ePaper Bisnis : International Journal of Entrepreneurship and Management

E-ISSN: 3047-907X
P-ISSN: 3047-9061

Research Article

Clinical Leadership Mediating Nurses' Knowledge and Motivation in Patient Safety Goal Implementation

Endang Triyani Kusuma Widyawati[1*], Duta Liana[2], Kemala Rita Wahidi[3]

[1-3] Master of Hospital Administration, Esa Unggul University, Indonesia
* Corresponding Author: agapeetkw@student.esaunggul.ac.id

Abstract: The implementation of Patient Safety Goals remains a major challenge in hospital management, particularly in ensuring consistent compliance among nurses. This study aims to analyze the influence of nurses' knowledge and motivation on the implementation of Patient Safety Goals, with clinical leadership positioned as a mediating variable. A quantitative cross-sectional design was employed in a general hospital in Jakarta, Indonesia. Data were collected from 119 nurses across inpatient, outpatient, emergency, and operating units using structured questionnaires. The data were analyzed using Structural Equation Modeling (SEM) with AMOS, supported by the Three-Box Method to assess the level of variable achievement. The results indicate that nurses' knowledge and motivation have a significant direct effect on clinical leadership. Clinical leadership also demonstrates a significant positive effect on the implementation of Patient Safety Goals. Furthermore, clinical leadership plays a significant mediating role in the relationship between both nurses' knowledge and motivation and the implementation of Patient Safety Goals. The model explains 76.67% of the variance in Patient Safety Goal implementation, highlighting the strategic role of clinical leadership in translating individual competencies into safe clinical practices. These findings contribute to healthcare management literature by reinforcing the importance of clinical leadership as an organizational mechanism that strengthens patient safety performance. From a managerial perspective, the study emphasizes that improving patient safety outcomes requires not only enhancing nurses' knowledge and motivation, but also systematically developing clinical leadership competencies. Hospital management is encouraged to invest in leadership development programs, supportive supervision, and non-punitive incident reporting systems to ensure sustainable implementation of Patient Safety Goals.

Keywords: Clinical Leadership; Knowledge; Motivation; Nurses; Patient Safety Goals

Received: September 24, 2025
Revised: November 19, 2025
Accepted: January 14, 2026
Published: March 11, 2026
Curr. Ver.: March 11, 2026

1. Introduction

Patient safety has become a central issue in healthcare management as hospitals operate within increasingly complex and high-risk environments. The implementation of Patient Safety Goals is widely recognized as a critical indicator of healthcare quality, aimed at minimizing preventable harm through standardized procedures, effective communication, and systematic risk management. Despite the availability of guidelines and accreditation standards, many hospitals continue to face challenges in achieving consistent compliance with patient safety practices, particularly at the clinical implementation level.

Previous studies indicate that failures in patient safety are rarely caused by individual errors alone but are more often associated with systemic weaknesses, including inadequate leadership, limited staff engagement, and suboptimal organizational support. Nurses, as the largest group of healthcare professionals and primary providers of direct patient care, play a pivotal role in translating patient safety policies into daily clinical practice. However, variations in nurses' knowledge and motivation can significantly influence their adherence to patient safety procedures, leading to inconsistent implementation outcomes.

From a management perspective, clinical leadership has emerged as a key organizational mechanism that bridges individual competencies and system-level safety performance.

Clinical leadership refers to the ability of healthcare professionals to influence clinical practice through effective decision-making, communication, collaboration, and a strong commitment to quality and safety. Unlike formal managerial roles, clinical leadership is embedded in everyday clinical activities and is exercised through professional influence rather than positional authority. Strengthening clinical leadership is therefore considered essential for fostering a sustainable patient safety culture.

Although previous research has examined the direct effects of knowledge, motivation, and leadership on patient safety outcomes, empirical evidence on the mediating role of clinical leadership remains limited, particularly in hospital settings in developing countries. Many studies focus on leadership as an independent predictor, while fewer investigate how leadership functions as a mechanism that transforms individual-level factors into organizational safety performance.

Addressing this gap, the present study aims to analyze the influence of nurses' knowledge and motivation on the implementation of Patient Safety Goals, with clinical leadership positioned as a mediating variable. By adopting a structural equation modeling approach, this study seeks to provide a more comprehensive understanding of how clinical leadership contributes to patient safety management. The findings are expected to offer both theoretical contributions to healthcare management literature and practical insights for hospital leaders in designing effective strategies to strengthen patient safety implementation.

2. Literature Review

Patient Safety Goals Implementation

Patient Safety Goals represent a structured framework designed to reduce preventable harm and improve healthcare quality through standardized safety practices. International guidelines emphasize key dimensions of patient safety, including accurate patient identification, effective communication, medication safety, infection prevention, procedural accuracy, and fall prevention (World Health Organization, 2017; WHO, 2024). From a healthcare management perspective, the implementation of Patient Safety Goals is not merely a matter of procedural compliance but reflects the effectiveness of organizational governance, leadership commitment, and integrated safety systems (Vincent, 2010).

Hospitals function as complex socio-technical systems in which patient safety outcomes are shaped by dynamic interactions between human behavior, organizational processes, technology, and the work environment. The Theory of Coping with Complexity highlights that safety in complex systems cannot be achieved solely through rigid standardization, but rather through adaptive capacity, situational awareness, and continuous learning (Woods, 1988; Woods & Cook, 2002). In this context, patient safety implementation depends on the ability of healthcare organizations to recognize emerging risks, respond to uncertainty, and learn from errors and near-miss events.

Similarly, the Managing the Unexpected framework emphasizes that high-reliability organizations, such as hospitals, maintain safety through sustained vigilance, learning from failure, and collective mindfulness rather than reliance on formal rules alone (Weick & Sutcliffe, 2015). This perspective positions Patient Safety Goals as organizational mechanisms that support ongoing risk detection and resilience, particularly in high-risk clinical processes such as medication administration, surgical procedures, and infection control.

Empirical studies indicate that gaps in Patient Safety Goal implementation frequently occur in areas requiring coordination, communication, and follow-up actions, including incident reporting and fall prevention (Dhamanti et al., 2019; Murray & Cope, 2021). These findings suggest that effective implementation requires alignment between individual competencies, leadership practices, and organizational culture. Consequently, Patient Safety Goal implementation is increasingly understood as a continuous organizational process embedded within broader patient safety culture and leadership systems, rather than a static checklist-driven activity (Reason, 2000; Ricciardi, 2021).

Nurses' Knowledge

Nurses' knowledge is a fundamental determinant of safe and effective clinical practice. In the context of patient safety, knowledge encompasses understanding of safety principles, clinical guidelines, standard operating procedures, and risk prevention strategies that guide nurses' actions in daily patient care. Adequate knowledge enables nurses to recognize potential hazards, anticipate risks, and apply appropriate preventive measures, thereby reducing the likelihood of adverse events (World Health Organization, 2024).

From a theoretical perspective, Bloom's Revised Taxonomy conceptualizes knowledge as a multidimensional construct comprising factual, conceptual, procedural, and metacognitive domains (Wilson, 2016). These domains are particularly relevant to patient safety practices, as nurses are required not only to recall safety protocols but also to understand underlying principles, perform procedures correctly, and reflect on their clinical

decisions. Higher levels of patient safety knowledge have been associated with improved clinical judgment and more consistent adherence to safety standards (Stevanin et al., 2015).

Behavioral theories further explain how knowledge influences safety-related behavior. The Theory of Planned Behavior posits that knowledge contributes to the formation of beliefs that shape attitudes, perceived norms, and behavioral control, which ultimately influence professional behavior (Ajzen, 1991). In healthcare settings, nurses with strong knowledge of patient safety are more likely to develop positive attitudes toward safety practices and demonstrate higher confidence in implementing safety protocols, including incident reporting and risk prevention (Seo & Lee, 2022).

Empirical evidence supports the critical role of nurses' knowledge in patient safety implementation. Studies across diverse hospital settings have shown that higher levels of patient safety knowledge are associated with greater compliance with safety procedures and reduced clinical errors (Fahim et al., 2025; Quadros et al., 2024). However, research also suggests that knowledge alone may be insufficient to ensure consistent safety performance in complex clinical environments. Organizational support and leadership practices are often required to translate individual knowledge into sustained safety behaviors (Vincent, 2010; Reason, 2000).

Therefore, nurses' knowledge should be understood not only as an individual attribute but also as a strategic organizational resource that contributes to patient safety outcomes when supported by appropriate leadership and management systems. This perspective highlights the importance of integrating knowledge development with broader organizational efforts to strengthen patient safety implementation.

Work Motivation

Work motivation is a critical factor influencing nurses' performance, compliance with professional standards, and the consistent implementation of patient safety practices. Nurses with higher levels of work motivation tend to demonstrate greater vigilance, responsibility, and commitment to safe care delivery, which directly supports the achievement of Patient Safety Goals (Maslow & Green, 2000; WHO, 2017). In healthcare organizations, motivation functions not only as an individual psychological driver but also as an organizational resource that strengthens patient safety outcomes.

From a theoretical standpoint, Maslow's Hierarchy of Needs explains that nurses' motivation develops through the fulfillment of hierarchical needs, ranging from physiological and safety needs to social belonging, esteem, and self-actualization (Maslow & Green, 2000). In clinical settings, unmet basic needs, such as excessive workload, inadequate rest, or unsafe working conditions can increase fatigue and error risk, thereby threatening patient safety. Conversely, fulfillment of higher-level needs, including recognition, professional respect, and opportunities for growth, enhances nurses' intrinsic motivation and commitment to safe practice.

Motivation is further explained by Herzberg's Two-Factor Theory, which distinguishes between hygiene factors and motivator factors (Herzberg, 1987). Hygiene factors, such as hospital policies, supervision quality, and working conditions, prevent dissatisfaction but do not necessarily enhance motivation. Motivator factors, including achievement, recognition, responsibility, and professional development play a crucial role in strengthening intrinsic motivation. In nursing practice, achieving success in preventing patient safety incidents or delivering care according to standards reinforces professional pride and sustained safety-oriented behavior.

In addition, Goal-Setting Theory emphasizes that motivation is strengthened when nurses work toward clear, challenging, and mutually agreed-upon goals, supported by regular feedback mechanisms (Locke & Latham, 1992; 2002). In the context of patient safety, clear safety targets and constructive feedback enable nurses to evaluate performance, correct errors, and maintain consistent adherence to safety procedures. Effective goal-setting contributes to continuous improvement and reduces the recurrence of safety incidents.

Empirical studies consistently support the role of motivation in patient safety. Research indicates that motivated nurses are more willing to comply with safety protocols, participate in incident reporting, and engage in quality improvement initiatives (Seo & Lee, 2022; Rai et al., 2021; Hörberg et al., 2023). Moreover, supportive work environments that provide recognition, supervision, and opportunities for professional development have been shown to enhance motivation while simultaneously strengthening patient safety culture (Toode, 2014; Lee & Lee, 2022).

Overall, work motivation should be viewed as a multidimensional construct shaped by individual needs, organizational support, and leadership practices. Strengthening nurses' motivation—through intrinsic and extrinsic mechanisms—plays a vital role in sustaining safe clinical behavior and ensuring effective implementation of Patient Safety Goals in hospital settings.

Clinical Leadership

Clinical leadership is increasingly recognized as a critical factor in improving patient safety and healthcare quality. Unlike formal managerial leadership, clinical leadership is embedded in daily clinical practice and exercised through professional influence, clinical expertise, and interpersonal competence rather than positional authority. In nursing practice, clinical leadership enables nurses to guide decision-making, coordinate care, and promote adherence to safety standards within multidisciplinary teams (National Health Service Leadership Academy, 2011).

The Clinical Leadership Competency Framework (CLCF) conceptualizes clinical leadership as a set of competencies that include self-awareness, effective communication, teamwork, risk management, and service improvement (National Health Service Leadership Academy, 2011). These competencies are particularly relevant in high-risk clinical environments, where nurses are required to identify patient safety risks, manage complex care processes, and ensure that Patient Safety Goals are consistently implemented. Clinical leaders play a central role in translating safety policies into practical actions at the point of care.

From a patient safety perspective, leadership is widely acknowledged as a foundational element of safe healthcare systems. International guidelines emphasize that leadership commitment is essential for establishing non-punitive reporting systems, fostering learning from incidents, and sustaining a culture of safety (WHO, 2017; Vincent, 2010). Effective clinical leaders encourage open communication, support incident reporting, and promote collective responsibility for patient safety, thereby reducing preventable harm.

Empirical studies provide strong evidence for the role of clinical leadership in enhancing patient safety outcomes. Research indicates that hospitals with strong clinical leadership experience fewer safety incidents and demonstrate higher compliance with patient safety standards (Murray & Cope, 2021; American Hospital Association, 2025). Studies in nursing contexts further show that clinical leadership competencies, such as risk assessment, team coordination, and quality improvement are significantly associated with improved safety culture and safer clinical practices (Haskins & Roets, 2022; Xue et al., 2025).

Clinical leadership also functions as an integrative mechanism linking individual attributes and organizational outcomes. By empowering nurses to apply their knowledge, sustain motivation, and collaborate effectively, clinical leadership strengthens the implementation of Patient Safety Goals across clinical units. This integrative role positions clinical leadership not only as an individual capability but also as a strategic organizational asset for risk management and quality improvement in hospital settings (Makiah et al., 2023; Yodang & Nuridah, 2020).

Overall, the literature highlights that strengthening clinical leadership among nurses is essential for ensuring consistent patient safety practices. Hospitals that invest in developing clinical leadership competencies are better positioned to embed safety priorities into daily clinical work and achieve sustainable improvements in patient safety performance.

Relationships among Variables

The implementation of Patient Safety Goals in hospital settings is shaped by the dynamic interaction between individual competencies and organizational mechanisms. Previous literature consistently emphasizes that patient safety outcomes cannot be explained by single factors in isolation, but rather by the combined influence of knowledge, motivation, and leadership within complex healthcare systems (Reason, 2000; Vincent, 2010). This integrative perspective aligns with contemporary views of patient safety as an organizational performance issue rather than merely an individual compliance problem.

Nurses' knowledge provides the cognitive foundation for safe clinical practice by enabling the recognition of risks, understanding of safety procedures, and appropriate clinical decision-making. However, empirical studies indicate that high levels of knowledge do not automatically translate into consistent safety behavior when organizational support and leadership are weak (Stevanin et al., 2015; Quadros et al., 2024). In complex clinical environments, nurses often face competing demands, time pressure, and uncertainty, which may limit the practical application of knowledge unless reinforced by leadership practices that prioritize patient safety.

Similarly, work motivation influences nurses' willingness to comply with safety procedures, remain vigilant, and engage in proactive safety behaviors such as incident reporting. Motivated nurses are more likely to internalize safety goals and demonstrate sustained commitment to quality care (Toode, 2014; Seo & Lee, 2022). Nevertheless, motivation alone may fluctuate over time and is sensitive to organizational conditions, including workload, recognition, and supervisory support. Without effective leadership, individual motivation may not be consistently directed toward patient safety priorities.

Clinical leadership emerges in the literature as a critical organizational mechanism that integrates individual-level attributes into collective safety performance. By facilitating communication, coordination, and shared responsibility, clinical leadership enables nurses to apply their knowledge effectively and sustain motivation within the context of daily clinical practice (National Health Service Leadership Academy, 2011; Weick & Sutcliffe, 2015). Leaders who demonstrate clinical leadership foster environments that encourage learning from errors, support non-punitive reporting, and reinforce adherence to Patient Safety Goals.

From a systems perspective, the interaction among nurses' knowledge, work motivation, and clinical leadership reflects a multilevel process in which individual capabilities are transformed into organizational outcomes. Clinical leadership plays a central role in aligning individual behavior with institutional safety objectives, thereby strengthening the implementation of Patient Safety Goals. This integrative relationship underscores the importance of examining patient safety implementation through a comprehensive model that accounts for both individual and organizational dimensions.

Overall, the literature suggests that sustainable patient safety performance depends on the synergy between knowledgeable and motivated nurses and effective clinical leadership. Understanding these relationships provides a robust theoretical foundation for examining how Patient Safety Goals are implemented in hospital settings and informs the development of management strategies aimed at improving patient safety outcomes.

Research Framework

The research framework of this study integrates individual and organizational perspectives to explain the implementation of Patient Safety Goals in hospital settings. Nurses' knowledge and work motivation are positioned as key individual antecedents that provide the cognitive and psychological foundation for safe clinical practice. Knowledge enables nurses to understand safety principles and recognize clinical risks, while motivation encourages consistent compliance with safety procedures and engagement in proactive safety behaviors. However, the framework assumes that the influence of these individual factors on patient safety implementation is not solely direct.

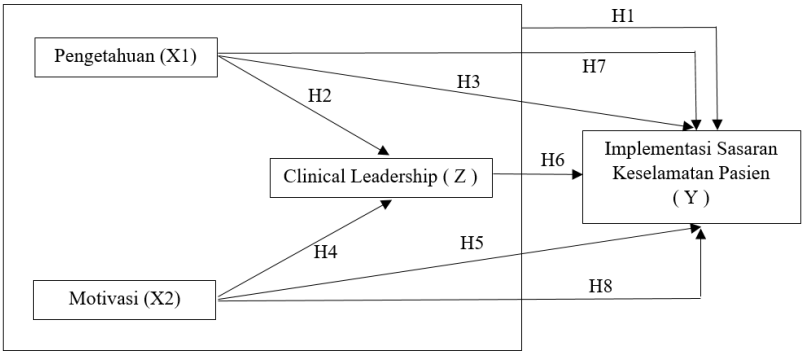


Figure 1. Research Constelation

Clinical leadership is conceptualized as a central organizational mechanism that mediates the relationship between individual attributes and patient safety outcomes. Through professional influence, communication, coordination, and commitment to quality and safety, clinical leadership facilitates the effective application of nurses' knowledge and sustains motivation in daily clinical practice. The implementation of Patient Safety Goals is treated as the outcome variable, reflecting the extent to which patient safety standards are consistently applied. Overall, the framework provides a comprehensive basis for examining how individual competencies and leadership mechanisms interact to support patient safety performance and guide the formulation of research hypotheses.

Based on the theoretical rationale and the conceptual model underlying this study, the following hypotheses are:

H_1: Nurses' knowledge, work motivation, and clinical leadership simultaneously have a significant effect on the implementation of Patient Safety Goals.
H_2: Nurses' knowledge has a significant effect on clinical leadership.
H_3: Nurses' knowledge has a significant effect on the implementation of Patient Safety Goals.
H_4: Work motivation has a significant effect on clinical leadership.
H_5: Work motivation has a significant effect on the implementation of Patient Safety Goals.
H_6: Clinical leadership has a significant effect on the implementation of Patient Safety Goals.
H_7: Nurses' knowledge has an indirect effect on the implementation of Patient Safety Goals through clinical leadership as an intervening variable.

H_8: Work motivation has an indirect effect on the implementation of Patient Safety Goals through clinical leadership as an intervening variable.

3. Research Method

Research Design

This study employed a quantitative approach with an explanatory research design to examine the relationships among nurses' knowledge, work motivation, clinical leadership, and the implementation of Patient Safety Goals. The research design was selected to test the proposed conceptual framework and hypotheses through empirical data analysis and to explain both direct and indirect effects among variables.

Population and Sample

The population of this study comprised all nurses working at Royal Taruma Hospital, specifically those assigned to the Outpatient Department, Inpatient Wards, Operating Room, and Emergency Department. The total population consisted of 170 nurses who were directly involved in clinical services and the implementation of Patient Safety Goals.

The sample size was determined using the Slovin formula with a 5% margin of error, in order to obtain a representative sample from the population. The formula is expressed as follows:

$$n = \frac{N}{1 + N(e)^2}$$

where n represents the sample size, N denotes the population size, and e indicates the margin of error. Based on this calculation, the sample size was determined as follows:

$$n = \frac{170}{1 + 170(0.05)^2} = 119.30$$

Thus, the final sample consisted of 119 nurses, who were selected as research respondents. The respondents were considered adequate to represent the population and to meet the requirements for subsequent data analysis.

Data were collected using a structured questionnaire with a four-point Likert scale, ranging from 1 (strongly disagree) to 4 (strongly agree), to measure respondents' perceptions of the study variables.

Research Variables and Measurement

This study examined four main variables: nurses' knowledge, work motivation, clinical leadership, and implementation of Patient Safety Goals. Nurses' knowledge was measured through indicators reflecting understanding of patient safety principles, procedures, and risk prevention practices. Work motivation was assessed using indicators representing both intrinsic and extrinsic motivational factors related to nursing performance. Clinical leadership was measured based on indicators capturing professional influence, communication, coordination, and commitment to patient safety. The implementation of Patient Safety Goals was measured by indicators reflecting nurses' compliance with established patient safety standards and clinical procedures.

4. Results

Respondent Characteristics

A total of 119 nurses participated in this study and completed the questionnaire. The respondents represented various clinical units, including the outpatient department, inpatient wards, operating room, and emergency department. All respondents were directly involved in patient care activities and the implementation of Patient Safety Goals, ensuring the relevance of the data to the research objectives.

Table 1. Respondent Characteristics

Characteristics		Freq. (f)	Percentage (%)
Gender	Male	11	9.2%
	Female	108	90.8%
Working Unit	ER	18	15.1%
	Operating Room	3	2.5%
	Inpatient Unit	82	68.9%
	Outpatient Unit	16	13.4%
Assignment Field	Practicing Nurse	69	58.0%
	Head Nurse	50	42.0%
Age	< 25 y.o	18	15.1%
	26 - 35 y.o	53	44.5%
	36 - 45 y.o	33	27.7%
	46 - 55 y.o	15	12.6%
	> 55 y.o	0	0.0%
Education	Diploma 3	47	39.5%
	Bachelor's degree	70	58.8%
	Master's degree	2	1.7%
Length of service	< 3 years	23	19.3%

Characteristics	Freq. (f)	Percentage (%)
3 - 4 years	20	16.8%
4 - 5 years	6	5.0%
> 5 years	70	58.8%
Total Respondent	**119**	**100%**

Measurement Model Evaluation

The measurement model was evaluated to assess the validity and reliability of the research instruments. Convergent validity was examined through factor loadings, which met the recommended threshold, indicating that the indicators adequately represented their respective constructs. Construct reliability and average variance extracted (AVE) values also satisfied acceptable criteria, confirming the internal consistency and reliability of the measurement model.

These results indicate that the measurement instruments used in this study were valid and reliable for further structural model analysis.

Table 2. Measurement Goodness of Fit

Measurement	Result	Description
Absolute Fit Measures		
RMSEA	0.061	*Good Fit*
Incremental Fit Measures		
IFI (*Incremental Fit Index*)	0.903	*Good Fit*
CFI (*Comparative Fit Index*)	0.901	*Good Fit*
Parsimonious Fit Measures		
PGFI (*Parsimony Based Indexes of Fit*)	0.538	*Good Fit*

Based on the Model Suitability Test, it can be said that the model of this study is suitable because it meets at least four goodness-of-fit criteria (Sarstedt et al., 2020) in Latan (2012).

Structural Model Evaluation

Based on the structural model diagram, the proposed model is designed to examine the relationships between latent variables (X1, X2, Z, and Y) and their respective observed indicators (e.g., X1.1, Y1.1). The model illustrates both direct and indirect causal relationships among the variables, as indicated by the directional paths. Overall, the results demonstrate that the structural model adequately represents the relationships among the study variables and exhibits an acceptable level of model fit, indicating that the model is valid and suitable for further analysis of variable relationships within the context of this study.

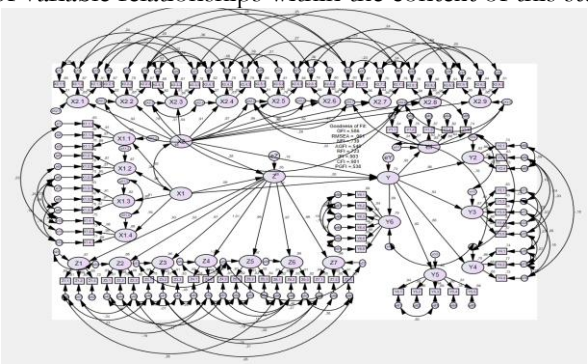


Figure 2. Structural Path Diagram Model

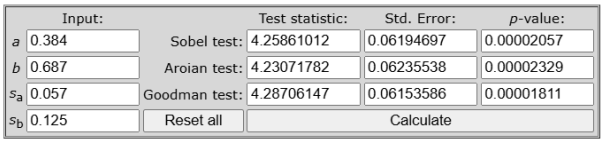
The structural model was assessed the relationships among nurses' knowledge, work motivation, clinical leadership, and the implementation of Patient Safety Goals. The evaluation of the model fit indices demonstrated that the proposed research model achieved an acceptable level of goodness-of-fit, indicating that the model was appropriate for hypothesis testing.

The results of the structural model analysis showed that nurses' knowledge and work motivation had significant effects on clinical leadership. In addition, nurses' knowledge, work motivation, and clinical leadership significantly influenced the implementation of Patient Safety Goals. These findings support the theoretical assumption that both individual factors and leadership mechanisms play important roles in patient safety implementation.

Mediation Analysis

Mediation analysis was conducted to examine the role of clinical leadership in linking nurses' knowledge and work motivation to the implementation of Patient Safety Goals. The results indicated that clinical leadership acted as a significant intervening variable, strengthening the indirect effects of nurses' knowledge and work motivation on patient safety implementation.

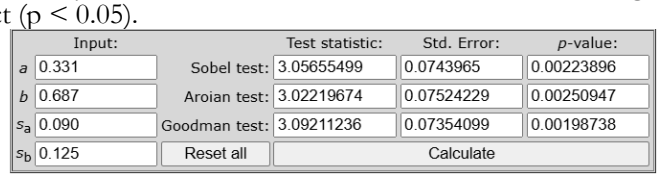
In this study, mediation hypothesis testing was conducted using the Sobel test to examine the indirect effects among variables.



Input:			Test statistic:	Std. Error:	*p*-value:
a 0.384		Sobel test:	4.25861012	0.06194697	0.00002057
b 0.687		Aroian test:	4.23071782	0.06235538	0.00002329
s_a 0.057		Goodman test:	4.28706147	0.06153586	0.00001811
s_b 0.125	Reset all		Calculate		

Figure 3. Output Results of Sobel Test Hypothesis 7

The Sobel test results indicate a significant mediating effect of clinical leadership on the relationship between knowledge and the implementation of Patient Safety Goals ($z = 4.258$; $p < 0.05$). Knowledge positively affects clinical leadership ($a = 0.384$), while clinical leadership positively influences the implementation of Patient Safety Goals ($b = 0.687$). These findings are further supported by the Aroian and Goodman tests, both confirming the significance of the indirect effect ($p < 0.05$).



Input:			Test statistic:	Std. Error:	*p*-value:
a 0.331		Sobel test:	3.05655499	0.0743965	0.00223896
b 0.687		Aroian test:	3.02219674	0.07524229	0.00250947
s_a 0.090		Goodman test:	3.09211236	0.07354099	0.00198738
s_b 0.125	Reset all		Calculate		

Figure 4. Output Results of Sobel Test Hypothesis 8

The Sobel test results indicate that clinical leadership plays a significant intervening role in the relationship between work motivation and the implementation of Patient Safety Goals ($z = 3.056$; $p < 0.05$). The significant indirect effect is further supported by the Aroian and Goodman tests ($p < 0.05$), confirming partial mediation and supporting Hypothesis H8.

This finding suggests that clinical leadership serves as an important mechanism through which individual competencies are translated into effective patient safety practices in hospital settings.

Summary of Hypothesis Testing

Overall, the results demonstrate that the proposed hypotheses were supported by the empirical data. The findings confirm that the implementation of Patient Safety Goals is influenced not only by nurses' knowledge and motivation but also by the presence of effective clinical leadership that integrates individual and organizational factors.

Table 3. Simultaneous Testing

	Variable	F-value	F-tabel	Desc.
H_1	**X_1, X_2, Z --> Y**	**76,67**	**2,68**	**H_1= Accepted**

The results of simultaneous testing showed that the tested model demonstrated a significant relationship between knowledge (X1), motivation (X2), and clinical leadership (Z) that influenced the implementation of patient safety goals (Y) with an F value of 76.67, which means that all variables simultaneously influenced the patient safety goal variable.

Table 4. Recapitulation of Direct Effect Testing

Variable		Coefficient (Standardized)	t-value	P-value	Desc.
H_2	X_1 --> Z	0,591	6,789	0,000	H_2= Accepted
H_3	X_1 --> Y	0,319	3,919	0,000	H_3= Accepted
H_4	X_2 --> Z	0,281	3,686	0,000	H_4= Accepted
H_5	X_2 --> Y	0,181	2,851	0,004	H_5= Accepted
H_6	Z --> Y	0,496	5,494	0,000	H_6= Accepted

Overall, the hypothesis testing results indicate that all proposed hypotheses are supported. Nurses' knowledge and work motivation significantly influence clinical leadership and the implementation of Patient Safety Goals, while clinical leadership also demonstrates a strong and significant effect on patient safety implementation. These findings highlight the critical roles of individual competencies and clinical leadership in enhancing the successful implementation of Patient Safety Goals in healthcare settings.

Table 5. Recapitulation of Indirect (Intervening) Effect Testing

	Variable	Sobel-test (z)	Sig.	Desc.
H_7	X_1 --> Z --> Y	4,258	0,000	H_7= Accepted
H_8	X_2 --> Z --> Y	3,056	0,002	H_8= Accepted

The results of the indirect effect testing indicate that clinical leadership plays a significant intervening role in the relationships between knowledge, work motivation, and the implementation of Patient Safety Goals. Knowledge has a significant indirect effect on patient safety implementation through clinical leadership ($z = 4.258$; $p < 0.05$), as does work motivation ($z = 3.056$; $p < 0.05$). These findings confirm that clinical leadership significantly mediates the effects of knowledge and motivation on the implementation of Patient Safety Goals, supporting Hypotheses H7 and H8.

5. Comparison

The findings of this study are consistent with previous research highlighting the critical roles of nurses' knowledge, work motivation, and clinical leadership in improving patient safety practices. Prior studies have demonstrated that adequate knowledge of patient safety principles enhances nurses' ability to comply with safety protocols and reduces the likelihood of adverse events (Stevanin et al., 2015; Zaitoun et al., 2023). Similarly, motivation has been widely recognized as a key driver of nurses' engagement in patient safety initiatives, particularly when supported by a conducive leadership environment (Kohnen et al., 2024; Williams & Foster, 2022).

However, this study extends existing research by empirically confirming clinical leadership as a significant intervening variable that bridges the effects of knowledge and motivation on the implementation of Patient Safety Goals. While earlier studies often examined leadership as a direct predictor of patient safety outcomes (Hamdan et al., 2024; Lusianah et al., 2022), the present study demonstrates that clinical leadership functions as a mechanism that translates individual competencies into effective safety practices. This mediating role aligns with the Clinical Leadership Competency Framework and reinforces international evidence emphasizing leadership commitment as a cornerstone of sustainable patient safety systems (WHO, 2024; National Health Service Leadership Academy, 2011).

Overall, compared to prior studies, this research provides a more integrative model by combining individual factors and leadership mechanisms within a single structural framework. The findings contribute to the state-of-the-art by offering empirical support for strengthening nurses' clinical leadership as a strategic approach to enhancing the effectiveness and sustainability of Patient Safety Goal implementation in hospital settings.

.

6. Conclusion

This study demonstrates that nurses' knowledge, work motivation, and clinical leadership play significant roles in the implementation of Patient Safety Goals. The findings indicate that knowledge and motivation not only have direct effects on patient safety implementation but also indirectly influence it through clinical leadership. Clinical leadership was empirically confirmed as a significant intervening variable, strengthening the translation of individual competencies into effective patient safety practices.

In relation to the research objectives, the results support all proposed hypotheses and confirm that clinical leadership serves as a critical mechanism linking individual factors with organizational safety outcomes. These findings reinforce the argument that improving patient safety requires not only competent and motivated nurses but also strong clinical leadership that guides, coordinates, and sustains safe clinical practices.

The main contribution of this study lies in the development of an integrative model that positions clinical leadership as a strategic mediator between nurses' knowledge, motivation, and the implementation of Patient Safety Goals. This model contributes to the patient safety and healthcare management literature by providing empirical evidence that strengthening nurses' clinical leadership can enhance the effectiveness and sustainability of patient safety initiatives in hospital settings.

Despite these contributions, this study has several limitations. The research was conducted in a single hospital using a cross-sectional design, which may limit the generalizability of the findings and preclude causal inference. Future studies are encouraged to involve multiple healthcare institutions, apply longitudinal designs, and incorporate additional organizational variables, such as patient safety culture or teamwork, to further refine and validate the proposed model.

Author Contributions: Conceptualization: E.T.; Methodology: E.T.; Software: E.T.; Validation: E.T.; Formal analysis: E.T.; Investigation: E.T.; Resources: E.T.; Data curation: E.T.; Writing—original draft preparation: E.T.; Writing—review and editing: E.T.; Visualization: E.T.; Supervision: E.T.; Project administration: E.T.; Funding acquisition: Not applicable.

Funding: This research received no external funding.

Data Availability Statement: The data presented in this study are available from the corresponding author upon reasonable request. The data are not publicly available due to privacy and ethical restrictions related to the research participants.

Acknowledgments: The author would like to express gratitude to the management and nursing staff of Royal Taruma Hospital for their cooperation and support during the data

collection process. The author takes full responsibility for the content, interpretation, and conclusions presented in this manuscript.

Conflicts of Interest: The authors declare no conflict of interest.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

American Hospital Association. (2025). Leadership and patient safety performance. *Journal of Healthcare Management, 70*(1), 15–27. https://doi.org/10.1097/JHM.0000000000000123

Bloom, B. S. (1956). *Taxonomy of educational objectives: The classification of educational goals*. Longman.

Dhamanti, I., Leggat, S. G., & Barraclough, S. (2019). Patient safety incident reporting in Indonesia: An analysis using WHO guidelines. *International Journal of Health Planning and Management, 34*(1), e474–e488. https://doi.org/10.1002/hpm.2676

Fahim, A. E., Abd El-Hay, S. A., & Said, N. B. (2025). Nurses' knowledge and compliance with patient safety standards. *Journal of Nursing Management, 33*(2), 201–210. https://doi.org/10.1111/jonm.14122

Hamdan, M., Saleem, A. A., & Al-Sharif, A. (2024). Leadership practices and patient safety outcomes in hospitals. *Leadership in Health Services, 37*(1), 89–104. https://doi.org/10.1108/LHS-08-2023-0056

Haskins, J. L., & Roets, L. (2022). Clinical leadership competencies and patient safety culture. *Curationis, 45*(1), a2257. https://doi.org/10.4102/curationis.v45i1.2257

Herzberg, F. (1987). One more time: How do you motivate employees? *Harvard Business Review, 65*(5), 109–120.

Hörberg, U., Ozolins, L. L., & Ekebergh, M. (2023). Motivation and patient safety engagement among nurses. *Nursing Ethics, 30*(2), 345–357. https://doi.org/10.1177/09697330221110234

Kohnen, J., Smith, P., & Willis, E. (2024). Motivation and safety compliance in healthcare organizations. *Journal of Health Organization and Management, 38*(3), 356–371. https://doi.org/10.1108/JHOM-05-2023-0184

Lee, S. E., & Lee, J. H. (2022). The role of motivation and leadership in patient safety culture. *BMC Health Services Research, 22*, 1134. https://doi.org/10.1186/s12913-022-08567-4

Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation. *American Psychologist, 57*(9), 705–717. https://doi.org/10.1037/0003-066X.57.9.705

Lusianah, E., Widodo, J., & Handayani, R. S. (2022). Clinical leadership and patient safety goals implementation. *Journal of Nursing Practice, 6*(1), 1–10. https://doi.org/10.30994/jnp.v6i1.168

Makiah, J., Salanova, M., & Bakker, A. B. (2023). Leadership and healthcare quality improvement. *Journal of Advanced Nursing, 79*(4), 1432–1444. https://doi.org/10.1111/jan.15566

Maslow, A. H., & Green, C. D. (2000). A theory of human motivation. *Psychological Review, 50*(4), 370–396. https://doi.org/10.1037/h0054346

Murray, E., & Cope, V. (2021). Leadership influence on patient safety outcomes. *Journal of Nursing Management, 29*(5), 1131–1139. https://doi.org/10.1111/jonm.13240

National Health Service Leadership Academy. (2011). *Clinical leadership competency framework*. NHS.

Quadros, S., Carvalho, D. P., & Santos, J. L. G. (2024). Knowledge and patient safety practices among nurses. *Journal of Clinical Nursing, 33*(7–8), 1901–1912. https://doi.org/10.1111/jocn.16945

Reason, J. (2000). Human error: Models and management. *BMJ, 320*(7237), 768–770. https://doi.org/10.1136/bmj.320.7237.768

Ricciardi, W. (2021). Patient safety culture in healthcare systems. *Public Health Reviews, 42*, 1604237. https://doi.org/10.3389/phrs.2021.1604237

Seo, Y., & Lee, Y. (2022). Motivation and safety behavior among nurses. *International Journal of Environmental Research and Public Health, 19*(3), 1578. https://doi.org/10.3390/ijerph19031578

Stevanin, S., et al. (2015). Knowledge of patient safety and nursing practice. *Journal of Nursing Scholarship, 47*(6), 501–511. https://doi.org/10.1111/jnu.12164

Vincent, C. (2010). *Patient safety*. Wiley-Blackwell. https://doi.org/10.1002/9781444323856

Weick, K. E., & Sutcliffe, K. M. (2015). *Managing the unexpected: Sustained performance in a complex world* (3rd ed.). Wiley. https://doi.org/10.1002/9781118862418

World Health Organization. (2017). *Patient safety: Making health care safer*. WHO.

World Health Organization. (2024). *Global patient safety action plan 2021–2030*. WHO.