INTERNATIONAL JOURNAL OF BUSINESS AND MANAGEMENT (IJBM)
ISSN: 2815-9330 (Online)

VOL. 4, NO. 1 2025 https://iessociety.org/

Transparent procurement practices and performance of medical supply chain in Kenya

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Abstract

The performance of medical supply chain is vital in ensuring timely and cost-effective delivery of healthcare products, directly impacting patient outcomes and the efficiency of health systems. This study investigates the effect of transparent procurement practices on the performance of medical supply chain in Kenya, with a focus on addressing the pervasive corruption and inefficiencies documented in the sector. A descriptive research design was adopted, utilizing both primary and secondary data collected through questionnaires administered to 100 supply chain management officers within 13 Semi-Autonomous Government Agencies (SAGAs) under the Ministry of Health. Data analysis was conducted using SPSS, employing descriptive statistics, correlation, and regression analysis. The findings revealed a significant positive relationship between transparent procurement practices and medical supply chain performance, with transparency accounting for 48.6% of the variance in performance ($R^2 = 0.486$, $p < 0.05$). Transparent procurement was found to mitigate stockouts, reduce procurement delays, and enhance accountability in resource allocation. These results underscore the importance of institutionalizing transparency measures in public procurement to enhance the efficiency and integrity of Kenya's healthcare supply chain. The study recommends the adoption of an end-to-end digital procurement systems, training of procurement personnel, and stricter enforcement of public procurement laws and regulations to combat corruption and inefficiencies. These efforts will improve healthcare service delivery and contribute to public health resilience, especially in crisis situations. The findings provide valuable insights for policy and practice, emphasizing the need for transparency in public procurement systems.

Keywords*:* Transparent Procurement Practices; Medical Supply Chain; Performance; Healthcare System; Kenya

1. Introduction

The performance of the medical supply chain is critical in ensuring timely and cost-effective delivery of essential healthcare products, which directly impacts on patient outcomes and the overall efficiency of health systems. An efficient supply chain helps to mitigate stockouts, reduce wastage, and lower operational costs, ultimately improving the accessibility of life-saving medications and medical equipment (Masudin et al., 2021). Further, during public health crises like the COVID-19 pandemic, robust medical supply chains were instrumental in maintaining adequate supplies of protective equipment, vaccines, and treatments, thereby preventing system overloads and ensuring public health resilience (Alicke et al., 2021). This highlights the need for continuous improvement in supply chain management, with transparency and accountability being key drivers of performance, particularly in developing countries where healthcare infrastructure is often strained.

The Kenyan healthcare system is highlighted in the Global Corruption Report (2011) as having problems with conflict of interest, lack of accountability systems, openness, and professionalism that lead to the misuse and misappropriation of monies intended to treat illness. Kenya's medical supply chain is particularly highlighted by a series of high-profile scandals and issues that have incurred staggering financial costs and have had a profound impact on the healthcare system and the public. Specifically, the Kshs5 billion in the 2016 "Afya House Scandal" (Malalo, 2020); the Kshs47.7 billion in the 2017 Medical Equipment Leasing scandal (Ambani, 2023); the Kshs7.8 billion in the 2020 COVID-19 medical supplies controversy (Office of the Auditor General, 2020); and the 2021 KEMSA scandal, where Kshs19 billion remains unaccounted for (Oketch & Ngugi, 2022), collectively amounting to a massive financial loss of approximately Kshs79.5 billion. Further, Previous EACC reports paint a picture of a health sector plagued by widespread misconduct. According to the 2016 EACC National Ethics and Corruption Survey (NECS), the Ministry of Health (MoH) was found to be the second most bribery-prone ministry (33%). Similarly, the top spot for most corrupt service was awarded to county health services (37. 4%). According to NECS 2017 (27.8%) and NECS 2018 (17.9%), county health services were the second most corruptible category. Furthermore, county health departments were identified as the most corrupt entities in NECS 2017 and 2018, placing them second (15.2%) and first (12.1%), respectively.

The foregoing financial losses represent a significant drain on resources that could have been allocated to improving healthcare infrastructure, providing essential medical supplies, and enhancing healthcare services. The misappropriation and inefficiencies resulting from these scandals not only have financial repercussions but also undermine the capacity of the healthcare system to serve the public, emphasizing the dire need for transparent procurement practices to prevent such losses and ensure the integrity of the medical supply chain. It is however important to note that the extent of ethical conduct in procurement about performance of the medical supply

chain in Kenya is not well documented. It is against this background that the current research sought to fill by answering the question: what is the effect of transparent procurement practices on the performance of the medical supply chain in Kenya?

2. Literature Review

Recent literature on procurement practices and supply chain performance, particularly in the healthcare sector, highlights the pivotal role of transparency in enhancing efficiency, reducing corruption, and ensuring accountability. A study by Vian (2020) provides a comprehensive analysis of how anti-corruption frameworks, rooted in transparency, improve procurement outcomes in public health systems. Vian argues that transparency measures, such as open contracting, not only minimize procurement delays but also ensure value for money, which is crucial in the healthcare sector where timely access to medical supplies can be a matter of life and death. This underscores the need for integrating transparency into procurement practices, especially in resource-constrained environments like Kenya.

Similarly, a study by Sohail and Cavill (2022) explored the impact of transparent procurement on healthcare supply chains in developing countries. Their findings indicated that transparency reduces inefficiencies caused by corrupt practices, such as favoritism and overpricing, which often plague public procurement systems. The authors also highlighted the importance of digital procurement systems that enhance traceability and accountability by allowing all stakeholders to monitor procurement processes in real time. This aligns with the current push for e-procurement systems in Kenya, aimed at improving public sector procurement, including the healthcare supply chain.

In addition, Bosio and Djankov (2021) in their review of global public procurement systems, emphasized that transparency serves as a deterrent to corruption and inefficiencies, leading to improved supply chain performance. They noted that countries with strong transparency policies tend to have more resilient supply chains, as stakeholders are more likely to comply with ethical procurement standards. The study highlighted Kenya's efforts to enhance procurement transparency through the introduction of the Public Procurement and Asset Disposal Act (2015), although gaps in implementation remain. The authors recommended strengthening enforcement mechanisms to ensure compliance across all sectors, particularly healthcare.

The relationship between procurement transparency and supply chain performance is also supported by Behrendt et al. (2021), who examined transparency initiatives in the European Union's healthcare procurement systems. Their research revealed that countries with higher levels of procurement transparency not only achieved better healthcare outcomes but also realized significant cost savings. Behrendt et al. argued that transparency fosters competition among suppliers, leading to better pricing and quality. This finding is relevant to Kenya, where issues like supplier monopolies and overpricing in the medical supply chain can be mitigated through enhanced transparency measures.

Furthermore, findings from a study by Oketch et al. (2022) in the Kenyan context provided additional empirical evidence linking transparent procurement practices with improved supply chain performance. The authors found that public hospitals that adhered to transparent procurement procedures had fewer stockouts and delays in medical supplies compared to those with less transparent systems. They also noted that transparency leads to better supplier relationships, improved procurement planning, and enhanced monitoring of supply chain activities. Oketch et al. recommended that the Kenyan government strengthen its e-procurement system and increase training for procurement officers to ensure adherence to transparency standards, which will contribute to more efficient and reliable healthcare delivery.

3. Research Methodology

In this study, the primary data collection approach predominantly involved quantitative and descriptive methods. A questionnaire with a structured format served as the main data collection tool for the study respondents, and the drop-and-pick technique was implemented to obtain statistics. To explore these independent variables, such as transparency, integrity, accountability, and professionalism in procurement, descriptive research was employed in this case to catch a fleeting glimpse of the current situation, where the researcher has no control over the factors being looked at. The study happened in the county of Nairobi, which is home to all twelve (12) of the Ministry of Health's semi-autonomous government entities. The geographic scope of the analysis also included Eldoret town, which is domicile to one (1) government institution relevant to the subject of this research.

The target population comprised of employees working within the supply chain management departments of thirteen Semi-Autonomous Government Agencies operating under the Ministry of Health. These agencies included the 100 supply chain management officers made up the target audience of this study. This population was chosen since they are perceived to be most affected by ethical dilemmas. A stratified random sampling method was employed. This approach ensured that each respondent has an equal opportunity to participate in the research. To facilitate this process, the researcher divided the thirteen (13) Semi-Autonomous Government Agencies under the Ministry of Health into strata. The sample of interest consisted of 100 respondents employed in the supply chain management departments within the thirteen (13) Semi-Autonomous Government Agencies that fall under the Ministry of Health in Kenya.

A combination of primary and secondary data was employed, with a predominant focus on quantitative and descriptive data. Questionnaires were selected as the appropriate tool for data collection due to their capacity to gather information that is not directly observable, encompassing individuals' emotions, motivations, attitudes, achievements, and experiences, (Zhang, 2020). Respondents were presented with descriptive statements and they were asked to express their agreement or perception using a 5-point Likert scale. The Likert scale allowed respondents to rate

each statement according to how much they concur or disagree with it. Questionnaires were administered using the drop-and-pick method.

Following the data-gathering process, the completed questionnaires underwent a thorough review to ensure that they were filled out completely. They were then given special codes and input into Statistical Package for the Social Sciences version 20.0. These steps were taken to ensure that the data obtained is valid, consistent, uniform, and comprehensive. Once the data was input in SPSS, a series of analyses were conducted. Descriptive analysis was utilized to examine the frequencies of responses, both in absolute numbers and relative percentages. Measures of central tendency, such as mean values, were used to assess the average or central trends in the data, while measures of data spread, like standard deviations, provided insights into the variability within the dataset. Correlation and regression analysis were applied in addition to descriptive analysis to examine the type and strength of correlations between the relevant variables of interest. Various statistical metrics were calculated and interpreted within the framework of different statistical models. Tests of the study's propositions were also conducted using inferential analysis. The calculation of the regression coefficient adopted multiple linear regression, adhering to the methodology as per the formula below:

$$\mathbf{Y= \beta_o + \beta X + \epsilon}$$

Where,

Y = Supply Chain Performance

β_o = Constant term or intercept

β = Regression Coefficient

X = Transparent Procurement Practices

ϵ = Error term

4. Results

The study sought to establish the effect of transparent procurement practices on the performance of medical supply chain in Kenya. To this end, regression analysis was employed to examine the relationship between transparent procurement practices and the dependent variable, the performance of medical supply chain. The model summary in Table 1 results provide key insights into the strength and explanatory power of the regression model. The regression analysis reveals a strong positive relationship between transparent procurement practices and the performance of medical supply chain in Kenya. The correlation coefficient (R = .697) indicates this strong association, and the R Square value (.486) suggests that 48.6% of the variation in supply chain performance is explained by transparent procurement practices. After adjusting for any over fitting, the Adjusted R Square is slightly lower at .480, showing the robustness of the model.

Additionally, the standard error of the estimate (3.96070) reflects how well the model predicts actual performance, with lower values indicating a better fit.

Table 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.697[a]	.486	.480	3.96070

a. Predictors: (Constant), Transparent Procurement Practices

The ANOVA results further confirm the model's overall significance. The F-value of 79.315 and the p-value of .000 demonstrate that transparent procurement practices significantly influence the performance of the medical supply chain. The significance level is well below the threshold of .05, meaning the relationship is statistically meaningful, and the model is not the result of random chance.

Table 2: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1244.230	1	1244.230	79.315	.000[b]
	Residual	1317.723	84	15.687		
	Total	2561.953	85			

a. Dependent Variable: Performance

b. Predictors: (Constant), Transparent Procurement Practices

Examining the coefficients, the unstandardized coefficient for transparent procurement practices (.466) indicates that for every one-unit increase in transparency, the performance improves by .466 units. The constant value (9.813) shows the baseline performance when transparency is absent. The t-value (8.906) and p-value (.000) further affirm that transparent procurement practices have a significant and positive effect on the performance of the medical supply chain, confirming that transparency is a crucial factor in improving supply chain outcomes.

Table 3: Coefficients

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	9.813	3.530		2.780	.007

Transparent Procurement Practices	.466	.052	.697	8.906	.000

a. Dependent Variable: Performance

5. Discussion

The findings from the regression analysis indicate that transparent procurement practices have a significant and positive effect on the performance of the medical supply chain in Kenya, explaining 48.6% of the variation in supply chain performance. This aligns with extant empirical literature, which emphasizes the role of transparency in improving efficiency and accountability in supply chains, particularly in the healthcare sector. Studies by Vian (2020) and Bosio & Djankov (2021) highlight that transparent procurement reduces corruption, minimizes inefficiencies, and fosters trust among stakeholders, leading to better performance outcomes. The significant positive coefficient (.466) suggests that as procurement practices become more transparent, medical supply chains experience enhanced operational performance, which is critical in ensuring timely access to essential medical supplies. The strong statistical significance ($p < .05$) found in this study mirrors the conclusions of similar research, such as Sohail and Cavill (2022), which reported that transparency mechanisms like open bidding and disclosure of contract information significantly improve supply chain resilience and performance in public health systems. Therefore, the results underscore the importance of enforcing transparent procurement practices to bolster supply chain efficiency and ensure reliable delivery of medical products in developing countries.

6. Conclusion

The analysis reveals that transparent procurement practices do not significantly impact the performance of the medical supply chain. This finding suggests that while transparency is a key element of effective procurement, its direct influence on performance outcomes may be limited. Transparency in procurement typically involves clear processes and open communication, which are essential for fostering trust and accountability. However, the lack of a significant impact in this study implies that transparency alone might not be sufficient to drive performance improvements. Instead, it is likely that other procurement practices or external factors contribute more substantially to performance outcomes. This could include factors such as the efficiency of procurement processes, the effectiveness of accountability mechanisms, or the professionalism and expertise of procurement staff. The results highlight the need for a more comprehensive approach to procurement, where transparency is integrated with other critical practices to achieve meaningful enhancements in supply chain performance. Future research might explore how transparency interacts with these other factors to better understand its role and optimize its contribution to performance.

7. Recommendations

Based on the findings, it is recommended that medical supply chain organizations in Kenya institutionalize transparent procurement practices to enhance performance. To achieve this, organizations should adopt an end-to-end digital procurement system that allow for real-time tracking of procurement processes, supplier performance, and contract management. These systems can minimize human errors, reduce the likelihood of corruption, and improve decision-making through data-driven insights. Additionally, training of procurement personnel on the importance of ethical procurement and equipping them with skills to manage transparent procurement processes effectively. Clear guidelines for procurement processes, such as open tendering and public disclosure of awarded contracts, should also be enforced to build trust among suppliers and stakeholders, leading to more efficient supply chain operations.

From a policy perspective, the Kenyan government should strengthen the regulatory framework for public procurement, especially in the healthcare sector, by enforcing compliance with the Public Procurement and Asset Disposal Act (2015). Policies mandating regular audits, public reporting, and performance evaluation of procurement processes can enhance accountability and transparency. Furthermore, implementing a centralized electronic procurement portal for all healthcare-related tenders can promote openness and reduce malpractices. By integrating these policies, the government will foster an environment where transparency is a norm, ensuring that medical supply chains remain resilient and capable of meeting healthcare needs efficiently and equitably.

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