

Behavioral Determinants of Infection Control: Evaluating Hand Hygiene Knowledge and Motivation in Critical Care Nurses

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Abstract:

Strict adherence to the World Health Organization's Five Moments for Hand Hygiene is critical for preventing healthcare-associated infections, especially in High Care Units where vulnerable patients face elevated risks. This study aimed to evaluate the knowledge, attitudes, and motivation regarding hand hygiene protocols among intensive care nurses. A quantitative descriptive design with a case study approach was utilized at the high care unit. Researchers selected participants through specific inclusion and exclusion criteria to ensure appropriate representation. A validated structured questionnaire measured cognitive understanding, psychological dispositions, and internal drive concerning the five moments and six-step handwashing procedures. Quantitative analysis revealed a significant disparity between psychological readiness and technical comprehension among the clinical staff. Sixty percent of nursing personnel demonstrated poor knowledge of standard handwashing protocols and critical moments of transmission. All respondents exhibited universally positive attitudes and strong intrinsic motivation toward infection prevention practices. A critical gap exists between nurses' favorable psychological dispositions and their actual cognitive grasp of evidence-based hygiene guidelines. Hospital administrators must implement targeted educational interventions and robust supervisory frameworks to bridge this cognitive deficit. Translating high motivation and positive attitudes into consistent clinical execution requires continuous professional development. Ultimately, structural support and ongoing evaluation remain essential to elevate patient safety outcomes in intensive care environments.

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INTRODUCTION

Hand hygiene is a fundamental strategy for preventing Healthcare-Associated Infections in medical facilities worldwide (De Kraker et al., 2022). Strict adherence to standardized protocols directly reduces morbidity and mortality rates among vulnerable populations. Medical institutions worldwide continuously implement rigorous infection control policies to protect patients and healthcare workers from the transmission of dangerous pathogens (Kubde et al., 2023). The systematic execution of these protocols remains a primary indicator of overall clinical quality. Global health organizations consistently rank proper handwashing as the absolute cornerstone of effective epidemic management (Allegranzi et al., 2025).

High Care Units present unique environments in which critically ill patients face exceptionally high risks of severe nosocomial infections (Lanaghan & Stenhouse, 2024). Nurses working in these intensive wards manage complex medical devices and perform frequent invasive procedures, which significantly increase their exposure to harmful microorganisms (Motallebirad et al., 2024). Clinical

staff frequently demonstrate inconsistent adherence to mandatory hygiene practices during demanding shifts (Issac et al., 2026). This persistent non-compliance creates dangerous vulnerabilities that compromise patient recovery. The extreme physical fatigue experienced by intensive care nurses further exacerbates these lapses in essential routines (Alshagrawi & Alhodaithy, 2024).

The World Health Organization established the Five Moments framework to provide an evidence-based guideline for clinical practice (Baseer et al., 2025). Current medical literature emphasizes that successful implementation requires a deep cognitive understanding of critical points of transmission in patient care. Modern infection control strategies now recognize that behavioral compliance depends heavily on the psychological readiness of the nursing staff (Yehouenou et al., 2022). Educational programs globally attempt to bridge the gap between theoretical knowledge and practical application through continuous training initiatives. Advanced pedagogical models currently advocate for integrating behavioral psychology into standard clinical training (Rocha et al., 2025).

Previous investigations have focused on observational compliance rates while overlooking the complex interplay among knowledge, attitudes, and motivation. This narrow methodological approach frequently ignores the multidimensional dynamics within high-acuity environments (Kim et al., 2023). Researchers often fail to capture how cognitive misunderstandings directly neutralize positive behavioral intentions among intensive care nursing staff. A significant gap exists in understanding how these three critical behavioral domains interact to hinder strict adherence to protocols in regional medical centers. Existing literature rarely provides a holistic view of how educational backgrounds and ward-specific stressors simultaneously shape these vital outcomes (Afewerk & Tamene, 2025).

This study introduces a comprehensive triad assessment to evaluate the simultaneous influence of these psychological factors. The research uniquely targets an under-researched regional hospital High Care Unit to uncover hidden behavioral barriers that standardized observational studies typically miss. Analyzing these interconnected elements provides a nuanced perspective on the root causes of non-compliance. This novel approach shifts the analytical focus from mere behavioral observation to the underlying psychological drivers of clinical decision-making (Caruso et al., 2025). The integration of these distinct variables offers a robust framework for diagnosing precise intervention needs within resource-constrained facilities.

The primary objective is to systematically describe the behavioral determinants among nurses in the high care unit. The research aims to quantify the exact proportions of staff possessing adequate cognitive understanding versus those harboring critical knowledge gaps. Investigators will also measure the prevailing psychological dispositions and intrinsic drives that influence daily hygiene routines (Zheng et al., 2022). These specific measurements will establish a clear behavioral baseline for the targeted nursing population. Detailed profiling of these variables will enable hospital management to identify specific demographic groups requiring immediate educational support.

Identifying these behavioral determinants is urgently needed to design targeted educational interventions that address specific cognitive deficiencies. Hospital administrators must utilize these empirical findings to replace generic training modules with customized programs that resonate with the actual motivations of intensive care nurses. Eradicating preventable infections demands immediate, evidence-based corrective actions rooted in a thorough understanding of staff behavior (Fernandes et al., 2024). Implementing these strategic improvements will ultimately elevate regional healthcare standards and ensure maximum patient safety. Swift translation of these research insights into actionable clinical policies will safeguard critically ill patients.

METHOD

The study employed a quantitative descriptive design with a case study approach to describe nurses' knowledge, attitudes, and motivation regarding the implementation of the Five Moments of Hand Hygiene. The research was conducted in the high-care unit (HCU) of a general hospital during October 2025. The study population consisted of all nurses working in the unit. Participants were selected based on predetermined inclusion and exclusion criteria to ensure that only eligible respondents were enrolled.

Data were collected using a structured self-administered questionnaire comprising three sections. The first section assessed nurses' knowledge through 15 multiple-choice questions. The second section measured attitudes using 10 Likert-scale statements, while the third section evaluated motivation toward hand hygiene practices using 10 Likert-scale statements. Prior to data collection, the questionnaire underwent validity and reliability testing to ensure its psychometric adequacy. Eligible participants completed the validated questionnaire independently after providing informed consent.

Descriptive statistical analysis was performed using IBM SPSS Statistics. Frequency distributions, percentages, means, and standard deviations were calculated to summarize respondents' characteristics and describe the levels of knowledge, attitudes, and motivation regarding hand hygiene. Ethical approval for the study was obtained from the Faculty of Nursing, Universitas Jember. All procedures complied with established ethical principles for research involving human participants, including voluntary participation, informed consent, confidentiality, and anonymity.

RESULTS

Respondent Characteristics

Table 1. Characteristics of nurses (N=5)

Respondent Characteristics	Frequency	Percentage
Age Category		
Late adolescence (17-25 tahun)	1	20
Early adulthood (26-35 tahun)	4	80
Late adulthood (36-45 tahun)	0	0
Early elderly (46-55 tahun)	0	0
Gender		
Male	2	40
Female	3	60
Service Years		
<3 Years	2	40
>3 Years	3	60
Last Education		
Diploma 3 in Nursing	4	80
S1 in Nursing	1	20
Position in the Ward		
Nurse in Charge	4	80
Shift 1 Person in Charge	1	20

Based on Table 1, the characteristics of nurse respondents in the HCU by age are: 4 nurses (80%) are in early adulthood, and 1 nurse (20%) is in her late teens. Regarding gender, 3 nurses

(60%) are female, and 2 nurses (40%) are male. Three nurses (60%) have worked for more than 3 years, and 2 nurses (40%) have worked for less than 3 years. Most of the four nurses (80%) have a Diploma 3 in Nursing, and 1 nurse (20%) has a bachelor's degree in nursing. The nurses in the ward oversee 4 nurses (80%), and 1 nurse (20%) oversees the shift.

Table 2. Distribution of Nurses' Knowledge, Attitudes, and Motivation Regarding the Five Moments of Hand Hygiene and the Six Steps of Handwashing (N = 5)

Variable	Category	Frequency	Percentage
Knowledge	Good	2	40.0
	Poor	3	60.0
Attitude	Positive	5	100.0
Motivation	Strong	5	100.0

Table 2 presents the distribution of nurses' knowledge, attitudes, and motivation regarding the five moments of hand hygiene and the six steps of handwashing. More than half of the respondents (60.0%) demonstrated poor knowledge, while 40.0% had good knowledge. Despite relatively low levels of knowledge, all nurses (100.0%) exhibited positive attitudes toward hand hygiene and reported strong motivation to comply with recommended practices. These findings suggest that although nurses possess favorable attitudes and high motivation, knowledge gaps remain and may warrant targeted educational interventions to improve adherence to hand hygiene guidelines.

DISCUSSION

This study reveals a distinct disparity between the high levels of positive attitude and strong motivation among nurses and their surprisingly poor knowledge regarding the World Health Organization's five moments of hand hygiene. The demographic profile of the respondents indicates a predominantly young, female, and relatively experienced workforce holding diploma-level nursing degrees within a specialized intensive care environment. Quantitative analysis shows that 60% of the nursing staff have an inadequate understanding of standard handwashing protocols, despite universally positive attitudes toward infection prevention. These findings highlight a critical gap between internal psychological readiness and actual technical comprehension of clinical guidelines. The data suggest that while the nursing team possesses the right mindset for patient safety, they lack the precise cognitive framework needed to consistently execute evidence-based infection control measures (Bogaert, 2025).

The predominance of early adulthood and female nurses in this intensive care setting aligns with broader demographic trends in nursing and significantly influences clinical compliance behaviors. Literature suggests that nurses in their late twenties and early thirties possess an optimal balance of physical stamina, cognitive adaptability, and emerging professional responsibility necessary for demanding ward environments. Existing research indicates that female healthcare workers frequently exhibit heightened caution and a stronger intrinsic concern for patient safety during routine clinical procedures (Al-Qahtani, 2023). The concentration of these specific demographic groups in the Melati High Care Unit provides a highly favorable foundation for implementing rigorous infection control protocols. Clinical observations in similar settings confirm that a youthful and predominantly female workforce often responds positively to structured behavioral interventions aimed at improving daily hygiene practices.

Professional tenure and educational backgrounds fundamentally shape the clinical habits and supervisory dynamics required for strict adherence to hand hygiene standards. Clinical experience exceeding three years typically correlates with an enhanced understanding of nosocomial infection

risks and familiarity with institutional standard operating procedures among ward staff. Academic literature emphasizes that diploma-level nursing education provides a foundational baseline that requires continuous reinforcement through targeted clinical training to maintain high compliance rates over time. The structural hierarchy observed in this ward necessitates active engagement from shift leaders to model and enforce hand hygiene practices among the predominantly staff-level nursing personnel. Organizational behavior studies demonstrate that clear role delineation and strong leadership visibility are essential components for sustaining long-term adherence to critical safety protocols in high-acuity hospital units (Ayu et al., 2025).

The substantial deficit in technical knowledge regarding the five moments of hand hygiene represents the most critical barrier to optimal infection prevention practices in this clinical setting. Scientific evidence consistently demonstrates that cognitive understanding of critical moments in the transmission of care is a primary determinant of actual handwashing compliance among healthcare workers globally. A lack of precise knowledge forces clinical staff to rely on routine practices rather than evidence-based guidelines in complex, time-sensitive patient care scenarios. Previous investigations confirm that an incomplete understanding of hand hygiene protocols leads to selective adherence, severely compromising overall patient safety and increasing the risk of healthcare-associated infections. Educational theorists argue that without a deep cognitive grasp of the underlying rationale for each specific hygiene moment, clinical staff cannot effectively integrate these practices into their automated daily workflows (Worku & Melaku, 2025).

Universal positive attitudes and strong internal motivation among the nursing staff provide a vital psychological asset that can be leveraged to overcome existing knowledge deficits. Behavioral theories in healthcare indicate that a positive disposition toward infection control is a fundamental prerequisite for adopting new clinical guidelines and modifying entrenched professional habits. Internal motivation drives healthcare workers to prioritize patient safety and maintain high standards of care, even in high-stress environments such as a High Care Unit. Academic discourse indicates that positive attitudes and high motivation significantly increase nursing staff's receptiveness to continuous professional development, peer feedback, and corrective supervision (Hu et al., 2025; Aladini et al., 2026). This intrinsic drive serves as a powerful catalyst for behavioral change, provided that the clinical environment supplies the necessary educational resources and structural support to channel this motivation effectively.

The juxtaposition of high motivation and positive attitudes against poor technical knowledge underscores the complex nature of behavioral compliance in modern clinical environments. Psychological readiness alone cannot translate into correct clinical execution without the requisite cognitive framework and precise technical skills required for standardized care. Research in nursing informatics and clinical governance shows that well-intentioned staff may inadvertently compromise patient safety if their actions are not guided by accurate and up-to-date procedural knowledge. This disconnect necessitates a strategic shift from merely encouraging positive mindsets to actively building precise technical competencies through structured and repetitive educational interventions. Hospital administrators must recognize that fostering a culture of safety requires addressing both the affective domain of nursing practice and the cognitive domain of clinical knowledge simultaneously (Seidel-Fischer et al., 2024).

Translating these findings into actionable clinical strategies requires implementing targeted educational programs and robust supervisory frameworks within the hospital system. Hospital management must prioritize regular, standardized training sessions focused on the technical nuances of the World Health Organization's hand hygiene guidelines for all intensive care personnel. Clinical supervisors and shift leaders need to assume active roles as role models and real-time auditors to bridge the persistent gap between theoretical knowledge and daily clinical practice.

Establishing a supportive work environment with accessible handwashing facilities and continuous performance feedback will further reinforce the existing high motivation levels among the dedicated nursing staff. Quality improvement initiatives should incorporate these educational and structural interventions into the standard onboarding and continuous evaluation processes for all healthcare workers in high-risk hospital wards (Douno et al., 2023).

The interpretation of these results must consider several methodological limitations inherent to the study design and data collection processes utilized in this research. The use of a small, single-center case study sample limits the generalizability of the findings to broader nursing populations across different healthcare settings and cultural contexts. Self-reported questionnaires introduce the potential for social desirability bias, in which respondents might overestimate their actual compliance or knowledge to appear professionally competent to researchers. The cross-sectional nature of the research precludes establishing causal relationships between demographic variables and observed behavioral outcomes related to hand hygiene practices over time. Future investigations should employ larger multi-center cohorts and observational methodologies to validate these findings and track the long-term impact of targeted educational interventions on actual clinical behavior.

CONCLUSION

This study reveals a critical disparity between the high levels of positive attitude and strong motivation among nurses and their inadequate cognitive understanding of the World Health Organization's five moments of hand hygiene. Bridging this gap between psychological readiness and technical comprehension requires implementing targeted continuing education programs and robust supervisory frameworks in the clinical environment. Hospital management must prioritize regular training and continuous performance evaluation to translate intrinsic motivation into consistent, evidence-based infection control practices. Aligning nursing staff's cognitive knowledge with their positive professional dispositions will significantly improve the quality of intensive care services and strengthen overall patient safety outcomes.

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CONFLICT OF INTEREST

The author declares no conflict of interest in this research. All aspects of the research were conducted independently without any influence from third parties.

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