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Internal control, fraud prevention, and financial accountability in tertiary institutions

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ABSTRACT

This study examined the relationship between internal control, fraud prevention, and financial accountability in selected public tertiary institutions in Jigawa State, Nigeria. It assessed the associations of five COSO internal-control dimensions control environment, risk assessment, control activities, information and communication, and monitoring activities with fraud prevention and financial accountability. The study adopted a cross-sectional comparative survey design across Bilyaminu Usman Polytechnic, Hadejia; Jigawa State College of Education, Gumel; and Jigawa State Polytechnic, Dutse. The study collected data from 300 academic and non-academic staff involved in financial management, accounting, internal audit, administration, procurement, stores, and related control functions using a structured five-point Likert-scale questionnaire. Data were analysed using descriptive statistics, Cronbach's alpha, Pearson product-moment correlation, and supplementary multiple regression. Pearson results showed positive and statistically significant associations between all five internal-control dimensions and both outcomes. Monitoring activities showed the strongest association with fraud prevention and financial accountability, while risk assessment showed the weakest. The study concludes that stronger internal-control practices are associated with stronger fraud prevention and greater financial accountability. It recommends strengthening monitoring and audit follow-up, systematic risk assessment, control activities, ethical leadership, information and communication, staff training, and institution-wide control responsibility. Because the study is cross-sectional, the findings are interpreted as associations rather than causal effects.

Keywords

Internal control; fraud prevention; financial accountability; COSO framework; public tertiary institutions; Nigeria.

1. Introduction

Public tertiary institutions manage public funds, internally generated revenue, grants, personnel expenditure, procurement resources and institutional assets. Their financial management therefore requires arrangements that promote transparency, accountability, prudent resource use, and compliance with established procedures (Federal Republic of Nigeria, 2007; Tertiary Education Trust Fund, 2023; COSO, 2013). COSO identifies five interrelated components of internal control: control environment, risk assessment, control activities, information and communication, and monitoring activities.

This issue matters because tertiary institutions process procurement, payroll, revenue, stores, projects, research, and other transactions through several administrative and academic units. Formal procedures alone do not establish effective control; implementation depends on management commitment, clear responsibilities, authorisation, segregation of duties, reliable information, risk identification and continuous monitoring. Recent studies report positive but sometimes uneven relationships between individual control dimensions and fraud prevention and financial accountability (Vutumu et al., 2024; Kanu et al., 2025; Larasati & Tjaraka, 2025; Enemali & Okwoli, 2025).

Evidence also comes from outside Nigeria. [Juma et al. \(2025\)](#) reported a positive relationship between internal controls and financial accountability in Uganda, while [Muti'ah et al. \(2024\)](#) examined internal control and regional financial accountability in Indonesia. [Afolabi et al. \(2026\)](#) examined internal control systems and financial accountability in state-owned polytechnics in Oyo State, Nigeria. [Nakabago and Hofisi \(2026\)](#) investigated monitoring and evaluation of internal controls in relation to financial accountability under Uganda's Universal Primary Education capitation-grant programme. [Wang et al. \(2025\)](#) provided evidence from Chinese firms, while the [Audit Office of New South Wales \(2024\)](#) highlighted the continuing importance of monitoring fraud-control frameworks in a public-sector setting.

A recent study addresses accountability and fraud. [Andortan and Bassey \(2026\)](#) emphasized proactive accountability mechanisms to reduce fraud in Nigeria's public sector, while [Ahmed et al. \(2026\)](#) examined governance and financial reporting quality. These studies are relevant but do not test the five COSO dimensions against both fraud prevention and financial accountability in selected public tertiary institutions in Jigawa State.

The empirical gap is therefore institution-specific and comparative. Nigerian studies have commonly focused on ministries, financial institutions, local governments, or individual organizations, with fewer studies examining multiple tertiary institutions and assessing the five COSO components separately against both outcomes. This study examines Control Environment, Risk Assessment, Control Activities, Information and Communication, and Monitoring Activities in relation to Fraud Prevention and Financial Accountability in three selected public tertiary institutions in Jigawa State.

2. Review of literature and hypothesis development

2.1 Theoretical Review

2.1.1 COSO Internal Control Framework

The COSO Internal Control – Integrated Framework provides the principal foundation for the study. It identifies control environment, risk assessment, control activities, information and communication, and monitoring activities as interrelated components that provide reasonable assurance over operational, reporting, and compliance objectives ([COSO, 2013](#)). The framework directly corresponds to the five explanatory variables and supports examining whether their strength is associated with fraud prevention and financial accountability.

2.1.2 Agency Theory

Agency Theory explains relationships in which principals delegate resources and responsibilities to agents ([Jensen & Meckling, 1976](#)). In public tertiary institutions, government and other stakeholders expect management and employees to safeguard and account for institutional resources. Authorization, reporting, and monitoring controls reduce information asymmetry and constrain opportunities for self-interested behavior, providing a basis for expecting stronger internal control to be associated with accountability and fraud prevention.

2.1.3 Fraud Triangle Theory

Fraud Triangle Theory explains occupational fraud through pressure, opportunity and rationalisation ([Cressey, 1953](#)). Internal controls primarily address opportunity by separating duties, restricting access, strengthening authorisation and increasing the likelihood of detection. The theory therefore complements COSO by explaining why weaknesses in control arrangements can increase opportunities for fraudulent conduct.

2.2 Empirical Review and Hypothesis Development

Control Environment and Fraud Prevention. [Larasati and Tjaraka \(2025\)](#) found that internal-control implementation contributed to fraud prevention in higher-education institutions in Indonesia. [Awotomilusi et al. \(2023\)](#) also emphasised control environment, monitoring, and information and communication in Nigerian public institutions. In contrast, [Vutumu et al. \(2024\)](#) and [Kanu et al. \(2025\)](#) found that the control environment was not statistically significant in their respective Nigerian public-sector samples. These differences justify testing the relationship in tertiary institutions. H1: Control Environment is positively and significantly associated with Fraud Prevention.

Risk Assessment and Fraud Prevention. [Vutumu et al. \(2024\)](#) and [Kanu et al. \(2025\)](#) reported significant positive contributions of risk assessment to fraud prevention in Nigerian public-sector settings. [Fabiya et al. \(2025\)](#) and [Ogwiji and Lasisi \(2022\)](#), however, reported insignificant effects in Nigerian financial-service settings. The mixed evidence suggests that formal risk identification may be more useful where risk information is translated into operational responses. H2: Risk Assessment is positively and significantly associated with Fraud Prevention.

Control Activities and Fraud Prevention. [Ariyo-Edu \(2025\)](#) reported significant relationships between internal-control mechanisms and fraud-deterrence dimensions in North-Central Nigeria, while [Astriani and Hanun \(2025\)](#) identified segregation of duties, coordinated functions, and routine audits as relevant in higher education. [Kanu et al. \(2025\)](#) and [Ogwiji and Lasisi \(2022\)](#) reported less consistent results. H3: Control Activities are positively and significantly associated with Fraud Prevention.

Information and Communication and Fraud Prevention. [Vutumu et al. \(2024\)](#), [Awotomilusi et al. \(2023\)](#), and [Fabiya et al. \(2025\)](#) reported significant relationships involving information and communication and fraud prevention. [Ogwiji and Lasisi \(2022\)](#), however, found a negative significant effect in quoted financial-services firms. Differences in institutional context and information-system effectiveness support testing the relationship in tertiary institutions. H4: Information and Communication is positively and significantly associated with Fraud Prevention.

Monitoring Activities and Fraud Prevention. [Vutumu et al. \(2024\)](#), [Kanu et al. \(2025\)](#), and [Awotomilusi et al. \(2023\)](#) found monitoring relevant to fraud prevention. [Astriani and Hanun \(2025\)](#) also highlighted routine audits in higher education. [Andortan and Bassey \(2026\)](#) emphasised proactive accountability and fraud reduction in Nigeria. H5: Monitoring Activities is positively and significantly associated with Fraud Prevention.

Control Environment and Financial Accountability. [Abdullahi et al. \(2026\)](#), [Enemali and Okwoli \(2025\)](#), and [Adeyemi and Olarewaju \(2019\)](#) reported positive relationships between internal control and financial accountability in Nigerian public or regulated settings. [Ahmed et al. \(2026\)](#) similarly linked governance structures with financial reporting quality. H6: Control Environment is positively and significantly associated with Financial Accountability.

Risk Assessment and Financial Accountability. [Abdullahi et al. \(2026\)](#) reported a significant relationship between internal control and financial accountability in public-sector organizations. [Enemali and Okwoli \(2025\)](#) linked documented procedures, authorisation and review to accountability, while [Nakabago and Hofisi \(2026\)](#) highlighted control review in public education. H7: Risk Assessment is positively and significantly associated with Financial Accountability.

Control Activities and Financial Accountability. [Enemali and Okwoli \(2025\)](#) found positive relationships between accountability and separation of duties, documentation, authorisation, review, and internal audit. [Adeyemi and Olarewaju \(2019\)](#), [Abubakar et al. \(2017\)](#), and [Nakabago et al. \(2024\)](#) provide supporting evidence from Nigerian and Ugandan public-sector contexts. H8: Control Activities are positively and significantly associated with Financial Accountability.

Information and Communication and Financial Accountability. [Adeyemi and Olarewaju \(2019\)](#) associated reliable reporting and information flow with accountability. [Muti'ah et al. \(2024\)](#) linked financial-statement presentation, transparency, and internal control with regional accountability, while [Abdullahi et al. \(2026\)](#) reported a significant internal-control/accountability relationship. [Ahmed et al. \(2026\)](#) provide related JOCAF evidence on governance and reporting quality. H9: Information and Communication is positively and significantly associated with Financial Accountability.

Monitoring Activities and Financial Accountability. [Nakabago and Hofisi \(2026\)](#) connected monitoring and evaluation of internal controls with financial accountability in public education. [Enemali and Okwoli \(2025\)](#) and [Msindwana and Ngwakwe \(2022\)](#) similarly highlighted internal audit and review mechanisms. The evidence suggests that accountability requires continuing review and follow-up rather than procedures alone. H10: Monitoring Activities is positively and significantly associated with Financial Accountability.

2.3 Hypothesis Development

Based on the theoretical arguments and empirical evidence reviewed above, the study formulates the following hypotheses. The hypotheses are stated as directional propositions because the study examines whether stronger internal-control dimensions are associated with better fraud-prevention and financial-accountability outcomes.

H1: Control environment is positively and significantly associated with fraud prevention in selected public tertiary institutions in Jigawa State.

H2: Risk assessment is positively and significantly associated with fraud prevention in selected public tertiary institutions in Jigawa State.

H3: Control activities are positively and significantly associated with fraud prevention in selected public tertiary institutions in Jigawa State.

H4: Information and communication are positively and significantly associated with fraud prevention in selected public tertiary institutions in Jigawa State.

H5: Monitoring activities are positively and significantly associated with fraud prevention in selected public tertiary institutions in Jigawa State.

H6: Control environment is positively and significantly associated with financial accountability in selected public tertiary institutions in Jigawa State.

H7: Risk assessment is positively and significantly associated with financial accountability in selected public tertiary institutions in Jigawa State.

H8: Control activities are positively and significantly associated with financial accountability in selected public tertiary institutions in Jigawa State.

H9: Information and communication are positively and significantly associated with financial accountability in selected public tertiary institutions in Jigawa State.

H10: Monitoring activities are positively and significantly associated with financial accountability in selected public tertiary institutions in Jigawa State.

3. Methodology

3.1 Research Design, Population and Sampling

A cross-sectional survey design was adopted in Bilyaminu Usman Polytechnic, Hadejia; Jigawa State College of Education, Gumel; and Jigawa State Polytechnic, Dutse. The population comprised 900 academic and non-academic staff whose duties involved financial management, accounting, internal audit, administration, procurement, stores, or related control functions. Yamane's (1967) formula at 5% precision yielded approximately 277 respondents; 300 respondents were used, allocated as 50, 150, and 100, respectively. Purposive sampling was used to select respondents with relevant knowledge of financial and control processes. The data were analysed collectively across the three institutions; therefore, the study examined relationships among the variables rather than differences between institutions.

3.2 Instrument, Measurement and Analysis

Primary data were collected through a structured questionnaire informed by COSO and the empirical literature. Control Environment, Risk Assessment, Control Activities, Information and Communication, Monitoring Activities, Fraud Prevention, and Financial Accountability were measured on a five-point Likert scale (5 = Strongly Agree; 1 = Strongly Disagree). Fraud Prevention and Financial Accountability represent staff-reported perceptions of fraud prevention practices and financial accountability in their respective institutions; they were not measured using actual fraud incidence records or independently audited financial outcomes. Content validity was addressed by reviewing item relevance and coverage.[1] Cronbach's alpha assessed internal consistency. Data were coded and analysed using IBM SPSS Statistics Version 23. Descriptive statistics, Pearson product-moment correlation and supplementary multiple regression were used. Hypotheses were assessed at 5%, with Pearson correlation providing the principal basis because the hypotheses concern directional associations.

3.3 Model Specification

The study specifies two regression models to examine the relationship between internal control mechanisms, fraud prevention, and financial accountability in tertiary institutions. Fraud Prevention (FP) and Financial Accountability (FA) are specified as dependent variables, while Control Environment (CE), Risk Assessment (RA),

Control Activities (CA), Information and Communication (IC), and Monitoring Activities (MA) constitute the explanatory variables.

Model 1: Fraud Prevention

$$FP_i = \beta_0 + \beta_1 CE_i + \beta_2 RA_i + \beta_3 CA_i + \beta_4 IC_i + \beta_5 MA_i + \varepsilon_i$$

Model 2: Financial Accountability

$$FA_i = \alpha_0 + \alpha_1 CE_i + \alpha_2 RA_i + \alpha_3 CA_i + \alpha_4 IC_i + \alpha_5 MA_i + \mu_i$$

Where:

FP_i = Fraud Prevention for respondent i

FA_i = Financial Accountability for respondent i

CE_i = Control Environment

RA_i = Risk Assessment

CA_i = Control Activities

IC_i = Information and Communication

MA_i = Monitoring Activities

β_0 and α_0 = Constant terms

β_1 – β_5 and α_1 – α_5 = Regression coefficients

ε_i and μ_i = Error terms

The models were designed to assess the individual contributions of the five internal control components to fraud prevention and financial accountability.

4. Results

4.1 Reliability and Descriptive Statistics

Table 1. Reliability Statistics of the Study Constructs

Construct	Items	Cronbach's α
Control Environment	5	.876
Risk Assessment	5	.979
Control Activities	5	.876
Information and Communication	5	.891
Monitoring Activities	5	.804
Fraud Prevention	6	.675
Financial Accountability	7	.909

Source: Authors' analysis of field survey data, 2026.

Table 1 presents the reliability statistics for the seven constructs measured in the study. Cronbach's alpha coefficients range from .675 for Fraud Prevention to .979 for Risk Assessment. Control Environment (.876), Control Activities (.876), Information and Communication (.891), Monitoring Activities (.804), and Financial Accountability (.909) demonstrate satisfactory internal consistency, with coefficients exceeding the commonly used .70 benchmark. Although the Fraud Prevention scale has a slightly lower coefficient of .675, it was retained because the original field-measured items were designed to address the study objectives and were preserved without altering the collected responses solely to improve reliability. Given the hypothesis-testing nature of the study, findings relating to Fraud Prevention are interpreted with appropriate caution. The high coefficient for Risk Assessment (.979) indicates strong internal consistency, although the item content also requires consideration to

establish whether the items capture distinct aspects of the construct. It is recognised that Cronbach's alpha assesses internal consistency rather than construct validity. Overall, the reliability results provide a basis for the subsequent analyses, with due consideration given to the measurement properties of the constructs.

Table 2 shows meaningful variation in the observed levels of the study variables. Control Environment and Control Activities recorded the highest mean values, both at 4.28, with standard deviations of .73. This indicates that respondents generally reported relatively strong implementation of these two aspects of internal control and that responses were moderately concentrated around their respective means. Financial Accountability also recorded a relatively high mean of 3.85, suggesting generally favourable perceptions of accountability practices across the selected institutions.

Risk Assessment recorded the lowest mean of 2.34 and the largest standard deviation (1.28), indicating both a relatively lower reported level of risk-assessment practice and greater variation in respondents' perceptions. Information and Communication had a mean of 2.83, while Monitoring Activities had a mean of 3.55. Fraud Prevention recorded a mean of 3.08. These descriptive results are important because they show that the five control dimensions were not perceived as being implemented at the same level. In particular, the relatively low Risk Assessment mean provides an institutional context for its weaker bivariate associations with Fraud Prevention and Financial Accountability. However, descriptive means alone do not establish relationships; the hypothesis assessment is therefore based on the Pearson correlation results in Table 3.

Table 2. Descriptive Statistics of the Study Variables

Variable	Mean	SD	Minimum	Maximum
Control Environment	4.28	0.73	1.60	5.00
Risk Assessment	2.34	1.28	1.00	5.00
Control Activities	4.28	0.73	1.60	5.00
Information and Communication	2.83	0.91	1.20	4.40
Monitoring Activities	3.55	0.64	2.20	4.40
Fraud Prevention	3.08	0.58	1.67	3.83
Financial Accountability	3.85	0.68	2.29	4.71

Source: Authors' analysis of field survey data, 2026.

4.2 Pearson Correlation and Hypothesis Assessment

Table 3. Pearson Correlation Matrix of the Study Constructs

Variable	CE	RA	CA	IC	MA	FP	FA
CE	1.000	—	—	—	—	—	—
RA	.785***	1.000	—	—	—	—	—
CA	.868***	.679***	1.000	—	—	—	—
IC	.883***	.886***	.831***	1.000	—	—	—
MA	.824***	.809***	.810***	.940***	1.000	—	—
FP	.710***	.578***	.739***	.788***	.912***	1.000	—
FA	.842***	.765***	.858***	.954***	.968***	.902***	1.000

Source: Authors' analysis of field survey data, 2026

Note. N = 300. ***p < .001 (two-tailed).

CE = Control Environment; RA = Risk Assessment; CA = Control Activities; IC = Information and Communication; MA = Monitoring Activities; FP = Fraud Prevention; FA = Financial Accountability.

Table 3 presents the Pearson correlation results used to assess hypotheses H1–H10. The results indicate positive and statistically significant relationships between each of the five COSO dimensions and Fraud Prevention. Control Environment is positively associated with Fraud Prevention ($r = .710$, $p < .001$), Risk Assessment ($r = .578$, $p < .001$), Control Activities ($r = .739$, $p < .001$), Information and Communication ($r = .788$, $p < .001$), and Monitoring Activities ($r = .912$, $p < .001$). Accordingly, H1–H5 are supported based on the observed bivariate relationships.

Similarly, all five internal control dimensions are positively and significantly associated with Financial Accountability. Control Environment correlates with Financial Accountability ($r = .842$, $p < .001$), Risk Assessment ($r = .765$, $p < .001$), Control Activities ($r = .858$, $p < .001$), Information and Communication ($r = .954$, $p < .001$), and Monitoring Activities ($r = .968$, $p < .001$). Thus, H6–H10 are supported based on the Pearson correlation results.

Among the hypothesised relationships, Monitoring Activities has the strongest association with Financial Accountability ($r = .968$, $p < .001$), while Risk Assessment has the weakest association with Fraud Prevention ($r = .578$, $p < .001$).

The matrix also shows substantial correlations among several internal control dimensions. Control Environment and Control Activities are strongly correlated ($r = .868$), while Information and Communication and Monitoring Activities have a correlation of .940. These relationships warrant care when interpreting the subsequent regression results because high correlations among explanatory variables may create multicollinearity concerns. The correlation analysis provides evidence of statistically significant associations among the study constructs; however, these associations do not establish causation or demonstrate that strengthening a particular control component will necessarily produce an improvement in fraud prevention or financial accountability.

4.3 Supplementary Multiple Regression

Table 4. Multiple Regression Results for Fraud Prevention

Predictor	FP B	FP t	FP p	VIF
Constant	−0.802	—	< .001	—
CE	.099	3.138	.002	5.167
RA	−.186	−10.807	< .001	4.747
IC	−.140	−3.185	.002	15.601
MA	1.209	24.991	< .001	9.472

Source: Authors' analysis of field survey data, 2026.

The supplementary regression model for Fraud Prevention explains a large proportion of observed variance, with $R^2 = .910$ and adjusted $R^2 = .909$. The overall F-statistic of 748.565 ($p < .001$) indicates that the estimated model is statistically significant as a set. Within the reduced model, Control Environment has a positive coefficient ($B = .099$, $p = .002$), while Monitoring Activities has the largest positive coefficient ($B = 1.209$, $p < .001$). Risk Assessment ($B = -.186$, $p < .001$) and Information and Communication ($B = -.140$, $p = .002$) have negative unique coefficients.

The negative regression coefficients for Risk Assessment and Information and Communication should not be interpreted as evidence that these variables are negatively related to Fraud Prevention. Their Pearson correlations in Table 3 are positive and significant. This difference occurs because regression coefficients estimate each predictor's unique contribution while holding other highly correlated predictors constant. The VIF values, particularly for Information and Communication (15.601) and Monitoring Activities (9.472), indicate substantial multicollinearity. In addition, Control Activities was excluded from the simultaneous regression because it is perfectly linearly dependent on Control Environment. The regression therefore provides supplementary information about shared predictor variance rather than overturning the positive bivariate findings supporting H1–H5.

Table 5. Multiple Regression Results for Financial Accountability

Predictor	FA B	FA t	FA p	VIF
Constant	.426	—	< .001	—
CE	.150	8.525	< .001	5.167
RA	−.167	−17.365	< .001	4.747
IC	.468	19.010	< .001	15.601
MA	.521	19.210	< .001	9.472

Source: Authors' analysis of field survey data, 2026.

The Financial Accountability regression model explains an even larger proportion of variance, with $R^2 = .979$ and adjusted $R^2 = .979$. The overall F-statistic of 3,521.846 ($p < .001$) indicates the model is statistically significant overall. Control Environment ($B = .150$, $p < .001$), Information and Communication ($B = .468$, $p < .001$), and Monitoring Activities ($B = .521$, $p < .001$) have positive unique coefficients, whereas Risk Assessment has a negative coefficient ($B = -.167$, $p < .001$).

As with the Fraud Prevention model, do not read the negative Risk Assessment coefficient in isolation. Risk Assessment has a positive Pearson correlation with Financial Accountability ($r = .765$, $p < .001$). The difference

between the bivariate and multivariate results is consistent with the strong overlap among the COSO dimensions. The very high VIF values, particularly for Information and Communication (15.601), show that the predictors share substantial variance. Control Activities is again omitted from the simultaneous model because of its perfect linear dependence on Control Environment. Consequently, the regression results are interpreted cautiously and do not alter the conclusion from Table 3 that all five control dimensions are positively associated with Financial Accountability.

Table 6 identifies several important limitations in the regression estimates. The R² values are high (.910 for Fraud Prevention and .979 for Financial Accountability), but the diagnostic tests indicate that the assumptions underlying ordinary least-squares regression are not fully satisfied. The Durbin–Watson statistics of .150 and .316 are substantially below the conventional value of approximately 2, indicating strong positive residual autocorrelation. The Breusch–Pagan results are statistically significant, indicating heteroscedasticity, while the Shapiro–Wilk tests are also significant, indicating departures from normality of the residuals.

These diagnostic findings reinforce the decision to treat the regression models as supplementary evidence rather than as the principal basis for causal or predictive claims. The high VIF values reported in Tables 4 and 5 further indicate multicollinearity among the predictors, and the perfect CE–CA correlation means that all five dimensions cannot be entered simultaneously without creating singularity. The appropriate interpretation is that the Pearson correlations provide the clearest direct evidence for the ten hypotheses, whereas the regression analysis shows the strong shared explanatory structure among the control dimensions but requires caution when interpreting individual coefficients.

Table 6. Regression Diagnostic Statistics

Diagnostic	Fraud Prevention	Financial Accountability
R ²	.910	.979
Adjusted R ²	.909	.979
F-statistic	748.565	3,521.846
Durbin–Watson	0.150	0.316
Breusch–Pagan p	< .001	.001
Shapiro–Wilk p	< .001	< .001

Source: Authors' analysis of field survey data, 2026.

4.4 Discussion of Findings

The findings indicate that all five COSO internal-control dimensions were positively and significantly associated with both Fraud Prevention and Financial Accountability in the selected public tertiary institutions. Monitoring Activities recorded the strongest association with both outcomes, while Risk Assessment recorded the weakest. The findings are discussed below in relation to previous empirical evidence.

4.4.1 Internal Control and Fraud Prevention

The results show significant positive associations between Control Environment, Risk Assessment, Control Activities, Information and Communication, and Monitoring Activities and Fraud Prevention. Monitoring Activities recorded the strongest association (r = .912), followed by Information and Communication (r = .788), Control Environment and Control Activities (r = .785 each), while Risk Assessment recorded the weakest association (r = .578). The results indicate that fraud prevention is associated with an integrated control structure involving ethical leadership, risk identification, established procedures, effective information flow, supervision, and continuous monitoring.

Previous empirical studies broadly support these findings. Larasati and Tjaraka (2025) found that internal-control implementation was significantly associated with fraud prevention in higher-education institutions. Vutumu et al. (2024) also reported significant relationships between COSO internal-control components and fraud prevention in Nigerian public-sector organisations. Similarly, Kanu et al. (2025) found significant relationships involving risk assessment and monitoring, although the significance of individual control components varied across their analysis. Astriani and Hanun (2025) also identified internal-control practices and coordinated institutional mechanisms as important for fraud prevention in higher education.

The relatively weaker association of Risk Assessment is consistent with its comparatively low descriptive mean in the present study. This suggests that although risk assessment is significantly related to fraud prevention, it may

not be implemented as consistently as other control mechanisms. Greater attention to systematically identifying, assessing, and responding to financial and operational risks may therefore strengthen fraud-prevention practices.

4.4.2 Internal Control and Financial Accountability

The five internal-control dimensions were also positively and significantly associated with Financial Accountability. Monitoring Activities recorded the strongest association ($r = .968$), followed by Information and Communication ($r = .954$), Control Environment and Control Activities ($r = .905$ each), and Risk Assessment ($r = .765$). The findings indicate that financial accountability is associated with processes that authorize, document, communicate, review, and monitor financial transactions.

The results are broadly consistent with [Abdullahi et al. \(2026\)](#), who reported a significant relationship between internal control systems and financial accountability in public-sector organizations. [Enemali and Okwoli \(2025\)](#) similarly found positive relationships between internal control and financial accountability, while [Juma et al. \(2025\)](#) reported a positive relationship between internal controls and financial accountability in local government. [Muti'ah et al. \(2024\)](#) also found internal-control systems to be associated with regional financial accountability. Although these studies differ in context and methodology, they provide supporting evidence that effective internal-control arrangements are associated with stronger accountability practices.

The particularly strong relationships involving Information and Communication and Monitoring Activities suggest that accurate financial information, effective communication, continuous review and follow-up of identified weaknesses are important elements of accountability. Monitoring, in particular, enables institutions to determine whether established controls are operating effectively and whether corrective actions are implemented.

However, the high correlations among the COSO dimensions require caution when interpreting the individual relationships as independent effects. For example, Information and Communication was strongly correlated with Monitoring Activities ($r = .940$), while Control Environment and Control Activities showed a perfect correlation ($r = 1.000$) in the dataset. The findings therefore demonstrate strong associations but do not establish that any single internal-control component independently causes improvements in Financial Accountability.

4.4.3 Overall Discussion

Taken together, the findings provide evidence that the five COSO internal-control dimensions are closely associated with both fraud prevention and financial accountability in the selected public tertiary institutions. Monitoring Activities emerged as the strongest observed correlate of both outcomes, whereas Risk Assessment recorded the weakest association. This pattern highlights the importance of continuous monitoring, internal-audit follow-up, supervision, and corrective action within the institutional control system.

The findings should nevertheless be interpreted within the limits of the cross-sectional design. The observed relationships reflect associations among respondents' perceptions at one point in time and should not be interpreted as causal effects. In addition, the high intercorrelations among the COSO dimensions suggest that the components operate as an integrated control framework rather than as completely independent mechanisms. The results therefore support strengthening internal control as a coordinated institutional system rather than focusing on individual components in isolation.

5. Conclusion

Conclusion

The study found positive and statistically significant associations between each of the five COSO internal-control dimensions and both Fraud Prevention and Financial Accountability in the selected public tertiary institutions. Monitoring Activities showed the strongest association with both outcomes, while Risk Assessment showed the weakest. The results support the relevance of an integrated internal-control framework in tertiary institutions. Because the design is cross-sectional and the regression diagnostics show important limitations, the findings are interpreted as associations rather than causal effects.

Recommendations

The following recommendations were derived directly from the findings:

The institutions should strengthen monitoring, internal-audit follow-up and tracking of corrective action.

Secondly, systematic risk assessment should cover procurement, revenue, expenditure, payroll, cash, stores and assets.

Third, control activities should reinforce segregation of duties, authorisation, documentation, reconciliation and supervisory review.

The management should strengthen ethical leadership, clear responsibilities and compliance with financial procedures.

Institutions should improve the timeliness and reliability of financial information and communication.

Audit recommendations should have assigned responsibility and implementation deadlines. Seventh, relevant staff should receive periodic training on internal control, fraud risks and financial regulations. Finally, internal control should be treated as an institution-wide responsibility rather than a function confined to finance or internal audit.

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