
Competency and Compliance of Nurses in Preventing Healthcare-Associated Infections: a Cross-Sectional Study

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ABSTRACT

This study assessed the competency and compliance of nurses in preventing healthcare-associated infections (HAIs) in a tertiary hospital in the Philippines. It examined nurses' competency in terms of knowledge, skills, and attitude, and their compliance with infection prevention practices such as hand hygiene, use of personal protective equipment, aseptic technique, and environmental disinfection. A quantitative descriptive-correlational design was utilized. A total of 68 ICU nurses were selected using proportionate stratified random sampling. Data were collected using a researcher-developed questionnaire based on World Health Organization guidelines and validated by experts. Descriptive statistics, Mann-Whitney U test, Kruskal-Wallis test, and Spearman's rank-order correlation coefficient were used. Findings revealed very high competency and compliance. No significant difference was found when grouped according to age, sex, educational attainment, ICU area, and training, while a significant difference in compliance was noted by years of experience. A moderate positive relationship ($r = 0.416$, $p < 0.05$) between competency and compliance was identified, indicating that higher competency is associated with higher compliance.

Keywords: Healthcare-associated infections, competency, compliance, infection prevention, ICU nurses

INTRODUCTION

Healthcare-associated infections (HAIs) severely impact patient safety, costs, and hospital stay durations, affecting 7% of patients in high-income and 15% in low-to-middle-income countries (World Health Organization [WHO], 2022). Standard precautions such as hand hygiene, PPE, aseptic technique, and disinfection can prevent these infections (Centers for Disease Control and Prevention [CDC], 2023). While a nurse's competency (knowledge, skills, and attitude) directly drives protocol adherence (Alhumaid et al., 2021; Kim et al., 2023), organizational barriers like workload and limited resources cause persistent compliance gaps (Haque et al., 2021). This study addresses this issue by evaluating the relationship between competency and compliance among ICU nurses.

Statement of the Problem

This study aimed to assess the competency and compliance of nurses in preventing healthcare-associated infections. Specifically, it seeks to determine: (1) the demographic profile of respondents; (2) the level of competency in terms of knowledge, skills, and attitude; (3) the degree of compliance with infection prevention practices such as hand hygiene, personal protective equipment use, aseptic technique, and environmental disinfection; (4) whether

significant differences exist in competency and compliance when grouped according to demographic profile; and (5) whether a significant relationship exists between competency and compliance.

Scope and Delimitations

This study is delimited to ICU nurses in a selected tertiary hospital, focusing on their competency (knowledge, skills, and attitude) and compliance (hand hygiene, use of personal protective equipment, aseptic technique, and environmental disinfection). The study utilized a self-reported questionnaire among 68 respondents. It does not include direct observation and is limited to a single institution, which may affect generalizability.

Review of Related Literature

Healthcare-associated infections remain a global concern affecting patient safety and healthcare quality (WHO, 2022). Adherence to infection prevention practices significantly reduces infection rates. Nurses' competency influences compliance with infection control measures (Alhumaid et al., 2021; Kim et al., 2023). However, compliance is also affected by organizational factors such as workload and resource availability (Haque et al., 2021; Murray et al., 2022).

Theoretical Framework

The study is anchored on the Theory of Planned Behavior (behavior driven by attitude, subjective norms, and behavioral control), and supported by Pender's Health Promotion Model (knowledge and self-efficacy) and Nightingale's Environmental Theory (cleanliness and environmental control).

Conceptual Framework

It posits that nurses' competency (knowledge, skills, attitude) influences their compliance with infection prevention practices (hand hygiene, PPE, aseptic technique, and disinfection). Demographic factors act as grouping variables affecting both core elements.

METHODOLOGY

This quantitative descriptive-correlational and cross-sectional study assessed the competency and compliance of nurses in preventing healthcare-associated infections.

Research Design

A quantitative descriptive-correlational design was employed to statistically analyze ICU nurses' infection prevention competency and compliance. The descriptive aspect measured baseline competency (knowledge, skills, attitude) and compliance levels (hand hygiene, PPE, aseptic technique, disinfection). The correlational aspect assessed the relationship between these variables and examined differences across demographic groups. A survey method was used to collect data within the ICU setting.

Research Steps

The study began with a literature review based on WHO and CDC guidelines to establish the research framework and instrument. Following a quantitative descriptive-correlational design and securing ethical and institutional approvals, data were gathered from ICU nurses using a validated questionnaire via proportionate stratified random sampling. The collected data were coded, organized, and analyzed using descriptive statistics (frequency, percentage, mean, standard deviation) and inferential tests (Mann-Whitney U, Kruskal-Wallis, and Spearman Rank Correlation). Finally, the results were interpreted to formulate conclusions and recommendations.

Data Collection and Sample Selection

The population consisted of 82 ICU nurses, with 68 respondents selected using proportionate stratified random sampling. Data were collected using a validated researcher-developed questionnaire based on infection prevention guidelines.

Data Analysis Methods

Descriptive statistics were used to summarize the data. Mann-Whitney U test and Kruskal-Wallis test was applied to determine differences across demographic variables, while Spearman's rank-order correlation coefficient was used to assess the relationship between competency and compliance.

Research Hypotheses and Validation

The study tested the following null hypotheses: (1) there is no significant difference in the level of competency and compliance among nurses when grouped according to their demographic profile, and (2) there is no significant relationship between competency and compliance. The instrument was subjected to expert content validation and pilot testing, demonstrating acceptable reliability using appropriate statistical measures.

Study Limitations and ethical considerations

The study adhered to ethical principles by obtaining approval from the appropriate ethics review body and securing informed consent from all participants. Confidentiality, anonymity, and voluntary participation were ensured throughout the research process, and respondents were allowed to withdraw at any time without penalty. The study was limited to ICU nurses from a single tertiary hospital, which may affect the generalizability of the findings. In addition, data were collected using self-reported questionnaires, which may be subject to response bias. Despite these limitations, appropriate measures were taken to ensure the accuracy, validity, and integrity of the data collected.

RESULTS AND DISCUSSION

Findings revealed that ICU nurses demonstrated a very high level of competency in terms of knowledge, skills, and attitude, as well as a very high degree of compliance with infection prevention practices. No statistically significant differences were found in competency and compliance when grouped according to age, sex, educational attainment, ICU area, and training. However, a significant difference in compliance was observed when grouped

according to years of experience, indicating the influence of clinical exposure on adherence. A moderate positive relationship between competency and compliance ($r = 0.416$, $p < 0.05$) was identified, suggesting that higher competency is associated with higher compliance, while acknowledging the role of organizational factors.

SUMMARY

The study assessed the competency and compliance of intensive care unit (ICU) nurses in preventing healthcare-associated infections in a tertiary hospital in Region II, Philippines. The findings revealed that the respondents demonstrated very high levels of competency in terms of knowledge, skills, and attitude, as well as very high compliance with infection prevention practices, including hand hygiene, personal protective equipment use, aseptic technique, and environmental disinfection. No significant differences in competency and compliance were found according to age, sex, educational attainment, ICU assignment, and training exposure. However, years of experience significantly influenced compliance. Furthermore, a significant moderate positive relationship was identified between competency and compliance, indicating that nurses with higher competency are more likely to adhere to infection prevention measures. These findings highlight the importance of maintaining nurses' competency to promote patient safety and reduce the risk of healthcare-associated infections.

CONCLUSIONS

The study concluded that ICU nurses demonstrated very high levels of competency and compliance in preventing healthcare-associated infections. Their strong knowledge, skills, and positive attitudes contributed to consistent adherence to infection prevention and control practices. No significant differences in competency and compliance were found according to age, sex, educational attainment, ICU assignment, and training exposure; however, years of experience significantly influenced compliance. Furthermore, a significant moderate positive relationship was identified between competency and compliance, indicating that nurses with higher competency are more likely to adhere to infection prevention measures. These findings highlight the importance of continuous professional development, competency enhancement, and institutional support in sustaining effective infection prevention practices and promoting patient safety.

RECOMMENDATIONS

Based on the findings and conclusions of the study, it is recommended that healthcare institutions continue strengthening infection prevention and control programs through regular training, seminars, and competency validation activities for nurses. Nursing administrators should provide continuous professional development opportunities and adequate resources to support compliance with infection prevention practices. Special attention should be given to newly employed and less experienced nurses through mentorship and coaching programs to enhance their competency and adherence to infection control guidelines. Furthermore, healthcare facilities should maintain regular monitoring and evaluation of infection prevention practices to ensure sustained compliance and patient safety. Future researchers may conduct similar studies in multiple healthcare institutions and utilize observational methods to further validate nurses' competency and compliance in preventing healthcare-associated infections.

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AI DECLARATION STATEMENT:

AI-supported tools helped with grammar and structure in creating this article. No AI tools were used to collect, analyze, or interpret data; all authors are credited for their academic contributions.

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