



Associations of Communication, Work-Related Distractions, and Workload with Patient Safety Incidents among Nurses

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Abstract

Background: Patient safety incidents remain a problem in the delivery of primary health care because they can reduce the quality of care and endanger patients. Various factors suspected of contributing to patient safety incidents at community health centers include communication, work interruptions, and the workload of health care workers. The purpose of this study was to analyze the determinants of patient safety practices in relation to patient safety incidents at community health centers in Kediri Regency. **Methods:** The study design used in this research was a quantitative, analytical, cross-sectional study. The population consisted of all nurses at community health centers in Kediri Regency, totaling 321 respondents. The study sample comprised 178 respondents. Proportional cluster sampling was used. The independent variables were communication, work-related interruptions, and patient safety incidents, while the dependent variable was patient safety incidents. **Results:** The results of the study showed that communication had a significant effect on patient safety incidents ($p=0.000$; $r=0.507$), work-related interruptions had a significant effect ($p=0.000$; $r=0.529$), and workload also had a significant effect ($p=0.000$; $r=0.553$). Multiple linear regression analysis showed that communication was the most dominant factor influencing patient safety incidents ($\beta=2.536$; $p=0.012$), followed by work-related interruptions ($\beta=2.308$; $p=0.022$) and workload ($\beta=2.067$; $p=0.040$). Collectively, communication, work-related interruptions, and workload had a significant effect on patient safety incidents ($p=0.000$) with an Adjusted R^2 value of 0.276, indicating that these three variables account for 27.6% of the variation in patient safety incidents, while 72.4% is influenced by other factors outside the research model. **Discussion:** Strengthening effective communication, controlling work-related interruptions, and managing workload appropriately are necessary to improve the patient safety culture and the quality of health services at community health centers.

Keywords: Communication, Work-Related Distractions, Workload, Patient Safety Incidents, Community Health Centers

1. Introduction

Patient safety is a core dimension of healthcare quality because preventable failures in care processes can harm patients and erode trust in health services. Incident reporting and organizational learning are central to identifying risks and improving systems, yet underreporting remains common and can obscure the true burden of unsafe care (Pramesona et al., 2023). In Indonesia, the implementation of patient safety is mandated across healthcare facilities, including community health centers, but primary care services face operational conditions that differ from those of hospitals.

Community health centers provide curative, preventive, promotive, rehabilitative, and community-based services while operating with finite staff and infrastructure (Dhynianti et al., 2025; Satria Perdana & Rika, 2025). Their broad mandate can create competing priorities, frequent task switching, and substantial administrative work. Studies in Indonesian primary care have reported continuing challenges in incident reporting, safety culture, and implementation of formal patient safety steps (Dhamanti et al., 2021). These findings indicate that the presence of policies alone does not ensure consistent safety practices.

Communication, work-related distractions, and workload represent distinct but connected human and organizational factors. Clear communication supports accurate information transfer and coordination across professions, particularly during handovers and clinical decision-making (Katantha et al., 2025). Interruptions can

divert attention from an ongoing task, increase cognitive demand, and raise the possibility of omission or documentation error (Danesh et al., 2022). Workload reflects the physical, cognitive, and administrative demands placed on healthcare personnel and may affect the time and attention available for assessment, verification, and documentation (Ivziku et al., 2022). Evidence from Indonesian community health centers also links nursing workload with implementation of patient safety practices (Kusumaningsih et al., 2020).

Local service data strengthen the rationale for examining these factors. A preliminary assessment in Kediri Regency indicated that patient safety reporting was not yet optimal. The 2024 recapitulation from 37 community health centers recorded 258 reported incidents. Near-miss incidents accounted for 86 cases (33.3%), patient identification errors for 73 cases (28.3%), and potential injury incidents for 39 cases (15.1%). Medication errors and healthcare-associated infection incidents were reported less frequently, while no severe events were documented. The absence of reported severe events may reflect either a genuinely low occurrence or incomplete reporting and therefore should not be interpreted as evidence that such events did not occur.

Research on patient safety determinants has been concentrated in hospital settings, whereas evidence that evaluates communication, distractions, and workload together among nurses in Indonesian primary care remains limited. Examining these variables simultaneously may help clarify how much variation in self-reported incident scores is associated with modifiable work-system factors. This study therefore aimed to examine the associations of communication, work-related distractions, and workload with patient safety incident scores among nurses at community health centers in Kediri Regency.

2. Materials and Methods

2.1 Study Design and Participants

This analytical cross-sectional study was conducted among nurses working at community health centers in Kediri Regency, Indonesia. The target population comprised 321 nurses, of whom 178 were selected using proportional cluster sampling. Communication, work-related distractions, and workload were specified as independent variables, while the patient safety incident score was the dependent variable.

2.2 Data Collection and Measures

Data were collected using structured questionnaires administered to the selected participants. The instruments assessed communication, work-related distractions, workload, and patient safety incidents. Instrument validity and reliability were assessed before data collection. Questionnaire scores were analyzed according to their respective scoring procedures, with the patient safety incident score retained as a quantitative outcome.

2.3 Statistical Analysis

Participant characteristics and study variables were summarized using frequencies and percentages for categorical variables and means, standard deviations, medians, ranges, and 95% confidence intervals (CIs), as appropriate. Spearman's rank correlation coefficient (ρ) was used to examine bivariate associations between communication, work-related distractions, workload, and patient safety incident scores. Multiple linear regression was subsequently performed to estimate the independent association of each predictor with the patient safety incident score while adjusting for the other variables in the model. Regression assumptions, including linearity, normality and homoscedasticity of residuals, independence of errors, and multicollinearity, were assessed before interpreting the model. Regression coefficients were reported with 95% CIs. All tests were two-sided, with statistical significance set at $p < 0.05$. Statistical analyses were performed using SPSS.

3. Results

The analysis included 178 nurses. Half were 31 to 40 years old (50.6%), most were women (74.7%), and nearly two thirds had worked for more than three years (62.4%). Most respondents held a Diploma III qualification (74.7%). Permanent civil servants constituted the largest employment group (42.1%), followed by government employees under fixed-term contracts (38.8%).

Table 1 Participant characteristics (n = 178)

Characteristic	n	%
Age		
21–30 years	45	25.3
31–40 years	90	50.6
41–50 years	30	16.9
>50 years	13	7.2
Gender		
Men	45	25.3
Women	133	74.7
Length of employment		
<1 year	12	6.7
1–3 years	55	30.9
>3 years	111	62.4
Highest education		
Diploma III	133	74.7
Bachelor's degree	29	16.3
Professional nursing degree	15	8.4
Master's degree	1	0.6
Employment status		
Permanent civil servant	75	42.1
Government employee under a fixed-term contract (PPPK)	69	38.8
Public service agency employee	20	11.2
Fixed-term contract employee	14	7.9

Table 1 presents the demographic characteristics of the 178 respondents included in this study. Most respondents were aged 31–40 years (50.6%), female (74.7%), had a Diploma III degree educational background (74.7%), and had more than three years of work experience (62.4%). Regarding employment status, the majority were permanent civil servants (42.1%), followed by Government Employee under a Fixed-Term Contract (PPPK) (38.8%). These findings indicate that the respondents were predominantly experienced healthcare professionals working in primary healthcare settings.

Table 2 Descriptive statistics for study variables (n = 178)

Variable	Mean	Median	Min	Max	95% CI lower	95% CI upper
Communication score	24.23	24.00	11	45	23.25	25.21
Work-related distraction score	26.42	25.00	11	48	25.30	27.53
Workload score	25.44	25.00	11	45	24.49	26.40
Patient safety incident score	3.43	2.00	0	23	2.85	4.02

Table 2 presents the descriptive statistics of the study variables. The mean communication score was 24.23 (95% CI: 23.25–25.21), with scores ranging from 11 to 45. The mean score for work-related distractions was 26.42 (95% CI: 25.30–27.53), ranging from 11 to 48. The workload variable had a mean score of 25.44 (95% CI: 24.49–

26.40), with scores ranging from 11 to 45. Meanwhile, the mean patient safety incident score was 3.43 (95% CI: 2.85–4.02), with observed values ranging from 0 to 23. Overall, work-related distractions showed the highest mean score among the independent variables, followed by workload and communication.

Table 3 Bivariate associations with patient safety incident scores (n = 178)

Independent variable	Outcome	Spearman's r_s	p value
Communication score	Patient safety incident score	0.507	< 0.001
Work-related distraction score	Patient safety incident score	0.529	< 0.001
Workload score	Patient safety incident score	0.553	< 0.001

Table 3 presents the results of the bivariate analysis using Spearman's rho correlation test. Communication, work-related distractions, and workload were all significantly associated with patient safety incidents ($p < 0.001$). Communication showed a moderate positive correlation with patient safety incidents ($r = 0.507$), while work-related distractions demonstrated a moderate positive correlation ($r = 0.529$). The strongest correlation was observed between workload and patient safety incidents ($r = 0.553$), indicating that workload had the highest correlation coefficient among the independent variables.

Table 4. Available significance tests from the multivariable linear regression (n = 178)

Predictor	Outcome	t statistic	p value
Communication score	Patient safety incident score	2.536	0.012
Work-related distraction score	Patient safety incident score	2.308	0.022
Workload score	Patient safety incident score	2.067	0.040

Table 4 presents the results of the multiple linear regression analysis examining the effects of communication, work-related distractions, and workload on patient safety incidents. All independent variables were significantly associated with patient safety incidents, with communication ($p = 0.012$; $\beta = 2.536$), work-related distractions ($p = 0.022$; $\beta = 2.308$), and workload ($p = 0.040$; $\beta = 2.067$). Among the independent variables, communication had the highest standardized regression coefficient, indicating that it was the most influential predictor of patient safety incidents, followed by work-related distractions and workload.

4. Discussion

This study found moderate positive bivariate associations of communication, work-related distractions, and workload scores with patient safety incident scores. Each variable also remained statistically significant in the reported multivariable analysis, and the model accounted for 27.6% of outcome variance. The findings identify relevant work-system correlates of self-reported incident scores, but the cross-sectional design does not establish temporal order or causality.

The communication result requires particularly careful interpretation. The manuscript did not state whether a higher questionnaire score represented better communication or more communication problems. If higher values represent poorer communication, the positive association with incident scores is consistent with evidence that incomplete information exchange and weak interprofessional coordination can compromise safe care (Katantha et al., 2025). If higher values represent better communication, the positive association is counterintuitive and the coding of reverse-scored items, construction of the total score, and outcome coding should be checked before a directional conclusion is made. The data therefore support an association with a communication score, not the claim that effective communication increased or reduced incidents.

Work-related distractions showed a positive association with incident scores. Interruptions and task switching can disrupt attention and working memory (Chen et al., 2022; Hu et al., 2023), especially when clinical

care, documentation, telephone communication, and administrative requests occur concurrently (Ardian et al., 2026; Hong & Lee, 2025; Wahyuningtyas et al., 2026). A systematic review of emergency department work environments similarly found that interruptions are common and can affect workflow and cognitive performance (Danesh et al., 2022). Although the present setting differs from an emergency department, the underlying attention demands are relevant to community health centers that deliver multiple services with limited personnel.

Workload had the largest bivariate correlation with incident scores, although the difference from the other coefficients was small and should not be interpreted as proof of dominance. Workload includes physical, cognitive, and administrative demands that compete for clinicians' time and attention (Ivziku et al., 2022). Indonesian primary-care evidence has also linked nursing workload with patient safety implementation (Kusumaningsih et al., 2020). In this study, however, workload and incidents were measured at the same time, so it is possible that incident experience influenced workload perceptions or that both were shaped by unmeasured staffing and organizational conditions.

The adjusted R^2 of 0.276 indicates that most variation in incident scores remained unexplained by the three measured variables. Patient safety incidents generally arise from interacting defenses and latent system conditions rather than a single individual factor, which is consistent with a systems perspective on error (Amalia et al., 2026; Kakemam et al., 2025; Shabani et al., 2024). Other relevant factors may include staffing adequacy, leadership, safety culture, adherence to procedures, reporting climate, case complexity, availability of resources, and the maturity of incident-learning systems. These factors were not measured and should not be inferred from respondents' age, education, or length of employment.

The practical implication is to strengthen reliable work processes rather than assign responsibility to individual nurses. Community health centers may consider standardized handover and escalation procedures, protected periods for high-risk tasks, clearer task allocation, review of avoidable administrative interruptions, and routine workload monitoring. These recommendations are proportionate to the observed associations but should be evaluated prospectively before effectiveness is claimed.

Limitations

The cross-sectional design prevents causal and temporal inference. Questionnaire scores may be affected by recall, common-method, and social-desirability bias, and the manuscript did not clarify whether incident reports were verified against records. Missing information on instrument scoring and psychometric performance limits interpretation, particularly for communication. Generalizability is also limited because participants were nurses from one regency. Finally, unavailable outcome-distribution and regression-diagnostic results prevent full assessment of the linear model, while the adjusted R^2 indicates substantial residual confounding.

5. Conclusions

Communication, work-related distractions, and workload scores were significantly associated with patient safety incident scores among nurses at community health centers in Kediri Regency, and the reported model explained 27.6% of outcome variance. The findings do not establish causal effects, and the direction of the communication association must be confirmed from the questionnaire scoring. Further studies should use clearly documented instruments, objective incident data where feasible, complete regression reporting, and longitudinal or controlled designs.

Acknowledgment

The authors would like to thank the Health Research Ethics Committee of STRADA Indonesia University for ethical approval of this study. Appreciation is also extended to all respondents and supporting staff.

Ethical considerations

This study was approved by the Health Research Ethics Committee of STRADA Indonesia University (No. 0823430/EC/KEPK/I/05/2026).

Conflict of Interest

There is no conflict of interest.

Funding

This research did not receive any financial support.

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