



A Risk-Based Approach to Financial Implications of Procurement Fraud in Public Health Facilities

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ABSTRACT

Procurement fraud significantly threatens healthcare delivery in developing economies, yet its financial impacts are underexplored. This study examined procurement fraud in public health facilities across Ghana's Bono Region, using the fraud triangle and fraud diamond theories. A survey of 240 staff from procurement, finance, and management departments in eight districts revealed that 75.4% perceived procurement fraud as common, with inflated pricing (25.0%) and kickbacks (20.8%) most prevalent. Analysis showed strong correlations between procurement fraud and financial losses ($r = 0.872$), rising operational costs ($r = 0.928$), and reduced service quality ($r = 0.768$). Every 1% increase in procurement fraud corresponded to a 4.2% rise in financial losses. Contributing factors included weak internal controls, poor transparency, and external pressures. The study recommends robust procurement procedures, clear duty segregation, and comprehensive fraud risk management to mitigate these impacts and improve financial performance in the health sector.

Keywords: Procurement Fraud, Financial Performance, Risk Factors, Management Strategies

JEL Classifications: D73, H51, H57, G32, K42

1. INTRODUCTION

1.1. Background to the Study

Procurement entails the purchase of goods and services required for an organisation's operations (Naderpajouh et al., 2024; Suchowerska et al., 2025). Every organisation's procurement strategy aims to maximise profit by maximising resource use while minimising cash expenditure. Procurement specialists use techniques in corporate business to look for possibilities in the supplier market to buy the right goods and services in the right amount at the right price at the right time and location. Proactive planning, identification, sourcing, contracting, and contract management are used to carry out these purchases that a business needs or may need so as to achieve its strategic and commercial goals (Anane et al., 2019; Brunet, 2025).

Public officials have been known to use procurement as a primary means of embezzling public funds by conspiring with service providers and contractors to inflate contract costs in government institutions (Holmgaard et al., 2025). According to Aryee et al. (2025), the Ghanaian public sector has been plagued by bribery, fraud, corruption, treasury looting, embezzlement, resource misappropriation, concealment, false representation, and forgery. Corrupt practices thrive in public institutions due to the scope and complexity of procurement activities (Phimolsathien, 2026; Suardi et al., 2025). Businesses all over the world are susceptible to fraud in their procurement processes, which has an impact on their financial performance. Companies are vulnerable to procurement fraud because of the intricacy of the supply chain's networks. The most expensive white-collar crime is procurement fraud, which is cross-sectoral (Muñoz-Cancino and Ríos, 2025). Although there are significant direct costs, the indirect expenses,

such as the resources and time needed to address reputational damage and legal liabilities, are typically higher (Johari et al., 2023). Businesses' viability is further threatened by the possibility of procurement fraud (Suardi et al., 2025).

Procurement fraud is a type of economic crime that damages public organisations' integrity and wastes large sums of money, especially in fields like healthcare that are vital to the general welfare (Saeed and Kohler, 2024). The public procurement system's susceptibility to fraud is aggravated by several factors, including the complex relationships between bureaucratic, corporate and political stakeholders; the discretionary powers of political actors; and the ambiguity of market prices for specialised goods and services (Jama and Mohamud, 2024; Rendon and Rendon, 2022). This susceptibility is especially noticeable in the healthcare industry, where fraudulent operations frequently jeopardise purchasing necessary medical supplies and services, resulting in lower quality, higher costs, and ultimately negative effects on public health (Nsowah et al., 2024; Omata et al., 2024).

Procurement fraud has become the fastest-growing economic crime in Ghana and has overtaken traditional forms of corruption like bribery (Aryee et al., 2025). Among the major contributing factors to procurement fraud is perceived financial pressure, which can be categorised into three types: social, economic, and occupational pressure (Omata et al., 2024; Zabyelina and Pozsgai-Alvarez, 2025). The fraud diamond and fraud triangle theory identify financial pressure as one of the four key factors that impact fraudulent behaviour, along with opportunity, rationalization, and capability (Johari et al., 2023; Kagias et al., 2022). Financial pressure in public procurement can come from a variety of sources, such as the need to uphold a particular social standing, personal financial hardships, or insufficient remuneration (Anane and Kwarteng, 2019). These pressures can force procurement officials to commit fraud to reduce their financial burdens or fulfil their professional or personal objectives (Stamouli et al., 2025).

1.2. Problem Statement

According to Omata et al. (2024), procurement fraud is the second most commonly reported of the five types of economic crime and poses a serious risk to the majority of firms. About 70% of corrupt activities in Ghana are related to the procurement and provision of necessities for certain government departments, ministries, and organisations (Adjorlolo et al., 2025). According to the nation's Auditor General's Report (2024), procurement makes up 70% of public spending, of which 20% is lost to corruption. The 2021 Auditor-General Report in Ghana stated that more than 12 million cedis worth of medical equipment and medicines were lost to procurement fraud (Auditor-General Report, 2021). The same report stated that some hospitals had contracts with inflated costs without competitive bidding. The 2019 Auditor-General Report also stated that some health institutions in Ghana paid for medical supplies to non-existent vendors, and more than 50 million cedis in procurements were without proper documentation (Auditor-General Report, 2019). In addition, a World Bank (2018) study discovered that approximately 30% of procurement contracts in Ghana had irregularities such as favouritism and rigging. This shows serious problems in the Ghana Health Sector. As a result,

the effectiveness of procurement performance in the health sector is questioned and in danger of completely declining.

It is particularly astounding that research on fraudulent procurement has received so little attention in the academic community, given the seriousness of the potential harm connected to these practices. The majority of research on the topic has tended to concentrate on the causes of organisational misconduct and non-adherence to public procurement standards. Thus, this study (i) identify the forms and prevalence of procurement fraud in public health facilities in Bono Region of Ghana, (ii) investigate the effect of procurement fraud on financial performance, (iii) determine the key risk factors that enable procurement fraud, and assess fraud risk management strategies in procurement processes to alleviate financial losses.

2. LITERATURE REVIEW

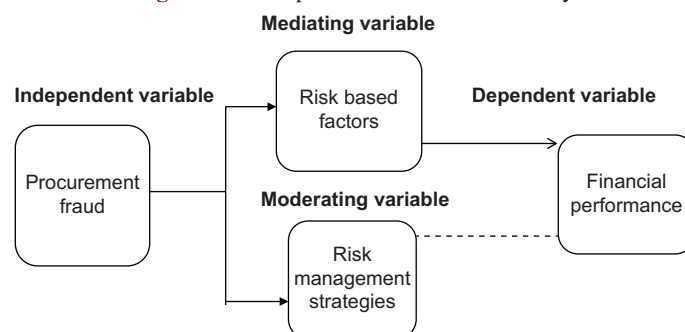
2.1. Conceptual Framework

The study's conceptual framework is categorised into independent, dependent, mediating, and moderating variables (Figure 1). The independent variable is procurement fraud in health institutions in the Bono Region of Ghana. These procurement frauds comprised inflated prices, kickbacks, bid rigging/collusion, sole sourcing abuse, product substitution where suppliers deliver substandard goods, ghost suppliers, and fake invoicing. The mediating variable is the risk-based factors, which comprise weak internal controls, lack of accountability and transparency, ethical violations and corruption, inadequate personnel and oversight, and external and systemic risks. The moderating variable is fraud risk management strategies, comprising preventive, detective, and corrective controls. Subsequently, the dependent variable in the study is financial performance, comprising loss of government/donor funding, financial losses, reduced quality of health services, delayed procurement, increased operational costs and budget shortfalls (Figure 1).

2.1.1. Procurement fraud

Procurement fraud is the deliberate use of deception to undermine any step of the procurement process in order to profit financially or harm the company (Taylor, 2022). Both insiders and outsiders to the victim organization may be involved in procurement fraud, which can happen at any point along the procure to pay process. According to research conducted worldwide, the payment stage of the procure to pay process is where fraud most frequently occurs,

Figure 1: Conceptual framework of the study



closely followed by the vendor selection and invitation of bids/quotes stages (Sánchez-Aguayo et al., 2021; Saeed and Kohler, 2024). Because procurement fraud can happen at any point in the procurement process and the perpetrators have a better awareness of the victim organization's procedure, investigating it can be challenging (Quayle and West, 2025). The author also thinks that the tight working relationships between vendors and personnel of the procurement and payment departments may present a chance for sophisticated fraud schemes against the organization through collaboration.

According to Plaček et al. (2026), fraud schemes in the procurement process are deliberately planned by the perpetrators. They gain the faith of others, then use that trust for their own gain. The fraudster starts with small-scale events before escalating them into larger ones since they believe no one is aware of them or is looking for them (Phimolsathien, 2026). Fraudsters begin as innocent people, grow more self-assured, and participate in larger schemes (Phimolsathien, 2026). According to Muñoz-Cancino and Ríos (2025), fraud is tied to human behavior, and individuals who commit this crime do it on purpose. Procurement fraud entails counterfeit goods, anticompetitive policy violations, substandard quality issues, product substitutions, falsified pricing, kickbacks, and bribes. These frauds may concentrate on the purchase of components, finished goods, services, and raw materials. Perpetrators of procurement fraud comprise rogue employees, external suppliers, and internal buyers (Salihu, 2025).

2.1.2. Risk based factors

In general, dealing with fraud necessitates identifying and evaluating the risk factors. According to Salihu (2025), there are two main types of fraud risk variables: individual and organizational factors, which include personal traits, opportunity, disciplinary measures, justice, ethical work climate, and remuneration. The authors emphasized that the fraudster's intention to commit fraud is positively impacted by these elements taken together. The individual factors include alcohol, drug dependency, external/internal pressure to steal, gambling, living above one's means, and financial hardship (Adjorlolo et al., 2025).

The organizational risk factors include weak internal controls, ineffective supervision, inadequate segregation of duties, a close relation with suppliers, high industry competition, unusual remuneration patterns, and insufficient remuneration plans (Aryee et al., 2025). Additionally, Omata et al. (2024) noted the following as possible risk areas or contributing factors to procurement fraud: (i) Regular reports of reservations of transgression by procurement personnel, (ii) low-quality and noncompetitive vendors consistently winning bids, (iii) a social bond between procurement personnel and employees of a vendor company (e.g., leisure activities or joint vacation), (iv) providing favours to vendors, (v) procurement staff turnover is high, (vi) unknown vendors recently form companies, and (vii) procurement controls are not implemented successfully. The aforementioned elements that the different scholars have noted are risk factors of procurement fraud.

2.1.3. Risk management strategies

Managers must take proactive steps to prevent fraud from happening. These risk management strategies guarantee that there are less opportunities for fraudulent acts to take place (Mwalukasa and Sallwa, 2024). Understanding the underlying causes of fraud is essential for both preventing and identifying procurement fraud. The chance to comprehend the reasons behind the scam is provided by the fraud triangle. According to Zahra (2025), the first step in stopping fraud is learning about it and how it affects the company. In their research on preventing procurement fraud in the public sector, Barimah and Mensah (2024) found that upholding a high standard of integrity in procurement requires a controlled environment that improves professionalism, transparency, and accountability. The function of internal auditors in stopping and identifying fraud was covered by Paraskeva and Tsoulfas (2025), who indicated that cash reviews, consistent internal controls, operational audits, and a strong code of sanctions against procurement personnel and suppliers are the best methods for identifying and stopping fraud.

Management role and internal controls in preventing procurement fraud are emphasized in the works of Adenodi et al. (2025). Additionally, Celestin et al. (2025) noted that management commitment is necessary to guarantee that procurement fraud is effectively addressed by detection and preventative controls. The authors contended that regular communication and engagement between management and staff would aid in spotting and averting potentially fraudulent circumstances. In addition to the cost of an investigation, legal action, and corrective measures, procurement fraud can have a very costly effect on the victim company. It also diverts management from its primary focus, which has a detrimental effect on productivity (Tshikhovhokhovho, 2024). Therefore, it is imperative that both management recognize the procurement system's susceptibility to fraud and develop a strategy to stop, identify, and handle such misbehaviour. Such a strategy should be multifaceted and integrated, encompassing program maintenance, incident response, detection, and prevention.

Top management's dedication to creating and maintaining the proper organizational culture is the first step in combating fraud. Long-term business viability and the prevention of procurement fraud depend on an honest and sincere culture (Harju et al., 2024). By demonstrating its dedication to such a course, management must also make sure that the ethical ideals of honesty are promoted and communicated to employees (Zahra, 2025).

Jama and Mohamud (2024) also recommended that fraud prevention and detection systems be established cooperatively with suitable penalties for violators. According to Zahra (2025), selecting the appropriate personnel for procurement is crucial to preventing fraud. Another strategy to stop procurement fraud is to make the correct hiring choices for important procurement roles. A great preventative method is to regularly train personnel on ethical values and do background checks (Yang et al., 2024). According to Onukwulu et al. (2024), hiring managers must perform background checks on candidates, which include criminal record check, reference check, social media search, and resume verification. The authors also recommended using integrity

and honesty exams as a pre-employment screening method. To understand the expectations and penalties for nonconformance, all staff should get policy and procedure training. These penalties ought to be severe enough to include termination and criminal prosecution (Barimah and Mensah, 2024).

Preventing fraud also requires evaluating the organization's internal controls. Internal controls are guidelines and practices developed by management and staff to guarantee the accomplishment of an organization's goal (Paraskeva and Tsoulfas, 2025). The company created internal control systems with five components: (i) Control environment; (ii) control activities; (iii) risk assessment; (iv) information and communication; and (v) monitoring activities. According to Zahra (2025), the controls safeguard assets from misuse and theft, guarantee accurate and consistent financial reporting, and ensure adherence to relevant regulations. According to Tshikhovhokhovho (2024), it is essential to routinely evaluate the efficacy and sufficiency of the internal control system in order to find and fix any flaws that allow fraud. More accountability in resource management improves operational efficiency and deters fraud when internal controls are strong (Celestin et al., 2025). Stronger control systems, according to Jama and Mohamud (2024), increase adherence to established procedures and policies and discourage personnel from acting unethically (Adenodi et al., 2025). However, a deficiency in the control systems makes fraud possible, which lowers the company's market value and sales (Mwalukasa and Sallwa, 2024). According to Zahra (2025), a strong internal control system is ultimately an assurance tool for attaining optimal performance and shielding a business from unforeseen circumstances, such as a decrease in fraudulent activity.

The implementation of a whistleblower policy is one of the internal control strategies to prevent and manage fraud. According to Tshikhovhokhovho (2024), such a policy is an efficient way to gather information about employees regarding illicit activities like fraud. An efficient whistleblower system allows managers to identify fraudulent procurement practices. (Onukwulu et al., 2024). To encourage others to utilize the channel, it must be sufficient to hide the identity of the whistleblower. In order to protect themselves from victimization and reprisal, the majority of employees could prefer that the reporting channels be handled by a third party outside the company (Harju et al., 2024). According to Adenodi et al. (2025), an efficient whistleblower system aids to boosts employee loyalty, detection of financial losses and fraud, and protects the company's reputation.

Another efficient way to identify and stop procurement fraud is to conduct routine audits of procurement processes and systems (Mwalukasa and Sallwa, 2024). To assess procedural adherence, the company should use both internal and external auditors. If workers are aware of these audits, they would not commit fraud. In order to identify tampering or alterations, Paraskeva and Tsoulfas (2025) recommended conducting surprise audits on information systems. Although using auditors as a fraud prevention strategy may be advantageous, it must be supplemented with additional controls because auditors may eventually be compromised (Paraskeva and Tsoulfas, 2025).

2.2. Theoretical Framework

Various authors have provided two main theories underlining the act of fraud by individuals. These theories are the fraud triangle theory and fraud diamond theory.

2.2.1. The fraud triangle theory

Fraud Triangle Theory explains that 3 components must be available for an individual to perform fraud, which include perceived pressure/incentive/motive; opportunity to commit fraud and rationalisation on the part of the fraudsters (Sánchez-Aguayo et al., 2021).

Perceived pressure/motive: is related to the motivations that result in unethical actions. Every perpetrator of fraudulent activity is confronted with some forms of force to commit immoral behaviour. For example, financial pressure has an impact on the motivation of employees, and regarded as the most common type of pressure (Plaček et al., 2026). In the current study, underfunded hospital may partake in fraudulent procurement practices (such as fake purchases and inflating prices) to cover budget deficits. Procurement staff may take advantage of the system for personal gain through corruption incentives or low wages. Embezzled funds decrease the resources available for medical supplies, resulting in liquidity shortages and higher operational costs.

Perceived opportunity: emanates when the fraudsters find a way to use their position to solve their financial problem when they know they are not likely to be caught (Quayle and West, 2025). In the corporate sector, opportunities are created by ineffective control or governance system that allows an individual to commit fraud. In many instances, the lower the risk of being caught, the more probable that fraud will occur. In this study, conspiracy between hospital personnel and suppliers' poor record-keeping, and lack of procurement oversight create dodges for fraud such as bid-rigging and ghost vendors. Some hospitals may not have standardized electronic procurement systems, and this increases risks of fraud. Fake transactions result in decreased budget efficiency, audit losses, and overstated costs, weakening fiscal sustainability.

Rationalisation: This is a justification to commit fraud because the individual lacks integrity. In the current study, hospital personnel may rationalize fraud giving excuses such as insufficient salary. If fraud is normalized, staff regard fraud as a survival strategy, and not a crime. Fraud when committed repeatedly increases audit costs, wear down trust in financial reporting, and may bring about sanctions or donor fund withdrawal.

2.2.2. The fraud diamond theory

The study is underpinned by the fraud diamond theory. The fraud diamond theory elements are interconnected to the level that a worker cannot perpetuate fraud until all of the essentials are available (Abdullahi et al., 2015; Salihu, 2025). These essential elements are capability, position, intelligence/creativity/ego, and coercion, deceit and stress. Capability is the position of having the necessary abilities and skills to commit fraud. Sujana et al. (2019) explain that capability is an instance where the fraudster knows of a particular fraud opportunity and can turn it into reality. The position or function of an individual in an organisation may

provide the capability to abuse or generate an opportunity for fraud not available to others (Muñoz-Cancino and Ríos, 2025). Regarding the intelligence, a fraudulent person is an individual who understands and is capable of manipulating internal control weaknesses and using the position; function or authorised access to their benefit (Lamawitak and Goo, 2021). In terms of the coercion, deceit and stress, a successful fraudster can force others to commit or conceal the fraud (Ratmono and Frendy, 2022).

In applying fraud diamond theory to the study, chronic underfunding of hospitals may compel personnel to partake in deceitful procurement practices to get vital medical supplies. Lack of benefits and low salaries may inspire procurement staff to agree to take kickbacks from suppliers. Misused funds decrease the resources available for patient care, resulting in liquidity crises and higher costs. Conspiracy between procurement personnel and vendors, poor documentation, and absence of electronic procurement systems enable fraud. Some hospitals work with minimal scrutiny, and this increases the risks of fraud. Fraudsters must have the confidence, authority, and expertise to take advantage of weaknesses.

2.3. Hypothesis

Based on the reviewed literature, the following hypothesis have been suggested:

- Null hypothesis: Procurement fraud has no significant effect on hospitals' financial performance
- Alternative hypothesis: Procurement fraud has significant effect on hospitals' financial performance.

3. METHODOLOGY

3.1. Research Approach

This study collected quantitative data. The quantitative research technique entails post-positive assertions for knowledge development, including the use of measurement and observation, cause and effect reasoning, breaking down the phenomena into particular hypotheses, variables, and questions, and testing ideas. Quantitative data was used since it lessened the bias of researchers. This is because data were derived from numerical measures, and the exact measurements are provided by numerical data such as percentages and frequencies. Findings from quantitative data can be extrapolated to larger populations thanks to large sample sizes. Moreover, in quantitative research, external validity is enhanced by the random sampling method. Advanced statistical tests (such as regression) were able to find patterns and relationships with the use of quantitative data.

3.2. Research Design

This study adopted a cross-sectional explanatory research design using a quantitative survey approach to examine the financial implications of procurement fraud in public health facilities in the Bono Region of Ghana.

The explanatory research design was considered appropriate because the study sought not only to describe the prevalence and forms of procurement fraud but also to establish causal relationships between procurement fraud and financial performance indicators

in public health institutions. Specifically, the design enabled the researcher to investigate how procurement fraud influences financial losses, operational costs, budget shortfalls, delayed procurement processes, and healthcare service quality.

The study employed a cross-sectional design, where data were collected from respondents at a single point in time. This design was suitable because it allowed for the efficient collection of data from multiple public health facilities simultaneously, thereby providing a snapshot of procurement fraud practices and their financial consequences within the selected period.

A quantitative survey strategy was adopted because it permits objective measurement of variables through structured questionnaires and supports statistical analysis for hypothesis testing. The use of quantitative methods enhanced the reliability, objectivity, and generalizability of findings across public health facilities in the Bono Region.

The explanatory design was further justified because the study examined relationships among:

- Independent variable: Procurement fraud
- Dependent variable: Financial performance
- Mediating variable: Risk-based factors
- Moderating variable: Fraud risk management strategies.

To analyse these relationships, descriptive statistics were used to identify the forms and prevalence of procurement fraud, while inferential statistical tools such as Pearson correlation, multiple regression, and logistic regression were employed to determine the magnitude and direction of relationships among the variables.

The design was appropriate for testing the study hypothesis:

H_0 : Procurement fraud has no significant effect on hospitals' financial performance

H_1 : Procurement fraud has a significant effect on hospitals' financial performance.

Overall, the research design provided a systematic framework for generating empirical evidence on procurement fraud and its financial implications, while supporting valid conclusions and policy recommendations for improving procurement governance in Ghana's public healthcare sector.

3.3. Population and Sampling

The study's population was chosen using inclusion and exclusion criteria. The inclusion criteria comprised public hospitals in the Bono Region of Ghana. The study excluded public hospitals outside the Bono Region of Ghana. The Bono Region of Ghana has 12 administrative districts. The major hospitals in the 12 districts served as the study population. However, there were no major (district) hospital in four of the districts, limiting the study to eight district (major) hospitals. After selecting the hospitals, the purposive sampling method was employed to restrict the sample to personnel from the procurement department (including supply chain personnel), the finance and accounting departments, the administration, the internal audit and compliance departments, and senior management. The Yamane formula was used to calculate a

sample size of 240 personnel from the sampled hospitals for the study, as shown in Table 1.

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

Where n denotes the sample size, N denotes the study population, and e indicates the desired precision, which is 0.05.

Sample selection from the hospitals		
Hospital	Total population	Sample size
Dormaa Hospital	38	$n = \frac{38}{1 + 38 (0.05)^2} = 35$
Berekum Hospital	32	$n = \frac{32}{1 + 32 (0.05)^2} = 30$
Banda Ahenkro Hospital	29	$n = \frac{29}{1 + 29 (0.05)^2} = 27$
Tain Hospital	29	$n = \frac{29}{1 + 29 (0.05)^2} = 27$
Sunyani Municipal Hospital	44	$n = \frac{44}{1 + 44 (0.05)^2} = 40$
Wenchi Hospital	30	$n = \frac{30}{1 + 30 (0.05)^2} = 28$
Drobo Hospital	28	$n = \frac{28}{1 + 28 (0.05)^2} = 26$
Sampa Government Hospital	29	$n = \frac{29}{1 + 29 (0.05)^2} = 27$
Total	259	240

3.4. Sources of Data

Research data sources can be broadly categorised into primary and secondary. Primary data comprises information obtained directly by the researcher using approaches like surveys, interviews, observations, or experiments (Prada-Ramallal et al., 2018). In contrast, secondary data is information that others have already gathered for different purposes. This type of information includes databases, government reports, archive documents, and ongoing research investigations. This study used primary data sources.

3.5. Data Collection Method

A structured questionnaire was employed to gather primary data for the study. The researchers used a 5-point Likert scale to gauge the responses, with 1 denoting strongly disagree or very ineffective and 5 denoting strongly agree or very effective. There were five parts to the questionnaire. Part one was developed to gather data on the study participants' demographics. Part two was developed to collect information on the forms and prevalence of procurement fraud in public health facilities in the Bono Region of Ghana. The third part was developed to collect information on the effect of procurement fraud on financial performance, while the fourth part collected data on the key risk factors that enable procurement fraud

Table 1: Demographics of respondents

Profile	Frequency	Percentage
Position/department		
Procurement	75	31.2
Finance/Accounting	46	19.2
Senior management	53	22.1
Internal audit	26	10.8
Administration	40	16.7
Working experience		
<5 years	53	22.1
5-10 years	67	27.9
More than 10 years	120	50.0
Gender		
Male	61	25.4
Female	179	74.6
Educational level		
Diploma	46	19.2
Graduate	157	65.4
Postgraduate	37	15.4
Age (years)		
21-30	24	10.0
31-40	50	20.8
41-50	105	43.8
51-60	61	25.4

Source: Field Survey

in public health facilities. Moreover, the final part was developed to collect data on fraud risk management strategies in procurement processes to alleviate financial losses.

3.6. Validity and Reliability Measures

The questionnaire underwent rigorous validation through: - Content validity: Expert panel review by three procurement specialists and two healthcare administrators - Construct validity: Exploratory factor analysis (KMO = 0.812, Bartlett's test $P < 0.001$) - Reliability: Cronbach's alpha coefficients ranged from 0.78 to 0.91 across constructs - Test-retest reliability: Pilot study with 30 respondents showed 0.89 correlation over a 2-week interval.

3.7. Data Analysis

The study employed both inferential and descriptive statistics to analyse the collected information with the aid of the Statistical Package for Social Science (SPSS) Version 21. Descriptive statistics such as percentages and frequencies were used to identify forms and the prevalence of procurement fraud. In investigating the effect of procurement fraud on financial performance, correlation analysis was employed to measure the direction and strength of the association between the occurrence of fraud and financial performance. In determining the key risk factors that enable procurement fraud, logistic regression analysis and Likert scale analysis were used to determine the risk factors that mostly influence the occurrence of fraud. Finally, Likert scale analysis using mean scores was carried out to assess fraud risk management strategies in procurement processes.

3.8. Ethical Considerations

The rights and welfare of research participants were safeguarded, and the research was carried out with honesty, openness, and adherence to ethical standards. Prior to conducting the study, the researcher first requested approval from the selected hospitals.

Before distributing the questionnaire, permission was requested from the research participants. In addition, every journal, newspaper, book, and article that was consulted for the study was cited.

4. RESULTS

4.1. Demographic Characteristics of the Respondents

The demographic characteristics of the respondents assessed in the study were the position/department of the respondents, educational qualification, working experience, gender, and age (Table 1).

The study showed that the respondents were evenly distributed among the various departments selected for the study. Seventy-five (75) respondents, representing 31.2%, were from the procurement department, 53 respondents, representing 22.1% were from senior management, 46 respondents, representing 19.2%, were from the finance/accounting department, and 40 respondents, representing 16.7%, were from internal audit. Half (50.0%) of the respondents had worked for more than 10 years, while only 53 (22.1%) had worked for <5 years. The educational background of the study indicated that the majority (65.5%) of the respondents had completed graduate studies, while only 37 (15.4%) had completed postgraduate studies. The study further showed that most (74.6%) respondents were males, and 61 (25.4%) were females. The study further revealed that 105 respondents, representing 43.8%, were between the ages of 41 and 50, and only 24 respondents, representing 10.0%, were between 21 and 30 (Table 1).

4.2. Forms and Prevalence of Procurement Fraud in Public Health Facilities in Bono Region

This section of the results presents the forms and prevalence of procurement fraud in public health facilities in the Bono Region of Ghana.

4.2.1. Forms of procurement fraud

The most common forms of procurement fraud were inflated prices (high risk), kickbacks (high risk), bid rigging/collusion (medium risk), and sole sourcing abuse (medium risk). The annual financial impact of these four frauds were \$6.7 million (Table 2).

4.2.2. Prevalence of procurement fraud

Based on the respondents' experience, 49 respondents, representing 20.4 stated that procurement fraud is very common, 132 respondents, representing the majority (55.0%), stated that procurement fraud is somewhat common, and 19 respondents, representing the minority (7.9%) stated that they have never

observed procurement fraud. In addition, while 144 (60.0%), representing the majority, mentioned that they occasionally suspect procurement fraud, 19 (7.9%), representing the minority, stated that they never suspect procurement fraud. In response to whether the respondents have personally witnessed procurement fraud in the last 3 years, 37 (15.4%) stated yes, 65 (27.1%) stated no and 138 (57.5%) declined to answer (Table 3).

The study further determined the stage of procurement where fraud is most vulnerable (Table 3). It was further determined that procurement fraud is most vulnerable during the bidding and supplier selection stage (50.0%), contract execution stage (21.7%), payment process (16.7%), needs assessment stage (9.1%), and planning and budgeting stage (2.5%). The most frequent procurement fraud perpetrators were procurement officers (40.8%), senior management (30.4%), finance/accounting personnel (20.8%), and external suppliers (7.9%).

4.3. Effect of Procurement Fraud on Financial Performance in Public Health Facilities

This section was measured using the Pearson correlation (Table 4). From the study, procurement fraud affects financial performance in various ways: loss of government funding, financial losses, reduced quality, delayed procurement processes, increased operational costs, and budget shortfalls.

4.3.1. Procurement fraud and loss of government/donor funding

In the analysis, the P-value was 0.116, which is more than 0.05, indicating an insignificant relationship between procurement fraud and loss of government/donor funding. This implies that procurement fraud in public health sectors in the Bono Region is not correlated with the loss of government/donor funding.

From the regression coefficient, the P-value for procurement fraud was 0.204 (Table 5).

4.3.2. Procurement fraud and significant financial losses

This section assessed the relationship between procurement fraud and significant financial losses. The study runs a Pearson rank correlation to determine the relationship (Table 6). It was shown that the P-value was 0.004, which is <0.05, indicating a significant relationship between procurement fraud and significant financial losses. This implies that procurement fraud at health facilities in Ghana's Bono Region increases financial losses.

From Table 7, the analysis revealed that the P-value for procurement fraud was 0.042, which implies a significant relationship between procurement fraud and financial losses. The 0.042 significant

Table 2: Forms of procurement fraud (n=240)

Fraud type	Frequency	Percentage	Risk level*	Financial impact**
Inflated pricing	60	25.0	High	\$2.3M annually
Kickback	50	20.8	High	\$1.8M annually
Bid rigging/collusion	48	20.0	Medium	\$1.5M annually
Sole sourcing abuse	35	14.6	Medium	\$1.1M annually
Product substitution	31	12.9	Low	\$0.8M annually
Ghost suppliers	10	4.2	Low	\$0.3M annually
Fake invoicing	6	2.5	Low	\$0.2M annually

*Based on frequency and severity assessment and **Estimated based on budget analysis and audit findings

Table 3: Prevalence of procurement fraud

Prevalence of fraudulent practices	Frequency	Percentage
How common is procurement fraud based on experience		
Very common	49	20.4
Somewhat common	132	55.0
Rare	40	16.7
Never observed	19	7.9
Frequency of suspecting fraud in procurement		
Frequently	42	17.5
Occasionally	144	60.0
Rarely	35	14.6
Never	19	7.9
Personally witness procurement fraud in the last 3 years		
Yes	37	15.4
No	65	27.1
Prefer not to say	138	57.5
Procurement stage most vulnerable to fraud		
Needs assessment	22	9.1
Procurement planning and budgeting	6	2.5
Bidding and supplier selection	120	50.0
Contract execution	52	21.7
Payment processing	40	16.7
Most frequent procurement fraud perpetrators		
Procurement personnel	98	40.8
Senior management	73	30.4
External suppliers	19	7.9
Finance/accounting personnel	50	20.8

Table 4: Relationship between procurement fraud and loss of government/donor funding

Variables	Procurement fraud	Loss of government funding
Procurement fraud		
P.C	1	0.443
Sig. (2-tailed)	-	0.116
N	240	240
Loss of government funding		
P.C	0.443	1
Sig. (2-tailed)	0.116	-
N	240	240

** At 0.01 (2-tailed), correlation is significant. P.C=Pearson Correlation

Table 5: Regression coefficient on procurement fraud and loss of government/donor funding

Model variables	Unstandardised coefficients		Standardised coefficients	t	Significant
	B	S. E	Beta		
(Constant)	3.915	0.361		2.816	0.118
Procurement fraud	0.649	0.215	0.104	1.335	0.204

Dependent variable: Loss of government/donor funding

difference implies that a sudden change in procurement fraud will result in a 4.2% increase in financial losses at health facilities in the Bono Region of Ghana.

4.3.3. Procurement fraud and reduced quality of healthcare services

The relationship between procurement fraud and reduced quality of healthcare services is determined in this section of the study using Pearson rank correlation (Table 8). It was shown that the P-value was 0.008, which is <0.05, indicating a significant

Table 6: Relationship between procurement fraud and financial losses

Variables	Procurement fraud	Financial losses
P.C	1	0.872**
Sig. (2-tailed)	-	0.004
N	240	240
Financial losses		
P.C	0.872**	1
Sig. (2-tailed)	0.004	-
N	240	240

** At 0.01 (2-tailed), the correlation is significant. P.C: Pearson correlation

Table 7: Regression coefficient on procurement fraud and financial losses

Model variables	Unstandardised coefficients		Standardised coefficients	t	Significant
	B	S. E	Beta		
(Constant)	7.032	0.512		4.215	0.030
Procurement fraud	0.320	0.464	0.103	1.144	0.042

a. Dependent variable: financial losses

Table 8: Relationship between procurement fraud and reduced quality of healthcare services

Variables	Procurement fraud	Reduced quality of healthcare services
Procurement fraud		
P.C	1	0.768**
Sig. (2-tailed)	-	0.008
N	240	240
Reduced quality of healthcare services		
P.C	0.768**	1
Sig. (2-tailed)	0.008	-
N	240	240

** At 0.01 (2-tailed), correlation is significant. P.C: Pearson correlation

relationship between procurement fraud and reduced quality of healthcare services.

As shown in Table 9, the study indicates a significant relationship between procurement fraud and reduced quality of healthcare services. The 0.041 significant difference implies that a sudden change in procurement fraud will result in a 4.1% change in the quality of healthcare service.

4.3.4. Procurement fraud and delayed procurement processes

The relationship between procurement fraud and delayed procurement processes is assessed in this subsection using Pearson rank correlation (Table 10). It was shown that the P-value was 0.009, which is <0.05, indicating a significant relationship between procurement fraud and delayed procurement processes. This implies that procurement fraud at health facilities in the Bono Region of Ghana delays procurement processes.

From Table 11, there was a significant relationship between procurement fraud and delayed procurement. The 0.038 significant difference implies that a sudden change in procurement fraud will result in 3.8% delay in procurement processes at health facilities in the Bono Region of Ghana.

Table 9: Regression coefficient on procurement fraud and quality of healthcare services

Model variables	Unstandardised coefficients		Standardised coefficients	t	Significant
	B	S. E	Beta		
(Constant)	6.690	0.513		4.061	0.030
Procurement fraud	0.248	0.470	0.132	1.254	0.041

a. Dependent variable: reduced quality of healthcare services

Table 10: Relationship between procurement fraud and delayed procurement processes

Variables	Procurement fraud	Delayed procurement
Procurement fraud		
P.C	1	0.722**
Sig. (2-tailed)	-	0.009
N	240	240
Delayed procurement		
P.C	0.722**	1
Sig. (2-tailed)	0.009	-
N	240	240

** At 0.01 (2-tailed) correlation is significant. P.C: Pearson correlation

Table 11: Regression coefficient on procurement fraud and delayed procurement

Model variables	Unstandardised coefficients		Standardised coefficients	t	Significant
	B	S. E	Beta		
(Constant)	6.920	0.483		3.854	0.024
Procurement fraud	0.314	0.445	0.110	1.106	0.038

a. Dependent variable: delayed procurement

4.3.5. Procurement fraud and increased operational costs

The relationship between procurement fraud and increased operational costs is determined in this section of the study using Pearson rank correlation (Table 12). It was shown that the P-value was 0.002, which is <0.05, indicating a significant relationship between procurement fraud and increased operational costs.

The P-value for procurement fraud was 0.045 (Table 13). This indicates a significant relationship between procurement fraud and increased operational fraud. The 0.045 significant difference implies that a sudden change in procurement fraud will result in 4.5% change in operational costs.

4.3.6. Procurement fraud and budget shortfalls

The relationship between procurement fraud and budget shortfalls is shown in Table 14. It was shown that the P-value was 0.010, which is <0.05, indicating a significant relationship between procurement fraud and budget shortfalls.

The P-value for procurement fraud was 0.036. This indicates a significant relationship between procurement fraud and budget shortfalls. The 0.036 significant difference implies that a sudden change in procurement fraud will result in 3.6% change in budget shortfalls (Table 15).

Table 12: Relationship between procurement fraud and increased operational costs

Variables	Procurement fraud	Increased operational costs
Procurement fraud		
P.C	1	0.928**
Sig. (2-tailed)	-	0.002
N	240	240
Increased operational costs		
P.C	0.928**	1
Sig. (2-tailed)	0.002	-
N	240	240

** At 0.01 (2-tailed), the correlation is significant. P.C: Pearson Correlation

Table 13: Regression coefficient on procurement fraud and operational costs

Model variables	Unstandardised coefficients		Standardised coefficients	t	Significant
	B	S. E	Beta		
(Constant)	7.332	0.524		4.118	0.037
Procurement fraud	0.216	0.491	0.126	1.341	0.045

a. Dependent variable: increased operational costs

Table 14: Relationship between procurement fraud and budget shortfalls

Variables	Procurement fraud	Budget shortfalls
Procurement fraud		
P.C	1	0.684**
Sig. (2-tailed)	-	0.010
N	240	240
Budget shortfalls		
P.C	0.684**	1
Sig. (2-tailed)	0.010	-
N	240	240

** At 0.01 (2-tailed), correlation is significant. P.C: Pearson correlation

Table 15: Regression coefficient on procurement fraud and budget shortfalls

Model variables	Unstandardised coefficients		Standardised coefficients	t	Significant
	B	S. E	Beta		
(Constant)	6.388	0.495		4.104	0.022
Procurement fraud	0.201	0.463	0.113	1.214	0.036

a. Dependent variable: budget shortfalls

4.4. Key Risk Factors that Enable Procurement Fraud in Public Health Facilities

The key risk factors enabling procurement fraud were analysed using both Likert scale descriptive analysis and logistic regression analysis.

4.4.1. Likert scale analysis

The study demonstrated that the key risk factors that enable procurement fraud were weak internal controls, lack of accountability and transparency, ethical violations and corruption, inadequate personnel and oversight, and external and systemic risks. Among these risk factors, external and systemic risk came top with a composite

mean of 4.26. The respondents agreed that political interference influences procurement decisions (Mean = 4.48; SD = 0.71), suppliers conspire with personnel to inflate prices or rig bids (Mean = 4.24; SD = 0.81), and weak legal execution inspires procurement fraud (Mean = 4.05; SD = 0.86) are risk factors for procurement fraud. Moreover, the respondents were of the view that lack of transparency and accountability contributes to procurement fraud, with Likert values ranging from 4.18 to 4.31 with a composite mean of 4.23. In regards to accountability and transparency, the respondents agreed that the bid evaluation process is not transparency (Mean = 4.31; SD = 0.70), no public disclosure of awarded contracts (Mean = 4.20; SD = 0.73), and procurement decisions are often influenced by personal relations rather than merit (Mean = 4.18; SD = 0.80).

The third risk factor contributing to procurement fraud was inadequate personnel and oversight, with mean values ranging from 4.01 to 4.25 and a composite mean of 4.13 (Table 16). The respondents agreed that there is no functional anti-fraud unit (Mean = 4.25; SD = 0.70), supervisors hardly monitor procurement activities for compliance (Mean = 4.13; SD = 0.84), and procurement personnel lack training on fraud prevention (Mean = 4.01; SD = 0.92). In the study, ethical violations and corruption contribute to procurement fraud, as the respondents agreed that personnel always accept kickbacks from suppliers (Mean = 4.22; SD = 0.75) and red flags of fraud are ignored by management as a result of personal interest (Mean = 4.10; SD = 0.86). The last risk factor that enables procurement fraud is weak internal controls. With a composite mean of 4.04, the respondents agreed that their facilities lack clear procurement guidelines/policies (Mean = 4.11; SD = 0.74) and poor procurement role segregation (Mean = 4.06; SD = 0.80).

Table 16: Risk factors that enable procurement fraud

Risk factors	Mean	SD
Weak internal controls	4.04	0.83
This hospital lacks clear procurement guidelines and policies	4.11	0.74
Procurement audits are rarely carried out in this hospital	3.94	0.96
Poor segregation of roles in the procurement process	4.06	0.80
Lack of accountability and transparency	4.23	0.74
No public disclosure of awarded contracts	4.20	0.73
Bid evaluation processes are not transparent	4.31	0.70
Procurement decisions are often influenced by personal relations rather than merit	4.18	0.80
Ethical violations and corruptions	4.06	0.84
Whistle-blowers face retaliation for reporting procurement fraud	3.85	0.91
Management ignores red flags of fraud due to personal interests	4.10	0.86
Staff frequently accept kickbacks from suppliers in exchange for contracts	4.22	0.75
Inadequate personnel and oversight	4.13	0.82
There is no functional anti-fraud unit in this facility	4.25	0.70
Supervisors rarely monitor procurement activities for compliance	4.13	0.84
Procurement staff lack training on fraud detection and prevention	4.01	0.92
External and systemic risks	4.26	0.79
Weak legal enforcement encourages procurement fraud	4.05	0.86
Suppliers collude with staff to rig bids or inflate prices	4.24	0.81
Political interference influences procurement decisions	4.48	0.71

Likert scale: 1=Strongly Disagree, 2=Disagree, 3=Indifferent, 4 Agree, 5=Strongly Agree, SD: Standard deviation

4.4.2. Logistic regression analysis

The Cox and Snell R Square is based on the log-likelihood for the model compared with the log-likelihood for a baseline model. The Nagelkerke R Square is an adjusted version of the Cox and Snell R Square (Table 17). It adjusts the scale of the statistic to cover the full range from 0 to 1. The size of R^2 (72%) indicates that the model contributes considerably to the prediction of procurement fraud.

Table 18 shows the Hosmer and Lemeshow Test of the model's goodness-of-fit. The values of chi-square and P-value mean that the model fits the data well.

In general, all the risk factors had a significant effect on procurement fraud. The P-values for all the risk factors were 0.000 (Table 19).

4.5. Fraud Risk Management Strategies in Procurement proCesses to Alleviate Financial Losses

In the study, fraud risk management strategies in procurement processes to alleviate financial losses were preventive, detective, and corrective controls. The preventive controls recorded a composite mean of 4.15 and a standard deviation of 0.82. The preventive controls were separate roles for requisition, approval, and payment; pre-qualification and due diligence of suppliers; clear procurement policies/guidelines; and staff training on fraud detection and ethical procurement.

The detective controls recorded a composite mean of 4.04 and a standard deviation of 0.88. The detective controls examined in the study were automated procurement systems such as e-procurement; random spot-checks on deliveries; regular internal audits; and whistle-blower policies (Table 20).

The last risk management strategy assessed in the study was corrective controls, which recorded a composite mean of 4.29 and a standard deviation of 0.79. The corrective controls were recovery of stolen funds when fraud occurs; disciplinary action such as prosecutions and suspensions; and process improvements after fraud cases to prevent recurrence.

5. DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1. Discussion

The study revealed that the most fraudulent procurement type include inflated price, kickbacks, and bid rigging. In this instance, procurement officials increase price of items or service and later

Table 17: Model summary

Step	2 Log likelihood	Cox and Snell R Square	Nagelkerke R Square
1	222.220 ^a	0.633	0.720

Table 18: Hosmer and Lemeshow test

Step	Chi-square	Df	Significant
1	20.538	7	0.000

Table 19: Variables in the equation

Risk factors	B	S.E.	Wald	Df	Sig.	Exp (B)
Step 1 ^a						
Weak internal controls	0.745	0.216	12.982	1	0.000	0.803
Lack of accountability/transparency	0.996	0.285	14.900	1	0.000	2.014
Ethical violations and corruption	0.804	0.221	13.231	1	0.000	0.930
Inadequate personnel and oversight	0.813	0.204	13.684	1	0.000	1.424
External and systemic risks	1.226	0.319	16.102	1	0.000	2.470
Constant	1.448	1.163	9.804	1	0.000	2.015

a. variable (s) entered on step 1: weak internal controls, lack of accountability and transparency, ethical violations and corruptions, inadequate personnel and oversight, external and systemic risks

Table 20: Risk management strategies to alleviate financial losses

Risk management strategies	Mean	SD
Preventive controls	4.15	0.82
Pre-qualification and due diligence of suppliers	4.16	0.83
Staff training on fraud detection and ethical procurement	4.05	0.90
Separate roles for requisition, approval, and payment	4.30	0.71
Clear procurement policies/guidelines	4.10	0.85
Detective controls	4.04	0.88
Random spot-checks on deliveries (quality/quantity verification)	4.04	0.92
Whistle-blower policies	3.90	0.98
Automated procurement systems (such as e-procurement)	4.18	0.76
Regular internal audits	4.02	0.84
Corrective controls	4.29	0.79
Process improvements after fraud cases to prevent recurrence	4.19	0.80
Recovery of stolen funds when fraud occurs	4.35	0.70
Disciplinary action such as prosecutions and suspensions	4.33	0.78

Likert scale: 1=Very ineffective, 2=Ineffective, 3=Neutral, 4=Effective, 5=Very effective, SD: Standard deviation

take his/her share from the vendor. In agreement to the findings of the current study, Muñoz-Cancino and Ríos (2025), and Salihu, (2025) indicated that procurement fraud entails counterfeit goods, anticompetitive policy violations, substandard quality issues, product substitutions, falsified pricing, kickbacks, and bribes.

The study showed that procurement personnel and senior management are more likely to conduct procurement fraud. These personnel are more linked to procurement activities in an organisations, making them more liable to procurement fraud. In agreement, Omata et al. (2024) evaluated the relationship between procurement fraud in public hospitals and perceived financial strain. According to the results, SCM and procurement officers are more likely to engage in fraudulent activities as a way to relieve their economic burdens. This relates to the Fraud Triangle Theory, where fraud is performed by individual under financial pressure.

From the study, weak internal controls, poor segregation of roles in the procurement process and lack of monitoring were assessed as risk factor to procurement fraud. When organisation have weak internal controls, monitoring becomes low and the staff are able to carry out fraudulent activities. This is in line with the fraud diamond theory, which underscore that for fraud to take place, there should be capability and conducive climate. In a related study and agreement to the current findings, Omata et al. (2024) and Aryee et al. (2025) underlined that organizational risk factors of procurement fraud include weak internal controls, ineffective supervision, and inadequate segregation of duties.

Moreover, the study showed that the fraud risk management strategies in procurement processes to alleviate financial losses were preventive, detective, and corrective controls. Among the preventive measures found in the study was clear procurement policies/guidelines. Upholding a high standard of integrity in procurement requires a controlled environment that improves professionalism, transparency, and accountability (Barimah and Mensah, 2024). Zahra (2025) also indicated that the first step in stopping fraud is learning about it and how it affects the company. Long-term business viability and the prevention of procurement fraud depend on an honest and sincere culture (Harju et al., 2024). By demonstrating its dedication to such a course, management must also make sure that the ethical ideals of honesty are promoted and communicated to employees (Zahra, 2025).

Staff training on fraud detection and ethical procurement was further found in the study among the preventive controls. Staff training is very crucial as it inculcate into the personnel on the dos and don'ts in the organisation. Moreover, staff training enables the personnel to detect and prevent procurement fraud. In agreement, Zahra (2025) indicated that selecting the appropriate personnel for procurement is crucial to preventing fraud. In the study by Yang et al. (2024), the authors reported that a great procurement fraud preventative method is to regularly train personnel on ethical values and do background checks. According to Onukwulu et al. (2024), hiring managers must perform background checks on candidates, which include criminal record check, reference check, social media search, and resume verification. The authors also recommended using integrity and honesty exams as a pre-employment screening method. To understand the expectations and penalties for nonconformance, all staff should get policy and procedure training. These penalties ought to be severe enough to include termination and criminal prosecution (Barimah and Mensah, 2024).

The implementation of a whistleblower policy was one of the control strategies to prevent and manage fraud. An efficient whistleblower system allows managers to identify fraudulent procurement practices. Whistleblower policy is an efficient way to gather information about employees regarding illicit activities like fraud. In line with this finding, Adenodi et al. (2025) underscored that an efficient whistleblower system aids to boosts employee loyalty, detection of financial losses and fraud, and protects the company's reputation. Harju et al. (2024) were of the view that to protect themselves from victimization and reprisal, the majority of employees could prefer that the reporting channels be handled by a third party outside the company.

From the study, another efficient way to identify and stop procurement fraud was to conduct routine audits of procurement processes and systems. If workers are aware of these audits, they would not commit fraud. The function of internal auditors in stopping and identifying fraud was covered by Paraskeva and Tsoulfas (2025), who indicated that cash reviews, consistent internal controls, operational audits, and a strong code of sanctions against procurement personnel and suppliers are the best methods for identifying and stopping fraud. To assess procedural adherence, Mwalukasa and Sallwa (2024) indicated that companies should use both internal and external auditors. Although using auditors as a fraud prevention strategy may be advantageous, Paraskeva and Tsoulfas (2025) cautioned that it must be supplemented with additional controls because auditors may eventually be compromised. When organisations have strong internal controls, they are able to detect fraud, at times even they occur. It is essential to routinely evaluate the efficacy and sufficiency of the internal control system in order to find and fix any flaws that allow fraud. In a related study, Zahra (2025) underlined that internal controls safeguard assets from misuse and theft, guarantee accurate and consistent financial reporting, and ensure adherence to relevant regulations. More accountability in resource management improves operational efficiency and deters fraud when internal controls are strong (Celestin et al., 2025). Stronger control systems, according to Jama and Mohamud (2024), increase adherence to established procedures and policies and discourage personnel from acting unethically (Adenodi et al., 2025). According to Zahra (2025), a strong internal control system is ultimately an assurance tool for attaining optimal performance and shielding a business from unforeseen circumstances, such as a decrease in fraudulent activity. Additionally, in agreement with the study's findings, Nurlina et al. (2018) studied the impact of applying the procurement system of goods and services on the accountability of the performance of government agencies in preventing fraud in Papua. The authors reported that internal controls have a major influence on increasing agency performance responsibility.

The study's findings further agree with Taylor (2022), who set out qualitative multiple case study to investigate the methods company managers use to effectively identify, manage, and stop procurement fraud. Three themes surfaced from the thematic analysis. These themes comprised: (i) procurement fraud was detected, controlled, and prevented by internal control; (ii) ethical and anti-fraud training for suppliers and employees facilitates effective communication; and (iii) realistic job descriptions with equitable compensation.

From the current study, among the corrective measures to prevent fraud is through prosecution and suspensions. Using prosecution and suspensions will serve as deterrence to others, and will also enable the company to recoupe some of the items, products, or money that were lost during the fraudulent activity. In a related study, Mensah and Barimah (2024) highlight that prosecution or legal action efficiently regulates and prevents procurement fraud, however, it is not particularly common in many firms. In agreement to the findings of the current study, Zahra (2025) claims that one great way to convey management's intolerance for fraud and

discourage employees from committing fraud is to file a lawsuit against fraudulent workers.

In other related study, Kanana (2018) studied how fraud risk management affects NGOs' fiscal performance in Kenya. The study demonstrated that NGOs in the study area have experienced fraud, with 60% of the organisations experiencing 6-10 cases of fraud. In response, 30.9% of the NGOs carry out weekly and daily fraud monitoring, while only 12.5% conduct annual fraud monitoring. The anti-fraud policies established by the NGOs included penalties and fines, a whistle-blower approach, fraud awareness training, a fraud risk register, staff supervision, and safe controls. In general, the study showed that fraud detection, fraud deterrence, and anti-fraud strategies significantly impacted the NGOs' fiscal performance. Approximately 63% of these variables explained the NGOs' fiscal performance variation.

6. CONCLUSION AND RECOMMENDATIONS

This study examined the financial implications of procurement fraud in public health facilities in the Bono Region of Ghana using a risk-based analytical framework. The findings confirm that procurement fraud remains a significant challenge within public healthcare procurement systems and poses serious threats to financial sustainability, operational efficiency, and healthcare service delivery.

The study established that the most prevalent forms of procurement fraud in public health facilities are inflated pricing, kickbacks, bid rigging/collusion, and sole-sourcing abuse. These fraudulent practices reflect persistent weaknesses in procurement governance structures and indicate vulnerabilities in supplier selection, contract administration, and internal oversight systems.

The findings further reveal that procurement fraud has statistically significant adverse effects on key dimensions of financial performance, including increased operational costs, financial losses, delayed procurement processes, budget shortfalls, and reduced quality of healthcare services. This confirms that procurement fraud is not merely an administrative misconduct issue but a critical financial and service-delivery problem that undermines the effective functioning of public health institutions.

The study also identified weak internal controls, lack of accountability and transparency, ethical violations, inadequate personnel oversight, and external systemic pressures as key drivers of procurement fraud. Among these factors, external and systemic risks emerged as the strongest predictors, highlighting the role of political interference, weak legal enforcement, and supplier collusion in enabling fraudulent procurement practices.

Furthermore, the study found that preventive, detective, and corrective fraud risk management strategies are effective mechanisms for mitigating procurement-related financial losses. In particular, corrective controls such as prosecution, sanctions,

and recovery of stolen funds were perceived as the most effective deterrent measures.

The study concludes that procurement fraud in public health facilities is a multidimensional institutional problem requiring integrated responses that combine strong internal controls, technological reforms, transparency mechanisms, legal enforcement, and ethical institutional culture.

The findings also validate the relevance of the Fraud Diamond Theory in explaining procurement fraud within Ghana's public healthcare sector, while suggesting that institutional and systemic variables should be incorporated into existing fraud theories to better reflect public-sector realities in developing economies.

Based on the findings of this study, the following recommendations are proposed to strengthen procurement governance and reduce the financial implications of procurement fraud in public health facilities:

1. Public health facilities should adopt integrated electronic procurement (e-procurement) systems for all procurement activities, including tender advertisement, supplier selection, contract award, and payment processing
2. Each public health facility should establish an independent procurement compliance and anti-fraud monitoring unit reporting directly to top-level oversight authorities
3. Public hospitals should ensure that all awarded contracts, supplier details, bid evaluation criteria, and procurement outcomes are publicly disclosed
4. Hospitals should implement secure and anonymous whistleblowing systems that protect employees from retaliation.

6.1. Managerial and Policy Implications

The managerial and policy implications of the study is partitioned into short term, medium term and long term. In the short term (0-6 months), the study underscore the need to implement e-procurement systems in all the 8 districts, establish dedicated fraud investigation units, and launch ethics training programs for procurement staff.

In the medium-term (6-24 months), the study underscore the need for the hospitals to develop inter-district procurement consortia for economies of scale, create supplier performance databases with fraud risk ratings, and implement real-time financial monitoring systems.

In the long term (2-5 years), the study underscore the need to reform procurement regulations to reduce discretionary powers, establish an independent procurement oversight authority, and integrate fraud risk assessment into hospital accreditation standards.

6.2. Theoretical Implications

The findings extend fraud theory in several important ways:

1. Context-dependent risk factors: Unlike previous studies focusing primarily on individual motivations, this research reveals that external systemic risks (political interference,

weak legal enforcement) are the strongest predictors of fraud in Ghana's context. This suggests that environmental factors may be more influential than individual characteristics in resource-constrained settings.

2. Multi-stage vulnerability: The identification of bidding/supplier selection as the most vulnerable stage (50% of cases) contradicts the assumptions that payment processing represents the highest risk period. This finding has significant implications for control system design.
3. Fraud diamond theory validation: The strong significance of all four fraud diamond elements (pressure, opportunity, rationalisation, capability) validates this theoretical framework in the African healthcare context, with capability showing the strongest predictive power ($\beta = 1.226$, $P < 0.001$).

6.3. Limitations and Suggestions for Further Studies

Although this study offers insightful information on procurement fraud and financial performance, a few limitations exists. First, the data used in this study was gathered from 8 hospitals in Bono Region of Ghana, which may not accurately reflect the procurement fraud and financial performance in other regions. Thus, similar study is recommended in other regions of Ghana, and other parts of Africa.

Second, the study collects data at a specific point in time using a cross-sectional methodology. This method makes it more difficult to track how procurement fraud affect hospitals' performance over the long run. A more dynamic knowledge of procurement fraud could be obtained through a longitudinal study that offers deeper insights into how procurement fraud and hospitals' performance change over time.

Lastly, although this study offers a solid quantitative analysis on procurement fraud and hospitals' performance, it lacks qualitative insights, thus, future research could profit from a mixed-methods approach that includes case studies or interviews.

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