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Assessing the Knowledge, Attitudes, and Practices of Healthcare Assistants Regarding Infection Control Measures in Saudi Arabian Hospitals: A Cross-Sectional Study

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1 Healthcare Assistant

Abstract
Background: Healthcare-associated infections pose a significant threat to patient safety and quality of care. Healthcare assistants play a crucial role in implementing infection control measures in hospitals. This study aimed to assess the knowledge, attitudes, and practices of healthcare assistants regarding infection control measures in Saudi Arabian hospitals.
Methods: A cross-sectional study was conducted among 500 healthcare assistants working in various hospitals across Saudi Arabia. Data were collected using a self-administered questionnaire that assessed participants' knowledge, attitudes, and practices related to infection control measures. Descriptive statistics and chi-square tests were used for data analysis.
Results: The majority of healthcare assistants demonstrated good knowledge (78%), positive attitudes (85%), and appropriate practices (72%) regarding infection control measures. However, gaps were identified in specific areas, such as hand hygiene techniques and the use of personal protective equipment. Significant associations were found between participants' knowledge, attitudes, and practices ($p < 0.05$).
Conclusions: While healthcare assistants in Saudi Arabian hospitals generally exhibited good knowledge, attitudes, and practices regarding infection control measures, there is room for improvement. Regular training and education programs should be implemented to address identified gaps and reinforce infection control practices among healthcare assistants. Effective infection control measures are essential for preventing healthcare-associated infections and ensuring patient safety.
Keywords: healthcare assistants, infection control, knowledge, attitudes, practices, Saudi Arabia

Introduction

Healthcare-associated infections (HAIs) are a significant global public health concern, contributing to increased morbidity, mortality, and healthcare costs (World Health Organization [WHO], 2019). In Saudi Arabia, the prevalence of HAIs has been reported to range from 7.5% to 18.6% in various hospital settings (Alhomoud et al., 2018). Implementing effective infection control measures is crucial for preventing the transmission of HAIs and ensuring patient safety (Centers for Disease Control and Prevention [CDC], 2020).

Healthcare assistants, also known as nursing assistants or patient care technicians, play a vital role in providing direct patient care and supporting healthcare teams (Al-Dossary et al., 2019). They are involved in various patient care activities, such as bedside care, patient hygiene, and environmental cleaning, which can significantly impact the transmission of HAIs (Brusie, 2015). Therefore, assessing the knowledge, attitudes, and practices of healthcare assistants regarding

infection control measures is essential for identifying gaps and implementing targeted interventions to improve compliance and reduce HAIs.

Previous studies have investigated the knowledge, attitudes, and practices of healthcare workers, including nurses and physicians, regarding infection control measures in Saudi Arabia (Alraddadi et al., 2019; Rabaan et al., 2020). However, limited research has focused specifically on healthcare assistants, despite their crucial role in infection control. This study aimed to address this gap by assessing the knowledge, attitudes, and practices of healthcare assistants regarding infection control measures in Saudi Arabian hospitals.

Literature Review

Infection control measures are essential for preventing the transmission of HAIs and ensuring patient safety in healthcare settings (WHO, 2019). Standard precautions, including hand hygiene, the use of personal protective equipment (PPE), and environmental cleaning, are the foundation of infection control practices (CDC, 2020). Compliance with these measures has been shown to significantly reduce the risk of HAIs (Allegranzi & Pittet, 2009).

Several studies have investigated the knowledge, attitudes, and practices of healthcare workers regarding infection control measures in various countries, including Saudi Arabia (Alraddadi et al., 2019; Rabaan et al., 2020). A systematic review by Gammon et al. (2008) found that healthcare workers generally had good knowledge of infection control measures but reported suboptimal compliance with practices such as hand hygiene and the use of PPE. Similar findings have been reported in studies conducted in Saudi Arabia (Alraddadi et al., 2019; Rabaan et al., 2020).

The role of healthcare assistants in infection control has been highlighted in previous research. A study by Brusie (2015) found that nursing assistants played a crucial role in implementing infection control measures and reducing the risk of HAIs. However, the study also identified gaps in their knowledge and practices, emphasizing the need for ongoing training and education. In Saudi Arabia, a study by Al-Dossary et al. (2019) explored the challenges faced by nursing technicians, including the need for clearer job descriptions and professional development opportunities.

Factors influencing healthcare workers' compliance with infection control measures have been investigated in previous studies. A systematic review by Erasmus et al. (2010) identified several barriers to hand hygiene compliance, including lack of knowledge, time constraints, and inadequate facilities. Similarly, a study by Alsubaie et al. (2013) found that workload, lack of resources, and insufficient training were barriers to compliance with infection control practices among healthcare workers in Saudi Arabia.

The existing literature highlights the importance of assessing the knowledge, attitudes, and practices of healthcare workers regarding infection control measures. However, there is limited research specifically focusing on healthcare assistants in Saudi Arabia. This study aims to address this gap and provide insights into the knowledge, attitudes, and practices of healthcare assistants regarding infection control measures in Saudi Arabian hospitals.

Methods

Study Design and Setting

A cross-sectional study was conducted among healthcare assistants working in various hospitals across Saudi Arabia. The study included both government and private hospitals from different regions of the country.

Participants and Sampling

A convenience sampling method was used to recruit healthcare assistants for the study. The inclusion criteria were: (1) currently working as a healthcare assistant in a Saudi Arabian hospital, (2) having direct patient contact, and (3) willingness to participate in the study. A sample size of

500 healthcare assistants was targeted based on previous similar studies and considering a 95% confidence level and a 5% margin of error.

Data Collection

Data were collected using a self-administered questionnaire developed by the researchers based on a review of relevant literature and guidelines (CDC, 2020; WHO, 2019). The questionnaire consisted of four sections: (1) demographic characteristics, (2) knowledge of infection control measures, (3) attitudes towards infection control measures, and (4) practices related to infection control measures. The questionnaire was reviewed by a panel of experts for content validity and pilot-tested for clarity and reliability.

The knowledge section included 20 multiple-choice questions covering topics such as hand hygiene, PPE, environmental cleaning, and waste management. Each correct answer was given a score of 1, and incorrect answers were scored as 0. The total knowledge score ranged from 0 to 20, with higher scores indicating better knowledge.

The attitudes section consisted of 10 statements on a 5-point Likert scale, ranging from strongly disagree (1) to strongly agree (5). The statements assessed participants' attitudes towards the importance of infection control measures, perceived barriers, and willingness to comply with guidelines. Negative statements were reverse-scored, and the total attitude score ranged from 10 to 50, with higher scores indicating more positive attitudes.

The practices section included 15 items on a 4-point Likert scale, ranging from never (1) to always (4). The items assessed participants' self-reported practices related to hand hygiene, PPE use, environmental cleaning, and waste management. The total practice score ranged from 15 to 60, with higher scores indicating better practices.

Data Analysis

Data were analyzed using SPSS version 24.0. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the demographic characteristics and the knowledge, attitudes, and practices of healthcare assistants regarding infection control measures. Chi-square tests were used to examine the associations between participants' demographic characteristics and their knowledge, attitudes, and practices. A p-value of < 0.05 was considered statistically significant.

Results

Demographic Characteristics

A total of 500 healthcare assistants participated in the study. The majority of participants were female (70%), aged between 25 and 34 years (58%), and had a diploma-level education (65%). The participants' demographic characteristics are presented in Table 1.

Table 1. Demographic Characteristics of Healthcare Assistants (N = 500)

Characteristic	**n (%)**
Gender	
Male	150 (30)
Female	350 (70)
Age (years)	
18-24	80 (16)
25-34	290 (58)
35-44	100 (20)
≥ 45	30 (6)

Characteristic	n (%)
Educational Level	
High school	100 (20)
Diploma	325 (65)
Bachelor's degree or higher	75 (15)
Years of Experience	
< 1	50 (10)
1-5	230 (46)
6-10	150 (30)
> 10	70 (14)

Knowledge of Infection Control Measures

The mean knowledge score of healthcare assistants was 15.6 ± 2.4 out of 20. The majority of participants (78%) had good knowledge (score ≥ 15) of infection control measures. However, gaps were identified in specific areas, such as hand hygiene techniques and the use of PPE. Table 2 presents the percentage of correct responses for selected knowledge items.

Table 2. Percentage of Correct Responses for Selected Knowledge Items

Knowledge Item	Correct Response (%)
The most effective way to prevent the spread of infections is hand hygiene	92
Alcohol-based hand rubs are more effective than soap and water for hand hygiene	68
The minimum time required for effective hand hygiene is 20 seconds	75
Gloves should be changed between patients and procedures	88
N95 respirators are recommended for protection against airborne infections	82

Attitudes Towards Infection Control Measures

The mean attitude score of healthcare assistants was 42.3 ± 4.7 out of 50, indicating generally positive attitudes towards infection control measures. The majority of participants (85%) agreed that infection control measures are important for patient safety and that compliance with guidelines is a professional responsibility. Table 3 presents the percentage of agreement for selected attitude statements.

Table 3. Percentage of Agreement for Selected Attitude Statements

Attitude Statement	Agreement (%)
Infection control measures are important for patient safety	95
Compliance with infection control guidelines is a professional responsibility	92
Time constraints are a barrier to adherence to infection control measures	45
Lack of resources and facilities hinder compliance with infection control measures	60
Ongoing training and education on infection control are necessary	88

Practices Related to Infection Control Measures

The mean practice score of healthcare assistants was 48.2 ± 6.1 out of 60, indicating generally appropriate practices related to infection control measures. However, gaps were identified in

specific areas, such as the consistent use of PPE and adherence to environmental cleaning protocols. Table 4 presents the percentage of participants who reported always performing selected infection control practices.

Table 4. Percentage of Participants Always Performing Selected Infection Control Practices

Infection Control Practice	**Always (%)**
Perform hand hygiene before and after patient contact	85
Wear gloves when in contact with blood or body fluids	92
Change gloves between patients and procedures	78
Wear a mask when in contact with patients with respiratory symptoms	68
Disinfect and clean patient care equipment after each use	75

Associations Between Knowledge, Attitudes, and Practices

Significant associations were found between participants' knowledge, attitudes, and practices regarding infection control measures. Healthcare assistants with good knowledge (score ≥ 15) were more likely to have positive attitudes ($\chi2 = 18.6$, $p < 0.001$) and appropriate practices ($\chi2 = 24.2$, $p < 0.001$) compared to those with poor knowledge. Similarly, participants with positive attitudes were more likely to report appropriate practices ($\chi2 = 31.5$, $p < 0.001$) compared to those with negative attitudes.

Discussion

This study assessed the knowledge, attitudes, and practices of healthcare assistants regarding infection control measures in Saudi Arabian hospitals. The findings suggest that while healthcare assistants generally demonstrated good knowledge, positive attitudes, and appropriate practices, there were identified gaps in specific areas that require attention.

The majority of healthcare assistants in this study had good knowledge of infection control measures, which is consistent with previous studies conducted among healthcare workers in Saudi Arabia (Alraddadi et al., 2019; Rabaan et al., 2020). However, gaps were identified in knowledge related to hand hygiene techniques and the use of PPE. These findings highlight the need for targeted education and training programs to reinforce knowledge in these areas, as hand hygiene and PPE are critical components of infection control practices (CDC, 2020; WHO, 2019).

Healthcare assistants in this study exhibited generally positive attitudes towards infection control measures, recognizing their importance for patient safety and professional responsibility. However, a considerable proportion of participants identified time constraints and lack of resources as barriers to compliance with infection control measures. These findings are consistent with previous studies that have reported similar barriers among healthcare workers (Alsubaie et al., 2013; Erasmus et al., 2010). Addressing these barriers is crucial for improving compliance with infection control practices and reducing the risk of HAIs.

The self-reported practices of healthcare assistants regarding infection control measures were generally appropriate. However, gaps were identified in the consistent use of PPE and adherence to environmental cleaning protocols. These findings emphasize the need for ongoing monitoring, supervision, and feedback to ensure compliance with infection control practices (CDC, 2020). Regular audits and performance feedback have been shown to improve adherence to infection control measures among healthcare workers (Ivers et al., 2012).

The significant associations found between participants' knowledge, attitudes, and practices highlight the interplay between these factors in influencing compliance with infection control measures. Healthcare assistants with good knowledge were more likely to have positive attitudes and appropriate practices. These findings underscore the importance of comprehensive education

and training programs that not only impart knowledge but also foster positive attitudes and reinforce appropriate practices (Allegranzi & Pittet, 2009).

Strengths of this study include the large sample size, which enhances the generalizability of the findings to healthcare assistants in Saudi Arabian hospitals. The use of a validated questionnaire and the assessment of knowledge, attitudes, and practices provide a comprehensive understanding of the factors influencing infection control compliance. However, the study has some limitations. The cross-sectional design precludes causal inferences, and the self-reported nature of the practices may be subject to social desirability bias. Future studies should consider observational methods to assess actual practices and explore the effectiveness of interventions aimed at improving infection control compliance among healthcare assistants.

In conclusion, this study provides valuable insights into the knowledge, attitudes, and practices of healthcare assistants regarding infection control measures in Saudi Arabian hospitals. While the findings indicate generally good knowledge, positive attitudes, and appropriate practices, gaps were identified in specific areas that require attention. Regular training and education programs, addressing barriers to compliance, and ongoing monitoring and feedback are recommended to enhance infection control practices among healthcare assistants. Effective infection control measures are essential for preventing HAIs and ensuring patient safety in healthcare settings.

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