

Analysis of Nurse Competence in Prevention of Nosocomial Infections in Inpatient Ward Umar Wirahadikusumah Hospital

Jesika Theresia Sagala¹, Iyos Sutresna¹ Heri Ridwan¹

¹Universitas Pendidikan Indonesia, Sumedang, Indonesia

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Corresponding Author :

Jesika Theresia Sagala
E-mail : Jesikathrs.3@upi.edu

ABSTRACT

Background & Objective: Nosocomial infections are an important indicator of hospital service quality because they increase morbidity, mortality, length of hospital stay, and healthcare costs. The success of nosocomial infection prevention is closely related to nurses' competencies, including knowledge, skills, attitudes, and professional behavior. This study aimed to analyze nurses' competencies in the successful prevention of nosocomial infections in the inpatient wards of RSUD Umar Wirahadikusumah Sumedang. **Method:** This study used a descriptive quantitative design with a survey approach. The population consisted of nurses working in the inpatient wards, with 134 nurses selected as samples using stratified random sampling techniques. Data were collected using an infection prevention and control competency questionnaire that had been tested for validity and reliability. Data were presented in the form of frequency distributions and analyzed using univariate analysis to describe the level of nurses' competencies. **Result:** The findings showed that nurses' competencies in preventing nosocomial infections were generally categorized as high, indicating that nurses possessed adequate competence to support infection prevention efforts in the inpatient wards. **Conclusion:** The study concludes that nurses' competencies play an important role in supporting the successful prevention of nosocomial infections in inpatient care settings.

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Introduction

Nosocomial infections or Healthcare-Associated Infections (HAIs) are infections acquired by patients during treatment in hospitals or other healthcare facilities. These infections can occur as a result of medical procedures or an unsterile treatment environment (Amelia, et al 2020). This phenomenon poses a major challenge to both global and national healthcare systems. The impact of nosocomial infections is very detrimental because they can prolong hospitalization, increase the risk of serious complications, and even cause death (Longadi, et al 2016). Data from the World Health

Organization (WHO) in 2022 shows that around 7–10% of patients in hospitals in developed countries experience healthcare-associated infections, while in developing countries, including Indonesia, the prevalence reaches 15%. This figure far exceeds the standard for nosocomial infections according to Minister of Health Decree No. 129 of 2008, which is <1.5%. Hospitals with rates above this standard are considered to have poor service quality and require strengthening of infection prevention and control programs.

Inpatient wards are units with a high risk of nosocomial infections due to high clinical activity, the use of invasive devices, and the frequency of interaction between patients and health workers. Prevention of nosocomial infections is crucial because infections during treatment can prolong hospital stays, increase costs, and raise the risk of death, while effective infection control programs can prevent most of these cases (WHO, 2022). If protocols are not optimally implemented, hospitals will face significant clinical and socioeconomic burdens, as demonstrated by research at the Makassar City Hospital, which found that weak surveillance and infection control policies resulted in increased length of stay and operational costs (Zaenal, 2022). This condition is exacerbated by dangerous microorganisms that cause nosocomial infections, which can worsen the patient's condition, complicate medical management, and increase the risk of mortality (Pramesti, 2025).

Nurses, as health workers who interact directly with patients, are required to have competence in providing nursing care. Spencer (1993) states that competence is a set of characteristics that underlie effective work behavior. Nurse competence includes knowledge, technical and interpersonal skills, professional attitudes, and motivation that influence daily work practices (Hyeon and Moon, 2024). The success of nosocomial infection prevention is reflected in the incidence of infections reported by hospitals, which also reflects the effectiveness of preventive measures taken by nursing staff. The relationship between nurse competence and the success of infection prevention is an important phenomenon, as nurses with low competence tend to be more prone to errors that can increase the incidence of infection.

Various studies show that nursing competence plays an important role in preventing nosocomial infections. Research by Lee and Yang (2024) confirms that improving competence through continuing education and training is necessary to reduce nosocomial infection rates. (Li, et al 2025) also highlight that scientific and measurable work competence ensures quality of service and patient safety. Similar findings were shown by Aliyupiudin (2018), who found a significant relationship between nurses' knowledge as part of professional competency and nosocomial infection prevention behavior. This reinforces the evidence that nurses' competency, particularly in terms of knowledge and behavior, influences the success of infection prevention.

However, there is still limited research that comprehensively analyzes nurses' competencies in the success of nosocomial infection prevention, especially in regional hospitals. Most previous studies only highlight one aspect of competence without considering other components.

Umar Wirahadikusumah Sumedang Regional General Hospital, as a class B referral hospital, showed a very low nosocomial infection rate of 0.45% in 2024. In the inpatient ward, the rate in July 2025 was recorded at 0.18%, despite an increase from 0.72% in the previous month. This achievement is still considered very good according to Minister of Health Decree No. 129 of 2008. However, to date, there have not been

many in-depth studies analyzing nursing competence as a supporting factor for this success in the context of regional hospitals.

Based on the phenomenon of low nosocomial infection rates in the inpatient wards of Umar Wirahadikusumah Regional General Hospital, previous research findings, and the limitations of quantitative studies in Indonesia, the researchers deemed it necessary to conduct a more in-depth analysis of nurse competence in the success of nosocomial infection prevention in the inpatient wards of Umar Wirahadikusumah Regional General Hospital.

Objective

Analyzing the competency level of nurses in the success of preventing nosocomial infections in the inpatient ward of Umar Wirahadikusumah Regional General Hospital, Sumedang.

Method

This study used a descriptive quantitative design with a survey method and was conducted in the inpatient ward of Umar Wirahadikusumah Regional General Hospital in Sumedang in November 2025. The study population consisted of 202 nurses, with a sample of 134 nurses selected using the Slovin formula and stratified random sampling technique. Data were collected using the Infection Control Competency Scale questionnaire, which consisted of 33 Likert scale statements and covered seven dimensions of competence. The instrument has been declared valid and reliable. Data collection was conducted online after the respondents gave their consent. Data analysis was performed univariately by converting scores into low, medium, and high categories. All data were analyzed using JASP software, and the study obtained ethical approval from the Binawan University Health Research Ethics Committee.

Results

1. Characteristics of Nurses in the Inpatient Ward of Umar Wirahadikusumah Regional General Hospital

The results of data analysis of 134 respondents showed that the characteristics of respondents in this study included three types of characteristics, namely: age of nurses, gender, and length of service. The following are the results of the distribution of respondents according to the three characteristics:

TABLE 1. Frequency Distribution of Responden (f=134)

| Characteristics | f | % |
|----------------------------------|-----|------|
| <i>Age</i> | | |
| 15-24 years old | 7 | 5,2 |
| 25-44 years old | 107 | 79,9 |
| 45-59 years old | 20 | 14,9 |
| <i>Gender</i> | | |
| Male | 26 | 19,4 |
| Female | 108 | 80,6 |
| <i>Length of service (years)</i> | | |
| < 5 | 56 | 41,8 |
| > 5 | 78 | 58,2 |

Based on age data, it is known that most nurses in this study were in the 22-32 age range (52.2%). Based on gender, it is known that most respondents were female

(80.6%) and a small number were male (19.4%). Based on length of service, most were in the 0.5-10 year range (63.4%).

2. Nurse Competence in Preventing Nosocomial Infections in the Inpatient Ward of Umar Wirahadikusumah Regional General Hospital

TABLE 2 . Nurse Competence in Nosocomial Infection Prevention in the Inpatient Ward of Umar Wirahadikusumah Regional General Hospital (f=134)

| No | Competence | Low | | Medium | | High | | Mean (%) |
|----|--|-----|------|--------|------|------|------|----------|
| | | f | % | f | % | f | % | |
| 1 | Basic Microbiology | 26 | 19,4 | 34 | 25,4 | 74 | 55,2 | 76,08 |
| 2 | Critical Thinking | 5 | 3,7 | 30 | 22,4 | 99 | 73,9 | 83,86 |
| 3 | Patient Communication and Assessment | 5 | 3,7 | 33 | 24,6 | 96 | 71,6 | 82,96 |
| 4 | Compliance with Infection Control Guidelines | 2 | 1,5 | 5 | 3,7 | 127 | 94,8 | 91,58 |
| 5 | Patient Education | 4 | 3 | 10 | 7,5 | 120 | 89,6 | 87,54 |
| 6 | Infection Control Leadership | 7 | 5,2 | 15 | 11,2 | 112 | 83,6 | 86,08 |
| 7 | Occupational Exposure Prevention | 3 | 3,7 | 2 | 1,5 | 127 | 98,4 | 91,09 |

Based on Table 2, the competence of nurses in preventing nosocomial infections in the inpatient ward of Umar Wirahadikusumah Regional General Hospital is generally in the high category. The order of competencies based on the mean score from highest to lowest is prevention of occupational exposure with a mean score of 91.09, compliance with infection control guidelines with a mean score of 91.58, patient education with a mean score of 87.54, infection control leadership with a mean score of 86.08, critical thinking with a mean score of 83.86, communication and patient assessment with a mean score of 82.96, and basic microbiology with a mean score of 76.08. These findings indicate that nurses have good competence in supporting efforts to prevent and control nosocomial infections.

Discussion

This study analyzed nurses' competencies in the successful prevention of nosocomial infections in the inpatient wards of RSUD Umar Wirahadikusumah Sumedang. The discussion focuses on the meaning and implications of each competency variable, the main findings, and their comparison with previous studies.

Respondent Characteristics

Most respondents were aged 25–44 years (79.9%), followed by those aged 45–59 years (14.9%) and 15–24 years (5.2%). This age distribution reflects a predominantly productive workforce. Nurses in this age group generally have high work energy, good adaptability, and sufficient cognitive capacity to support clinical decision-making. This finding is consistent with Auliya, et al (2024), who reported that nurses in productive age groups demonstrate better understanding of nursing tasks and optimal clinical performance.

In terms of gender, female nurses dominated the sample (80.6%), while male nurses accounted for 19.4%. This finding aligns with previous studies by Mita, et al (2022) and Megawati (2017), which reported that the nursing profession remains

female-dominated. Historically, nursing has emphasized caring values, empathy, and compassion, which are often socially associated with women. These characteristics support therapeutic communication and patient-centered care, both of which are essential in infection prevention practices.

Regarding work experience, most respondents had worked for five years or more (58.2%), while 41.8% had less than five years of experience. Longer work experience is associated with greater clinical exposure, skill mastery, and professional maturity. This finding is in line with Handayani, et al (2024), who stated that nurses with longer working periods tend to demonstrate higher service quality and stronger professional responsibility.

Basic Microbiology Competency

The majority of nurses demonstrated high basic microbiology competency (55.2%), followed by moderate (25.4%) and low (19.4%) categories. This indicates that most nurses possess adequate foundational knowledge of microorganisms and infection mechanisms. The highest-scoring item reflected nurses' ability to explain antibiotic susceptibility test results, while the lowest score was related to explaining multidrug-resistant bacteria concepts.

Basic microbiology competency forms the foundation of safe nursing practice and infection prevention (Durrant, et al 2017; Hyeon & Moon, 2024). These findings are consistent with Sumaryati (2017), who reported that 58.3% of nurses had moderate to good knowledge of infection prevention. However, Aulianah (2022) reported higher levels of knowledge, suggesting that differences in institutional training programs and safety culture influence nurses' microbiological competence.

Critical Thinking Competency

Most nurses demonstrated high critical thinking competency (73.9%), with 22.4% in the moderate category and only 3.7% in the low category. The highest score reflected nurses' use of trusted guidelines and literature when gathering infection-related information, while difficulty in accessing literature received the lowest score.

Critical thinking enables nurses to identify infection risks, analyze clinical data, and determine appropriate interventions (Carrico, et al 2018; Hyeon & Moon, 2024). These findings align with Arruum et al. (2025), who reported that 90.6% of nurses demonstrated good critical thinking skills. However, they differ from Urhan, et al (2021), who found moderate critical thinking levels, indicating that education, workload, and organizational support significantly influence this competency.

Communication and Patient Assessment Competency

High competency in communication and patient assessment was observed in 71.6% of nurses, followed by moderate (24.6%) and low (3.7%) categories. The highest scores reflected open discussion among nurses and detailed documentation of infection risks, while considering uncommon infection symptoms received the lowest score.

Effective communication ensures continuity of care and supports accurate patient assessment, which is essential for infection prevention (Ita, et al 2021). These findings are consistent with Masmumah and Suminar (2024), who reported that 91% of patients were satisfied with nurses' communication. However, Pratiwi (2022) reported lower effectiveness, suggesting that workload and limited interaction time affect communication quality.

Compliance with Infection Control Guidelines

Compliance with infection control guidelines was the most dominant high-category competency (94.8%). The highest score reflected correct and timely hand hygiene practices, while the lowest related to exclusive use of special medical equipment for isolated patients.

Compliance is a critical determinant of successful infection prevention (Hyeon & Moon, 2024). This finding aligns with Mendrofa (2020), who reported 98% compliance among nurses. In contrast, Erasmus, et al (2020) reported only 47% compliance, highlighting the influence of supervision, workload, and institutional policies on adherence to infection control practices.

Patient Education Competency

Most nurses demonstrated high patient education competency (89.6%), with the highest score reflecting the ability to guide patients in infection prevention measures. The lowest score related to addressing psychological conditions of patients infected with multidrug-resistant bacteria.

Patient education supports infection prevention and empowers patients to participate in safety practices (Hyeon & Moon, 2024). These results are consistent with Setianingsih (2023), but differ from Hammoud (2020), who found inconsistent patient education practices, emphasizing the importance of institutional support.

Infection Control Leadership Competency

High leadership competency was observed in 83.6% of nurses. The highest score reflected self-improvement efforts, while the lowest related to requesting environmental management support. Effective leadership fosters adherence to infection control standards (Hyeon & Moon, 2024).

These findings align with Batran, et al (2025), but differ from Banjarnahor and Ragini (2018), who reported poor supervision and low hand hygiene compliance, underscoring the role of organizational support.

Occupational Exposure Prevention Competency

Occupational exposure prevention competency was very high (98.4%). Proper use of personal protective equipment received the highest score, while protecting skin wounds received the lowest. This reflects strong awareness of occupational safety (Hyeon & Moon, 2024). Similar findings were reported by Elshaer and Agage (2022), while Pratiwi, et al (2022) reported lower compliance.

Strengths and Limitations of the Study

This study's strength lies in its comprehensive assessment of multiple nurse competency dimensions related to nosocomial infection prevention using a validated instrument and a representative inpatient nurse sample.

A limitation of this study is the relatively lengthy data collection process due to nurses' workload and limited time during working hours, which prevented simultaneous questionnaire returns. However, this condition did not affect data quality, as coordination with ward heads supported timely distribution and collection of questionnaires

Conclusion

This study shows that nurses' competence in preventing nosocomial infections in the inpatient ward of Umar Wirahadikusumah Regional General Hospital is generally high. The order of competence based on the highest scores starts from prevention of occupational exposure, compliance with infection control guidelines,

patient education, infection control leadership, critical thinking, communication and nursing care, to basic microbiology. These findings indicate that nurses have been able to optimally implement infection prevention practices, particularly in terms of compliance with safety standards and self-protection.

This study emphasizes the importance of maintaining and strengthening nurses' competencies through continuous training and hospital management support. Further research is recommended using a longitudinal design or mixed methods and involving various hospitals to obtain a more comprehensive and generalizable picture of nurses' competencies in nosocomial infection prevention.

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