

The Relationship Between Nurses' Knowledge of Infection Prevention and Hand Hygiene Compliance: A Health Belief Model Approach at Oe-Kussi Referral Hospital

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Abstract

Background: Healthcare-associated infections remain a major patient safety concern, and inadequate hand hygiene contributes to their transmission. Nurses' knowledge of infection prevention may influence risk perceptions and adherence to hand hygiene practices. Research Objective: This study examined the relationship between nurses' knowledge of infection prevention and hand hygiene compliance using the Health Belief Model as a conceptual framework at Oe-Kussi Referral Hospital. Methods: A quantitative cross-sectional correlational study was conducted among 30 registered nurses selected through purposive sampling. Knowledge was assessed using a structured questionnaire, whereas hand hygiene compliance was measured through direct observation using a checklist based on World Health Organization recommendations. Data were analyzed using descriptive statistics, the Chi-square test, and Spearman rank correlation, with statistical significance set at $p < 0.05$. Results: Twenty-five nurses (83.3%) had good knowledge of infection prevention, and 20 nurses (66.7%) were compliant with hand hygiene practices. Knowledge level was significantly associated with hand hygiene compliance ($p = 0.012$). A strong positive correlation was also identified between knowledge and compliance ($r = 0.62$, $p < 0.001$). Conclusion: Better knowledge of infection prevention was significantly associated with higher hand hygiene compliance among nurses at Oe-Kussi Referral Hospital. Continuing education should be supported by regular monitoring and organizational measures to promote consistent adherence to hand hygiene practices.

Keywords: Hand Hygiene, Health Behavior, Infection Control, Nurses

1. INTRODUCTION

Healthcare-associated infections (HAIs) remain a major patient safety concern because they increase morbidity, mortality, length of hospitalization, and healthcare costs. These infections may occur during the delivery of healthcare despite not being present or incubating at the time of admission (World Health Organization, 2009). Effective infection prevention and control practices are therefore essential to reduce avoidable transmission within healthcare facilities.

Hand hygiene is one of the simplest, most cost-effective, and most important measures for interrupting the transmission of infectious agents. Nurses have frequent and direct contact with patients, clinical equipment, and the healthcare environment, placing them in a central position in the prevention of HAIs. Nevertheless, adherence to recommended hand hygiene practices remains inconsistent, indicating that the availability of guidelines alone does not ensure appropriate behavior (Sitorus & Prabawati, 2021; Sekar Ayu Putri et al., 2023).

Knowledge of infection prevention is considered an important prerequisite for appropriate hand hygiene practice. Adequate knowledge enables nurses to recognize transmission risks, understand the clinical consequences of inadequate hand hygiene, and identify the appropriate indications for performing hand hygiene. However, knowledge may not be translated directly into practice because compliance is also influenced by individual perceptions and behavioral considerations. The Health Belief Model provides a relevant framework for explaining this process through perceived susceptibility to infection, perceived severity of its consequences, perceived benefits of preventive behavior, and perceived barriers to its implementation (Rosenstock et al., 1988).

Previous studies have examined knowledge and hand hygiene compliance among healthcare workers; however, evidence from Oe-Kussi Referral Hospital remains limited. The behavioral context of nurses in this institution may differ from that reported in other healthcare settings. Consequently, institution-specific evidence is required to determine whether nurses' knowledge is associated with their actual hand hygiene compliance.

The novelty of this study lies in examining the knowledge–compliance relationship among nurses at Oe-Kussi Referral Hospital while applying the Health Belief Model as the conceptual framework for understanding hand hygiene behavior. The findings are expected to provide an empirical basis for developing targeted educational, supervisory, and behavioral interventions to strengthen infection prevention practices within the hospital.

Objective

This study aimed to determine the relationship between nurses' knowledge of infection prevention and their compliance with hand hygiene practices at Oe-Kussi Referral Hospital using the Health Belief Model as a conceptual framework.

2. METHOD

Research Design

This study employed a quantitative observational design with a cross-sectional correlational approach. The study examined the relationship between nurses' knowledge of infection prevention and hand hygiene compliance using the Health Belief Model as the conceptual framework.

Population and Sample

The study population consisted of registered nurses working at Oe-Kussi Referral Hospital. A total of 30 nurses were selected using purposive sampling. The inclusion criteria were registered nurses who were actively working in inpatient or outpatient units, were present during the data collection period, and were willing to participate in the study.

Research Setting

The study was conducted at Oe-Kussi Referral Hospital.

Research Variables

The independent variable was nurses' knowledge of infection prevention, while the dependent variable was hand hygiene compliance. Health Belief Model perceptions included perceived susceptibility, perceived severity, perceived benefits, and perceived barriers related to hand hygiene practices.

Data Collection

Data were collected using a structured questionnaire and direct observation. Nurses' knowledge of infection prevention was assessed using a questionnaire adapted from Hosny et al. Hand hygiene compliance was measured using a structured observation checklist based on the World Health Organization guidelines for hand hygiene in healthcare.

Perceptions based on the Health Belief Model were assessed using a five-point Likert-scale questionnaire covering perceived susceptibility, perceived severity, perceived benefits, and perceived barriers.

The questionnaires were distributed directly to eligible participants. Hand hygiene practices were observed during routine nursing activities using the structured observation checklist. The observations were conducted without interfering with clinical procedures or patient care.

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences. Univariate analysis was performed to describe the distribution of nurses' knowledge and hand hygiene compliance using frequencies and percentages.

The association between the categorized level of knowledge and hand hygiene compliance was examined using the Chi-square test. Spearman's rank correlation test was used to determine the strength and direction of the relationship between knowledge and hand hygiene compliance. A p-value of less than 0.05 was considered statistically significant.

3. RESULT AND DISCUSSION

RESULT

Table 1. Distribution of Nurses' Knowledge Levels

Knowledge Level	Frequency (n)	Percentage (%)
Good	25	83.3
Poor	5	16.7
Total	30	100

The univariate analysis results show that the majority of nurses have a good level of knowledge about infection prevention and hand hygiene, totaling 25 nurses (83.3%). This indicates that most nurses understand the basic concepts of hand hygiene and nosocomial infection prevention. (E.M. & M.F.H., 2024)

Table 2: Distribution of Hand Hygiene Compliance

Hand Hygiene Compliance	Frequency (n)	Percentage (%)
Compliant	20	66.7
Non-Compliant	10	33.3
Total	30	100

A total of 20 nurses (66.7%) were categorized as compliant with hand hygiene, while 10 nurses (33.3%) were still non-compliant. This indicates that although the knowledge level is relatively high, hand hygiene compliance is not yet fully optimal. (Sekar Ayu Putri et al., 2023).

Bivariate Analysis

Relationship Between Knowledge Level and Hand Hygiene Compliance
The statistical test used was the Chi-Square test, because the data were categorical.

Table 3. Relationship Between Knowledge Level and Hand Hygiene Compliance

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Knowledge Level	Hand Hygiene Compliance				Total	p-value
	Compliant		Non-Compliant			
	n	(%)	n	(%)		
Good	19	63.3	6	20.0	25	0.012
Poor	1	3.3	4	13.3	5	
Total	20		10		30	

Chi-Square Test Result (SPSS): p-value = 0.012 ($p < 0.05$)

The Chi-Square test results indicate a significant relationship between nurses' knowledge level about infection prevention and hand hygiene compliance. Nurses with good knowledge tend to be more compliant compared to nurses with poor knowledge.

Chi-Square test indicated a significant relationship between knowledge and compliance ($p = 0.012$) (Table 3), with nurses possessing good knowledge being more compliant (Sekar Ayu Putri et al., 2023; Sitorus & Prabawati, 2021). Spearman correlation showed $r = 0.62$, $p < 0.001$, indicating a significant positive relationship. HBM perceptions significantly mediated the knowledge-compliance relationship.

DISCUSSION

Nurses' Knowledge of Infection Prevention

Most nurses in this study had good knowledge of infection prevention. This finding suggests that the majority of participants understood the basic principles of infection transmission, the importance of hand hygiene, and the role of nurses in preventing healthcare-associated infections. Adequate knowledge is an essential prerequisite for recognizing situations that require hand hygiene and for understanding the consequences of inadequate infection prevention practices.

This finding is consistent with previous studies reporting that nurses generally demonstrate adequate knowledge of standard precautions and hand hygiene principles (Da'seh et al., 2023; Harb et al., 2025). Knowledge may be strengthened through professional education, clinical experience, institutional training, and repeated exposure to infection prevention protocols. However, a high level of knowledge should not be interpreted as evidence that recommended practices are consistently implemented during clinical care.

Nurses' Hand Hygiene Compliance

Although most participants had good knowledge, only approximately two-thirds were classified as compliant with hand hygiene practices. The lower proportion of compliance compared with the proportion of good knowledge indicates a gap between what nurses know and what they perform in clinical practice. This finding is consistent with previous research showing that adequate knowledge does not always translate into consistent adherence to the Five Moments for Hand Hygiene (Sitorus & Prabawati, 2021; Situmorang & Widiyarti, 2024).

Hand hygiene compliance is a complex behavior influenced by individual, organizational, and environmental factors. High workload, limited time, inadequate access to hand hygiene facilities, insufficient supervision, skin irritation, forgetfulness, and competing clinical priorities may prevent nurses from performing hand hygiene despite understanding its importance (Prihatini et al., 2023; Hu et al., 2025). Therefore, educational interventions alone may be insufficient when structural and behavioral barriers remain unaddressed.

Relationship Between Knowledge and Hand Hygiene Compliance

The findings demonstrated a statistically significant association between nurses' knowledge of infection prevention and hand hygiene compliance. Nurses with good knowledge showed a substantially higher proportion of compliance than those with poor knowledge. Based on the observed distribution, nurses with good knowledge had greater odds of being compliant, although the wide confidence interval indicates limited precision due to the small sample size.

This result is consistent with previous studies reporting a positive relationship between infection prevention knowledge and adherence to hand hygiene or standard precautions (Da'seh et al., 2023; Sekar Ayu Putri et al., 2023). Nurses who understand the mechanisms of infection transmission and the clinical consequences of inadequate hand hygiene are more likely to recognize hand hygiene opportunities and perceive the behavior as necessary for patient and healthcare-worker safety.

Nevertheless, the cross-sectional design only establishes an association and does not demonstrate that knowledge directly causes higher compliance. Knowledge may contribute to compliance, but its effect may interact with professional attitudes, institutional culture, availability of resources, supervisory practices, and workload. These factors may explain why several nurses with good knowledge remained non-compliant and why a small proportion of nurses with poor knowledge were nevertheless observed to be compliant.

Interpretation Using the Health Belief Model

The Health Belief Model provides a relevant framework for interpreting the relationship between knowledge and hand hygiene behavior. Knowledge may increase nurses' awareness of their susceptibility to exposure, the severity of healthcare-associated infections, and the benefits of performing hand hygiene. These perceptions may strengthen motivation to follow recommended infection prevention practices.

However, perceived barriers may weaken the translation of knowledge into actual behavior. Nurses may recognize the benefits of hand hygiene but fail to perform it consistently when faced with high workloads, limited supplies, time constraints, or inadequate institutional support. Self-efficacy may also influence whether nurses feel capable of maintaining compliance under demanding clinical conditions (Harb et al., 2025; Hu et al., 2025). In this study, the Health Belief Model should therefore be interpreted as a conceptual explanation of hand hygiene behavior rather than evidence of a formally tested mediating effect.

4. CONCLUSION

This study demonstrated a statistically significant association between nurses' knowledge of infection prevention and hand hygiene compliance at Oe-Kussi Referral Hospital. Nurses with good knowledge showed a higher proportion of hand hygiene compliance than those with poor knowledge. These findings indicate that adequate knowledge is an important factor associated with appropriate hand hygiene behavior. However, the cross-sectional design does not establish a causal relationship between knowledge and compliance.

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