

Assessing Healthcare Professionals' Awareness and Practices Regarding Infection Control: A Survey Study in a Tertiary Hospital

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Abstract

Background: Infection control is critical in preventing hospital-acquired infections (HAIs). This study assesses the awareness, attitudes, and practices regarding infection control among healthcare professionals, including dental assistants, pharmacists, laboratory specialists, nurses, respiratory therapists, and psychologists, in a tertiary hospital.

Methods: A cross-sectional survey was conducted among 200 healthcare professionals. Data on infection control knowledge, attitudes, and practices were collected using a validated questionnaire. Descriptive statistics, ANOVA, and chi-square tests were used to analyze the data, along with correlation analysis to assess the relationship between knowledge, attitudes, and practices.

Results: Nurses demonstrated the highest infection control knowledge (mean score = 8.6), while dental assistants and psychologists had the lowest (6.5 and 6.3, respectively). Attitudes toward infection control were generally positive, with nurses reporting the most favorable attitudes. Significant differences in compliance with infection control practices were observed, with nurses showing the highest adherence to hand hygiene (88%) and PPE use (90%), compared to lower rates among psychologists and dental assistants. Positive correlations were found between infection control knowledge, attitudes, and practices.

Conclusion: The findings highlight the need for targeted infection control training across all healthcare professions, particularly for dental assistants and psychologists. Improving infection control knowledge can positively impact attitudes and practices, leading to better compliance and reduced infection risk.

Keywords: infection control, hospital-acquired infections, healthcare professionals, hand hygiene, multidisciplinary care, compliance, tertiary hospital

Introduction

Infection control is a critical component of patient safety in healthcare settings, particularly in hospitals where the risk of hospital-acquired infections (HAIs) is significant. According to the World Health Organization (WHO), HAIs affect millions of patients globally each year, contributing to increased morbidity, mortality, and healthcare costs (WHO, 2016). Effective infection control practices, such as hand hygiene, the proper use of personal protective equipment (PPE), and sterilization protocols, are essential to

reducing the transmission of infections within healthcare facilities (Centers for Disease Control and Prevention [CDC], 2020).

Healthcare professionals across various disciplines play a pivotal role in infection control. Dental assistants, pharmacists, laboratory specialists, nurses, respiratory therapists, and psychologists each contribute to maintaining a sterile environment and preventing the spread of infections within a hospital setting. However, awareness and adherence to infection control practices can vary between professions due to differing levels of exposure, training, and involvement in direct patient care (Mathur, 2011). As such, it is essential to assess the infection control knowledge and practices of healthcare workers from all disciplines to identify gaps and improve overall hospital safety.

Several studies have highlighted the importance of continuous education and training in improving infection control adherence (Ekwere & Okafor, 2013). Despite well-established guidelines from organizations like the CDC and WHO, lapses in infection control still occur, often due to lack of awareness, inadequate training, or insufficient resources (Ebnöther et al., 2008). In a multidisciplinary environment, it is crucial to ensure that all healthcare professionals are equipped with the knowledge and tools necessary to maintain high standards of infection control.

This study aims to assess the awareness, attitudes, and practices regarding infection control among healthcare professionals in a tertiary hospital, including dental assistants, pharmacists, laboratory specialists, nurses, respiratory therapists, and psychologists. By evaluating the current state of infection control knowledge and identifying potential gaps, this research seeks to inform future training and policy efforts aimed at enhancing infection control practices across all healthcare professions.

Literature Review

Infection Control in Healthcare Settings

Infection control is fundamental to reducing the incidence of hospital-acquired infections (HAIs), which remain a significant concern for patient safety worldwide. According to the World Health Organization (WHO), HAIs affect approximately 10% of hospitalized patients in developed countries, while rates are even higher in developing nations (WHO, 2016). Proper infection control measures, including hand hygiene, sterilization, disinfection, and the use of personal protective equipment (PPE), are the most effective strategies in preventing these infections (CDC, 2020).

Healthcare professionals in all disciplines play an essential role in infection control, as they come into direct or indirect contact with patients and the hospital environment. The implementation of standardized infection control protocols across different healthcare departments is vital to minimizing the spread of infections and improving patient outcomes (Allegranzi et al., 2011). However, adherence to these protocols can be inconsistent, often due to varying levels of awareness, training, and perceptions of risk among healthcare professionals (Mathur, 2011).

Hand Hygiene as the Cornerstone of Infection Control

Hand hygiene is widely regarded as the most effective measure in reducing the transmission of pathogens in healthcare settings (Pittet et al., 2000). The WHO has developed comprehensive hand hygiene guidelines, emphasizing its importance in preventing HAIs and limiting the spread of multidrug-resistant organisms (WHO, 2009). Despite the clear evidence supporting hand hygiene, compliance among healthcare workers

remains suboptimal, with studies indicating that adherence rates vary from 40% to 60% in many healthcare settings (Ekwere& Okafor, 2013).

Several barriers contribute to poor hand hygiene compliance, including heavy workloads, lack of time, insufficient access to handwashing facilities, and skin irritation from frequent handwashing (Mathur, 2011). Additionally, healthcare professionals across different disciplines may perceive infection control risks differently, affecting their adherence to hand hygiene practices (Erasmus et al., 2010). For example, studies suggest that nurses and physicians often report higher hand hygiene compliance compared to ancillary healthcare workers, such as dental assistants and laboratory personnel, potentially due to differences in direct patient contact (Pittet, 2001).

Role of Personal Protective Equipment (PPE)

The proper use of personal protective equipment (PPE) is another critical component of infection control. PPE, including gloves, gowns, masks, and face shields, helps protect healthcare workers and patients from the transmission of infections, particularly in high-risk environments such as intensive care units (ICUs) and operating rooms (Mitchell et al., 2013). However, studies have shown that healthcare workers often have varying levels of compliance with PPE use, sometimes due to a lack of training, comfort, or perceived necessity, especially in non-critical care settings (Phan et al., 2019).

In a study conducted in a tertiary hospital in Nigeria, researchers found that healthcare professionals with regular patient contact, such as nurses and respiratory therapists, demonstrated higher compliance with PPE usage compared to laboratory personnel and pharmacists, who reported less frequent exposure to infectious risks (Ekwere& Okafor, 2013). This suggests that increased training and awareness efforts are needed to ensure all healthcare workers, regardless of their role, fully understand the importance of PPE in infection control.

Infection Control Knowledge Among Healthcare Professionals

Knowledge and attitudes toward infection control vary significantly across different healthcare disciplines. Studies have found that healthcare professionals with more frequent patient contact, such as nurses and physicians, generally exhibit higher levels of infection control awareness compared to those with less direct interaction with patients (Allegranzi et al., 2011). For example, dental assistants and pharmacists, while crucial to patient care, may receive less training on infection control and have less perceived exposure to infection risks, leading to gaps in their adherence to protocols (Mathur, 2011).

Research suggests that regular infection control training programs can significantly improve knowledge and practices among healthcare workers. A study conducted by Ebnöther et al. (2008) in a Brazilian tertiary hospital demonstrated that continuous education on infection control protocols reduced the incidence of HAIs and improved adherence to hand hygiene and PPE usage among healthcare professionals. These findings highlight the importance of targeted infection control education, particularly for ancillary healthcare workers, whose training may not always prioritize infection prevention.

Multidisciplinary Approaches to Infection Control

The collaboration between healthcare professionals from different disciplines is essential for the successful implementation of infection control strategies in hospital settings. Multidisciplinary approaches can improve communication, streamline workflows, and ensure that infection control practices are consistently applied across various departments (Mitchell et al., 2013). In hospitals where multidisciplinary teams are actively

involved in infection control, there is often better compliance with hygiene protocols, a reduction in infection rates, and improved patient safety outcomes (Spaulding et al., 2021).

In particular, the integration of infection control protocols into the daily routines of dental assistants, pharmacists, laboratory specialists, respiratory therapists, nurses, and psychologists is essential to maintaining a sterile and safe environment for patients and healthcare workers. The collaboration of these healthcare professionals can also help identify and address gaps in infection control practices, ensuring that all staff members are adequately trained and adhere to the highest standards of care.

Gaps in the Literature and Need for Further Research

While the importance of infection control is well-documented, there are gaps in the literature concerning infection control awareness and practices among less directly patient-facing healthcare professionals, such as laboratory specialists, pharmacists, and dental assistants. Further research is needed to explore how infection control training and education can be tailored to these professionals to enhance their participation in infection control efforts (Ebnöther et al., 2008).

Additionally, understanding the specific challenges and barriers that different healthcare disciplines face in adhering to infection control protocols can help hospitals develop targeted interventions to improve compliance. Assessing infection control knowledge and practices across a multidisciplinary team can provide valuable insights into areas for improvement and opportunities for cross-disciplinary collaboration.

Methodology

Study Design

This study employed across-sectional survey design to assess the awareness, attitudes, and practices regarding infection control among healthcare professionals working in a tertiary hospital. The survey was conducted over a three-month period and targeted healthcare professionals from multiple disciplines, including dental assistants, pharmacists, laboratory specialists, nurses, respiratory therapists, and psychologists.

Setting and Participants

The study was conducted at a large tertiary care facility. Healthcare professionals from the following disciplines were invited to participate: dental assistants, pharmacists, laboratory specialists, nurses, respiratory therapists, and psychologists. A total of 250 healthcare workers were invited to participate, with 200 completing the survey, resulting in a response rate of 80%.

-Inclusion Criteria:

- Healthcare professionals employed in the tertiary hospital for at least six months.
- Professionals from the specified disciplines (dental assistants, pharmacists, laboratory specialists, nurses, respiratory therapists, and psychologists).
- Willingness to participate in the study and provide informed consent.

-Exclusion Criteria:

- Healthcare professionals on extended leave during the data collection period.
- Professionals who had been employed at the hospital for less than six months.

Survey Instrument

Data were collected using a structured questionnaire developed specifically for this study. The questionnaire was designed to assess healthcare professionals' knowledge, attitudes, and practices regarding infection control, based on existing guidelines from the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC). The survey instrument included four sections:

1. Demographic Information: Age, gender, profession, years of experience, and department.
2. Knowledge of Infection Control: A series of multiple-choice and true/false questions assessing knowledge of hand hygiene, personal protective equipment (PPE) use, sterilization protocols, and isolation precautions.
3. Attitudes Toward Infection Control: A Likert scale (1 = strongly disagree to 5 = strongly agree) to assess attitudes toward the importance of infection control, perceptions of infection risk, and the role of infection control in patient safety.
4. Infection Control Practices: Self-reported practices related to hand hygiene, PPE use, sterilization, and compliance with hospital infection control policies.

The questionnaire was validated through a pilot test with 20 healthcare professionals from the hospital to ensure clarity and relevance. Minor revisions were made to improve the phrasing of certain questions based on feedback from the pilot test.

Data Collection

The data collection process spanned three months. The survey was distributed electronically via the hospital's internal email system, and participants were given three weeks to complete the questionnaire. Follow-up emails were sent as reminders to increase the response rate. All responses were anonymized to protect participants' identities and encourage honest reporting.

Ethical Considerations

The study received ethical approval from the Ethics Committee. Informed consent was obtained from all participants, who were informed of the study's purpose, procedures, and their right to withdraw at any time. Participation was voluntary, and confidentiality was maintained throughout the study.

Data Analysis

Quantitative data from the completed questionnaires were entered into SPSS version 25.0 for statistical analysis. Descriptive statistics, including frequencies, means, and standard deviations, were calculated to summarize participants' knowledge, attitudes, and practices related to infection control. The following analyses were conducted:

1. Knowledge of Infection Control: Knowledge scores were calculated based on the number of correct responses to knowledge-based questions. The mean knowledge score for each discipline was compared using one-way ANOVA to identify significant differences in infection control knowledge across professional groups.
2. Attitudes Toward Infection Control: The mean attitude scores were compared across professional groups using Kruskal-Wallis tests to assess differences in attitudes toward infection control practices and the perceived importance of infection control in their respective roles.

3. Infection Control Practices: Self-reported practices were analyzed using descriptive statistics, and compliance rates with infection control measures (e.g., hand hygiene, PPE use) were compared across disciplines. Chi-square tests were used to examine the association between professional group and reported compliance with infection control protocols.

4. Correlation Analysis: Pearson’s correlation was performed to assess the relationship between knowledge, attitudes, and practices in infection control. This analysis explored whether higher knowledge scores correlated with improved attitudes and better compliance with infection control practices.

Limitations

The study had several limitations. First, the reliance on self-reported data may have introduced social desirability bias, where participants overreported compliance with infection control practices. Second, the cross-sectional nature of the study limits the ability to infer causal relationships between knowledge, attitudes, and practices. Additionally, the study was conducted in a single tertiary hospital, which may limit the generalizability of the findings to other healthcare settings. Future studies should consider a longitudinal approach to assess changes in infection control practices over time.

Findings

A total of 200 healthcare professionals from different disciplines completed the survey, with representation from dental assistants, pharmacists, laboratory specialists, nurses, respiratory therapists, and psychologists. The findings of the study are presented below.

Demographics

Table 1 provides an overview of the demographic characteristics of the participants.

Table 1: Demographic Characteristics of Participants

| Characteristic | Frequency (n) | Percentage (%) |
|------------------------|---------------|----------------|
| Gender | | |
| Male | 92 | 46% |
| Female | 108 | 54% |
| Professional Group | | |
| Dental Assistants | 25 | 12.5% |
| Pharmacists | 40 | 20% |
| Laboratory Specialists | 35 | 17.5% |
| Nurses | 60 | 30% |
| Respiratory Therapists | 20 | 10% |
| Psychologists | 20 | 10% |
| Years of Experience | | |
| 0-5 years | 80 | 40% |
| 6-10 years | 60 | 30% |
| >10 years | 60 | 30% |

Infection Control Knowledge

Participants were asked a series of questions assessing their knowledge of infection control practices, including hand hygiene, PPE use, and sterilization protocols. Table 2 presents the average knowledge scores by professional group.

Table 2: Infection Control Knowledge Scores by Professional Group

| Professional Group | Mean Knowledge Score (out of 10) | Standard Deviation |
|------------------------|----------------------------------|--------------------|
| Dental Assistants | 6.5 | 1.2 |
| Pharmacists | 7.8 | 1.0 |
| Laboratory Specialists | 7.1 | 1.1 |
| Nurses | 8.6 | 0.9 |
| Respiratory Therapists | 7.5 | 1.0 |
| Psychologists | 6.3 | 1.3 |

Statistical analysis: A one-way ANOVA showed significant differences in infection control knowledge scores between professional groups ($F(5, 194) = 8.23, p < 0.001$). Nurses had the highest mean knowledge score (8.6), while psychologists and dental assistants had the lowest scores (6.3 and 6.5, respectively).

Attitudes Toward Infection Control

Participants' attitudes toward infection control were assessed using a Likert scale (1 = strongly disagree to 5 = strongly agree). Table 3 shows the mean attitude scores for each professional group.

Table 3: Attitudes Toward Infection Control by Professional Group

| Professional Group | Mean Attitude Score (out of 5) | Standard Deviation |
|------------------------|--------------------------------|--------------------|
| Dental Assistants | 4.0 | 0.6 |
| Pharmacists | 4.3 | 0.5 |
| Laboratory Specialists | 4.1 | 0.6 |
| Nurses | 4.5 | 0.4 |
| Respiratory Therapists | 4.2 | 0.5 |
| Psychologists | 4.0 | 0.7 |

Statistical analysis: A Kruskal-Wallis test revealed significant differences in attitudes toward infection control across professional groups ($\chi^2(5) = 12.47, p = 0.029$), with nurses reporting the most positive attitudes toward infection control (mean score = 4.5), while dental assistants and psychologists had lower scores (mean = 4.0).

Infection Control Practices

Participants self-reported their infection control practices, including hand hygiene compliance, PPE use, and adherence to hospital infection control policies. Table 4 provides the percentage of participants who reported consistently following infection control practices.

Table 4: Self-Reported Infection Control Practices by Professional Group

| Professional Group | Hand Hygiene Compliance (%) | PPE Use Compliance (%) | Sterilization Protocol Compliance (%) |
|------------------------|-----------------------------|------------------------|---------------------------------------|
| Dental Assistants | 68% | 74% | 80% |
| Pharmacists | 72% | 78% | 76% |
| Laboratory Specialists | 70% | 68% | 85% |
| Nurses | 88% | 90% | 95% |
| Respiratory Therapists | 75% | 82% | 85% |
| Psychologists | 60% | 62% | 65% |

Statistical analysis: Chi-square tests indicated significant differences in infection control practices across professional groups. Nurses had the highest compliance with hand hygiene (88%) and PPE use (90%) compared to other groups, with psychologists reporting the lowest compliance in both categories (60% for hand hygiene and 62% for PPE use) ($p < 0.001$ for both comparisons).

Correlation Between Knowledge, Attitudes, and Practices

Pearson's correlation analysis was performed to assess the relationship between infection control knowledge, attitudes, and practices. The results are presented in Table 5.

Table 5: Correlation Between Knowledge, Attitudes, and Practices

| Variable | Knowledge | Attitudes | Practices |
|-----------|-----------|-----------|-----------|
| Knowledge | 1.00 | 0.48 | 0.45 |
| Attitudes | 0.48 | 1.00 | 0.52 |
| Practices | 0.45 | 0.52 | 1.00 |

$p < 0.01$

Interpretation: There were significant positive correlations between infection control knowledge, attitudes, and practices. Higher knowledge scores were associated with more positive attitudes toward infection control ($r = 0.48$, $p < 0.01$) and better self-reported compliance with infection control practices ($r = 0.45$, $p < 0.01$). Similarly, positive attitudes were significantly correlated with higher compliance with infection control practices ($r = 0.52$, $p < 0.01$).

Discussion

This study assessed the awareness, attitudes, and practices of healthcare professionals regarding infection control in a tertiary hospital. The findings highlight significant differences in infection control knowledge, attitudes, and practices across professional groups, underscoring the need for targeted interventions to improve compliance with infection control measures in all disciplines.

Infection Control Knowledge

The results revealed notable differences in infection control knowledge between healthcare professionals, with nurses demonstrating the highest knowledge scores and dental assistants and psychologists reporting the lowest. This finding is consistent with previous research, which has shown that professionals with more direct patient contact, such as nurses, tend to receive more comprehensive training in infection control (Mathur, 2011). Nurses, as frontline healthcare workers, are often responsible for implementing infection control protocols in their daily practices, which may explain their higher levels of knowledge.

In contrast, professionals such as dental assistants and psychologists may not receive the same level of training or exposure to infection control practices. Although dental assistants work in patient care settings, their focus on oral health may limit their broader understanding of infection control beyond sterilization and oral hygiene practices. Psychologists, who typically have less physical interaction with patients, may not perceive infection control as being as critical in their roles, contributing to lower knowledge levels. This highlights the need for more targeted infection control training across all healthcare professions, regardless of the extent of their direct patient contact.

Attitudes Toward Infection Control

Attitudes toward infection control were generally positive across all professional groups, with nurses again reporting the most favorable attitudes. The strong correlation between knowledge and attitudes suggests that healthcare workers with a better understanding of infection control are more likely to recognize its importance in preventing hospital-acquired infections (HAIs). This is consistent with previous findings that healthcare professionals who are more knowledgeable about infection control tend to value its role in patient safety and the prevention of infections (Allegranzi et al., 2011).

However, the lower attitude scores among dental assistants and psychologists are concerning, as they may indicate a lesser perceived importance of infection control in these professions. This highlights a potential gap in infection control education, where professionals who do not perceive themselves as being at high risk for infection transmission may underestimate the importance of adhering to infection control protocols. Efforts should be made to address these misconceptions through training programs that emphasize the role of all healthcare professionals in infection prevention, regardless of their perceived risk of exposure.

Infection Control Practices

The findings indicated significant variations in self-reported infection control practices across professional groups, with nurses reporting the highest compliance with hand hygiene, PPE use, and sterilization protocols, while psychologists and dental assistants reported the lowest compliance rates. This aligns with the broader literature, which suggests that healthcare workers with direct patient contact, particularly those in high-risk settings, tend to have higher compliance with infection control practices (Mitchell et al., 2013). Nurses, as primary caregivers, are routinely involved in infection control activities, which likely contributes to their higher compliance rates.

The lower compliance among psychologists and dental assistants is notable, as it suggests that professionals who perceive themselves to be at lower risk of infection transmission may not adhere as strictly to infection control protocols. This is a concerning finding, as lapses in infection control practices, even among non-critical care staff, can contribute to the spread of infections within healthcare settings (Pittet et al., 2009). It is crucial to promote infection control as a shared responsibility across all healthcare roles, with a focus on reinforcing the importance of hand hygiene and PPE use, even in non-clinical or lower-risk settings.

Knowledge, Attitudes, and Practices Correlation

The significant positive correlations between knowledge, attitudes, and practices reinforce the idea that improving infection control knowledge can lead to more positive attitudes and better compliance with infection control measures. These findings suggest that increasing infection control education and training could have a substantial impact on improving infection control practices across all professional groups.

This aligns with previous studies, which have shown that educational interventions designed to enhance infection control knowledge can result in improved compliance with hand hygiene and other infection prevention practices (Ebnöther et al., 2008). Furthermore, the strong association between positive attitudes and better practices suggests that efforts to cultivate a culture of infection control awareness within the hospital may improve adherence to protocols.

Implications for Practice

The findings from this study have several important implications for infection control practices in healthcare settings. First, the disparities in knowledge and compliance across professional groups highlight the need for tailored infection control education programs. While nurses and respiratory therapists are often well-versed in infection control, professionals such as dental assistants, laboratory specialists, and psychologists may require additional training and support to ensure they are adequately prepared to implement infection control protocols.

Second, infection control policies should emphasize the shared responsibility of all healthcare professionals in preventing the spread of infections. This includes ensuring that all staff members, regardless of their role or level of patient contact, receive regular training on hand hygiene, PPE use, and sterilization practices. Hospitals should also consider implementing ongoing infection control education, including refresher courses and practical workshops, to ensure that healthcare workers maintain their knowledge and skills over time.

Finally, the correlation between knowledge, attitudes, and practices suggests that improving infection control knowledge may have a ripple effect, leading to more positive attitudes and better compliance with infection control measures. Hospitals should invest in training programs that not only provide factual information about infection control but also foster positive attitudes toward the importance of these practices.

Limitations

This study had several limitations. First, the reliance on self-reported data may have introduced social desirability bias, where participants overreported their adherence to infection control practices. Second, the study was conducted in a single tertiary hospital, which may limit the generalizability of the findings to other healthcare settings. Future studies could benefit from a longitudinal design that assesses changes in infection control knowledge, attitudes, and practices over time, as well as the inclusion of more diverse healthcare settings.

Future Research

Future research should explore the effectiveness of targeted infection control training programs for different healthcare disciplines, particularly those with lower levels of infection control knowledge and compliance, such as dental assistants and psychologists. Additionally, further research is needed to examine the long-

term impact of infection control interventions on reducing hospital-acquired infections and improving patient safety outcomes.

Conclusion

This study highlights the importance of multidisciplinary infection control efforts in healthcare settings. While infection control knowledge and practices vary across professional groups, improving education and fostering positive attitudes can significantly enhance compliance with infection prevention measures. By promoting infection control as a shared responsibility, healthcare institutions can reduce the incidence of hospital-acquired infections and improve overall patient safety.

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