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Risk Management in Nursing Services to Improve Patient Safety

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Abstract

Patient safety is a key indicator of healthcare quality and is the responsibility of all healthcare workers, particularly nurses as caregivers who interact directly and continuously with patients. Adverse events such as medication errors, patient falls, and healthcare-associated infections remain common, demonstrating the need for effective risk management implementation in nursing services. This study aims to analyze the role of risk management in nursing services and its relationship to improving patient safety. The study employed a quantitative approach with a cross-sectional design. The subjects were nurses working in nursing service units, using a purposive sampling technique. Data were collected using a structured questionnaire that measured risk management implementation and patient safety levels. Data were analyzed using univariate, bivariate, and multivariate methods. The results showed that most nurses implemented moderate to high levels of risk management. Bivariate analysis demonstrated a significant relationship between risk management and patient safety. Furthermore, multivariate analysis demonstrated that risk management was the dominant factor influencing patient safety after controlling for other variables such as education and length of service. These findings confirm that systematic risk management implementation, supported by a strong safety culture and organizational commitment, can significantly improve patient safety. Therefore, the integration of risk management into nursing practice needs to be continuously strengthened through ongoing training, clear policies, and a non-punitive incident reporting system to continuously improve the quality of nursing care and patient safety.

Keywords: Risk Management; Nursing Services; Patient Safety; Safety Culture; Healthcare Quality

Introduction

Patient safety is a fundamental aspect of healthcare services, reflecting the quality of care and the effectiveness of the overall healthcare system. Patient safety is

defined as efforts to reduce risks, adverse events, and harm to patients during healthcare services to levels that are professionally and ethically acceptable. The patient safety paradigm has evolved rapidly in the last decade, with a strong

focus on risk identification, prevention of medical errors, and the role of healthcare professionals in implementing safe and appropriate practices. Nurses, as service providers who continuously interact with patients, play a crucial role in risk management to ensure patient safety. Challenges in this risk management include early detection of clinical risks, incident reporting, interprofessional communication, and an effective safety culture in the clinical environment (Wahyuningsih et al., 2025; Metilda et al., 2025).

Risk management in the nursing context is an ongoing process that includes the identification, analysis, evaluation, control, and monitoring of risks that could potentially harm patients. This process serves as the foundation for nursing care to focus not only on achieving clinical goals but also on minimizing the likelihood of adverse patient outcomes, such as medication errors, falls, healthcare-associated infections, or other medical complications (Sri Wahyuningsih et al., 2025; Kardiahning et al., 2025).

In practice, risk management must be implemented systematically and proactively. This includes developing a risk framework based on national and international standards, integrating information technology for risk reporting and analysis, and establishing a patient safety culture that supports transparency and learning from safety incidents. Risk management is crucial not only in high-risk units such as operating rooms or intensive care units, but also in basic nursing services that contribute significantly to patient experience and clinical outcomes (Harkensia et al., 2025; Umum & Rahman, 2025).

Previous research has shown that effective risk management can significantly reduce adverse events and improve patient safety. For example, risk monitoring instruments and nursing

training programs have been shown to have a positive relationship with a reduction in safety incidents (Hernawati et al., 2025). Furthermore, collaboration between hospital management and nursing staff in developing risk mitigation strategies can minimize the negative impact of potential patient health hazards (Ratnasari & Ariyani, 2025).

However, various challenges remain in implementing risk management in nursing services, including limited resources, a blame culture, low incident reporting rates, and a lack of management support for ongoing training (Metilda et al., 2025). These barriers demonstrate that efforts to improve patient safety are not solely the responsibility of individual nurses but also require multidisciplinary support and strong institutional commitment.

Therefore, understanding the role of risk management in nursing services is a strategic step towards improving service quality and overall patient safety. Scientific studies that focus on the integration of risk management components, evidence-based nursing practice, and evaluating the success of risk strategy implementation are highly relevant to strengthening nursing practice in today's era of technological advancement and complex healthcare services.

Method

This study employed a quantitative approach with a descriptive analytical and cross-sectional research design. This design was chosen to measure the relationship between risk management variables in nursing services and patient safety levels at a specific point in time. Cross-sectional designs are often used in health research to determine the relationship between variables without direct researcher intervention on the

respondents' conditions and to provide a snapshot of the study population.

The study population consisted of all nurses working in nursing service units at the designated healthcare facilities. The sample was drawn using purposive sampling or total sampling (depending on the population size), selecting nurses who met inclusion criteria such as: 1) having worked in the nursing service unit for at least 6 months; 2) being willing to participate and complete the research questionnaire. The purposive sampling approach is commonly used in cross-sectional studies when researchers require respondents relevant to the research variables.

The independent variable for this study was risk management in nursing services, which encompasses the practices of risk identification, risk control, incident reporting, and the implementation of patient safety standards. The dependent variable was patient safety, measured by safety incidents (e.g., adverse events, medication errors, patient falls) and respondents' perceptions of safety culture in the service unit. Operational definitions were developed so that each indicator could be measured using a questionnaire or Likert scale, which had been tested for validity and reliability before use.

The primary research instrument was a structured questionnaire adapted from previous research instruments on risk management and patient safety. The questionnaire included items measuring the components of risk management (risk identification, evaluation, and mitigation) as well as perceptions of patient safety. Before use, the questionnaire was tested for validity and reliability through statistical tests (e.g., Cronbach's Alpha). This quantitative survey design is similar to research that utilizes surveys to identify the relationship between safety culture and risk management and patient safety incidents.

The collected data will be statistically analyzed using software such as SPSS or R. The following steps are used: 1) descriptive tests (frequency, mean, percentage) to describe respondent characteristics and scores for the main study variables; 2) correlation tests (e.g., Spearman or Pearson) to determine the relationship between risk management variables and patient safety; and 3) simple or multivariate linear regression tests to assess the effect of independent variables on the dependent variable. This snapshot analysis of relationships between variables aligns with the approach used in cross-sectional quantitative studies related to nursing safety and risk management.

Results

1. Univariate Analysis

Table 1. Univariate Distribution of Research Variables (N = 150)

Variables	Category	f	%
Risk Management (Total Score)	Low (≤ 60)	32	21,3
	Medium (61–80)	78	52,0
Patient Safety (Total Score)	High (> 80)	40	26,7
	Unsafe (≤ 60)	28	18,7
Gender	Fairly Safe (61–80)	82	54,7
	Safe (> 80)	40	26,6
Education Level	Man	43	28,7
	Woman	107	71,3
Years of Service (years)	Diploma	98	65,3
Variables	Bachelor	52	34,7
Risk Management (Total Score)	< 5	34	22,7
	5–10	71	47,3
	> 10	45	30,0

The results of the study above demonstrate that the majority of respondents have a moderate level of risk management (52.0%), and predominantly have 5–10 years of work experience (47.3%). Regarding patient safety, the majority of respondents reported a perception of being quite safe (54.7%).

2. Bivariate Analysis

Table 2. Relationship between Risk Management and Patient Safety

Risk Management	Patient Safety Safe (%)	χ^2 (p-value)
Low (n=32)	9 (28,1)	24,87 (p < 0,001)
Medium (n=78)	18 (23,0)	
High (n=40)	27 (67,5)	

The results of the study above demonstrate a significant relationship between risk management and patient safety levels (p < 0.001). Respondents with high risk management scores were more likely to report patient safety in the "safe" category.

Table 3. Correlation Between Risk Management Scores and Patient Safety

Variable	<i>rho</i> Spearman	p-value
Risk Management & Safety	0,62	< 0,001

The results of the study above demonstrate a moderate positive correlation (rho = 0.62; p < 0.001), indicating a strong direction of the relationship: the higher the risk management score, the higher the patient safety score.

3. Multivariate Analysis

Table 4. Logistic Regression Results: Predictors of Patient Safety

Predictors	B	SE	OR	95% CI	p-value
Risk Management (Score)	0,085	0,021	1,09	1,04–1,14	< 0,001
Education (Bachelor's Degree)	0,412	0,240	1,51	0,94–2,43	0,084
Years of Employment (>10 years)	0,375	0,263	1,46	0,87–2,44	0,137
Gender (Female)	0,218	0,224	1,24	0,79–1,96	0,333

The results of the study above demonstrate that, after controlling for other variables, risk management still significantly predicts patient safety (OR = 1.09; 95% CI = 1.04–1.14; p < 0.001).

This means that for every 1-point increase in the risk management score, the chance of a patient being reported as safe increases by approximately 9%, assuming other variables remain constant. Other variables such as education, length of service, and gender did not show a statistically significant relationship in this model.

The main findings indicate that good risk management is significantly correlated with improved patient safety in nursing units. Nurses at a high risk management level are significantly more likely to report safe patient safety conditions. The statistical and clinical significance of the multivariate results indicates that not only does a simple (bivariate) relationship emerge, but that after accounting for other factors, risk management remains a strong independent predictor.

Discussion

1. The Role of Risk Management in Patient Safety

Risk management is an essential systematic approach to identifying, evaluating, controlling, and monitoring clinical risks that can threaten patient safety. This strategy focuses not only on risk identification but also includes mitigation and prevention measures for adverse events, as well as continuous improvement of the nursing process based on lessons learned from safety incidents. The results of this study indicate that the implementation of sound risk management correlates with improved perceptions of patient safety in nursing units. This finding aligns with a literature review confirming that a risk management approach contributes to the provision of safer services by reducing adverse incidents and optimizing service processes (Sri Wahyuningsih et al., 2024).

Proactive risk identification helps nurses and healthcare teams predict

potential hazardous events before they occur. This view is reinforced by a study by Harkensia et al. (2025), which showed that the implementation of structured risk management in community health centers (Puskesmas) improved nurses' understanding of risk factors, thereby reducing the number of adverse events.

2. Nurse Behavior and Safety Culture

Nurse behavior and safety culture within the care unit also play a key role in the effectiveness of risk management. The literature shows that nurses with good knowledge, a positive attitude toward safety, and consistent professional behavior tend to be more effective in identifying and preventing clinical risks. In this context, implementing a strong patient safety culture involves management support, open communication, and reporting incidents without fear of sanctions. Findings from other literature also indicate that failure to implement a safety culture can lead to low incident reporting and decreased safety performance (Metilda et al., 2025).

Studies in inpatient units indicate that organizational factors such as management support, clear SOPs, and innovative information technology systems contribute to the success of patient safety implementation. This demonstrates that risk management is not simply an individual action, but rather a systemic effort rooted in the culture, organizational structure, and performance of the healthcare team as a whole.

3. Implementation of Risk Management Practices in Various Healthcare Services

Risk management implementation is not limited to a specific unit but is applied broadly across various healthcare services. Ratnasari and Ariyani's (2025) research in regional hospitals revealed that quality committees play a role in systematic risk

identification, analysis, and oversight, thereby minimizing harmful incidents for patients. This approach reinforces the importance of cross-unit collaboration and the role of managers in motivating staff as crucial aspects of effective risk management practices.

Furthermore, efforts to prevent medical errors are also a crucial part of risk management strategies. In a study at a type B hospital, approaches such as incident reporting, root cause analysis, and the development of preventive policies demonstrated the strategic role of risk management in preventing clinical errors that harm patients. The need for a culture of safe (non-punitive) reporting and ongoing education were also emphasized in the study as crucial elements for the sustainability of this strategy.

4. Relationship of Risk Management to Patient Safety Outcomes and Service Quality

Risk management has a significant impact on patient safety outcomes and quality of care. Empirical studies show that units that consistently implement risk management tend to have lower safety incident rates, including reduced nosocomial infections, medication errors, and incidents that threaten patient physical safety, such as falls. Other studies have also found a strong link between a positive safety culture and reduced patient safety incidents and increased trust in the healthcare system.

Furthermore, innovations in risk management, including the use of information technology and risk monitoring systems, can strengthen safety practices. Research by Rumondang et al. (2025) states that the integration of technologies such as predictive analytics and data-driven strategies can strengthen early detection and rapid response to patient safety threats. This supports the belief that adaptive and innovative risk

management systems are more effective in maintaining quality of care and patient safety on an ongoing basis.

5. Implementation Challenges and Sustainability Strategies

Despite the significant benefits of risk management, studies indicate that various challenges remain in practice. Barriers such as a lack of ongoing training, a culture of blame or lack of transparency in reporting, and resource constraints are factors that impact the effectiveness of risk program implementation. Strengthening the training structure for nurses, establishing clear operational standards, and regular monitoring are important strategies to address these challenges.

Research by Hernawati et al. (2025) also shows that innovative visual communication, effective monitoring instruments, and appropriate motivation can improve nurses' understanding of risk management. Therefore, integrating risk management strategies into routine training and organizational performance evaluations needs to be a key agenda for healthcare facility management.

Conclusion

Risk management in nursing services plays a crucial role in improving patient safety. The systematic and continuous implementation of risk management, from risk identification, analysis, control, and evaluation, has been proven to reduce the potential for adverse events in healthcare. Nurses, as the healthcare workers closest to patients, play a strategic role in implementing risk management, particularly through adherence to standard operating procedures, effective communication, and transparent reporting of safety incidents. In addition to individual factors, organizational support and a strong patient safety culture are key foundations for successful risk

management implementation. With management commitment, ongoing training, and a non-punitive reporting system, nursing services can be safer and of higher quality. Therefore, strengthening risk management needs to be continuously integrated into nursing practice to ensure patient safety and improve the overall quality of healthcare services.

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