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“Knowledge and Compliance of Nurses Toward Infection Control and Sterilization Standards”

Mashael belal alsakran
mbalsakran@moh.gov.sa
Zainab haji alghanem
zalghanem @moh.gov.sa
Fatimah Abdullah Hussain Alsalamin
Aslbanat1@hotmail.com
Eman zaid alkuraya
Ealkuraya@moh.gov.sa
Eman yousif Alsaeed
E.alsaeed86@gmail.com
Maryam Abdulraheem Mohammed Alkathiri
Maaalkathiri@moh.gov.sa
Mohammad yousef almajhad
Malmajhad@moh.gov.sa
Kumail ali alhaidain
Kalhaidain@moh.gov.sa
Ali Jafar Hashem Alyaseen
aalyaseen@moh.gov.sa
Ali hussain Alsutan
Alhalsultan@moh.gov.sa
Bushra Yaseen Eid Almajhad
Beeshoo123321@gmail.com
Howra Ali algrash
Halghirash@moh.gov.sa

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Abstract

Infection control and sterilization standards are fundamental components of patient safety and quality healthcare delivery. Nurses play a critical role in the implementation of these standards due to their continuous and direct contact with patients, medical equipment, and the clinical environment. Despite the availability of established guidelines and protocols, variations in nurses' knowledge and compliance with infection control and sterilization practices remain a significant concern in many healthcare settings, contributing to the prevalence of healthcare-associated infections.

This study aims to assess nurses' knowledge of infection control and sterilization standards and to evaluate their level of compliance with these standards in clinical practice. Additionally, the study seeks to examine the relationship between nurses' knowledge and their compliance, as well as to identify factors influencing adherence to infection control measures, including training, institutional policies, and workplace conditions.

A descriptive analytical research design was employed in this study. Data were collected from a sample of nurses working in healthcare institutions using a structured questionnaire designed to measure both knowledge and compliance related to infection control and sterilization standards. Statistical analysis was conducted using appropriate methods to analyze the data and address the research objectives.

The anticipated findings suggest that nurses may demonstrate a moderate to high level of knowledge regarding infection control and sterilization standards, while their actual compliance in practice may vary. This discrepancy highlights a potential gap between theoretical knowledge and practical application. The study concludes by emphasizing the importance of continuous education and training programs, effective monitoring systems, and supportive organizational environments to enhance nurses' compliance, thereby improving patient safety and reducing healthcare-associated infections.

Keywords: Infection Control, Sterilization, Nurses, Knowledge, Compliance, Patient Safety

Introduction

Infection control and sterilization practices are essential components of modern healthcare systems, as they play a vital role in preventing the transmission of infectious diseases and ensuring patient safety. Healthcare-associated infections (HAIs) remain a major global health concern, contributing to increased morbidity, mortality, prolonged hospital stays, and rising healthcare costs (World Health Organization [WHO], 2023). According to the Centers for Disease Control and Prevention (CDC), millions of patients worldwide are affected by HAIs each year, many of which are preventable through strict adherence to infection control and sterilization standards (CDC, 2022).

Nurses play a pivotal role in infection prevention and control due to their continuous and direct interaction with patients, medical devices, and the healthcare environment. Their responsibilities include administering medications, performing invasive procedures, handling sterile equipment, and ensuring proper hygiene practices. As a result, nurses are considered one of the most influential professional groups in reducing the spread of infections within healthcare facilities (Alhumaid et al., 2021). Effective infection control practices among nurses are therefore critical to maintaining a safe clinical environment.

Despite the availability of well-established international and institutional guidelines, studies have consistently reported variations in nurses' adherence to infection control and sterilization protocols. Research indicates that compliance rates among nurses are often suboptimal, particularly in areas such as hand hygiene, use of personal protective equipment, and proper sterilization of instruments (Erasmus et al., 2019; Alshammari et al., 2022). These gaps in practice increase the risk of cross-contamination and the transmission of infectious agents.

Several factors may influence nurses' compliance with infection control standards. These include individual factors such as knowledge, attitudes, and perceptions, as well as organizational factors such as workload, staffing shortages, availability of resources, and institutional support (Gould et

al., 2018). In high-pressure clinical environments, nurses may prioritize immediate patient care tasks over strict adherence to infection control protocols, even when they are aware of recommended guidelines. This highlights the complex relationship between knowledge and actual practice.

Knowledge is widely recognized as a fundamental determinant of safe clinical behavior. Nurses who possess adequate knowledge of infection control principles and sterilization techniques are more likely to understand the risks associated with non-compliance and to apply preventive measures effectively (Said & Abdelaziz, 2020). However, previous research suggests that knowledge alone does not always translate into consistent compliance, emphasizing the importance of continuous training, supervision, and reinforcement of best practices (Abdella et al., 2021).

Recent global health challenges have further emphasized the importance of infection control compliance among nurses. The COVID-19 pandemic exposed critical gaps in infection prevention practices and highlighted the need for improved preparedness, training, and adherence to guidelines (WHO, 2021). During such crises, inadequate compliance with infection control standards can have serious consequences for both patients and healthcare workers.

Given these concerns, assessing nurses' knowledge and compliance with infection control and sterilization standards is essential for identifying weaknesses in current practices and developing targeted interventions. Understanding the relationship between knowledge and compliance can help healthcare administrators and policymakers design effective educational programs and organizational strategies aimed at improving adherence to infection control measures (Khan et al., 2022).

This study seeks to evaluate nurses' knowledge and compliance regarding infection control and sterilization standards within healthcare settings. By examining these factors, the study aims to contribute to the existing literature and provide evidence-based recommendations to enhance

patient safety, protect healthcare workers, and reduce the burden of healthcare-associated infections.

Healthcare-associated infections (HAIs) remain a significant challenge for healthcare systems worldwide, despite the availability of comprehensive infection control and sterilization guidelines. These infections not only compromise patient safety but also place a substantial burden on healthcare resources, increase treatment costs, and prolong hospital stays (World Health Organization [WHO], 2023). Nurses, as the largest group of healthcare professionals, play a crucial role in implementing infection control measures; however, evidence suggests that adherence to these standards is not always optimal.

Several studies have reported inconsistencies between nurses' knowledge of infection control principles and their actual compliance in clinical practice. While many nurses demonstrate adequate theoretical understanding of infection prevention and sterilization procedures, this knowledge is not consistently translated into safe practices at the bedside (Erasmus et al., 2019; Abdella et al., 2021). Such discrepancies increase the risk of cross-infection and undermine the effectiveness of infection control programs within healthcare institutions.

The problem is further compounded by various individual and organizational factors that influence nurses' compliance. High workload, time constraints, inadequate staffing, limited availability of personal protective equipment, and insufficient institutional support have been identified as major barriers to effective infection control practices (Gould et al., 2018; Alshammari et al., 2022). In addition, variations in training quality and frequency may result in uneven levels of knowledge and skills among nursing staff, further affecting compliance rates.

In many healthcare settings, particularly in developing and transitional health systems, limited empirical data exist regarding nurses' knowledge and compliance with infection control and sterilization standards. The absence of such data hinders the ability of healthcare administrators and policymakers to design evidence-based interventions aimed at improving infection

prevention practices. Without a clear understanding of the current level of knowledge and compliance, efforts to reduce HAIs may remain fragmented and ineffective.

Therefore, there is a critical need to systematically assess nurses' knowledge and compliance toward infection control and sterilization standards and to examine the relationship between these two variables. Identifying gaps in knowledge, patterns of non-compliance, and associated influencing factors is essential for developing targeted educational programs, strengthening institutional policies, and enhancing monitoring mechanisms. Addressing this problem is expected to contribute to improved patient safety, reduced incidence of healthcare-associated infections, and overall enhancement of the quality of healthcare services.

Research Hypotheses

This study is guided by a set of research hypotheses formulated to examine nurses' knowledge and compliance toward infection control and sterilization standards, as well as the relationship between these two variables. Previous research suggests that adequate knowledge of infection control principles is a key factor influencing healthcare workers' adherence to safe practices; however, compliance is often affected by additional individual and organizational factors (Said & Abdelaziz, 2020; Abdella et al., 2021).

The primary hypothesis of this study assumes that nurses who possess higher levels of knowledge regarding infection control and sterilization standards are more likely to demonstrate greater compliance with these standards in clinical practice. This hypothesis is based on behavioral and educational theories which propose that knowledge serves as a prerequisite for appropriate professional behavior, particularly in healthcare settings where adherence to guidelines is critical for patient safety (Gould et al., 2018).

In addition to the main hypothesis, several secondary hypotheses are proposed to explore specific dimensions of knowledge and compliance. These include the assumption that nurses who have received formal training in infection control are more compliant with sterilization procedures than those who have not received such training. Furthermore, it is hypothesized that years of professional experience and level of education are positively associated with both knowledge and compliance levels (Alshammari et al., 2022).

Accordingly, the hypotheses of the study are formulated as follows:

- **H1:** There is a statistically significant positive relationship between nurses' knowledge of infection control and sterilization standards and their level of compliance with these standards.
- **H2:** Nurses who have received infection control training demonstrate higher compliance with infection control and sterilization standards than those who have not.
- **H3:** Nurses' level of education is significantly associated with their knowledge of infection control and sterilization standards.
- **H4:** Nurses' years of professional experience are significantly associated with their level of compliance with infection control and sterilization standards.

Testing these hypotheses will provide empirical evidence regarding the factors influencing nurses' compliance and will support the development of targeted interventions aimed at improving infection control practices within healthcare settings.

Research Objectives

The primary objective of this study is to assess nurses' knowledge and compliance toward infection control and sterilization standards within healthcare settings. By examining both knowledge and practice, the study seeks to provide a comprehensive understanding of how well infection control measures are understood and implemented by nursing staff. This objective is

particularly important given the critical role nurses play in preventing healthcare-associated infections and ensuring patient safety (World Health Organization [WHO], 2023).

In addition to the primary objective, the study aims to achieve several specific objectives. First, it seeks to determine the level of nurses' knowledge regarding infection control principles and sterilization procedures. Understanding knowledge levels can help identify areas where nurses may require additional education or training (Said & Abdelaziz, 2020). Second, the study aims to evaluate nurses' level of compliance with infection control and sterilization standards in their daily clinical practice.

Another objective of the study is to examine the relationship between nurses' knowledge and their compliance with infection control and sterilization standards. Exploring this relationship will help determine whether increased knowledge is associated with improved compliance, as suggested by previous studies (Abdella et al., 2021). Furthermore, the study seeks to identify factors that may influence nurses' knowledge and compliance, such as training, level of education, and years of professional experience (Alshammari et al., 2022).

Finally, the study aims to provide evidence-based recommendations that can support healthcare administrators and policymakers in developing effective strategies to enhance infection control practices. Achieving these objectives is expected to contribute to improving patient safety, reducing healthcare-associated infections, and strengthening the overall quality of healthcare services.

Significance of the Study

Infection control and sterilization standards are fundamental to ensuring patient safety and maintaining the quality of healthcare services. This study is significant as it addresses a critical issue in healthcare practice by examining nurses' knowledge and compliance with infection control and sterilization standards. Given that nurses are at the forefront of patient care, their

adherence to these standards has a direct impact on the prevention of healthcare-associated infections (HAIs) and the protection of both patients and healthcare workers (World Health Organization [WHO], 2023).

From a scientific perspective, this study contributes to the existing body of knowledge by providing empirical data on the relationship between nurses' knowledge and their compliance with infection control and sterilization practices. Although previous studies have explored infection control practices among healthcare workers, limited research has simultaneously examined knowledge and compliance among nurses within specific healthcare contexts (Abdella et al., 2021). Therefore, the findings of this study may help fill existing research gaps and support future academic investigations in the field of infection prevention and control.

Practically, the results of this study are expected to assist healthcare administrators and policymakers in identifying areas of weakness in current infection control practices. By understanding factors that influence nurses' knowledge and compliance, healthcare institutions can design targeted training programs, improve monitoring systems, and develop policies that promote adherence to infection control guidelines (Gould et al., 2018). This may lead to more effective infection prevention strategies and improved patient outcomes.

Furthermore, the study holds significance for nursing education and professional development. The findings may highlight the need for continuous education, regular refresher courses, and competency-based training related to infection control and sterilization standards (Said & Abdelaziz, 2020). Enhancing nurses' knowledge and compliance can contribute to fostering a culture of safety within healthcare settings.

Overall, the significance of this study lies in its potential to support evidence-based practice, improve patient safety, reduce the incidence of healthcare-associated infections, and enhance the overall quality of healthcare services.

Limitations of the Study *(≈ 230 words)*

While this study aims to provide valuable insights into nurses' knowledge and compliance with infection control and sterilization standards, several limitations should be acknowledged. First, the study relies on self-reported data collected through questionnaires, which may be subject to response bias. Nurses may overestimate their level of compliance or knowledge due to social desirability, leading to potential inaccuracies in the reported data (Alshammari et al., 2022). Observational or audit-based data could provide more objective measures of compliance but were not feasible within the scope of this study.

Second, the study focuses on nurses working in specific healthcare institutions, which may limit the generalizability of the findings. Differences in institutional policies, resources, staffing levels, and patient populations can influence knowledge and compliance levels. Therefore, the results may not fully represent nurses' practices in other healthcare settings or regions (Gould et al., 2018).

Third, the cross-sectional design of the study captures knowledge and compliance at a single point in time, which may not reflect changes or trends over time. Longitudinal studies would provide a more comprehensive understanding of how training, experience, and institutional interventions affect nurses' adherence to infection control and sterilization standards (Abdella et al., 2021).

Finally, certain external factors, such as the availability of resources, workload pressures, and emergency situations, were not directly controlled or measured, although they may significantly influence compliance levels. Recognizing these limitations is essential for interpreting the findings accurately and for guiding future research to address these constraints.

Definitions of Key Terms

1. **Infection Control:** Infection control refers to a set of policies, procedures, and practices designed to prevent the spread of infectious diseases within healthcare settings. It includes hand hygiene, use of personal protective equipment, environmental cleaning, and safe handling of medical instruments (WHO, 2023).
2. **Sterilization Standards:** Sterilization standards involve systematic procedures that eliminate all forms of microbial life from medical equipment and surfaces, ensuring that instruments are safe for patient use. These standards are essential to prevent cross-contamination and HAIs (CDC, 2022).
3. **Knowledge:** In this study, knowledge refers to the theoretical understanding nurses possess regarding infection control principles and sterilization procedures. It includes awareness of guidelines, protocols, risk factors, and preventive measures (Said & Abdelaziz, 2020).
4. **Compliance:** Compliance is defined as the extent to which nurses adhere to established infection control and sterilization standards in clinical practice. It reflects the actual implementation of procedures such as hand hygiene, proper use of PPE, and sterilization of instruments (Abdella et al., 2021).
5. **Nurses:** Nurses in this study are defined as licensed healthcare professionals who provide direct patient care, administer treatments, and perform procedures in healthcare facilities. The study includes both registered nurses and practical nurses working in hospitals or clinics (Alhumaid et al., 2021).
6. **Healthcare-associated Infections (HAIs):** HAIs are infections acquired by patients during their stay in a healthcare facility that were not present or incubating at the time of admission. They can result from inadequate infection control practices or sterilization procedures (WHO, 2023).

These operational definitions establish a clear understanding of the key variables in the study and provide a framework for measurement and analysis.

Theoretical Framework and Literature Review

Theoretical Framework

The study is grounded in the **Health Belief Model (HBM)**, which provides a conceptual framework for understanding health-related behaviors, including compliance with infection control and sterilization standards. The HBM suggests that individuals' adherence to preventive health practices is influenced by their perceived susceptibility to health risks, perceived severity of potential outcomes, perceived benefits of preventive actions, and perceived barriers to compliance (Rosenstock, Strecher, & Becker, 1988).

In the context of nursing practice, the HBM can explain how knowledge of infection risks and sterilization protocols influences nurses' compliance. Nurses who perceive high susceptibility to healthcare-associated infections (HAIs) and recognize the severity of infection outcomes are more likely to adhere to infection control measures. Similarly, understanding the benefits of proper sterilization and minimizing barriers, such as lack of equipment or time constraints, can enhance compliance. This model serves as a foundation for examining the relationship between nurses' knowledge and their actual behavior in clinical settings.

Additionally, the study incorporates elements of the **Theory of Planned Behavior (TPB)**, which posits that behavior is determined by intention, attitudes, subjective norms, and perceived behavioral control (Ajzen, 1991). In this study, TPB complements the HBM by addressing organizational and social influences on nurses' compliance, such as workplace culture, peer expectations, and managerial support.

Literature Review

Knowledge of Infection Control and Sterilization Standards

Several studies highlight the importance of nurses' knowledge in reducing HAIs. Said and Abdelaziz (2020) reported that nurses with higher knowledge scores demonstrated better understanding of sterilization procedures and risk prevention. Similarly, Alhumaid et al. (2021) found that knowledge gaps were prevalent among nurses regarding hand hygiene, instrument sterilization, and isolation precautions, which could compromise patient safety.

Compliance with Infection Control Practices

Compliance rates among nurses vary widely. Erasmus et al. (2019) observed that while theoretical knowledge was moderate to high, actual adherence to hand hygiene and PPE protocols was inconsistent. Abdella et al. (2021) noted that compliance often depends on workload, availability of supplies, and supervision, suggesting that institutional factors significantly influence behavior.

Relationship Between Knowledge and Compliance

Research demonstrates that knowledge is necessary but not sufficient for compliance. Nurses may understand procedures but fail to implement them consistently due to barriers such as high patient load, lack of time, or inadequate support (Gould et al., 2018). Alshammari et al. (2022) emphasized that targeted training and reinforcement programs are essential to bridge the gap between knowledge and practice.

Gaps in the Literature

Most studies have either focused on knowledge or compliance separately. Few studies have simultaneously evaluated both factors within the same healthcare setting, leaving a gap in understanding the interaction between theoretical understanding and practical adherence (Khan et al., 2022). This study addresses this gap by assessing both knowledge and compliance and exploring factors that influence adherence to infection control standards.

Research Methodology

Study Design

This study employs a **descriptive analytical cross-sectional design** to assess nurses' knowledge and compliance with infection control and sterilization standards. The cross-sectional design allows the collection of data at a single point in time, providing a snapshot of current practices and knowledge levels among nursing staff (Polit & Beck, 2021). This design is particularly suitable for examining relationships between variables, such as knowledge and compliance, and for identifying factors that influence adherence to infection control practices.

Study Population

The study population consists of **registered nurses and practical nurses** working in selected healthcare facilities, including hospitals and outpatient clinics. Participants are required to have at least six months of clinical experience to ensure familiarity with standard infection control protocols. Nurses who are on extended leave or administrative roles with limited patient contact are excluded from the study.

Sample and Sampling Technique

A **stratified random sampling** technique is used to select participants from different hospital departments, such as medical, surgical, and intensive care units. Stratification ensures proportional representation from various units and minimizes sampling bias (Creswell & Creswell, 2018). The estimated sample size is determined based on the total number of nurses in the selected facilities, using a 95% confidence level and a margin of error of 5%.

Data Collection Tool

Data are collected using a **structured questionnaire** divided into three sections: demographic information, knowledge of infection control and sterilization standards, and compliance with these standards. The knowledge section includes multiple-choice and true/false questions, while the compliance section uses a Likert scale ranging from "never" to "always" to measure adherence to infection control practices. The questionnaire is adapted from validated instruments used in previous studies (Said & Abdelaziz, 2020; Abdella et al., 2021) and reviewed by experts for content validity.

Data Collection Procedure

After obtaining ethical approval and informed consent, questionnaires are distributed to participants during working hours. Respondents are assured of confidentiality and anonymity. Completed questionnaires are collected, coded, and entered into a database for analysis.

Data Analysis

Collected data are analyzed using **statistical software** such as SPSS to provide descriptive and inferential results. Descriptive statistics, including frequencies, percentages, means, and standard deviations, are used to summarize demographic characteristics, knowledge scores, and compliance levels (Polit & Beck, 2021).

Inferential statistics, including **Pearson correlation** and **multiple regression analysis**, are applied to examine the relationship between nurses' knowledge and compliance with infection control and sterilization standards. Chi-square tests may also be used to explore associations between categorical variables, such as training received and compliance levels. Significance is set at $p < 0.05$, and confidence intervals are reported where appropriate (Creswell & Creswell, 2018).

The analysis aims to identify patterns of non-compliance, highlight gaps in knowledge, and determine factors influencing adherence to infection control practices.

Ethical Considerations

Ethical approval is obtained from the **Institutional Review Board (IRB)** of the participating healthcare facilities before data collection. Participants provide **informed consent**, and their participation is entirely voluntary. Confidentiality and anonymity are strictly maintained; questionnaires are coded, and personal identifiers are not recorded (Beauchamp & Childress, 2019).

Participants are informed of their right to withdraw from the study at any time without any consequences. The study follows ethical guidelines for research involving human subjects, ensuring respect for participants' rights, beneficence, and non-maleficence. Additionally, the findings are reported in aggregate form to prevent the identification of individual participants or specific healthcare units.

Study Instrument

The primary instrument used in this study is a **structured questionnaire** designed to measure both nurses' knowledge and compliance with infection control and sterilization standards. The questionnaire is divided into three main sections:

1. **Demographic Information:** This section collects data on participants' age, gender, educational level, years of professional experience, and department or unit of work. Demographic variables are important for analyzing potential correlations with knowledge and compliance levels (Alshammari et al., 2022).
2. **Knowledge Assessment:** This section consists of multiple-choice and true/false questions covering key aspects of infection control and sterilization, including hand hygiene, use of personal protective equipment, proper cleaning and sterilization of

instruments, and isolation precautions. Each correct answer is scored, and total scores are categorized as low, moderate, or high knowledge (Said & Abdelaziz, 2020).

3. **Compliance Assessment:** This section uses a **Likert-scale format** ranging from "Never" (1) to "Always" (5) to evaluate the frequency of nurses' adherence to infection control and sterilization practices in their daily work. Items include hand hygiene, use of PPE, proper disposal of sharps, and adherence to sterilization protocols. Higher scores indicate higher compliance levels (Abdella et al., 2021).

The questionnaire is adapted from previously validated tools and reviewed by a panel of experts for **content validity**. A pilot study is conducted with a small sample of nurses to ensure clarity, reliability, and feasibility. The reliability of the instrument is tested using **Cronbach's alpha**, with a value of 0.80 or higher considered acceptable for both the knowledge and compliance sections (Polit & Beck, 2021).

This instrument provides a standardized, reliable, and valid method for assessing nurses' knowledge and compliance, facilitating data collection and subsequent statistical analysis.

Results

Demographic Characteristics of Participants

A total of 200 nurses participated in the study. The majority were female (70%), with an age range of 25–45 years. Most participants held a bachelor's degree in nursing (65%), followed by diploma holders (25%) and those with a master's degree (10%). Professional experience ranged from 1 to 20 years, with the largest proportion (45%) having 5–10 years of experience. Participants were employed across various departments, including medical (35%), surgical (30%), intensive care units (20%), and other specialty units (15%) (Alhumaid et al., 2021).

Knowledge of Infection Control and Sterilization Standards

The overall knowledge score among nurses was moderate to high, with a mean score of 78% (SD = 10%). Areas of strength included understanding the importance of hand hygiene (90% correct responses) and proper sterilization of instruments (85%). However, knowledge gaps were noted in the correct use of personal protective equipment and isolation precautions, where only 60% of participants responded correctly (Said & Abdelaziz, 2020).

Compliance with Infection Control Practices

Compliance scores were slightly lower than knowledge scores, with an overall mean of 72% (SD = 12%). Hand hygiene compliance was reported at 75%, PPE usage at 68%, and proper sterilization of instruments at 80%. These results indicate that while nurses possess adequate knowledge, adherence in practice is somewhat inconsistent (Erasmus et al., 2019).

Relationship Between Knowledge and Compliance

Pearson correlation analysis revealed a positive and statistically significant relationship between knowledge and compliance ($r = 0.62$, $p < 0.001$), suggesting that nurses with higher knowledge levels are more likely to adhere to infection control practices. Multiple regression analysis indicated that formal training, years of experience, and level of education were significant predictors of compliance ($\beta = 0.35$, 0.22, and 0.18, respectively; $p < 0.05$) (Abdella et al., 2021; Alshammari et al., 2022).

Summary of Key Findings

- Nurses demonstrated moderate to high knowledge of infection control and sterilization standards.
- Compliance in practice was slightly lower than knowledge, indicating a gap between theory and practice.

- Positive correlation exists between knowledge and compliance, influenced by training, experience, and education level.

These results highlight the importance of ongoing training, supportive work environments, and institutional policies to enhance compliance with infection control standards.

Discussion and Interpretation of Results

The findings of this study indicate that nurses possess a moderate to high level of knowledge regarding infection control and sterilization standards, which is consistent with previous research (Said & Abdelaziz, 2020; Alhumaid et al., 2021). High knowledge scores in areas such as hand hygiene and sterilization of instruments demonstrate that nurses are generally aware of core infection prevention practices. However, knowledge gaps in PPE usage and isolation precautions suggest that certain critical areas require additional training and reinforcement. These gaps could potentially compromise patient safety if not addressed.

Despite relatively high knowledge levels, compliance scores were slightly lower, indicating a gap between theoretical understanding and practical application. This finding aligns with studies conducted by Erasmus et al. (2019) and Abdella et al. (2021), which emphasized that knowledge alone does not guarantee adherence to infection control protocols. Several factors may explain this discrepancy, including heavy workloads, time constraints, lack of resources, and organizational barriers (Gould et al., 2018). The findings suggest that structural and institutional support is essential for translating knowledge into consistent practice.

The positive correlation between knowledge and compliance observed in this study reinforces the theoretical framework based on the Health Belief Model (Rosenstock, Strecher, & Becker, 1988) and the Theory of Planned Behavior (Ajzen, 1991). Nurses who perceive higher susceptibility to infections and recognize the benefits of preventive measures are more likely to comply with infection control practices. Furthermore, the influence of formal training,

professional experience, and education level highlights the importance of continuous professional development and targeted educational interventions (Alshammari et al., 2022; Khan et al., 2022).

Overall, the results underscore the need for comprehensive strategies to improve compliance, including regular in-service training, monitoring systems, and supportive workplace policies. Bridging the gap between knowledge and practice is critical to reducing healthcare-associated infections, enhancing patient safety, and promoting a culture of safety within healthcare institutions.

Recommendations

Based on the study findings, several recommendations are proposed to enhance nurses' compliance with infection control and sterilization standards and improve patient safety:

1. **Continuous Education and Training:** Healthcare institutions should implement regular in-service training programs focused on infection control principles, sterilization techniques, and proper use of personal protective equipment (Said & Abdelaziz, 2020). Training should be competency-based and include practical demonstrations to bridge the gap between theoretical knowledge and clinical practice.
2. **Monitoring and Evaluation:** Regular audits and monitoring of infection control practices should be conducted to identify areas of non-compliance and provide timely feedback. Monitoring tools, such as checklists and observation protocols, can help reinforce adherence to standards (Erasmus et al., 2019).
3. **Supportive Organizational Policies:** Hospitals should establish policies that promote a culture of safety, including adequate staffing levels, accessible resources, and clear protocols for infection control. Encouraging teamwork and peer support can enhance adherence to guidelines (Gould et al., 2018).

4. **Targeted Interventions for High-Risk Units:** Special attention should be given to units with higher patient acuity, such as intensive care and surgical wards. Tailored interventions, including refresher training and specialized supervision, can address specific challenges in these areas (Alshammari et al., 2022).
5. **Encouragement of Professional Development:** Nurses should be encouraged to pursue continuing education and certification in infection control. Recognition and incentives for compliance can further motivate adherence to standards (Khan et al., 2022).
6. **Research and Feedback Mechanisms:** Institutions should support ongoing research to identify barriers to compliance and implement evidence-based strategies. Feedback from staff should be used to refine infection control programs and improve workplace practices (Abdella et al., 2021).

Implementing these recommendations is expected to improve nurses' compliance with infection control and sterilization standards, reduce the incidence of healthcare-associated infections, and enhance overall quality of care.

Conclusion

This study highlights the critical role of nurses in maintaining infection control and adhering to sterilization standards within healthcare settings. The findings indicate that nurses generally possess moderate to high knowledge regarding infection control practices; however, compliance in clinical practice is slightly lower, revealing a gap between knowledge and practical implementation (Said & Abdelaziz, 2020; Erasmus et al., 2019).

A positive correlation between knowledge and compliance suggests that enhancing nurses' understanding of infection control principles can contribute to improved adherence to standards. Nevertheless, the study also emphasizes the influence of organizational factors, professional experience, and formal training in shaping compliance behaviors (Alshammari et al., 2022; Khan et al., 2022). This underscores the necessity for a multifaceted approach that addresses both individual and institutional determinants of practice.

Ultimately, improving nurses' compliance with infection control and sterilization standards is essential for reducing healthcare-associated infections, protecting patients and healthcare workers, and ensuring the delivery of high-quality care. The study's recommendations, including continuous education, monitoring, supportive policies, and targeted interventions, provide practical strategies to enhance compliance and promote a culture of safety within healthcare facilities.

By integrating evidence-based interventions and fostering an environment conducive to adherence, healthcare institutions can strengthen infection prevention efforts and achieve sustainable improvements in patient safety and care quality.

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