the services being offered or being provided. The study recommends that product variety practices need to be adopted in hospitals. The limitation of the study is that it used hospital administrators as the study respondents instead of procurement staff.

2.6. Summary of Empirical Review and Research Gaps

Several studies reviewed have pointed to methodological and conceptual gaps in which the current study sought to fill as summarized in Table 2.1.

Table 2.1 Summary of the Empirical Review and Research Gaps

Authors	Study Topic	Objective	Methodology	Major outcomes	Knowledge gaps	Focus of present study
Adram (2021)	Variety reduction and material control	To establish the effect of variety reduction on effective material controls.	The study employed case study research design. Descriptive and inferential statistics were used to analyze data.	Many of the vocational institutions have a wide product variety basket for their customers aimed at accommodating customer requirements.	The study utilized vocational institutions which are different from the hospitals.	The study analyze data using descriptive & inferential statistics sampling hospitals.

Table 2.1 Summary of the Empirical Review and Research Gaps

Ahmad, Masel, Metcalf and Schuller (2019)	Inventory management and surgical equipment's in hospitals	To establish the various inventory management techniques employed by German Hospitals in Koln.	The study employed correlational research design. The study analyzed data using descriptive statistics.	Many of the supplies and instruments remain unused and idle for a longer period of time leading to high costs, low quality, and poor delivery performance.	The study identified various variety reduction practices but did not link with material control.	The current study linked the variety reduction practices with material controls.
Aminazahra and Chege (2020)	Material control practices on financial performance	To establish the type of material control practices on financial performance of KMC.	The study used correlational research design,	Inferential findings showed a positive significant effect exists between material control practices and financial performance.	The study focused on material control practices and financial performance	The current study did focus on variety reduction practices and material controls.

Table 2.1 Summary of the Empirical Review and Research Gaps

Battistello, Haug, Trattner, and Hvam (2021)	Barriers of product variety reduction	To establish the various classifications of barriers to product variety reduction among supermarkets	The study used case study research design. Data was analyzed using descriptive and inferential statistics	The study established that, due to global competitive pressure, the manufacturing firm used product diversification as a strategic weapon to control its market share.	The study focused on strategic decisions employed by manufacturing firms.	The study focused on specific variety reduction practices
Brun and Pero (2012)	Variety reduction and supply chain	To measure variety reduction along the supply chain.	The study employed a descriptive research design. Data was analyzed using descriptive and inferential statistics	Those organizations widen their product ranges but suffer from operational inefficiencies. That variety reduction is not part of their daily decisions	The study will sample hospitals instead and will use the variable materials controls.	The current study sampled hospitals.

Table 2.1 Summary of the Empirical Review and Research Gaps

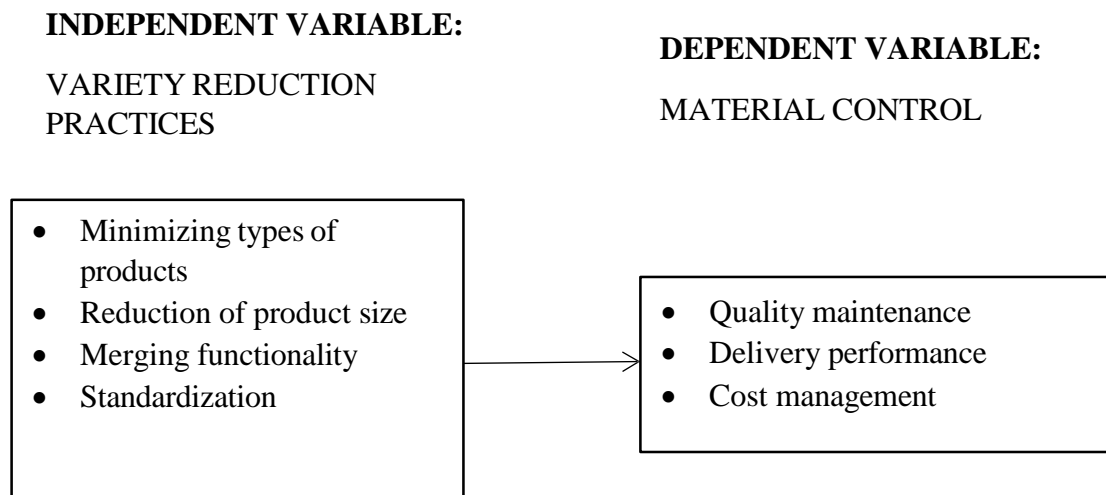
<p>Danso, B., Whyte, T. N. M., Jr, P. O. A., Fenteng, R. A., & Akyaa, L. A. (2021).</p>	<p>Inventory management practices at the hospitality Management</p>	<p>To conduct an assessment of inventory management practices performed by the department.</p>	<p>A descriptive research design was conducted; simple random sampling technique and data analyzed using descriptive statistics.</p>	<p>Descriptive findings showed that the department was holding a variety of product ingredients and equipment.</p>	<p>The study sampled firms in hospitality (hotels) industry and was focused on making an assessment of availability of equipment's</p>	<p>The current study focused on variety reduction practices instead of inventory practices</p>
<p>Trattner (2019)</p>	<p>Product variety management in process industry companies</p>	<p>To establish product variety practices in these hospitals.</p>	<p>The study employed descriptive research design. Data was analyzed using descriptive statistics.</p>	<p>Proportion of staff completely satisfied with the inventory in hospitals had increased. There is availability of variety reduction techniques.</p>	<p>The study focused on how variety reduction practices lead to satisfaction of the users instead of material controls.</p>	<p>The study linked variety reduction practices and material controls.</p>

Source: Author (2023)

2.6 Conceptual Framework

The variety reduction practice is the independent variable of the study measured by the types of products, product size, functionality and standardization. Material control is the dependent variable which is operationalized using quality maintenance, delivery performance, and cost management. Figure 2.1 diagrammatically displays the conceptual model.

Figure 2.1 Conceptual Model



Source: Author (2023)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This study methodology describes the sections in this chapter. It begins with the research design, followed by the population. Data collection methods are described, and the chapter ends with a detail of data analysis techniques.

3.2 Research Design

The study utilized descriptive cross-sectional design. According to Kothari (2004) descriptive cross-sectional design provides an opportunity to obtain information on uncertain variables' relationships across a number of chosen study groups. A study by Imbanbi (2018) utilized descriptive cross-sectional research design to obtain comprehensive information lining competitive advantage and strategic capabilities of selected companies in the Kenyan sugar belt. This information did provide comprehensive information that justified this relationship. Furthermore, the design was suitable for obtaining comprehensive information from the target population

3.3 Population of the Study

North Rift hospitals were the locations in which the study was conducted covering eight counties of Turkana, West Pokot, Elgeyo Marakwet, Baringo, Nandi, Uasin Gishu, Bungoma, and Trans Nzoia). According to the Ministry of Health approved list of 2022, there are 26 level 4-6 hospitals in North Rift Region (Appendix II) where 8 and 18 were public and private hospitals respectively. Level 4-6 hospitals were chosen because they perform procurement and supplies independently as listed by the Kenya Medical Supplies Agency (KEMSA) in Kenya. The study focused on either 26 heads of procurement or

supply officers from the 26 level 4-6 hospitals (private and public) in North Rift region. The heads were chosen because they perform strategic procurement and supply operations within their hospitals. The study did employ a census of the target population. The study did use this technique due justifying the smaller size of the target population and the different characteristics that they possess. Wanjohi (2014) opines that the census is suitable to be used in the study only if they have distinctive information they would offer

3.4 Data Collection

The primary data was collected using structured questionnaires issued to the respondents. This questionnaire was structured according to the variables of the study. They were structured according to the measurement scales (interval, nominal, and ratio) and guided by the research questions. The study respondents included either the head of supplies or procurement officers in all the respective hospitals. The respondents of the study were either 26 head of procurement or supply officers from the respective 26 level 4-6 hospitals in North Rift Region. The questionnaire was divided into sections; SectionA: background information, section B: variety reduction practices, and Section C: variety reduction practices and material controls.

Before the collection of data, a letter from the college to approve collection of data was obtained, and this was followed by allowance to collect data from the respective organizations and tests for validity and reliability being conducted. A period of 14 days is set for administering and collecting the research instruments, where before issuing the filled questionnaires, contacts and consent of the main respondents was obtained. Thereafter, the structured questionnaire was sent to the respective respondents through

their contacts. A higher response rate was obtained. This is because follow ups were conducted.

3.5 Data Analysis

The collected data from the questionnaire was filtered and coded in a statistical tool of analysis (Statistical Package of Social Sciences version 23). According to Kothari (2004), data analysis involves the conversion of data into useful information. The coded data was then analyzed using descriptive and inferential statistics. Descriptive statistics did employ frequencies, percentages, mean, and standard variance, whereas inferential statistics included the use of regression model. This statistical measure was appropriate in establishing the association between the variety of reduction practices and material controls. Independent t-test ($p < 0.05$) was used to test the significance difference of variety reduction practices and material controls between public and private hospitals in Kenya. Finally, data was presented using frequency distribution tables.

The predictive association between the study variables was tested using regression model. Several assumptions was tested before the regression model was accepted these include; linearity, homoscedasticity, multicollinearity, independence of errors and no auto-correlation. The regression model was as follows:

$$Y_i = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu_i$$

Where:

Y_i = Material control

X_1 = Product types minimization

X_2 = Product size reduction

X_3 = Merging functionality

X_4 = Standardization

β (1, 2, 3, 4) = Parameters to be estimated.

α = Constant

μ_i = error term

The objectives, methods of collecting and analyzing data were summarized in Table 3.1.

Table 3.1 Summary of Data Collection and Data Analysis Methods

Objectives	Research Instrument	Data analysis technique
To establish the extent of implementation of variety reduction practices on material control among level 4-6 Hospitals in North Rift Region of Kenya.	Questionnaire	Descriptive statistics (mean, standard deviation, percentages, and frequencies)
To test the significance of the difference of variety reduction practices on material controls between level 4-6 private and public Hospitals	Questionnaire	Inferential statistics (Independent t-test)
To determine the effect of variety reduction practices on material control among level 4-6 Hospitals in North Rift Region of Kenya.	Questionnaire	Inferential statistics (Regression model)

Source: Author (2023)

CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

The chapter provides a description of the analyzed data, presentation and discussion based on the questions from the research instrument issued to the respondents. Descriptive and inferential findings are outlined in the chapter. The study did obtain a 100% questionnaire response rate after sampling, issuing, and correctly receiving 26 instruments from the head of procurement and supplies in the targeted hospitals in the North Rift. This higher percentage of response rate was achieved by ensuring a follow up of the instruments issued is done adequately. The sections are categorized according to the research objectives.

4.2 General Information

The study provided questions to the respondents that sought to establish information related to the type of hospital, work station and experience of the employees and the main and number of materials that the hospitals are stocking in their premises. These questions were important in building a primary linkage between variety reduction practices and material controls in the hospitals.

4.2.1. Hospital and Workers Information

Respondents were provided with questions on the type of hospital, number of years and work station in which they employees are involved with in the entity. The findings of these questions were presented in Table 4.1.

Table 4.1 Hospital and workers information

Item	Response	Frequency	Percent	Valid Percent
Type of hospital	Public hospital	8	30.8	30.8
	Private Hospital	18	69.2	69.2
	Total	26	100.0	100.0
Number of Years	3 to 4 Years	14	53.8	53.8
Worked in the Hospital	Above 5 Years	12	46.2	46.2
	Total	26	100.0	100.0
Your work station	Procurement	13	50.0	50.0
	Supplies	5	19.2	19.2
	Stores	8	30.8	30.8
	Total	26	100.0	100.0

Source: Author (2023)

The findings (Table 4.1) shows that among the 26 hospitals sampled, there were more private hospitals 18 (69.2%) than public hospitals 8 (30.8%). This finding provides a comparative description of variety reduction practices between the two types of hospitals. Slightly more respondents 14 (53.8%) have worked for a period between 3 to 4 years compared to 12 (46.2%) respondents who have worked more than 5 years in the hospital. The finding showing that the respondents are experienced to understand the work dynamics and decisions which is helpful to the inquiry. The respondents were spread as follows in different work station; 13 (50%) in procurement, 5 (19.2%) in supplies and 8 (30.8%) in stores work stations. The representation of the respondents in different work station is useful in answering comprehensively the study objectives.

4.3.2. Information on Hospital Materials

The study sought to ascertain information relating to the main materials and number of materials that are being stocked in the hospital. These questions were important in establishing whether the organizations are involved with variety reduction and control of materials. Table 4.2 describes processed data.

Table 4.2 Information on Hospital Materials

Item	Responses	Frequency	Percent	Valid Percent
Main materials	Drugs	2	7.7	7.7
Stocked	Surgical equipment's	2	7.7	7.7
	Hospital Consumables	1	3.8	3.8
	All of the above	21	80.8	80.8
	Total	26	100.0	100.0
Number of materials stocked	Two	13	50.0	50.0
	More than 3	13	50.0	50.0
	Total	26	100.0	100.0

Source: Author (2023)

The findings showed that 21 respondents (representing 80.8%) agreed that they stocked all materials including; drugs, surgical equipment's, and hospital consumables. Findings shows that 2 (7.7%) and 2 (7.7%) respondents stated that the main material stocked in the hospital are drugs and surgical equipment's respectively. Furthermore, one respondent (representing 3.8%) stated that the main material stocked is hospital consumables. Findings in Table 4.2 further showed that 13 (50%) and 13 (50%) respondents stated that more than 3 materials are stocked by the hospital respectively. The findings showing that all the hospitals are stocking a variety of items meaning that variety reduction practices are a possibility for implementation.

4.4. Implementation of Variety Reduction Practices on Material Control

The first objective of the study was to establish the extent of implementation of variety reduction practices on material control among level 4-6 Hospitals in North Rift Region of Kenya. Respondents were provided with statements on variety reduction practices in the hospital in which they were supposed to rate. Table 4.3 summarized and presented the findings.

Table 4.3 Level of Agreement on Variety Reduction Practices

Statement	Mean	SD
Reduction of the types of products in the hospital is usually done.	2.3	1.3
The product resizing is usually done in the hospital.	2.4	1.7
Merging of products with the same functionality is done by the management	2.3	1.8
Standardization of the products and materials is usually done.	2.1	1.7
Composite (mean & SD)	2.3	1.6

Source: Author (2023)

Table 4.3 indicated that with a mean (standard deviation) of 2.3 (1.3) respondents showed disagreement that reduction of the types of products is done in the hospital is usually done. This shows that respondents did not agree that reduction of the types of products is performed by the staff in their hospitals. Furthermore, respondents with a mean (standard deviation) of 2.4 (1.7) disagreed that product resizing is usually done in the hospital. This shows that respondents did not agree that product resizing is being carried out in the hospital.

More of the findings showed that respondents with a mean (standard deviation) of 2.3 (1.8) showed disagreement that merging of products with the same functionality is done

by the management of the hospital. Last but not least, respondents with a mean (standard deviation) of 2.1 (1.7) did disagree that standardization of the products and materials is usually done. The composite mean (standard deviation) of 2.3 (1.6) showing level of disagreement that variety reduction practices are conducted in the hospitals. The aim of the study is to find the benefits accruing from management of materials in the hospital. These benefits in form of statement include; cost management, enhanced delivery performance to users, and quality of products and services. Table 4.4 provides a presentation of processed data.

Table 4.4 Level of Agreement on Material Controls Performance

Statement	Mean	SD
There is cost management through materials management	4.2	1.2
There is enhanced delivery performance to users of materials	4.2	1.2
Quality of services and products is enhanced by materials being offered.	4.3	1.2
Composite mean (SD)	4.2	1.2

Source: Author (2023)

Table 4.4 findings indicated that with a mean (standard deviation) of 4.2 (1.2) respondents agreed that there is cost management through materials management. Furthermore, the findings showed that respondents with a mean (standard deviation) of 4.2 (1.2) did agree that there is enhanced delivery performance to users of materials. Finally, respondents with a mean (SD) of 4.3 (1.2) did agree that quality of services and products is enhanced by materials being offered. The study with a composite mean (SD) of 4.2 (1.2) indicating that material control has been effective or beneficial in the hospitals. Many of the statements have shown that material control implemented has

benefited the hospitals in managing costs, enhancing delivery performance, and enhancing quality of services.

4.6. Differences of Variety Reduction Practices on Material Control Between Types of Hospitals.

The second study objective was to test the significance of the difference of variety reduction practices on material controls between levels 4-6 private and public Hospitals in North Rift Region of Kenya. The independent t-test ($p < 0.05$) analysis was used to test this objective. The indicator of standardization was used to represent variety reduction practices. Findings on group statistics and independent sample test were presented in Table 4.5.

Table 4.5 Group Statistics

Group Statistics					
	Type of hospital	N	Mean	Std. Deviation	Std. Error Mean
Standardization of the products and materials	Public hospital	8	1.425	1.3112	.7265
	Private Hospital	18	2.948	1.7848	.2774

Table 4.5 shows the distinctive grouping between public (1) and private (2) hospitals in reference to them performing standardization of products and materials. Table 4.6 shows independent samples test results to test the assumption that there is no difference in material controls between public and private hospitals either performing or not performing variety reduction practices.

Table 4.6 Independent Samples Test

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Standardization of the products and materials	Equal variances assumed	4.22	.062	1.08	24	.270	.7797	.734	-.649	2.578
	Equal variances not assumed			1.21	12.38	.249	.7897	.639	-.673	2.668

Findings (Table 4.6) shows that the Levene’s test has a probability greater than 0.05. This denotes that it is not significant and so the equal variance estimates are independent. At 5% significance level, the t-value at degree of freedom (24) of 1.08 is bigger than the critical value of 0.062 indicating no significant difference are apparent. Additionally, the statistical p-value less than t-table value of 2.064 which denotes that there is no significant difference in material control between public and private hospitals either performing or not performing standardization of the products. This is correlated by the 96% confidence interval which includes zero.

4.7 Predictive Effect Between Variables

The third study objective was to determine the effect of variety reduction practices on material control among level 4-6 hospitals in North Rift Region of Kenya. Multiple

regression model analysis was used to test the predictive association between the study variables. Thus data was regressed and the outcomes are explained in Table 4.7, Table 4.8 and Table 4.9.

Table 4.7 Coefficients

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	4.321	.491		8.805	.000
Reduction of types of products	.093	.257	.108	3.361	.022
Product resizing	.523	.305	.768	2.717	.001
Merging of product functionality	.297	.355	.460	2.836	.013
Standardization of the products and materials	.099	.230	.154	3.354	.039

a. Dependent Variable: material controls

The model summary explaining association between variety reduction practices and material control is summarized as follows:

$$Y_i = 4.321 + 0.093X_1 + 0.523X_2 + 0.297X_3 + 0.099X_4 + 0.491$$

Where:

Y_i = Material control

X_1 = Product types minimization = 0.093

$X_2 = \text{Product size reduction} = 0.523$

$X_3 = \text{Merging functionality} = 0.297$

$X_4 = \text{Standardization} = 0.099$

$\beta (1, 2, 3, 4) = \text{Parameters to be estimated.}$

$\alpha = \text{Constant} =$

$\mu_i = \text{error term}$

Findings in Table 4.7 shows that with $t=3.361$, $p<0.05$, reduction of the products contributes to 9.3% of a unit in material control. Likewise, at $t=2.717$, $p<0.05$, product resizing contributes to 52.3% of a unit in material controls. Furthermore, at $t=2.836$, $p<0.05$, merging of product functionality contributes to 29.7% of a unit in material control. Lastly, at $t=3.354$, $p<0.05$, standardization of the products and materials contributes to 9.9% of a unit in material control. Variety reduction practices as suggested by the model contain a relationship and influence on material control. This was proven by the p-values not exceeding 0.05 and t-values above 1.96. Furthermore, the model predicts that upon all variables being maintained at zero, the material control variable become 4.321. Model summary for the study variables is presented in Table 4.8.

Table 4.8 Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.405 ^a	.164	.005	1.1396

- a. Predictors: (Constant), Standardization, Product resizing, Reduction of types of products, Merging of product functionality
- b. Dependent variables: Material controls

Table 4.8 shows that both independent variables (Standardization, Product resizing, Reduction of types of products, Merging of product functionality) contribute to 16.4% changes in materials control. The outcome of the model indicating a slight predictive association between study variables with a large 83.6% changes is unexplained. Analysis of variance is outlined in Table 4.9.

Table 4.9 ANOVA

ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	5.342	4	1.336	1.028	.416 ^b
	Residual	27.273	21	1.299		
	Total	32.615	25			

a. Dependent Variable: Material controls

b. Predictors: (Constant), Standardization of the products , Product resizing, Reduction of types of products, Merging of product functionality

At 5% significance level, Table 4.9 shows the computed F-value (d.f=4, 21) of 1.028 is found to be bigger than the mean square critical value of 1.336. This is justified by the p-value of 0.416 being greater than 5% hence the model is not significant for explaining the predictive association between variety reduction practices and material control.

4.8 Discussion

The study did sample more private hospitals than public hospitals. This was aimed at obtaining a significant difference between the two categories of hospitals. Mwale (2021) did a similar study that made a comparison between NGOS and public entities in the implementation of strategic plans. The study sampled more public entities; this is because the public entities were assumed to have gaps in implementing strategic plans. This was

what the current study sought to achieve in its objective. Many of the respondents were found to be experienced and working in the procurement, supplies, and stores sections. According to Pero (2012), the study chose relevant respondents who are knowledgeable and experienced to obtain valid and reliable responses.

The findings revealed that many of the hospitals do not perform variety reduction practices. This contradicts the study by Yerpude and Singhal (2018), which pointed that best European hospitals have given priority strategic variety reduction practices in their sourcing and inventory management policies. This study was useful in ascertaining whether these variety reduction practices are performed, which is not the case. For example, a significant number of hospitals practice standardization, but few perform sub-assemblies. Decisions in the hospitals to purchase or store materials were found to be influenced by the specific needs of the users and the size and types of materials. This finding was supported by Preffer and Salancik (1978), who agree that similar problems on hospital management of resources are witnessed across many countries. The study pointed out similar challenges that the hospitals were facing.

Dominantly, the findings revealed that some of the variety practices, such as reduction of the types of materials, merging or resizing of products, and standardization of materials, are not being implemented in the hospitals. Other studies have also revealed that this is the case with other organizations. Ahmadi, Masel, Metcalf, and Schuller (2019) did a study among German hospitals in Koln and found that many of the supplies and instruments remain unused and idle for a longer period of time, which is attributed to poor inventory management techniques employed by hospitals, which have led to high costs, low quality, and poor delivery performance. Similarly, a study by Brun and Pero

(2012) showed that organizations that widen their product ranges suffer from operational inefficiencies, consequently leading to more capital held in stocks.

Despite many of the hospitals not implementing variety reduction practices, they were found to have agreed that material control management is beneficial. Many agreed that materials management has benefited from the quality of products and services, enhanced user delivery performance, and cost management. This finding is justified by a study conducted by Trattner (2019) at a tertiary academic hospital across the four highest-volume surgical services in Denmark. The study established that the majority of these hospitals in Denmark practice material controls, have enjoyed significant cost reductions, and have improved user satisfaction.

The study found it necessary to compare the situational problem gap that exists between public and private hospitals in the implementation of variety reduction practices. Inferential statistical findings then revealed that there is no significant difference in material control between public and private hospitals, either performing or not performing standardization of the products. Meaning neither private nor public hospitals have adequately implemented variety reduction practices. This finding fills the gap left by a study by Kihara and Ngugi (2018), which found that inventory management practices were inadequately practiced in public health facilities, but nothing was stated for private hospitals. Likewise, the study fills a gap in the study conducted by Haug and Hvam (2020), which sampled only public entities and established a significant effect between variety management and supply chain.

Lastly, the study did find a predictive association between variety reduction practices and material controls. This association was important in providing empirical evidence for strategic decision-making. Standardization, product resizing, reduction of types of products, and merging of product functionality explain a small percentage of the variance in materials control. This consistently agrees with the three theoretical frameworks anchoring the study. The resource dependency theory explains the importance of making strategic decisions on resources in organizations by implementing variety reduction practices. The hospitals depend on the resources used in running daily operations and therefore strategic decisions need to be done by them in managing inventory. On the other hand, transaction cost theory explains the various costs accruing from business transactions if strategic decisions are not made. This means if variety reduction practices are used in material controls it enables the hospitals to reduce transaction costs. Lastly, the strategic choice theory describes the better choices made by businesses to adopt better practices in their operations. This means that hospital managers are provided with viable strategic decisions to make to ensure that they adopt better practices in management of inventories.

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMEDATIONS

5.1 Introduction

The chapter outlines a summary of the findings, conclusive declarations and suggestive recommendations guided by the study objectives. The chapter provides suggestive ideas for addressing the gaps and limitations in the current study. Further, outlining suggestions that prospective researchers would utilize for future studies.

5.2 Summary of the Findings

To establish the extent of implementation of variety reduction practices among level 4–6 Hospitals in the North Rift Region of Kenya was the second study objective. The study found that a large number of hospitals standardize their materials, while many do not perform sub-assemblies. Furthermore, a large number of the respondents stated that the specific needs of users, size, and type of materials are the main factors that affect the purchase and storage of materials. In summary, the study found that variety reduction practices such as reduction of the types of materials, product resizing, merging of products, and standardization of the products and materials are not usually done in hospitals. The composite mean (SD) shows that variety reduction practices, to a greater extent, are not implemented in hospitals.

To test the significance of the difference in variety reduction practices on material controls between levels 4–6 private and public Hospitals in the North Rift Region of Kenya is the second objective. The two comparability groups in the study were public and private hospitals, guided by the measure of performance of standardization. Findings of the study revealed that no significant difference was apparent ($p > 0.05$). This denoted

that there is no significant difference in material control between public and private hospitals, either performing or not performing standardization of the products.

To determine how the variety reduction practices have an effect on material control among level 4–6 Hospitals in the North Rift Region of Kenya was the third study objective. The predictive effect between the study variables was tested using regression model. Findings as per the regression model showed that independent variables, which included standardization, product resizing, reduction of types of products, and merging of product functionality, explained 16.4% changes in materials control, which was significant, as indicated by the F-value of 1.028, p value was less than the critical value of 0.05. This indicated that variety reduction practice has a positive predictive effect on material control.

5.3 Conclusion

The conclusion is that many of the level 4–6 hospitals in the North Rift region recognize the benefits that accrue from material management but have not implemented variety reduction practices. This implementation of variety reduction practices is not only prevalent in public hospitals but is also reflected in private hospitals as well. This is because the study did conclude that there was no significant difference in material control between public and private hospitals, either performing or not performing standardization of the products.

The variety reduction practices, such as reduction of the types of materials, product resizing, merging of products, and standardization of the products and materials, were found to benefit the hospitals material control. The hospital would benefit from the

quality of products, meeting the users' needs, and reducing material-related costs. This association was attributed to the study conclusion that variety reduction practices have a significant predictive effect on material controls.

5.4 Recommendations

Organizations dealing with the provision of products and materials have been reported by empirical studies to lack the implementation of variety reduction in their strategic decisions. The study provides verified findings that would aid policymakers in developing strategic procurement and supply policies that factor in variety reduction as part of their practices. There is a need for supplies and store managers to reduce the types and sizes of their materials, as this will aid in reducing material-related costs. They can also merge some of the products or materials with similar utility features.

Hospital management or administrators are given the opportunity to rethink their strategic decisions in material, commodity, and product acquisitions. Variety reduction practices provide them with a means of reducing unnecessary costs, improving quality, and meeting user's needs. Trainings should be conducted for procurement, supply, and store staff to enable them to embrace variety reduction practices in their daily routine operations planning and execution.

Looking at the benefits that accrue from variety reduction practices, there is a need for academicians who are involved in designing curriculum and modules for learning to reconsider them. In many of the syllabuses of procurement and supply management, variety reduction is taught as a topic or terminology. There is a need for higher-learning institutions to upgrade it to an entire unit of study. This would allow future professionals

to implement it successfully for the benefit of organizations. Similarly, researchers utilize the current study gaps to conduct more studies that will build a rich knowledge on variety reduction.

5.5 Limitations of the Study

The research was able to identify certain limitations that the current study context was unable to fill. These limitations provided methodological, contextual, and conceptual limitations that cumulatively did not affect the outcome of the study. The study did sample level 4-6 hospitals rather than all other hospitals in the region; this was a methodological limitation. It was assumed that these hospitals in levels 4–6 have a variety of products and services to offer. The study did choose heads of units (procurement, supplies, and stores) to be the study respondents, locking other staff in these units. This was a methodological and contextual gap. The assumption is that these employees (top management) are involved in primary decisions in the hospitals.

The study only focused on material control or inventory management in hospitals. This was a conceptual limitation. The researcher identified variety reduction as a specific strategic decision that is not commonly utilized, while inventory management is a compulsory practice required in organizations. Material controls are specific and measurable by variety reduction practices such as resizing, standardization, merging, etc. These decisions made it possible to link the two variables.

5.6. Suggestion for Further Studies

To have a wider scope of the findings a similar study can be conducted in other organizations, especially those dealing with the manufacturing and distribution of materials. Researchers should widen the scope by increasing the number of respondents covering operative and managerial staff in procurement and supply sections. Lastly, the study was highly depended on the quantitative data, which means that future researchers should consider integrating both quantitative and qualitative data.

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Appendix I: Data Collection Letter



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FACULTY OF BUSINESS AND MANAGEMENT
SCIENCES**

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Nairobi, Kenya

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July 7, 2023

TO WHOM IT MAY CONCERN

KARANI FANUEL AHINGA – REGISTRATION NO: D61/34701/2019


This is to confirm that the above named is a Master of Business Administration Student at the faculty of Business and Management Sciences, University of Nairobi.

He is required to submit a research project report on topic: "A Variety Reduction Practices and Material Control in Level 4-6 Hospitals in North Rift Region of Kenya." We would like the student to do his project on real problems affecting firms in Kenya. We would, therefore, appreciate your assistance to enable him collect data in your organization.

The information and data required is needed for academic purposes only and will be treated in **Strict-Confidence**. A copy of the research project will be made available to your organization/firm upon request.

Your co-operation will be highly

appreciated. Thank you.


Dean's Office
University of Nairobi
Faculty of Business
and Management Science
P. O. Box 30197-00100, Nairobi

PATRICIA NGUGI

FOR DEAN, FACULTY OF BUSINESS AND MANAGEMENT SCIENCES

Appendix II: Questionnaire

Dear Respondents,

I am a student at University of Nairobi pursuing a Masters of business Administration. As part of my study, I am required to conduct a research in order to complete my studies. My research topic is ‘**VARIETY REDUCTION PRACTICES AND MATERIAL CONTROL IN NORTHRIFT HOSPITALS.**’ Your participation to this study will be useful and will be treated with the required privacy and ethics. Thank you in advance.

Participants code [Tick (√)] spaces provided.

SECTION A: GENERAL INFORMATION

1. Indicate: Public hospital [] Private hospital []
2. Indicate the number of years you have worked in the hospital?
Below 2 years []
3 to 4 years []
Above 5 years []
3. State your work station:
Procurement []
Supplies []
Stores []
4. Indicate the main materials in which your institution offers?
Drugs []
Surgical equipment's []
Hospital consumables []
All of the above []
5. State the number of materials of one kind do you stock?
One []
Two []
More than 3 []

SECTION B: VARIETY REDUCTION PRACTICES

6. Rate by ticking (√) where appropriate from the following statements that explain variety reduction practices in your hospital. Rating scale is as follows; 1=SD (strongly Disagree), 2=D (Disagree), 3=U (Undecided), 4=A (Agree), 5=SA (Strongly Agree).

Statements	5	4	3	2	1
Reduction of the types of products in the hospital is usually done.					
The product resizing is usually done in the hospital.					
Merging of products with the same functionality is done by the management					
Standardization of the products and materials is usually done.					

SECTION C: MATERIAL CONTROL

7. Rate by ticking (√) where appropriate from the following statements that explain material controls in your hospital. Rating scale is as follows; 1=SD (strongly Disagree), 2=D (Disagree), 3=U (Undecided), 4=A (Agree), 5=SA (Strongly Agree).

Statements	5	4	3	2	1
There is cost management through materials management					
There is enhanced delivery performance to users of materials					
Quality of services and products is enhanced by materials being offered.					

Appendix III: List of Hospitals in North Rift

No	HOSPITAL NAME (LEVEL 4-6)	COUNTY	TYPE
1	Race course hospital	Uasin Gishu	Private
2	Elgon View Hospital	Uasin Gishu	Private
3	Mercy Mission Hospital	Baringo	Private
4	Iten Referral hospital	Elgeyo Marakwet	Public
5	Top Hill Brain & Spine hospital	Uasin Gishu	Private
6	Moi Teaching & Referral hospital	Uasin Gishu	Public
7	Alexandria General hospital	Nandi	Private
8	Lowdwar County Referral	Lowdwar	Public
9	St. Luke Orthopedics & Trauma	Uasin Gishu	Private
10	Baringo Referral hospital	Baringo	Public
11	Royal Gardens hospital Kitale	Trans Nzoia	Private
12	Kiminini Cottage Mission Hospital	Trans Nzoia	Private
13	AIC Kapsowar mission	Elgeyo Marakwet	Mission
14	Kapsabet County Referral	Nandi	Public
15	Reale hospital	Uasin Gishu	Private
16	Barnet Memorial hospital	Baringo	Private
17	Kakuma Mission Hospital	Turkana	Mission
18	Mediheal hospital & fertility center	Uasin Gishu	Private
19	Fountain health care	Eldoret	Private
20	Kitale County Referral hospital	Trans Nzoia	Public
21	The white crescent Hospital	Nandi	Private
22	Ortum Mission Hospital	West Pokot	Private
23	Kapenguria County Referral	West Pokot	Public
24	Eldoret hospital	Uasin Gishu	Private
25	Bungoma Referral Hospital	Bungoma	Public
26	Family Care & Maternity	Trans Nzoia	Private

Source: Author (2023)

FANUEL KARANI AHINGA

ORIGINALITY REPORT NAME: DR. KIPKORIR M. CHIRCHIR

SIGN: 

Date: 16/11/2023

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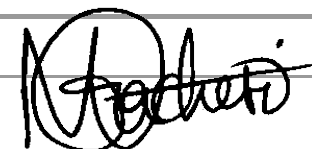
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