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FACTORS ASSOCIATED WITH PATIENT SAFETY IMPLEMENTATION AMONG INPATIENT NURSES IN AN INDONESIAN MENTAL HOSPITAL

Oki Trio Sudarta[1]*, Meri Herliza[2], Putri Widya Herman[3]

[1,2,3]*Hospital Administration Study Program, Faculty of Health Sciences, Universitas Mohammad Natsir Bukittinggi, West Sumatra, Indonesia*

*Corresponding author e-mail: *okitriosudarta18@gmail.com*

Abstract

Patient safety is a global concern, and nurses, who provide round-the-clock care, are central to its implementation; however, evidence from Indonesian mental hospitals remains scarce. This study examined associations between nurse characteristics (gender, age, education, and length of service), knowledge, and supervision and patient safety implementation in the inpatient wards of Prof. HB. Saanin Mental Hospital, Padang, West Sumatra. A quantitative cross-sectional design was applied in February 2026. Using purposive sampling, 117 inpatient nurses completed structured questionnaires, and we analyzed the data using univariate statistics and the Chi-Square test (α = 0.05). Good patient safety implementation was found in 53.0% of nurses, whereas 63.2% had poor knowledge and 55.6% reported poor supervision. Gender (p = 0.032), age (p = 0.030), length of service (p = 0.035), knowledge (p = 0.045), and supervision (p = 0.002) were significantly associated with patient safety implementation, whereas education was not (p = 0.534). Supervision showed the strongest association (Cramér's V = 0.29). This study contributes setting-specific evidence from a psychiatric referral hospital and identifies structured supervision and continuous training as priority management levers for strengthening patient safety.

Keywords: *Patient Safety; Nurses; Supervision; Knowledge; Mental Hospital*

1. Introduction

Patient safety is a cornerstone of quality healthcare and remains a serious global public health concern. The World Health Organization (WHO) estimates that about one in ten patients is harmed while receiving hospital care and that unsafe care contributes to more than three million deaths each year (WHO, 2023). In hospitals in low- and middle-income countries alone, an estimated 134 million adverse events occur annually, resulting in 2.6 million deaths (WHO, 2019). In Indonesia, hospitals are required to run a patient safety system that covers risk assessment, risk management, incident reporting and analysis, and the implementation of solutions to prevent recurrence, and the system is operationalized through six patient safety goals (Kementerian Kesehatan Republik Indonesia, 2017).

Psychiatric inpatient care adds further layers of complexity. Patients in inpatient mental health settings are exposed to the same risks as other hospital patients, such as medication errors, as well as to risks linked to their condition, including self-harm,

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aggression, and unauthorized leave (Thibaut et al., 2019). A recent systematic review identified behavior-related incidents, medication-related events, and patient falls as the most frequently reported patient safety incidents in psychiatric inpatient units (Russotto et al., 2026). Nevertheless, patient safety in mental health care has received less research attention than in other healthcare settings (Thibaut et al., 2019).

Nurses are the professionals closest to patients and deliver care around the clock. Their daily practice, such as verifying patient identity, assessing fall risk, administering medication safely, monitoring patients at risk of absconding, and reporting incidents, largely determines whether safety policies translate into safe care. Studies of what shapes this practice commonly distinguish individual characteristics such as age, gender, education, and length of service (Marquis & Huston, 2017) from knowledge and supervision, which are linked to behavior and to organizational management (Notoatmodjo, 2012). The empirical evidence, however, is inconsistent. Agustira et al. (2024) reported that nurse characteristics were not associated with patient safety implementation, whereas knowledge was; Sarasanti et al. (2018) found that age and length of service were not significant, whereas supervision was; and Kurniadi et al. (2023) identified nurses' knowledge and hospital management as significant factors. These studies were conducted in general hospitals, so it remains unclear whether the same factors operate in psychiatric inpatient wards.

Prof. HB. Saanin Mental Hospital in Padang is a type A specialized hospital and the main mental health referral hospital owned by the West Sumatra Provincial Government. As such, it is expected to implement a patient safety system in line with hospital accreditation standards. Its monthly report for January–June 2025 recorded 18 patient safety incident reports: 7 adverse events (38.9%), 5 near-miss events (27.8%), 2 potential-injury events (11.1%), and 4 absconding or sentinel events (22.2%) (RSJ Prof. HB. Saanin Padang, 2025). In a preliminary interview in July 2025, ward heads and the Quality Committee indicated that 6 of 10 nurses (60%) perceived patient safety efforts as not yet running well. These signals suggest that, although the program has been introduced, its implementation at ward level is uneven.

Little is known about the factors associated with patient safety implementation among inpatient nurses in this hospital, and empirical evidence from psychiatric hospitals in Indonesia is limited. Understanding which individual and organizational factors are associated with implementation is essential for hospital managers who must decide where to direct scarce training and supervision resources. This study therefore aims to analyze the association of gender, age, education, length of service, knowledge, and supervision with patient safety implementation among inpatient nurses at Prof. HB. Saanin Mental Hospital, Padang. Its contribution lies in examining individual and managerial factors jointly in a psychiatric referral hospital and in identifying which of them are most amenable to management action.

2. Literature Review

Patient Safety Implementation in Psychiatric Inpatient Nursing

Indonesian regulation defines patient safety as a system that makes patient care safer through risk assessment, identification and management of patient-related risks,

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incident reporting and analysis, learning from incidents, and the implementation of solutions to minimize risk and prevent injury (Kementerian Kesehatan Republik Indonesia, 2017). The regulation classifies incidents into adverse events, near-miss events, no-harm events, potential-injury conditions, and sentinel events, and sets six patient safety goals: correct patient identification, effective communication, safety of high-alert medication, correct procedure, site, and patient, reduction of healthcare-associated infection, and reduction of the risk of patient falls. Nurses carry much of this work in practice because they provide continuous care. In psychiatric hospitals, additional risks such as absconding must also be managed, and international reviews show that inpatient mental health settings face a broad range of incident types, including interpersonal violence, coercive interventions, harm to self, medication safety, unauthorized leave, and falls (Thibaut et al., 2019; Russotto et al., 2026).

Individual and Organizational Determinants

Marquis and Huston (2017) classify age, gender, education, and length of service as internal factors that shape nurses' work and, therefore, patient safety. Age is generally associated with maturity, emotional stability, and accumulated experience, but may also be accompanied by physical fatigue and slower adaptation to new procedures. Education is expected to broaden knowledge and understanding of safety procedures, and length of service reflects clinical experience that helps nurses recognize risk, although a very long tenure may bring routine and complacency, whereas novices are still adapting to the work environment. Gender is usually examined as a proxy for differences in work style and in tolerance of physical workload.

Following the theoretical framework adopted in this study, knowledge and supervision are treated as external factors (Notoatmodjo, 2012). Knowledge underlies behavior: nurses who understand patient safety principles are better able to recognize risk, make sound clinical decisions, and follow standard operating procedures (SOPs). Supervision is a managerial function of direction and control, comprising guidance, monitoring, and feedback by superiors so that work is carried out according to standards. International evidence supports this managerial emphasis: a recent narrative review positions nursing management, through leadership, supervision, and open communication, as the structural foundation of patient safety systems (Anders, 2025), and transformational leadership has been associated with fewer adverse patient outcomes (Ystaas et al., 2023).

Previous Studies and Research Position

Table 1 summarizes Indonesian studies on factors associated with patient safety implementation among nurses. Three observations emerge. First, knowledge has been consistently supported as a related factor (Agustira et al., 2024; Kurniadi et al., 2023). Second, supervision and other organizational factors were significant wherever they were tested (Nasution, 2022; Sarasanti et al., 2018). Third, evidence for nurse characteristics is inconsistent, with several studies reporting no association (Agustira et al., 2024; Sarasanti et al., 2018). All of these studies were conducted in general hospitals. The present study differs in context (a psychiatric referral hospital), examines individual

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and managerial factors in a single analysis, and draws on a near-census sample of inpatient nurses.

Table 1. Previous Indonesian Studies on Factors Associated with Patient Safety Implementation among Nurses

Study	Setting and design	Main findings
Sarasanti et al. (2018)	Inpatient installation of Hospital X, Jakarta; 48 paramedics (nurses and midwives); cross-sectional	Supervision (p = 0.033), facilities (p < 0.001), and organizational culture (p < 0.001) were significant; age (p = 0.220) and length of service (p = 0.200) were not.
Nasution (2022)	Inpatient wards of Dr. Kumpulan Pane Hospital, Tebing Tinggi; quantitative	Supervision significantly influenced nurses' performance in implementing patient safety (p < 0.001).
Kurniadi et al. (2023)	Inpatient wards of a hospital in Tanjungpinang; 75 nurses; cross-sectional, Chi-Square	Nurses' knowledge (p = 0.004) and hospital organization/management (p = 0.030) were associated with implementation.
Agustira et al. (2024)	Inpatient wards of Muhammadiyah Hospital Palembang; 51 nurses (total sampling); cross-sectional, Chi-Square	Age, gender, education, and length of service were not associated; knowledge and attitude were associated.

Conceptual Framework and Hypotheses

Figure 1 presents the conceptual framework, which combines the internal factors described by Marquis and Huston (2017) with the external factors described by Notoatmodjo (2012). Six alternative hypotheses were tested: gender (H1), age (H2), education (H3), length of service (H4), knowledge (H5), and supervision (H6) are each associated with patient safety implementation among inpatient nurses.

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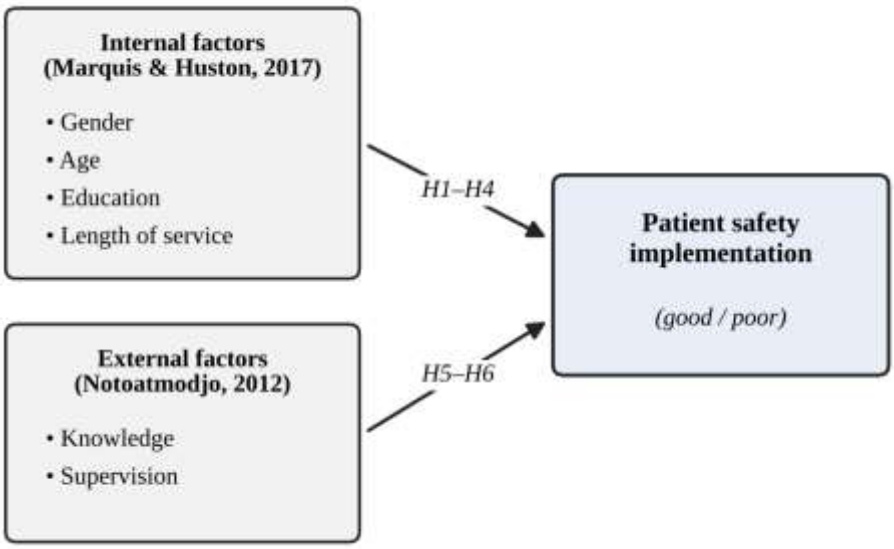


Figure 1. Conceptual Framework of the Study

3. Research Method

Research Approach, Design, and Setting

This study employed a quantitative approach with an analytical cross-sectional design, in which the independent variables (gender, age, education, length of service, knowledge, and supervision) and the dependent variable (patient safety implementation) were measured at the same point in time without follow-up (Notoatmodjo, 2018). It was conducted in the inpatient wards of Prof. HB. Saanin Mental Hospital, Padang, West Sumatra, Indonesia, from 6 to 20 February 2026. The theoretical framework combined the internal factors of Marquis and Huston (2017) and the external factors of Notoatmodjo (2012), as shown in Figure 1.

Population, Sample, and Sampling Technique

The population comprised all 130 nurses working in the inpatient installation. Participants were selected through purposive sampling using predefined criteria. The inclusion criteria were (a) working as a nurse in the inpatient installation, (b) having more than one year of work experience, and (c) willingness to participate. Nurses holding structural positions and those on leave during data collection were excluded. In total, 117 nurses met the criteria and were enrolled (90.0% of the population).

Data Types, Sources, and Instruments

Primary data were collected directly from respondents through structured, self-administered questionnaires, while secondary data (incident reports and the hospital profile) were obtained from hospital documents. The questionnaire comprised respondent characteristics (gender, age, education, and length of service) and three scales measuring knowledge, supervision, and patient safety implementation. Each scale

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contained 10 items rated on a five-point Likert scale (strongly disagree to strongly agree), giving total scores of 10–50. The knowledge and supervision items were adapted from Nasution (2022) and the patient safety items from Sari (2020). The patient safety scale covered patient identification, reduction of fall risk, reduction of absconding risk, reduction of medication errors, and overall patient safety.

Each scale was dichotomized using a cut-off score of 38: scores ≥ 38 were classified as good and scores < 38 as poor. Age was categorized as early adulthood (20–30 years), middle adulthood (31–40 years), and late adulthood (> 40 years). Education was recorded as diploma (D3), bachelor's degree (S1), professional nurse (Ners), or master's degree (S2). Length of service was categorized as < 5 years, 5–10 years, and > 10 years.

Data Collection Procedure and Data Credibility

After obtaining permission from the hospital, the researcher distributed the questionnaires to eligible nurses and explained the purpose of the study face-to-face to ensure that the items were understood and the responses were complete. Returned questionnaires were checked for completeness (editing), coded, scored, and tabulated in Microsoft Excel before analysis (Notoatmodjo, 2018). Data credibility was supported by direct clarification with respondents during collection, by completeness checks of every returned questionnaire, and by the use of instruments adapted from earlier studies.

Data Analysis

Univariate analysis described the distribution and percentage of each variable. Bivariate analysis used cross-tabulation and the Pearson Chi-Square test in SPSS to examine the association between each factor and patient safety implementation at a significance level of $\alpha = 0.05$. For each factor, the null hypothesis (H0) stated that there was no association with patient safety implementation, and H0 was rejected when $p < 0.05$. Education was analyzed as diploma (D3) versus bachelor's level or higher (S1, Ners, and S2); this grouping also avoids sparse cells because only four nurses held a master's degree. For 2 × 2 tables, the continuity-corrected and Fisher's exact results produced by SPSS were examined as sensitivity checks. Effect sizes (Cramér's *V*, and odds ratios with 95% confidence intervals for 2 × 2 tables) were additionally calculated from the cross-tabulations. Because bivariate tests do not adjust for confounding, the results are interpreted as associations rather than causal effects.

Ethical Considerations

Participation was voluntary. Each nurse received an explanation of the study and signed an informed consent form before completing the questionnaire. Identities were not recorded on the research instruments, data were kept confidential and stored separately in a locked place, and respondents could withdraw at any time without penalty.

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4. Result

Respondent Characteristics and Study Variables

Table 2 presents the characteristics of the 117 nurses and the distribution of the study variables. Most nurses were women (78.6%) and aged 31–40 years (46.2%). More than half held a diploma (D3) qualification (52.1%), and the largest group had worked for 5–10 years (44.4%). Nearly two-thirds of the nurses (63.2%) had poor knowledge about patient safety, and 55.6% rated the supervision they received as poor. Patient safety implementation was good among 62 nurses (53.0%) and poor among 55 (47.0%).

Table 2. Respondent Characteristics and Distribution of Study Variables (*n* = 117)

Variable	Category	*n*	%
Gender	Male	25	21.4
	Female	92	78.6
Age	20–30 years	39	33.3
	31–40 years	54	46.2
	> 40 years	24	20.5
Education	Diploma (D3)	61	52.1
	Bachelor's (S1)	28	23.9
	Professional nurse (Ners)	24	20.5
	Master's (S2)	4	3.4
Length of service	< 5 years	18	15.4
	5–10 years	52	44.4
	> 10 years	47	40.2
Knowledge	Poor	74	63.2
	Good	43	36.8
Supervision	Poor	65	55.6
	Good	52	44.4
Patient safety implementation	Poor	55	47.0
	Good	62	53.0

Source: Primary data (2026).

Association between Factors and Patient Safety Implementation

Table 3 and Figure 2 present the bivariate results. Five of the six factors were significantly associated with patient safety implementation. Poor implementation was more common among women (52.2%) than among men (28.0%) ($\chi^2 = 4.612$, df = 1, $p = 0.032$); the odds of good implementation among men were 2.81 times those among women (95% CI 1.07–7.36). Poor implementation increased with age, from 38.5% among nurses aged 20–30 years and 42.6% among those aged 31–40 years to 70.8% among those older than 40 years ($\chi^2 = 7.035$, df = 2, $p = 0.030$).

Education was not associated with implementation: poor implementation was found in 44.3% of diploma-level nurses and 50.0% of nurses with a bachelor's degree or

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higher (χ^2 = 0.386, df = 1, p = 0.534). Length of service showed a non-linear pattern. Poor implementation was most frequent among nurses with < 5 years of service (66.7%), least frequent among those with 5–10 years (34.6%), and again higher among those with > 10 years (53.2%) (χ^2 = 6.720, df = 2, p = 0.035). The linear-by-linear association test was not significant (p = 0.868), consistent with a U-shaped rather than a monotonic relationship.

Nurses with poor knowledge more often showed poor implementation (54.1%) than those with good knowledge (34.9%) (χ^2 = 4.012, df = 1, p = 0.045; odds ratio for good implementation = 2.20, 95% CI 1.01–4.77). The strongest association was found for supervision: 60.0% of nurses who rated supervision as poor had poor implementation compared with 30.8% of those who rated it as good (χ^2 = 9.909, df = 1, p = 0.002; odds ratio = 3.38, 95% CI 1.56–7.29; Cramér's V = 0.29). The associations for gender and knowledge were borderline: with continuity correction their p-values were 0.055 and 0.070, and Fisher's exact test gave 0.042 and 0.056, respectively. The association for supervision remained significant under both checks (p = 0.003).

Table 3. Association between Nurse Characteristics, Knowledge, Supervision, and Patient Safety Implementation (n = 117)

Factor	Category	Poor, *n* (%)	Good, *n* (%)	χ^2 (df)	*p*	*V*
Gender	Male	7 (28.0)	18 (72.0)	4.612 (1)	0.032	0.20
	Female	48 (52.2)	44 (47.8)			
Age	20–30 years	15 (38.5)	24 (61.5)	7.035 (2)	0.030	0.25
	31–40 years	23 (42.6)	31 (57.4)			
	> 40 years	17 (70.8)	7 (29.2)			
Education	D3	27 (44.3)	34 (55.7)	0.386 (1)[a]	0.534	0.06
	S1	14 (50.0)	14 (50.0)			
	Ners	11 (45.8)	13 (54.2)			
	S2	3 (75.0)	1 (25.0)			
Length of service	< 5 years	12 (66.7)	6 (33.3)	6.720 (2)	0.035	0.24
	5–10 years	18 (34.6)	34 (65.4)			
	> 10 years	25 (53.2)	22 (46.8)			
Knowledge	Poor	40 (54.1)	34 (45.9)	4.012 (1)	0.045	0.19
	Good	15 (34.9)	28 (65.1)			
Supervision	Poor	39 (60.0)	26 (40.0)	9.909 (1)	0.002	0.29
	Good	16 (30.8)	36 (69.2)			

Note. Poor/Good refers to patient safety implementation; percentages are row percentages. Pearson Chi-Square test, α = 0.05; V = Cramér's V (calculated from the cross-tabulations). [a]Education was tested as diploma (D3) versus bachelor's level or higher (S1, Ners, S2). Source: Primary data (2026).

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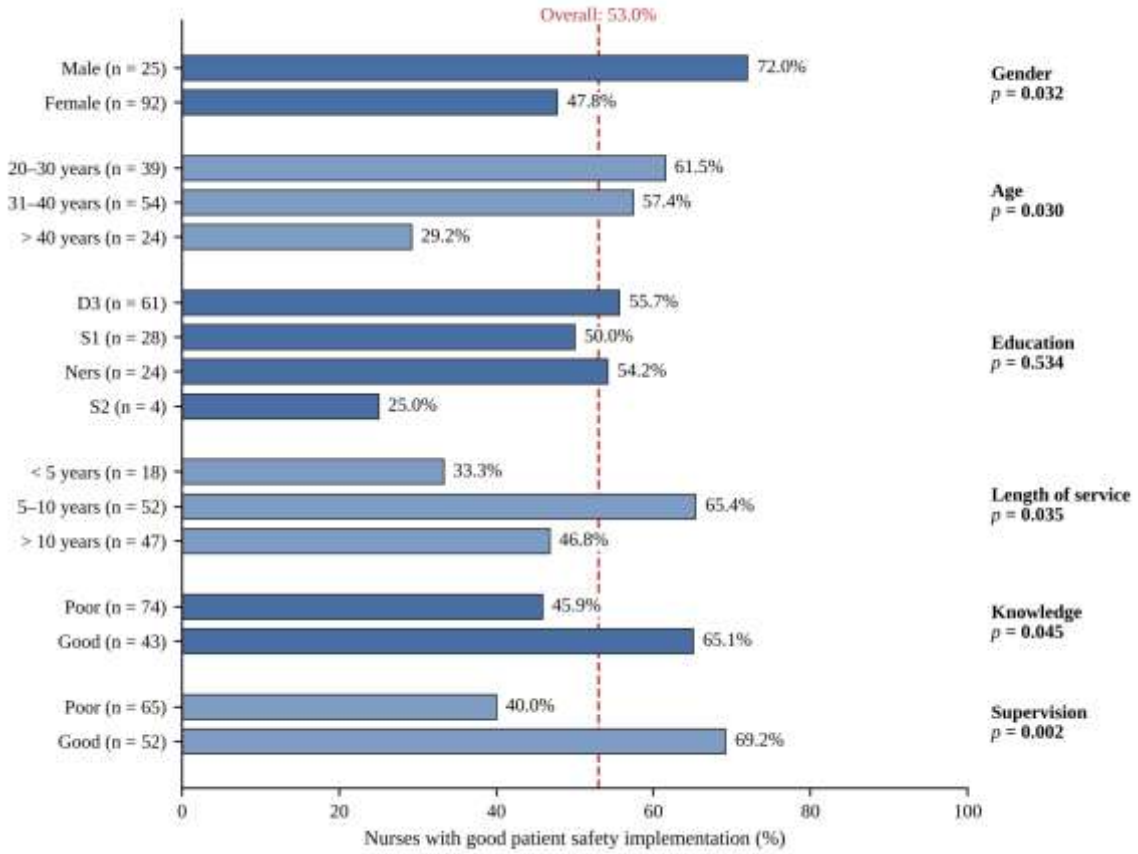


Figure 2. Proportion of Nurses with Good Patient Safety Implementation by Factor and Category

5. Discussion

Implementation, Knowledge, and Supervision

Just over half of the nurses (53.0%) implemented patient safety well, which leaves a sizeable minority of 47.0% whose practice falls short. This margin is thin for a psychiatric referral hospital, where, in addition to the six patient safety goals, nurses must manage risks such as absconding and aggression (Thibaut et al., 2019; Russotto et al., 2026), and it is in line with the incident profile and the mixed perceptions reported in the hospital's preliminary data.

Supervision showed the strongest association with implementation: nurses who rated supervision as good had about three times the odds of good implementation compared with those who rated it as poor. This agrees with Sarasanti et al. (2018), who found supervision significantly related to the implementation of patient safety goals, and with Nasution (2022), who reported that supervision influences nurses' performance in patient safety implementation. Supervision provides monitoring, immediate correction, and feedback, which help to keep SOPs consistently followed; possible explanations for the high share of poor supervision (55.6%) include infrequent direct monitoring, irregular performance evaluation, and limited feedback from superiors, although these aspects were not measured separately. The finding also fits the broader view that nursing

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management is the structural foundation of patient safety systems (Anders, 2025) and that leadership quality is related to patient outcomes (Ystaas et al., 2023).

Knowledge was also associated with implementation, in line with Agustira et al. (2024) and Kurniadi et al. (2023). Knowledge provides the basis for action (Notoatmodjo, 2012): nurses who understand patient identification, medication safety, hand hygiene, and fall prevention are more likely to act accordingly. However, the association was modest and borderline under continuity correction, which suggests that knowledge alone does not guarantee safe practice and that organizational support such as supervision matters. The high proportion of nurses with poor knowledge (63.2%) is a concern in its own right, independent of the strength of the association.

Nurse Characteristics

Men were more likely than women to implement patient safety well (72.0% versus 47.8%). This runs against the common assumption that women are more meticulous in following procedures and differs from Agustira et al. (2024), who found no gender association. In a psychiatric setting, items on absconding surveillance and the handling of agitated patients may be performed more actively by male nurses, but this explanation was not tested. Because the male subgroup was small (n = 25) and the association was borderline under continuity correction, the gender finding should be regarded as exploratory.

Poor implementation was most common among nurses older than 40 years (70.8%) and followed a U-shaped pattern across length of service (66.7% for < 5 years, 34.6% for 5–10 years, and 53.2% for > 10 years). Novice nurses may still be adapting and have limited experience and confidence in clinical decisions, whereas long-serving and older nurses may be affected by routine, fatigue, declining motivation, or less exposure to updated training; none of these mechanisms was measured here. The results contrast with Sarasanti et al. (2018) and Agustira et al. (2024), who found no association for age or length of service. Differences in sample composition and in the demands of psychiatric work, in which emotional and physical strain accumulates over the years, may explain the discrepancy. Because age and length of service are correlated, their separate contributions cannot be disentangled in a bivariate analysis.

Education was not associated with implementation, consistent with Agustira et al. (2024). More than half of the nurses held a diploma, and the finding suggests that formal education alone does not determine safe practice; in-service training, supervision, and the work system are likely to matter more.

Managerial Implications

Three implications follow for hospital management. First, supervision should be made structured and routine, with scheduled direct observation of the six patient safety goals, simple checklists, and constructive feedback, and ward heads need the competence to supervise. Second, development should be tailored to career stage: structured orientation and mentoring for nurses with less than five years of service, and refresher training, workload review, and burnout monitoring for nurses with more than ten years

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of service or older than 40 years. Third, periodic training on the six patient safety goals and psychiatric-specific risks such as absconding should be combined with a non-punitive incident reporting culture and regular audits. These measures target factors that management can change, unlike gender and age.

Limitations

Several limitations should be considered. The cross-sectional design precludes causal inference, and the direction of association, for example between supervision and implementation, cannot be established. All variables were self-reported, so perceived supervision and self-assessed implementation may be affected by social desirability, and no direct observation or incident data were linked to individual nurses. The study was conducted in a single hospital with purposive sampling, which limits generalizability, although the sample covered 90.0% of the population. Bivariate analysis without multivariable adjustment leaves room for confounding, for instance between age and length of service. Categorization with a cut-off score of 38 and the grouping of education reduce information, and the borderline results for gender and knowledge (p between 0.032 and 0.070 depending on the test) and six tests without correction for multiple comparisons call for cautious interpretation. Finally, the psychometric properties of the instruments were not reported.

6. Conclusion

Good patient safety implementation was found in 53.0% of the 117 inpatient nurses at Prof. HB. Saanin Mental Hospital, while poor knowledge (63.2%) and poor supervision (55.6%) were common. Supervision ($p = 0.002$), age ($p = 0.030$), gender ($p = 0.032$), length of service ($p = 0.035$), and knowledge ($p = 0.045$) were significantly associated with implementation, whereas education was not ($p = 0.534$); supervision showed the strongest association. By documenting these associations in a psychiatric referral hospital, a setting with limited published evidence in Indonesia, the study offers hospital managers a basis for prioritizing structured supervision, career-stage-specific development, and continuous patient safety training.

Future research should use multivariable models, such as logistic regression, in several psychiatric hospitals and should add workload, patient safety culture, leadership, and motivation as explanatory factors. Objective measures such as direct observation and incident data, and intervention designs that test improvements in supervision, would strengthen the evidence further.

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