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Determinants of Fraud Risk in Nutrition Service Kitchen Governance: A Leadership, Conflict, and Audit Approach

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ABSTRACT
Nutrition Service Kitchens, including the Nutrition Fulfilment Service Units (SPPG) that run Indonesia's Free Nutritious Meals programme, manage large public budgets through procurement, inventory, production and distribution, which makes them vulnerable to fraud. This study examines the effect of leadership style, conflict management and audit perception on fraud risk in Nutrition Service Kitchens. An explanatory quantitative design with a cross-sectional survey was applied to 35 employees directly involved in kitchen operations. The instrument consisted of 16 five-point Likert items; fraud risk was measured as the strength of fraud prevention, so a higher score indicates lower risk. Data were analysed using validity and reliability tests, classical assumption tests and multiple linear regression. All items were valid and reliable and all classical assumptions were met. The model was fit (F = 7.650; p = 0.001) and explained 42.5% of the variance in fraud risk. Partially, only conflict management had a positive and significant effect on the fraud prevention score (B = 0.417; p = 0.045), whereas leadership style (p = 0.401) and audit perception (p = 0.333) were not significant. Conflict that is resolved quickly, fairly and openly reduces work pressure and therefore lowers fraud risk, consistent with the pressure dimension of the Fraud Triangle Theory.

ABSTRAK
Dapur Pelayanan Gizi, termasuk Satuan Pelayanan Pemenuhan Gizi (SPPG) pelaksana program Makan Bergizi Gratis, mengelola anggaran publik yang besar melalui pengadaan, pengelolaan persediaan, produksi, dan distribusi makanan sehingga rawan terhadap fraud. Penelitian ini bertujuan menguji pengaruh gaya kepemimpinan, pengelolaan konflik, dan persepsi audit terhadap risiko fraud pada Dapur Pelayanan Gizi. Penelitian menggunakan pendekatan kuantitatif eksplanatori dengan survei cross-sectional terhadap 35 pegawai yang terlibat langsung dalam operasional dapur. Instrumen terdiri atas 16 butir skala Likert lima poin; risiko fraud diukur sebagai kekuatan pencegahan fraud sehingga skor tinggi menunjukkan risiko rendah. Data dianalisis dengan uji validitas, reliabilitas, asumsi klasik, dan regresi linier berganda. Seluruh butir valid dan reliabel, serta seluruh asumsi klasik terpenuhi. Model regresi layak digunakan (F = 7,650; p = 0,001) dan menjelaskan 42,5% variasi risiko fraud. Secara parsial hanya pengelolaan konflik yang berpengaruh positif signifikan terhadap skor pencegahan fraud (B = 0,417; p = 0,045), sedangkan gaya kepemimpinan (p = 0,401) dan persepsi audit (p = 0,333) tidak signifikan. Konflik yang diselesaikan secara cepat, adil, dan terbuka menekan tekanan kerja sehingga menurunkan risiko fraud, sejalan dengan dimensi tekanan dalam Fraud Triangle Theory.

INTRODUCTION

Nutrition services are strategic units because they relate directly to fulfilling the basic needs of beneficiaries and involve relatively large operating budgets. The activities of a Nutrition Service Kitchen include food procurement, inventory management, production and food distribution, all of which are prone to irregularities when they are not properly managed (Febryanti et al., 2025). The Indonesian government has made the reduction of stunting and malnutrition a priority on the path to Golden Indonesia 2045, among others through the Free Nutritious Meals (MBG) programme implemented by the Nutrition Fulfilment Service Units (SPPG). The size of the public funds involved is directly proportional to the risk of fraud (Farani,

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2022), and fraud in nutrition programmes not only causes state financial losses but also threatens the health of future generations (Sari & Lestari, 2020). Fraud risk therefore needs to be mitigated by strengthening organisational governance, including internal control, internal audit and an ethical organisational culture (Agustine & Susilowati, 2022).

The urgency of this issue is reflected in oversight findings. The Summary of Audit Results for the first semester of 2025 issued by the Audit Board of the Republic of Indonesia shows that fraud and irregularities in the public sector remain a serious challenge, particularly at the local government level, so more comprehensive early detection is needed (BPK RI, 2025). In the MBG programme, alleged irregularities have been indicated by reduced nutritional value, cuts in the price per portion, price *mark-ups* and conflicts of interest in vendor appointments. Globally, the Association of Certified Fraud Examiners also identifies asset misappropriation as the most frequent occupational fraud scheme, with weak internal control as a leading contributing factor (ACFE, 2024).

At the programme level, the Corruption Eradication Commission (KPK) has identified at least eight potential points of abuse in the MBG programme, including inadequate regulation of planning and procurement, assistance mechanisms that add bureaucratic layers and room for rent-seeking, centralised selection of kitchen partners that raises conflict-of-interest risks, weak transparency in financial reporting, and kitchens that do not meet technical standards (KPK RI, 2026). Long supply chains between the funding agency, kitchen units and suppliers have also been highlighted as a source of leakage, prompting proposals to shorten the chain and involve communities in oversight (Wibowo et al., 2026). These findings show that the SPPG kitchen is the operational point where budget, procurement and food quality meet, so the behaviour of the people who run it largely determines whether public funds reach beneficiaries as intended.

This study is grounded in the *Fraud Triangle Theory*, which explains fraud as the interaction of *pressure*, *opportunity* and *rationalization* (Homer, 2020; Schuchter & Levi, 2016). The framework continues to be extended, for example by adding capability and ego, and by highlighting organisational climate as a driver of rationalization (Murphy & Free, 2016; Vousinas, 2019). In the Indonesian context, a fraud pentagon study found that rationalization and capability, rather than pressure and opportunity, were the significant drivers of financial statement fraud (Apriandy et al., 2026). On the opportunity side, an effective leadership style built on integrity shapes an organisational culture that closes the room for misconduct (Cheliatsidou et al., 2021; Ng & Feldman, 2015), whereas authoritarian or permissive leadership opens space for fraud (Sudarmanto, 2020). An audit function that is perceived as strong increases the sense of being monitored (*perceived control*) and thus lowers individuals' tendency to commit fraud (Rahman & Jie, 2022; Suh et al., 2019). On the pressure side, workplace conflict that is not managed professionally can increase pressure and encourage dysfunctional behaviour, including fraud (Owusu et al., 2021; Rahim, 2023).

Empirical evidence from the Indonesian public sector remains mixed. A study of regional government agencies found that internal control, organisational culture and internal audit each reduce fraud, with internal audit having the largest effect (Agustine & Susilowati, 2022), whereas another study found that leadership and internal control strengthen fraud prevention while whistleblowing systems and organisational culture do not (Wardah et al., 2022). International studies similarly show that the willingness of employees to report wrongdoing depends on pressure, opportunity and rationalization factors that mirror the fraud triangle (Latan et al., 2019), and that auditors who attend to behavioural red flags are better able to anticipate fraud (Sandhu & Saluja, 2023). These inconsistencies suggest that the effect of leadership, conflict and

audit on fraud is context dependent, and that it needs to be tested in organisational settings with characteristics different from those of established government agencies.

Previous studies have mostly examined the determinants of fraud in banking, local government, village-owned enterprises or corporations, with dominant variables such as internal control, governance, information asymmetry and individual morality (Faisol et al., 2025; Kazemian et al., 2019; Said et al., 2017). Critiques of the *Fraud Triangle Theory* also stress the need to test it in diverse organisational contexts rather than only in corporate financial reporting (Free, 2015; Lokanan, 2015). Meanwhile, empirical studies that specifically examine Nutrition Service Kitchens as operational public service units remain very limited, even though the number of SPPG units has grown rapidly with the expansion of the MBG programme.

The novelty of this study lies in two aspects. First, its object is the Nutrition Service Kitchen/SPPG, a new service unit with large flows of public funds. Second, it integrates three organisational behaviour variables, namely leadership style, conflict management and audit perception, into a single model based on the *Fraud Triangle Theory*, in which leadership style and audit perception are mapped as factors that close opportunity, and conflict management as a factor that reduces work pressure. Accordingly, this article aims to examine the effect of leadership style (H1), conflict management (H2) and audit perception (H3) on fraud risk in Nutrition Service Kitchens, and to formulate fraud mitigation implications for their managers.

RESEARCH METHOD

Research Design and Respondents

This study used a quantitative approach with an explanatory design aimed at explaining the causal relationships between the independent variables and fraud risk (Hair et al., 2019). The research took the form of a *cross-sectional* survey using primary data collected through a questionnaire. Respondents were employees directly involved in the management and operation of Nutrition Service Kitchens/SPPG, including SPPG heads, accountants and finance staff, administrative staff, nutritionists and nutrition supervisors, and production staff. The questionnaire was distributed online in September 2026. After screening and cross-checking the completeness and consistency of the answers, 35 responses were eligible for analysis.

Instrument and Variable Operationalisation

Each variable was measured with four statements on a 1–5 Likert scale (1 = strongly disagree to 5 = strongly agree). The fraud risk items were worded positively as the strength of fraud prevention, so a high Y score means strong control and low fraud risk. The operationalisation of the variables is presented in Table 1.

Variable	Operational Definition	Indicators
Leadership Style (X1)	Behaviour patterns and ways in which leaders influence, direct and control subordinates	Clear direction and rules; integrity role model; openness to input; firm and fair sanctions
Conflict Management (X2)	Ability of the organisation and its leaders to identify, control and resolve conflict constructively	Prompt handling; fair deliberative solutions; open resolution without mutual blame; workflow remains conducive
Audit Perception (X3)	Employees' views on the presence, independence and effectiveness of audit	Audit as positive evaluation; recommendations aid improvement; routine audit disciplines record-keeping; audit results followed up
Fraud Risk (Y)	Degree of fraud vulnerability seen from the strength of prevention (high score = low risk)	Segregation of duties prevents asset misuse; low likelihood of report manipulation; staff not pressured to compromise procedures; safe and effective *whistleblowing*

Table 1. Operationalisation of Variables

Data Analysis Technique

Data analysis comprised data quality tests, classical assumption tests and multiple linear regression using the *Enter* method at a 5% significance level (Hair et al., 2019). An item was declared valid when its calculated r exceeded the critical r (0.334; df = 33), and a variable was declared reliable when *Cronbach's Alpha* exceeded 0.60. The classical assumption tests covered *Kolmogorov-Smirnov* normality of residuals, multicollinearity (*Tolerance* > 0.10 and VIF < 10), heteroscedasticity using the Glejser test, and autocorrelation using the Durbin-Watson test. Hypotheses were tested using the t-test (critical t = 2.040), the F-test (critical F = 2.911) and the coefficient of determination. The empirical model is as follows.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$$

Where: Y = fraud risk (fraud prevention score); X_1 = leadership style; X_2 = conflict management; X_3 = audit perception; α = constant; β_1–β_3 = regression coefficients; e = *error term*.

RESULTS

Respondent Profile

The profile of the 35 respondents by length of service, education and position is presented in Table 2. Almost all respondents (97.1%) had less than three years of service, in line with the relatively recent establishment of SPPG units. Most respondents held a bachelor's degree or higher (77.1%) and worked in accounting/finance (65.7%), so they understand the recording and reporting processes that are the main points of fraud vulnerability.

Table 2. Respondent Profile

Characteristic	Category	Number	%
Length of service	< 1 year	17	48.6
	1–3 years	17	48.6
	> 3 years	1	2.9
Education	Bachelor's or higher (S1/S2/S3)	27	77.1
	Diploma	8	22.9
Position	Accountant/finance/tax	23	65.7
	Administrative/office staff	6	17.1
	Nutrition and production	4	11.4
	Head of SPPG	2	5.7

Source: Processed primary data (2026)

Data Quality and Classical Assumption Tests

All items had calculated r values between 0.478 and 0.846, above the critical r of 0.334 with significance < 0.05, so all items were valid. The *Cronbach's Alpha* values of all variables exceeded 0.60 (Table 3), so the instrument was reliable. Item X2.4 had the lowest corrected item-total correlation (0.195) but was retained because it met the validity criterion.

Table 3. Validity and Reliability Test Results

Variable	Range of r	Cronbach's Alpha	Remark
Leadership Style (X1)	0.696–0.846	0.784	Valid, reliable
Conflict Management (X2)	0.478–0.843	0.643	Valid, reliable
Audit Perception (X3)	0.654–0.818	0.731	Valid, reliable
Fraud Risk (Y)	0.630–0.784	0.710	Valid, reliable

Source: Processed primary data (2026); critical r = 0.334; Alpha threshold = 0.60

The classical assumption tests in Table 4 show that the residuals were normally distributed, the model was free from multicollinearity, and there was no heteroscedasticity. The Durbin-Watson value of 2.280 lies between dU (1.653) and 4 − dU (2.347), indicating no autocorrelation. Since all assumptions were met, the regression model is appropriate for interpretation.

Table 4. Classical Assumption Test Results

Test	Result	Criterion	Conclusion
Normality (Kolmogorov-Smirnov)	D = 0.107; Sig. = 0.818	Sig. > 0.05	Normal
Multicollinearity	Tolerance 0.448–0.790; VIF 1.266–2.230	Tolerance > 0.10; VIF < 10	Not present
Heteroscedasticity (Glejser)	Sig. X1 = 0.066; X2 = 0.451; X3 = 0.792	Sig. > 0.05	Not present

Source: Processed primary data (2026)

Multiple Linear Regression and Hypothesis Testing

The regression results in Table 5 yield the equation $Y = 4.051 + 0.117X_1 + 0.417X_2 + 0.200X_3 + e$. All coefficients are positive. Because a high Y score means low fraud risk, a positive coefficient is read as follows: the better the independent variable, the stronger the prevention and the lower the fraud risk.

Table 5. Multiple Linear Regression Results

Variable	B	Std. Error	Beta	t	Sig.
Constant	4.051	2.841	–	1.426	0.164
Leadership Style (X1)	0.117	0.137	0.131	0.852	0.401
Conflict Management (X2)	0.417	0.200	0.425	2.091	0.045
Audit Perception (X3)	0.200	0.204	0.195	0.983	0.333
$R = 0.652$; $R^2 = 0.425$; Adjusted $R^2 = 0.370$; F = 7.650; Sig. F = 0.001; n = 35					

Source: Processed primary data (2026); dependent variable: Fraud Risk (Y)

The calculated F of 7.650 exceeds the critical F of 2.911 with a significance of 0.001, so the model is fit (*goodness of fit*). The R^2 of 0.425 indicates that 42.5% of the variation in fraud risk is explained by the three independent variables, while 57.5% is explained by other factors outside the model, such as internal control and ethical organisational culture. Partially, leadership style (t = 0.852; p = 0.401) and audit perception (t = 0.983; p = 0.333) have no significant effect, whereas conflict management (t = 2.091; p = 0.045) has a positive and significant effect. Thus H2 is accepted, while H1 and H3 are rejected. A summary of the model test is presented in Figure 1.

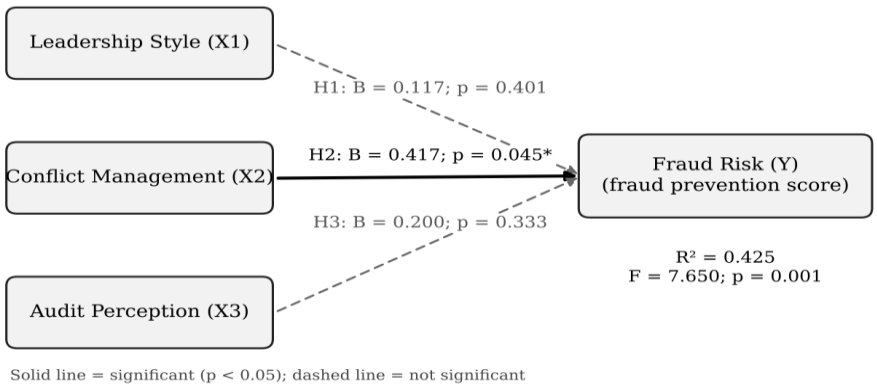


Figure 1. Results of the Research Model Test

DISCUSSION

Leadership style and fraud risk

Leadership style is positively correlated with the fraud prevention score at the bivariate level (r = 0.397; p = 0.018), but its effect is not significant after controlling for the other variables. Uniformly high ratings of leadership leave little variation to explain differences in risk between units. In addition, SPPG units operate under centralised SOPs and technical guidelines, so fraud opportunities are determined more by the system than by the individual style of the leader. Within the *Fraud Triangle Theory*, the leader's role in closing opportunities appears to be

channelled through the way conflict is managed (r X1–X2 = 0.445). This finding differs from studies that position ethical leadership as a direct predictor of deviant behaviour (Ng & Feldman, 2015), but is consistent with the view that leadership often works indirectly through the work climate (Cheliatsidou et al., 2021; Murphy & Free, 2016).

This result also differs from Wardah et al. (2022), who found that leadership significantly strengthens fraud prevention in established public organisations. A plausible explanation is organisational maturity. In long-standing agencies, leaders have time to shape norms, rotate staff and enforce sanctions, so their style leaves a visible imprint on control. SPPG units, by contrast, were established recently, most respondents have worked for less than three years, and operating rules are issued centrally. Under these conditions the room for leaders to differentiate themselves is narrow, and their influence is expressed mainly through day-to-day problem solving, which is captured by the conflict management variable.

Conflict management and fraud risk

Conflict management is the only significant predictor and also the strongest (Beta = 0.425). A one-point increase in the conflict management score raises the fraud prevention score by 0.417 points. This finding supports the pressure dimension of the *Fraud Triangle Theory*: conflicts that are resolved quickly, fairly and openly reduce work pressure, so staff are not driven to compromise procedures (Homer, 2020; Owusu et al., 2021). A conducive work climate also narrows the room for rationalization, because employees who feel treated fairly are less likely to justify fraudulent acts (Murphy & Free, 2016; Said et al., 2017). In kitchen units that work under tight time and portion targets, conflict resolution mechanisms are the pressure control closest to employees' daily activities.

Audit perception and fraud risk

Audit perception is strongly correlated with the fraud prevention score at the bivariate level (r = 0.554; p = 0.001), but is not significant partially. The main reason is its large overlap with conflict management (r X2–X3 = 0.723); the VIF still meets the criterion, but the unique effect of audit perception becomes small in a sample of 35 respondents. Substantively, audit in newly established units functions more as guidance on record-keeping than as a deterrent. This differs from findings in the financial sector showing that strongly perceived oversight directly reduces fraud occurrence (Rahman & Jie, 2022; Suh et al., 2019), and confirms that the effect of audit depends on consistent follow-up of its recommendations.

The finding is also in contrast with Agustine and Susilowati (2022), who reported that internal audit had the largest effect on reducing fraud in local government. The difference likely reflects the maturity of the audit function itself. In local government, audit cycles, follow-up mechanisms and sanctions are institutionalised, whereas in new kitchen units audits are still dominated by guidance on administration and reporting. Sandhu and Saluja (2023) argue that audit becomes more effective in anticipating fraud when auditors assess behavioural risk factors in addition to documents. For SPPG units, this means that audit programmes should also examine indicators such as unresolved disputes, target pressure and staff turnover, because these are the channels through which pressure translates into misconduct.

Whistleblowing and the prevention climate

One indicator of the fraud risk variable is the perceived safety and effectiveness of whistleblowing procedures. Whistleblowing behaviour is shaped by the same forces that shape fraud: employees report wrongdoing when they feel protected, when reporting channels are available, and when they can justify reporting as loyalty to the organisation (Latan et al., 2019). Fair and open conflict resolution builds exactly this climate, because staff learn that problems can be raised without retaliation. This helps explain why conflict management, rather than leadership

or audit perception, is most closely related to the overall fraud prevention score, and is consistent with evidence that the effectiveness of whistleblowing systems depends on the surrounding organisational culture (Wardah et al., 2022).

Theoretical contribution

The results add to the debate on the explanatory power of the *Fraud Triangle Theory*. Critics argue that the model focuses too much on individual offenders and too little on organisational conditions (Free, 2015; Lokanan, 2015). This study shows that an organisational-level variable, the way conflict is managed, operates through the pressure dimension and is more decisive than individual perceptions of leadership or audit. This supports calls to broaden the triangle with the social and climate dimensions of fraud (Murphy & Free, 2016). In addition, kitchen operations involve intensive interaction with suppliers, so the collusion element emphasised in the S.C.O.R.E. model is a relevant extension for subsequent studies (Vousinas, 2019). Notably, the dominance of the pressure dimension in this study differs from fraud pentagon evidence on financial statement fraud, where rationalization and capability were significant but pressure was not (Apriandy et al., 2026). This contrast suggests that the dominant fraud element depends on the type of fraud and setting: pressure matters most for operational fraud by frontline staff in service units, whereas rationalization and capability matter more for reporting fraud committed by those who control the accounts.

Implications

The model explains 42.5% of the variation in fraud risk even though only one variable is partially significant. This means that fraud mitigation in nutrition kitchens cannot rely on formal systems alone, but must also attend to the work climate, leadership and the audit function in an integrated manner (Agustine & Susilowati, 2022; Faisol et al., 2025). For SPPG managers, formal and fair conflict resolution mechanisms should be prioritised as a fraud prevention instrument. For supervisors and auditors, follow-up of audit recommendations should be monitored so that audit has a deterrent effect. For regulators of nutrition programmes, strengthening safe *whistleblowing* channels is an urgent need. These measures are also in line with KPK's recommendations to improve transparency in the selection of kitchen partners and in financial reporting (KPK RI, 2026), and with proposals to shorten the supply chain and involve communities in monitoring kitchen operations (Wibowo et al., 2026).

CONCLUSION

This study shows that conflict management is the main determinant of fraud risk in Nutrition Service Kitchens: the better conflict is managed, the stronger the prevention and the lower the fraud risk ($B = 0.417$; $p = 0.045$). Leadership style and audit perception have no significant partial effect, although both are positively correlated with fraud prevention at the bivariate level. Simultaneously, the three variables adequately explain fraud risk ($F = 7.650$; $p = 0.001$) with an explanatory power of 42.5%. These findings reinforce the pressure dimension of the *Fraud Triangle Theory* in the context of nutrition service units, namely that controlling work pressure through conflict management matters more than opportunity-closing factors in newly established units.

RECOMMENDATION

SPPG managers are advised to establish formal, prompt and fair conflict resolution mechanisms, such as regular deliberation forums and internal complaint procedures, to ease target pressure so that staff do not compromise procedures, and to strengthen safe *whistleblowing* channels. Auditors and supervisors should emphasise the follow-up of audit

recommendations so that audit not only guides record-keeping but also creates a deterrent effect. This study has several limitations: the sample of 35 respondents limits statistical power, the self-reported perception data are potentially subject to social desirability bias, and in-depth interviews have not yet been conducted. Future research is recommended to enlarge the sample across regencies and cities, add internal control, ethical culture and management commitment as variables, test mediating and moderating roles using SEM-PLS, and complement the survey with in-depth interviews.

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