Procurement Practices and Quality of Food Supplies in Secondary Schools: A Case of Nairobi County, Kenya

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Abstract

This research aimed at determining Procurement Practices on Quality of Food Supplies in Secondary Schools in Nairobi County. Quality of food supplies is a global issue that this study wishes to respond to in Kenyan Secondary schools of Nairobi County. The research was guided by the following objectives: first, to investigate the relationship between e-Procurement and quality of food supplies in secondary schools in Nairobi County. Secondly, to assess the influence of supplier relationship management between suppliers and schools on quality of food supplies. Thirdly, to establish how procurement planning affect quality of food supplies and finally, to evaluate how risk management practices influence quality of food supplies in secondary schools, Nairobi County. The research used mixed method convergent parallel design. This study used total quality management theory and agency theory. The research used mixed method convergent parallel design. The researcher preferred this design since it was used to collect both qualitative and quantitative data, and it provided a better understanding of the research problem as well as build on the strengths of both qualitative and quantitative data. The study adopted a census technique since the population was small. The target population was 32 secondary schools. The study sample was 96 respondents including 32 principals, 32 procurement officers and 32 storekeepers sampled from 32 secondary schools Nairobi County. Data collection was done through interview schedules and questionnaires. Quantitative data was analyzed descriptively through the distribution of frequencies, which have been expressed in means and percentages. The results were achieved using the Statistical Package for Social Sciences (SPSS) program and presented in tables and graphs, while qualitative data was transcribed and translated into themes that support the quantitative findings through a content analysis approach. In its findings, the study revealed that e-Procurement, supplier relationship management, procurement planning, and risk management practices significantly influence quality of food supplies. The study has therefore recommended that in order to enhance quality of food supplies, schools should fully make use of e-procurement, which include e-sourcing, e-tendering and e-advertisement. In addition, there should be proper management of suppliers to ensure that they supply on time and provide quality food supplies. The procurement planning processes should be adhered to in order to ensure that no part of the process is skipped. The risks faced on procurement should be documented and minimized of eliminated. All these will ensure an efficient procurement process.

Keywords: *E-Procurement, Inspection, Procurement Practices, Quality, Supplier relationship*

1.1 Background of the Study

Quality is currently a major global issue because resources are so tightly related to humanity's and nature's well-being. Procurement best practices refers to the practices that enhance prudent use of resources, sense of accountability, financial control and improved institutional efficiency in connection with purchasing components to meet the required demands and forecasts (Adow, Edabu & Kimamo, 2020). Quality is the ability of a product or service to meet customer / user needs according to (Heizer & Render, 2016).

In Kenya, the issue of quality of food supplies has a similar trend as the rest of the world. An investigation of the relationship between price and aflatoxin contamination using data from over 900 maize flour samples from 23 different brands in eastern and central Kenya, gave an interesting finding that price of the items had a strong negative correlation with contamination (Alonso et. al, 2018). International countries are discussed before Nairobi County is discussed in order to gain a global outlook on cities and nations.

According to Bazen (2018), Russia is the world's biggest economy, and it is both ancient and new at the same time. Lawal (2018) notes that Nigeria in Africa; has 36 states, it is a federal Presidential Republic and Abuja is the Federal Capital territory. The identification of such regions are to serve as the basis for the development of a sponsored growth and balanced regional development. Nigeria has a population of 195.9 million people and 923,768km2 of the land.

Nairobi County is one of the largest cities in Kenya. It covers an area of 694.9 Square Kilometers. It has the highest number of sub Counties, that is, 17 Sub Counties. These are; Dagoretti North, Dagoretti South, Embakasi Central, Embakasi East, Embakasi South, Embakasi North, Embakasi West, Kamukunji, Kasarani, Kibra, Lang'ata, Makadara, Mathare, Roysambu, Ruaraka, Starehe and Westlands (Matara, 2020).

Secondary school is defined as an institution that provides secondary education; that is, education after primary school. It includes buildings where learning takes place (DeYoung, 2017). Nairobi County has 325 secondary schools. It comprises of 87 Public schools and 238 Private schools (Centre, 2020). There is a great need to monitor Procurement practices in schools, so as to ensure good use of the tax payer's money in public schools as well as funds received in private schools. This will boost efficiency and maximize value for money by taking into account all related costs and quality benefits in the entire procurement cycle (Prempeh & Nsiah, 2016). Nairobi County has both boarding secondary schools and day secondary schools. Because of that, food is vital in a learner's life hence demand for quality food supplies. This brings about the demand for procurement practices so that schools get quality food supplies that are good to keep students in schools all day long, at the same time food supplies that are cost effective.

Enrolment has gone higher since the ministry of education introduced National Education Management Information System (NEMIS) and 100% transition to secondary schools. School fees has gone up as well due to the current pandemic as well as increases in the cost of food. Therefore, there is need for procurement practices that will ensure quality food supplies in the schools. This study will sample 32 secondary schools in Nairobi County, Kenya for data collection purposes in evaluating the procurement practices in relation to quality of food supplies that are cost effective but caters for the wellbeing of all students and workers in these schools.

Quality of food is defined as the total sum of all properties and attributes of a food item that are acceptable to the customer. These may include texture, size, appearance, shape, gloss, color and nutritional content (Petrescu, Vermeir & Petrescu-Mag, 2020). This study seeks to evaluate procurement practices on quality of food supplies in secondary schools, Nairobi County. Schools are required to improve on quality of food supplies by spot checking on a limited, representative portion of the food supplied.

Procurement practices refers to the practices that enhance prudent use of resources, sense of accountability, financial control and improved institutional efficiency in connection with purchasing components to meet the required demands and forecasts (Edabu & Kimamo, 2020). E-procurement is defined as the process of requisition of goods and services in an institution via internet. It is part of the supply chain and it helps suppliers sell their products and services online (Rahman, Radzai, Hamdan & Musa, 2019). Having procurement plan in place, the possibility of acquiring required quality is highly achieved that is why this practice is preferred to be used for this study. Risk management is defined as the means to estimate probabilities of an unwanted outcome happening. It involves risk analysis, risk assessment and risk mitigation (Suter, 2020).

1.2 Statement of the Problem

A key concern for any learning institution is that the learners are to be properly fed with good, fresh and healthy food products. Many of these learning institutions especially boarding schools, which have to feed thousands of students, have to spend millions of money in the purchase of food. It is therefore important that purchase of food products is cost effective and at the same of quality and do not pose health risk. This call for procurement practices which are executed by well-trained officers who are able to ensure that, the kind of food purchased are sourced from reliable suppliers whose products are able to guarantee quality and those which do not pose health risk.

It is not unknown that some suppliers sell food products, which pose health risk to consumers. For instance, Maombo (2019), reported that meat and peanut butter with high levels of chemical presence and were being sold in the Kenyan supermarkets, and that vegetables irrigated by sewage water was being sold in markets in the city. Moreover, similar reports of cases of food products, which pose health, risk being sold by suppliers (Eichler, Hess, Twerenbold, Sabatier, Meier & Wieser, 2019).

The World Health Organization estimated 91 million people in Africa falling ill from consuming contaminated food every year and 137,000 die as a result. The economic costs of food-related illnesses and deaths are estimated at $95.2 billion in lost productivity and $15 billion in medical expenses in low and middle-income countries. This elicited public outcry from educational stakeholders, religious leaders and activists in the field of human rights (Maombo, 2019). Quality food supply also has effect on the health and growth of children (Demir & Brouwer, 2018). Bii and Cheboi (2020) in their study on the provision of food to primary schools and its effects on enrolment of pupils in Mara Ward, Narok, found out that the quality of food given to learners is important for their overall growth and health. This makes the current study even more relevant as the aspect of following the procurement practices enhances quality of food supplies thus prevents the unnecessary costs as well as minimize the danger of health risk as a result of poor-quality food.

1.3 Objectives of the Study

i.   To investigate the relationship between e-Procurement and quality of food supplies in secondary schools in Nairobi County.
ii. To assess the influence of supplier relationship management between suppliers and schools on quality of food supplies in secondary schools in Nairobi County.
iii. To establish how procurement planning affect quality of food supplies in secondary schools in Nairobi County.
iv. To evaluate how risk management practices influence quality of food supplies in secondary schools in Nairobi County.

2.1 Theoretical Review

The study was guided by the Total Quality Management Theory, the Agency Theory and the Concept of Supplier Relationship Management.

2.1.1 Total Quality Management Theory

The Total Quality Management Theory is considered to have originated from W. A Shewart and colleagues, Deming and Juran in 1931 (Wilkinson et al. 1998). Shewhart's definition of quality was through an account of production. This was later referred to as value generation theory which later became known as Plan-Do-Check-Act cycle (PDCA), a scientific model which became the basis for improving quality and which came to be known as the Total Quality Management Theory (Koskela, Tezel & Patel, 2019).

Jensen, Berkowicz, Hansen and Hertel (2001), observes that it is unfortunate that in most existing literatures, the concept of quality appears fragmented and ambiguous and appears to have different meanings. According to them, quality control can best be defined through its four main components are which are: quality planning, quality control and quality assurance. The business world proposes different models in order to enhance quality in their operations.

Another definition can be found in the European Quality Management Foundation (EFQM) which is a self-assessment framework for measuring the strengths and areas for improvement of an organization across all of its activities. It proposes a model of excellence, which focuses on what an organization does, or could do, to provide an excellent service or product to its customers, service users, or stakeholders (Strand & Freeman, 2015). The above is reinforced by the Investors in People Standard which is a business improvement tool designed to advance an organization's performance through its employees. The tool follows three principles which are: plan, do and review. Through the three principles, the organization plans by developing strategies to improve its performance. First, the organization does the planning, it then takes action to improve its' performance and lastly, it evaluates the impact of its investment on people especially on performance.

2.1.2 Agency Theory

Agency theory is defined as the general model of social relations that involves giving of power of control to an agent to make decisions on behalf of the principal in a business relationship (Ross 1973; Jensen & Meckling, 1976). This theory was introduced first in the field of information economics literature in order to give a theoretical model that depicts the relationship between one party (the principal) assigning work to the other party (the agent). The agency theory got attention in administrative and information system literature (Thompson, 1967; Eisenhardt, 1985).

This theory aims at explaining organizational activities by emphasizing on the correlation between the institution's (agent), and the owner of the business (principal) (Zogning, 2017).

This theory has been used in the current study to guide the researcher on seeking to understand how suppliers are engaged and maintained in the secondary schools in Nairobi County, to ensure quality of food supplies, that is, the food delivered are cost effective and are healthy and nutritious. In consideration of risk management, the agency theory shows the influence of managerial aspects in an organization on risk taking and hedging (Smith & Stulz, 1985). This theory explains a possibility of mismatch of interest between suppliers, the management, and debtors. Such a mismatch may be as a result of asymmetric earning distribution, which results in an organization taking so much risks or engaging in net value projects that are not appealing (Mayers & Smith, 1987). The agency theory proposes that institutions like schools should not give much power to their suppliers (agent) but engage them rightfully in order not to compromise the quality of food supplies required.

2.1.3 Concept of Supplier Relationship Management

Supplier Relationship Management is defined as the systematic approach to evaluating vendors that supply goods, materials and services to an organization. It is about integrating the right technology, processes, resources, and tools needed to align your organization with your suppliers so as to create stronger and more loyal relationships. It allows for greater focus on what is critically important to one's business (Hughes & Jonathan, 2008). It also helps producers to improve their relationships and costs with suppliers (ITIL, 2001).

The Supplier Relationship Management (SRM) is a new concept in the business world. Formerly before its invention in 1980, what would have been close to it in terms of suppliers relationship was described either by 'logistics' and 'joint' operations, or by similar words. Being a relatively new concept, it was developed in order to create closer and better collaborative buyer-supplier relationship management with key suppliers so as to enhance accountability within the flow of information in the supply chain (Jacob, 2012).
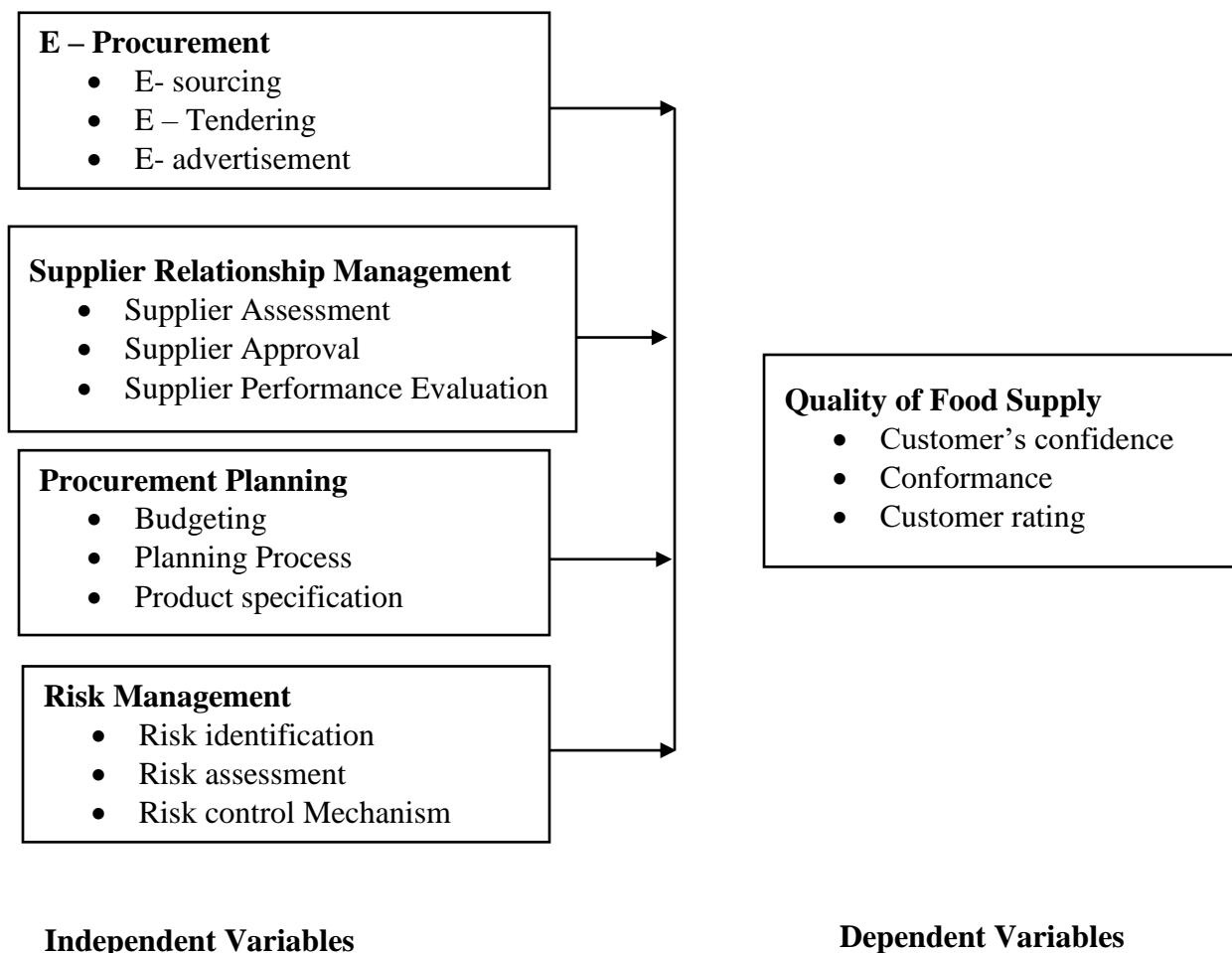
In the study, the principle of SRM was resourceful in giving insight on how to engage suppliers. Engaging the suppliers in a continuous collaborative relationship with a high level of transparency, constant optimism, improved process and increase in performance. The above will result into significant savings through lower cost of production, desired quality and lower final price of supplies. This concept helped the researcher to understand significance of the relationship between the suppliers and the customers which are the secondary schools in Nairobi County in enhancing quality food supplies in these institutions.

2.2 Conceptual Framework

This conceptual framework describes the relationship between the study's main concepts arranged in a logical structure which give a visual display of how ideas relate to each other in this study (Grant & Osanloo, 2014). It is the roadmap through which a researcher aims to follow, in order to present remedies to the perceived problems that may face effective procurement practices in secondary schools in Nairobi County (Akintoye, 2015). The study variables were conceptualized as shown (Figure 1).The Framework shows influence of procurement practices on quality of food supplies. This study considers that procurement practices have a direct impact on quality of food supply. There are several procurement practices, however this study only considers: E-procurement, Supplier Relationship Management, Procurement Planning and Risk Management

that have been proposed by (Weigel & Rucker, 2017). The researcher assessed quality of food by the customers' confidence on the product, the products' conformance with the pre-existing acceptable standards and the customers rating of the food quality after sale feedback. Also, how these variables will help in reducing running costs, efficient resource management, increased lead times and improved inventory control.

E – Procurement
- E- sourcing
- E – Tendering
- E- advertisement

Supplier Relationship Management
- Supplier Assessment
- Supplier Approval
- Supplier Performance Evaluation

Procurement Planning
- Budgeting
- Planning Process
- Product specification

Risk Management
- Risk identification
- Risk assessment
- Risk control Mechanism

Quality of Food Supply
- Customer's confidence
- Conformance
- Customer rating

Independent Variables   **Dependent Variables**

Figure 1: Conceptual Framework

2.3 Empirical Literature

This section discusses the existing research related to the impact of practices in procurement on quality of food supply. The review is presented in accordance with the research variables of which the themes of the research questions are derived. An attempt is made to criticize these studies from global, local and regional perspectives.

2.3.1 E- Procurement and Quality Food Supplies

Nabhani et al. (2018) explains that e-sourcing has many advantages. As a method, it helps in the optimization of process variance. It does this by improving costs as well as optimization of key performance indicators for suppliers in the whole sourcing process. In this way, E-sourcing enables quality improvement as suppliers of food products are subjected to assessment by the buyers.

Another advantage of E-sourcing is that it encourages green procurement since it involves less or no paper work. Neto and Caldas (2017), on their study about Green Public Procurement (GPP) recommended that one of procurement practices is the use of Green Public Procurement criteria within public and private purchasing of food products and catering services in Europe by national, regional or local governments. Their study, even carried out in Europe, has relevance to the current study on the influence of procurement practices on quality of food supplies in secondary schools, Nairobi County in its recommendation on paperless procurement processes.

Pavithra, Gracy, Saxena and Patil (2018), for example, examined the efficacy and challenges of the e-tendering marketing approach with a focus on pigeon pea in India. The scheme however was not fully implemented due to the reluctance of traders. Nevertheless, to a great extent, India uses e-tendering market approach. This approach can be adapted by secondary schools where most institutions still use the manual open tendering, which is prone to errors that could compromise supplies' quality (Kinyamasyo & Kihara, 2019).

On the same note, according to Saad (2018) in his study on challenges the open tendering system, pointed out that South Africa still faces the above challenges due to insufficient use of e-procurement, includes: infective Supply Chain Management systems, procurement documentation problems, contractual imbalance and lack of internal control mechanisms in the Public Finance Management Act. He observed that alongside the challenge of open tendering system is the lack of trained service providers, unclear service provider roles, vague project requirements, lack of trained users of e-procurement soft wares and weak procurement strategies. The findings of his study is of relevance to the present study as the scenario presented reflects a similar situation within the secondary schools in Kenya whereby the open tendering process is still operational (Buuri, 2016).

In Tanzania, the open tendering practice faces a number of challenges. According to Bryson (2018), because of the use of the open tendering system in Tanzania, the criteria used to pick suppliers in framework agreements are less competitive than those used by the Government Procurement Services Agency, the systems are still done manually (Kirama & Mayo, 2016). Rejeb and Keogh (2018) reported that the terms and conditions of contract agreements are generally not accepted by the procurement agencies and vendors.

According to Assefa (2018), the use of the latest technology, like e advertising, e-sourcing and e-tendering standard contract selection criteria, skilled and experienced procurement personnel and organized list of contractors, sub-contractors, suppliers and recorded performance are critical when it comes to quality supplies. It is worth noting that there is little data from literature that focuses on the challenges faced by secondary schools in Nairobi County in their attempts to digitize procurement and that is the concern for the current study.

2.3.2 Supplier Relationship Management and Quality of Food Supplies

Another important factor in procurement aimed at best quality products is Supplier Relationship Management which is a systematic process of evaluating vendors that supply goods, materials and services to an organization, determining each supplier's contribution to success and developing strategies to improve their performance. Supplier relationship is important in the process of procurement because of the influence suppliers have on the quality, price and reliability of delivery and accessibility of their products (Sonmez, 2016). Supplies/Goods received by the organization depend on suppliers' ability to deliver them on time and as required. In order to ensure supplies' quality, products must be of the right quality, the right price, delivered at the right time and at the

right quantity. Moreover, this call on the consumers to assess the credibility of suppliers in order to ensure quality supplies throughout the supply chain hence the need for supplier relationship management.

This study will seek to understand if secondary schools in Nairobi County assess their suppliers as part of the procurement practices criteria required in the Supplier Relationship Management. This is in order to ensure that quality is not compromised, and that obscured credibility and accountability, which ultimately results in high operating costs are, eliminated (Maina, Iravo & Ombui, 2021). Supplier Relationship Management and its supposed benefits have been widely studied as is affirmed by the existing literature, however, most of these studies do not focus on examining the direct supplier relationship management with institution's performance. Moreover, there is little research on the application and effectiveness of such connections in the third world countries (Amoako-Gyampah, Boakye, Adaku & Famiyeh, 2019). There is therefore the need to carry out extensive research on Supplier Relationship Management and its applicability, in institutions such as the secondary schools under study so as to ensure quality is not compromised, and less or no substandard supplies delivered in these schools.

Oghazi, Rad, Zaefarian, Beheshti and Mortazavi (2016), carried out a study that investigated the integration of the Supplier Relationship Management (SRM) within construction equipment industry in Europe. The study's first upstream tier was the suppliers within the construction equipment industry. The findings of this study pointed out that lack of supplier evaluation process, goal congruence, commitment, and trust between the manufacturer and its supplier are the major potential barriers to the SRM integration.

The study concluded that the SRM process integration can take place through the integration of its several sub-processes into strategic and operational characteristics. The findings of the study even though not directly focused on procurement practices in schools is resourceful to this study which aims at investigating how suppliers in schools are engaged, managed and evaluated in order to ensure that quality of food supplies is not compromised.

2.3.3 Procurement Planning and Quality of Food Supplies

Procurement planning which is described as the process of identification and selection of suppliers is a big challenge to many countries and institutions. In Tanzania, for example, a report by the World Bank pointed out that procurement budgeting is given less attention, and that there is no definite procurement planning for most government projects (World Bank, 2003). Similarly, in Ghana most entities do not carry out planning for most of the government funded projects as required by law (PPA E-Bulletin, 2012; PPA E-Bulletin, 2013; PPA E-Bulletin, 2014). For example, the Auditor General's Office, estimates that 45 % of Ministries, Departments and Agencies (MDAs) do not have Annual Procurement Plans (APP) in Ghana (Word Bank, 2010). This creates a loophole which allows the external suppliers to supply goods, works and services that are not planned for, and in this way, procurement practices and consequently, quality are compromised. In the light of the above, this study seeks to establish the existence and effectiveness of procurement planning which ensures quality of food supply in the secondary schools, Nairobi County.

In their study on procurement planning and management, Ndercaj and Ringwald (2014) found that the coordination between the legislative and institutional structure, procurement planning and management, control and integrity, contributed to the sustainability, performance, effectiveness and accountability of procurement in the public sector. They also established that the Sub-Saharan

countries are weak on procurement planning processes. Evidence of the above was in the lack of transparency and accountability, lack of competitiveness, small local businesses are not encouraged to enter the process due to lack of resources, lack of knowledge of procurement, training and professionalism, restricted use of e-acquisitions and high levels of corruption.

These problems compromise quality of supplies since procurement planning as one of the practices becomes impeded. These may be common issues that need to be addressed by those concerned in secondary Schools of Nairobi County so that quality of food supplies is achieved by the use of procurement practices. The current study is focused on schools and not to government agencies that other studies have already looked at.

According to the study by Mutoro, Makokha and Namisonge (2018), for the Kenyan government, procurement planning is an essential part of the traditional planning and it is even used at the county level. The obligation for planning at the local governments originates from Regulation 62 of the local government (PPDA, 2006) which states that, the user departments are to prepare an annual work plan for procurement based on the approved budget, which is submitted to the procurement and disposal unit to facilitate orderly execution of annual procurement activities. The Regulation further states that a procurement plan is to be integrated into the annual sector expenditure program so as to enhance financial predictability, accounting and control over procurement budgets. Nevertheless, it is also important to note that procurement plans are usually hindered by poor product specification which deters decision making and the provision of services to those who need them (Langseth, Kato, Kisubi & Pope, 1997). This study which has treated the topic of effectiveness of procurement planning in secondary schools found the theory of Procurement Planning applicable in view of influencing improvement in quality of food supplies in the institutions sampled for the study.

2.3.4. Risk Management Practices and Quality of Supplies

According to Mojtahedi and Oo (2017), risk management can effectively be achieved if consumers have proactive engagement with suppliers and other stakeholders in early phases of possible risk disaster. Risk identification at early stage especially by manufactures usually helps to avoid quality issues before the product is on the market. This study seeks to examine how suppliers can identify risks involved in food supplies in secondary schools so that such risks can be avoided early enough on the supply chain and that quality is not compromised.

Omar, Parker, Smith and Pollard (2017), carried out a research on drinking safe water in low and middle income countries. In his findings, he discovered that drinking water if not monitored regularly or well maintained, is prone to contamination. In other words, drinking water supplies may pose the danger of health risks on users if regular monitoring is overlooked.

Another study by Behzadi, O'Sullivan, Olsen and Zhang (2018) on Agribusiness supply chain risk management in New Zealand found out that supply chain risk management is a large and growing field of research. While the situation in New Zealand may be the case in many other countries, attention to it has been minimal. For instance in Kenya, agribusiness supply chain risk management seems to be a foreign concept to which little or no attention is being paid to. There is therefore need for even more attention to agribusiness so as to effectively meet the challenges associated with seasonality, supply spikes, long supply lead-times, and perishability.

Bachev (2017), in his study on Supply Chain Risk Management–Agri-Food Implications attempted to explain how risks in agri-food sector are caused are a result of consequences of

human's actions or inactions. He explains that certain human actions like agent's ignorance, which is referred to as "normal" human errors may cause risks. Such human errors include: lack of sufficient knowledge, lack of information, and training, risk-taking (retention) strategy of individuals (accepting "higher than normal" risk), mismanagement (bad planning, prevention, and recovery). Moreover, risks are deliberately caused as a result of opportunistic behavior such as pre-contractual cheating and adverse selection, or post-contractual cheating (moral hazard).

The above studies on risk management are hoped to be of help to the current study by offering insights on how to adapt risk management as one of the procurement practices which ensures that there is purchase of highest quality of food products at affordable costs which is the aim of the study.

3.0 Research Methodology

The research used convergent parallel design mixed method, an investigative approach incorporating both quantitative and qualitative elements in the same phase of the research process, weighs the methods equally, analyzes the two components independently, and interprets the results together (Creswell & Pablo-Clark, 2011). The unit of analysis were the secondary Schools while unit of observation were Principals, Procurement Officers and Storekeepers in Secondary schools in Nairobi County. Nairobi County is sub-divided into 17 Sub Counties with 325 secondary schools (Shule Zetu, 2020). Among these are 87 public schools and 238 private schools. The study targeted 10% of the 325 secondary schools and therefore targeted 32 schools as shown in Table 1 below.

Table 1: Target Population

Category	Frequency			Percent
	Day	Boarding	Total	
Public Schools	8	8	16	50%
Private Schools	8	8	16	50%
Total	16	16	32	100

The study adopted a census technique with respect to the unit of analysis which are the secondary schools in Nairobi County, Kenya. The census approach is justified since data gathered using census contributes towards gathering of unbiased data representing all individuals' opinions in the study population on a study problem (Orodho, 2009). The researcher decided to use a census since the population of 32 schools was manageable and this would give opportunity to all key respondents, in all these schools. The principals, storekeepers and the procurement officers were targeted since they are the ones directly involved in the procurement management and therefore are in the best position to have knowledge and on status of the implementation of procurement practices in the schools as well as the challenges being encountered. The sample size was as shown in Table 2 below.

Table 2: Sample Size

Respondents	Public Schools		Private Schools		
	Day	Boarding	Day	Boarding	Total
Principals	8	8	8	8	32
Procurement Officers	8	8	8	8	32
Storekeepers	8	8	8	8	32
Total	**24**	**24**	**24**	**24**	**96**

Questionnaires and interview schedules were used as data gathering instruments. Questionnaires gathered data from the procurement officers and storekeepers, because they are easy to form, easy to distribute and can collect larger amount for information of a sizeable sample volume as well as it gives enough time to fill and later can be collected. Interview plans were used on principals, this is because they were key informants of the institutions and so the researcher wanted to capture their experiences, opinions, behaviors and the phenomenon under study.

The analyzed data was interpreted and presented in form of tables. Collected data was processed and analyzed using inferential and descriptive statistics through multiple linear regression models. The presentation of quantitative data was done through tables. The study made use of the Statistical Package for Social Sciences (SPSS) version 22 with the aid of Microsoft Excel to analyze the link among the variables as shown below:

$$Y_t = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mathcal{E}$$

Where;
Y_t = Quality of food supply

X_1 = e-Procurement

X_2 = Supplier Relationship Management

X_3 = Procurement Planning

X_4 = Risk Management

α = Constant; y intercept that is, the value of y when x is equal to zero

β = Coefficients of the model,

$\mathcal{E}$ = Error term

4.0 Findings and Discussions

This section discusses the data analysis as well as the interpretation of the findings. The main objective of this study was to evaluate the relationship between procurement practices and quality of food supplies in secondary schools in Nairobi County, Kenya.

4.1 Response Rate

From a sample size of 32 principals, 32 procurement officers and 32 storekeepers. The researcher managed to interview all the 32 principals. Only 25 procurement officers and 27 storekeepers filled and returned the questionnaires. Forming a response rate of 100% for principals, 78.13% response rate for procurement officers and 84.38% response rate for storekeepers. The response rate was considered as suitable for making inferences from the data collected.

4.2 Descriptive Statistics

The respondents were requested to indicate their agreement or disagreement with the statements based on the four variables under study which were e-procurement, supplier relationship management, and procurement planning and risk management practices. Average response per variable and standard deviation were established. A 5 point Likert scale was used where 1 symbolized strongly disagree, 2 symbolized disagree, 3 symbolized neutral, 4 symbolized agree and 5 symbolized strongly agree.

4.2.1 E-Procurement

From the findings in Table 3 below, the respondents agreed that e-sourcing helps their school to collect and compare information about several suppliers so that to select the best supplier as shown by a mean of 3.654 and standard deviation of 0.668 and e-sourcing provides a faster way of identifying suppliers as shown by a mean of 3.692 and standard deviation of 0.919. However, the respondents showed a moderate agreement that their school publishes and communicates the available tenders through an online system as shown by a mean of 3.385 and standard deviation of 0.540, all tenders in their school are submitted through an online system as shown by a mean of 3.462 and standard deviation of 0.726 and e-advertisement has helped in reaching out to many people who apply for the school tenders as shown by a mean of 3.462 and standard deviation of 0.718. Most of the respondents admitted that their school has not adopted the e-sourcing method in selecting suppliers as shown by a mean of 2.519 and standard deviation of 0.191 and their school has adopted the e-advertisement to deliver information about available tenders as shown by a mean of 2.750 and standard deviation of 0.359.

Table 3: E-Procurement

Statements	1	2	3	4	5	Mean	Standard Deviation
The school has adopted the e-sourcing method in selecting suppliers	15	16	8	5	8	2.519	0.191
E-sourcing helps the school to collect and compare information about several suppliers so that to select the best supplier	1	2	20	20	9	3.654	0.668
E-sourcing provides a faster way of identifying suppliers	3	4	7	30	8	3.692	0.919
The school publishes and communicates about the available tenders through an online system	2	9	15	19	7	3.385	0.540
All tenders in the school are submitted through an online system	1	4	21	22	4	3.462	0.726
The school has adopted the e-advertisement to deliver information about available tenders	2	27	11	6	6	2.750	0.359
E-advertisement has helped in reaching out to many people who apply for the school tenders	3	3	18	23	5	3.462	0.718

4.2.2 Supplier Relationship Management

The results in Table 4 show that the respondents agreed that in their school the best suppliers are identified through a detailed assessment as shown by a mean of 3.885 and standard deviation of 0.739, their schools selects suppliers with an aim to receive quality products as shown by a mean of 3.846 and standard deviation of 0.757, in their schools supplier assessment is conducted to determine potential and existing suppliers as shown by a mean of 3.769 and standard deviation of 0.674 and in their schools only reliable suppliers are approved to provide products as shown by a mean of 3.712 and standard deviation of 0.618. However, these responses were moderate, since some schools have an established supplier evaluation plan as shown by a mean of 3.442 and standard deviation of 0.648, other schools collaborate with their suppliers for review and feedback

as shown by a mean of 3.404 and standard deviation of 0.570 and other schools measures supplier performance in terms of timely delivery and affordable cost of products as shown by a mean of 3.423 and standard deviation of 0.542. The findings concur with Oghazi, Rad, Zaefarian, Beheshti and Mortazavi (2016) who note that supplier relationship management (SRM) process integration can take place through the integration of its several sub-processes into strategic and operational characteristics as shown above.

Table 4: Supplier Relationship Management

Statements	1	2	3	4	5	Mean	Standard deviation
In our school supplier assessment is conducted to determine potential and existing suppliers	2	5	11	19	15	3.769	0.674
In our school the best suppliers are identified through a detailed assessment	2	3	12	17	18	3.885	0.739
Our school selects suppliers with an aim to receive quality products	1	5	9	23	14	3.846	0.757
In our school only reliable suppliers are approved to provide products	1	8	14	21	10	3.712	0.618
Our school has an established supplier evaluation plan	3	3	20	20	6	3.442	0.648
Our school collaborates with its suppliers for review and feedback	2	5	22	16	7	3.404	0.570
Our school measures supplier performance in terms of timely delivery and affordable cost of products	4	9	10	19	10	3.423	0.542

4.2.3 Procurement Planning

From the findings, the respondents agreed that procurement budget allows the school to allocate appropriate resources to procurement needs as shown by a mean of 3.846 and standard deviation of 0.948, procurement planning helps their school to specify the kind of products they need as shown by a mean of 3.923 and standard deviation of 0.855, in their school a procurement budget helps to determine what the school can afford depending on the set budget as shown by a mean of 3.712 and standard deviation of 0.783, their school conducts tendering process in a fair and transparency manner that meets the procurement law as shown by a mean of 3.731 and standard deviation of 0.694 and in their school a budget is prepared on the items that need to be procured as shown by a mean of 3.673 and standard deviation of 0.614. The respondents were moderate in their agreement that their school has pre-qualification procurement method that helps in the selection of qualified food suppliers as shown by a mean of 3.462 and standard deviation of 0.528 and that their school has an established procurement strategy as shown by a mean of 3.442 and standard deviation of 0.480.

Table 5: Procurement Planning

Statements	1	2	3	4	5	Mean	Standard Deviation
In our school a budget is prepared on the items that need to be procured	1	9	13	12	17	3.673	0.614
In our school a procurement budget helps to determine what the school can afford depending on the set budget	3	6	6	25	12	3.712	0.783
Procurement budget allows the school to allocate appropriate resources to procurement needs	2	4	5	30	11	3.846	0.948
Our school has an established procurement strategy	1	9	19	12	11	3.442	0.480
Our school have pre-qualification procurement method that helps them to have qualified suppliers selected for the organization	2	8	15	18	9	3.462	0.528
Our school conducts tendering process in a fair and transparency manner that meets the procurement law	2	7	8	21	14	3.731	0.694
Procurement planning helps our school to specify the kind of products they need	1	4	11	26	10	3.923	0.855

4.2.4 Risk Management Practices

From the findings in Table 6, the respondents agreed that their school carried out an assessment of potential procurement risks and their characteristics are identified as shown by a mean of 3.519 and standard deviation of 0.764. They also agreed that in their school the potential risk responses are determined as shown by a mean of 3.538 and standard deviation of 0.748, and loss reduction is adopted to control procurement risks as shown by a mean of 3.577 and standard deviation of 0.707.

The respondents were moderate in their agreement that in their school, the possible impact of procurement is determined as shown by a mean of 3.404 and standard deviation of 0.636, and that diversification is adopted to control procurement risks as shown by a mean of 3.442. And standard deviation of 0.738. They also agreed that an assessment is done on the possibility of a procurement risk occurring as shown by a mean of 3.308 and standard deviation of 0.557. The respondents disagreed that in their school the sources of procurement risks are documented as shown by a mean of 2.865 and standard deviation of 0. 409.

Table 6: Risk Management Practices

Statements	1	2	3	4	5	Mean	Standard deviation
In our school potential procurement risks and their characteristics are identified	2	7	11	26	6	3.519	0.764
In our school the sources of procurement risks are documented	2	19	20	6	5	2.865	0.409
In our school the potential risk responses are determined	1	4	18	24	5	3.538	0.748
In our school an assessment is done on the possibility of a procurement risk occurring	3	5	25	11	8	3.308	0.557
In our school the possible impact of procurement is determined	4	4	17	21	6	3.404	0.636
In our school loss reduction is adopted to control procurement risks	2	3	17	23	7	3.577	0.707
In our school diversification is adopted to control procurement risks	1	1	29	16	5	3.442	0.738

4.2.5 Quality of Food Supplies

The respondents were asked to provide information about the quality of food supplies in the secondary schools in Nairobi County. From the findings, the number of complaints about was high in 2020 at 50%, the volume of food wasted was high in 2019 at 51% and volume of food retuned to suppliers was high in 2020 at 48%. The principals were asked to indicate whether they have quality issues related to food supplies. Majority (53%) indicated they have quality issues related to food supplies. They further indicated that this does not occur very often. They indicated the quality is about the content of the food.

The principals were asked whether they think that the procurement officer and storekeeper have effectively been following the procurement practices designed for the school when dealing with food supplies. Majority 60% indicated that the procurement practices are effectively followed. This is so because a report is provided in every procurement done by the school.

The principals were asked to indicate the challenges they face in day to day carrying of the procurement practices on quality of food supplies. They indicated that they face delays and at times the suppliers deliver what has not been ordered. Another challenge is lack proper communication with the suppliers.

The principals were also asks to indicate other risks they face in their efforts to strictly implement the applicable procurement practices related to quality of food supplies. They indicated that sometimes they are required to change some procedures during procurement. Also, they change suppliers from time to time.

The principals were asked to indicate the extent to which they have helped the procurement office in addressing the challenges they encounter in the implementation of procurement practices so as to ensure quality food supplies in their school. The outcome of the responses showed that 100% had helped the procurement office.

The principals were also asked to indicate whether they have a system of professional updating for the storekeepers and procurement officers so as to help them have expertise to effectively discharge their duties. From the findings, 80% of the principals indicated that they do while 20% indicated they had not. Those principals who indicated that they organize updating program for their staff further explained that such training has helped to improve the knowledge and skills of storekeepers and procurement officers on matters on procurement. Consequently, the issues of poor quality of supplies have also been reduced to a great extent.

The principals were asked to suggest ways of improving quality of food supplies in their schools to which they made some suggestions. First, they indicated that this can be done by ensuring transparency in the procurement process. Secondly, they suggested that procurement officers need to identify the best suppliers to ensure the stable and quality delivery of food. Lastly, the schools need to make use of technology so as to ensure supplier compliance. Technology will help to record supplier performance details, easily check whether suppliers are meeting expectations and keeping up the terms of contract.

The principals were asked to indicate ways in which they motivate procurement officer and the storekeeper so as to effectively implement the procurement practices that are in place for their school. They stated that they do this by giving them a reasonable remuneration, ensuring they work in a conducive work environment and by giving them incentives such as rewarding good performance.

The principals were asked to suggest some solutions that can be applied to address the quality challenges that the procurement office is facing in their school. They indicated the need of upgrading of the procurement processes into electronic system. By using a comprehensive procurement software, the school would be able to assess new suppliers, onboard them, gain a view of all supplier-related data, track and maintain supplier relationships, reduce risks, have complete spend visibility, rule-based processes, automated processes and data-driven insights in a single platform.

The principals were asked to suggest ways in which procurement practices should be improved to enhance proper quality of food supplies. They indicated that there should be full usage of e-procurement. Automating the procurement process ensures that manual processes are eliminated; human error decreased, overall procurement efficiency increases and the school can ensure the procurement department is building value.

Table 7: Quality of Food Supplies

Statements	2018	2019	2020	2021
No of complaints	46%	41%	50%	39%
Volume of food wasted	43%	51%	45%	40%
Volume of food returned to suppliers	37%	40%	48%	35%

4.3 Inferential Statistics

Inferential statistics such as correlation analysis and regression analysis were used to assess the relationships between the independent variables. These models have been used to test results in such a way that evaluation is done to see data patterns and conclusions drawn in answering questions under the study.

4.2.1 Correlation Analysis

The correlation analysis is used to analyze the association between independent and dependent variables. The study used the Pearson Moment Correlation analysis to determine the association between the study variables. The results are as shown in Table 4.8.

The results in Table 8 revealed that there was a weak positive correlation between e-procurement and quality of food supplies as shown by r = 0.358; statistically significant p = 0.009<0.01; there was a weak positive correlation between supplier relationship management and quality of food supplies as shown by r = 0.431; statistically significant P = 0.007; there was a strong positive correlation between procurement planning and quality of food supplies as shown by r = 0.519. Statistically significant P = 0.005; there was a weak positive correlation risk management practices and quality of food supplies in the secondary schools in Nairobi County as shown by r = 0.407, statistically significant P = 0.007.

Table 8: Correlations Coefficient

		Quality of food supplies	E-procurement	Supplier relationship management	Procurement planning	Risk management practices
Quality of food supplies	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	52				
E-procurement	Pearson Correlation	.358**	1			
	Sig. (2-tailed)	.009				
	N	52	52			
Supplier relationship management	Pearson Correlation	.431	.457	1		
	Sig. (2-tailed)	.007	.007			
	N	52	52	52		
Procurement planning	Pearson Correlation	.519**	.554	.490	1	
	Sig. (2-tailed)	.005	.005	.005		
	N	52	52	52	52	
Risk management practices	Pearson Correlation	.407**	.412	.459	.378	1
	Sig. (2-tailed)	.007	.007	.007	.007	
	N	52	52	52	52	52

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

4.2.2 Regression Analysis

The study analyzed the variations of quality of food supplies in relation due to the changes of e-procurement, supplier relationship management, and procurement planning and risk management practices.

Table 9: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.808ᵃ	0.652	0.645	0.002

Adjusted R-squared was 0.645, implying that there was 64.5% variation of quality of food supplies, due to the changes of e-procurement, supplier relationship management, procurement planning and risk management practices. The remaining 35.5% imply that there are other factors that lead to quality of food supplies in the secondary schools in Nairobi County that were not discussed in the study.

Table 10: Analysis of Variance (ANOVA)

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	19.061	4	4.765	20.534	.001
	Residual	10.907	47	0.232		
	Total	29.968	51			

The analysis of variance ANOVA is used to determine whether the data used in the study is significant. From the ANOVA statistics, the processed data (population parameters) had a significance level of 0.001. This shows that the data is ideal for making conclusions on the population's parameter, as the value of significance (p-value) is less than 5%. The F calculated was greater than F critical (20.534 > 2.570). This shows that e-procurement, supplier relationship management, procurement planning and risk management practices significantly affect quality of food supplies in the secondary schools in Nairobi County.

Table 11: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.603	0.114		5.289	0.002
	E-procurement	0.213	0.089	0.190	2.393	0.006
	Supplier relationship management	0.328	0.113	0.257	2.903	0.006
	Procurement planning	0.396	0.101	0.314	3.921	0.004
	Risk management practices	0.299	0.098	0.232	3.051	0.004

The regression model was as follows:

$$Y = 0.603 + 0.213X_1 + 0.328X_2 + 0.396X_3 + 0.299X_4$$

The equation above reveals that holding e-procurement, supplier relationship management, procurement planning and risk management practices constant, the variables will significantly influence quality of food supplies as shown by constant = 0.603 as shown in Table 11 above.

The results show that e-procurement is statistically significant to quality of food supplies as shown by ($\beta = 0.213$, $P = 0.006$). This shows that e-procurement had significant positive relationship with quality of food supplies. This implies that a unit change in e-procurement will result to change in quality of food supplies in secondary schools in Nairobi County.

The findings show that supplier relationship management had significant positive relationship with quality of food supplies as shown by ($\beta = 0.328$, $P = 0.006$). This indicates that supplier relationship management is statistically significant to quality of food supplies. This implies that a unit change in supplier relationship management will result to change in quality of food supplies in the secondary schools in Nairobi County.

The results also show that procurement planning is statistically significant to quality of food supplies as shown by ($\beta = 0.396$, $P = 0.004$). This demonstrates that procurement planning had significant positive relationship with quality of food supplies. This implies that a unit change in procurement planning will result to a change in quality of food supplies in the secondary schools in Nairobi County.

The findings reveal that risk management practices is statistically significant to quality of food supplies as shown by ($\beta = 0.299$, $P = 0.004$). This shows that risk management practices had significant positive relationship with quality of food supplies. This implies that a unit change in risk management practices will result to change in quality of food supplies in secondary schools in Nairobi County.

5.0 Conclusions

The study revealed that e-procurement is statistically significant to quality of food supplies. In addition, e-procurement had significant positive relationship with quality of food supplies. The study concludes that e-procurement has a positive influence on quality of food supplies in secondary schools in Nairobi County. In its findings, the study established that supplier relationship management is statistically significant to quality of food supplies. In addition, supplier relationship management had significant positive relationship with quality of food supplies. The study concludes that supplier relationship management has a positive influence on quality of food supplies in secondary schools in Nairobi County. The study established that procurement planning is statistically significant to quality of food supplies. In addition, procurement planning had significant positive relationship with quality of food supplies. The study concludes that procurement planning has a positive influence on quality of food supplies in secondary schools in Nairobi County. The study revealed that risk management practices are statistically significant to quality of food supplies. In addition, risk management practices had significant positive relationship with quality of food supplies. The study concludes that risk management practices positively influences quality of food supplies in secondary schools in Nairobi County.

6.0 Recommendations

The study found a positive influence of e-procurement on quality of food supplies in the secondary schools in Nairobi County. The study recommends that the schools should fully adopt the e-procurement strategies. All the individuals involved in procurement should also have adequate training on how e-procurement works. This will enhance the whole procurement process.

The study revealed a positive influence of supplier relationship management on quality of food supplies in the secondary schools in Nairobi County. The study recommends that for the schools to ensure supplier relationship management, they should determine the activities to engage in with different suppliers, and planning and execution of all interactions with suppliers, in a coordinated way.

The study found a positive influence of procurement planning on quality of food supplies in the secondary schools in Nairobi County. The study recommends that the school should have a well-established procurement planning and all stakeholders should be involved in procurement planning. This enhances transparency and predictability in procurements.

The study established a positive influence of risk management practices on quality of food supplies in the secondary schools in Nairobi County. The study recommends that the schools should properly outline risks and adopt the risk management practices like risk sharing and reduction. This will enhance procurement of quality of food supplies.

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