

# Assessing the Knowledge, Attitudes, and Practices of Nursing Technicians Regarding Infection Prevention and Control Measures in Healthcare Facilities of Hafr Al-Batin, Saudi Arabia: A Cross-Sectional Study

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## ABSTRACT

Infection prevention and control (IPC) measures are crucial in healthcare settings to minimize the risk of healthcare-associated infections (HAIs). Nursing technicians play a vital role in implementing IPC practices. This study aimed to assess the knowledge, attitudes, and practices of nursing technicians regarding IPC measures in healthcare facilities of Hafr Al-Batin, Saudi Arabia. A cross-sectional study was conducted among 200 nursing technicians using a self-administered questionnaire. The mean knowledge score was 75.6%, indicating good knowledge. Positive attitudes towards IPC were observed, with 92% acknowledging the importance of IPC measures. The majority (85%) reported adherence to hand hygiene practices. However, challenges such as high workload and limited resources were identified as barriers to optimal IPC practices. The findings highlight the need for ongoing training, support, and resource allocation to strengthen IPC practices among nursing technicians in Hafr Al-Batin.

**KEYWORDS:** infection prevention and control, nursing technicians, knowledge, attitudes, practices, Saudi Arabia.

## 1. Introduction

Healthcare-associated infections (HAIs) pose a significant threat to patient safety and contribute to increased morbidity, mortality, and healthcare costs (World Health Organization, 2016). Effective infection prevention and control (IPC) measures are essential to minimize the risk of HAIs and ensure the delivery of quality healthcare services (Alshehari et al., 2018). Nursing technicians, as frontline healthcare workers, play a crucial role in implementing IPC practices in healthcare settings

(Alshammari et al., 2018). Their knowledge, attitudes, and practices regarding IPC have a direct impact on patient outcomes and the overall success of IPC programs (Alyami et al., 2020).

In Saudi Arabia, the Ministry of Health has prioritized IPC as a key component of its healthcare quality improvement initiatives (Ministry of Health, 2019). However, limited studies have been conducted to assess the knowledge, attitudes, and practices of nursing technicians regarding IPC measures in the context of Hafr Al-Batin, a city in the Eastern Province of Saudi Arabia. This study aims to address this gap by evaluating the current state of IPC knowledge, attitudes, and practices among nursing technicians working in healthcare facilities of Hafr Al-Batin.

## **2. Literature Review**

### **2.1 Importance of Infection Prevention and Control in Healthcare**

Infection prevention and control (IPC) measures are fundamental to ensuring patient safety and reducing the burden of healthcare-associated infections (HAIs) (World Health Organization, 2016). HAIs are a significant challenge in healthcare settings worldwide, leading to prolonged hospital stays, increased healthcare costs, and adverse patient outcomes (Allegranzi et al., 2011). Effective implementation of IPC practices, such as hand hygiene, use of personal protective equipment (PPE), and environmental cleaning, has been shown to significantly reduce the incidence of HAIs (Gupta et al., 2018).

### **2.2 Role of Nursing Technicians in Infection Prevention and Control**

Nursing technicians are at the forefront of patient care and play a vital role in implementing IPC measures in healthcare facilities (Alshammari et al., 2018). Their responsibilities include maintaining a clean and safe environment, adhering to hand hygiene protocols, proper use of PPE, and ensuring the proper handling and disposal of infectious materials (Alyami et al., 2020). Nursing technicians' compliance with IPC practices is critical for preventing the transmission of infectious agents and minimizing the risk of HAIs (Alshehari et al., 2018).

### **2.3 Knowledge, Attitudes, and Practices of Nursing Technicians Regarding IPC**

Studies have highlighted the importance of assessing the knowledge, attitudes, and practices of nursing technicians regarding IPC measures (Alshammari et al., 2018; Alyami et al., 2020). Adequate knowledge and positive attitudes towards IPC are essential for ensuring compliance with recommended practices (Alshammari et al., 2018). However, gaps in knowledge and suboptimal practices have been reported among nursing technicians in various settings (Alyami et al., 2020). Factors such as workload, lack of training, and limited resources have been identified as barriers to optimal IPC practices among nursing technicians (Alshehari et al., 2018).

Despite the limited research specific to nursing technicians in Hafr Al-Batin, studies conducted in other regions of Saudi Arabia provide valuable insights into the knowledge, attitudes, and practices of nursing technicians regarding IPC measures. However, there is a need for further research to understand the unique challenges and

opportunities for improving IPC practices among nursing technicians in Hafr Al-Batin.

### **3. Methods**

#### **3.1 Study Design and Setting**

A cross-sectional study design was employed to assess the knowledge, attitudes, and practices of nursing technicians regarding infection prevention and control (IPC) measures in healthcare facilities of Hafr Al-Batin, Saudi Arabia. The study was conducted in various healthcare settings, including public hospitals, primary healthcare centers, and specialized clinics.

#### **3.2 Study Population and Sampling**

The study population consisted of nursing technicians working in healthcare facilities of Hafr Al-Batin. A convenience sampling technique was used to recruit participants. The inclusion criteria were being a nursing technician, working in a healthcare facility in Hafr Al-Batin, and willingness to participate in the study. Nursing technicians who were on leave or not available during the data collection period were excluded.

#### **3.3 Data Collection**

A self-administered questionnaire was used to collect data from the participants. The questionnaire was developed based on a review of relevant literature and consisted of four sections: (1) socio-demographic characteristics, (2) knowledge of IPC measures, (3) attitudes towards IPC, and (4) practices related to IPC. The questionnaire was piloted among a small group of nursing technicians to ensure clarity and comprehensibility.

Data collection was conducted over a period of three months. The questionnaires were distributed to nursing technicians during their work shifts and collected upon completion. Participants were provided with clear instructions and assured of the confidentiality of their responses.

#### **3.4 Data Analysis**

Data were analyzed using SPSS version 24.0. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the socio-demographic characteristics, knowledge, attitudes, and practices of the participants. Inferential statistics, such as independent t-tests and one-way ANOVA, were used to examine the associations between socio-demographic variables and IPC knowledge, attitudes, and practices. A p-value of less than 0.05 was considered statistically significant.

### **4. Results**

#### **4.1 Socio-Demographic Characteristics of Participants**

A total of 200 nursing technicians participated in the study. The majority of the participants were female (85%), and the mean age was  $28.5 \pm 5.2$  years. More than half of the participants (60%) had a diploma in nursing, while 40% had a bachelor's degree. The mean work experience was  $5.3 \pm 3.8$  years. Table 1 presents the socio-demographic characteristics of the participants.

Table 1: Socio-Demographic Characteristics of Participants (N = 200)

Characteristic	n (%)
Gender	
Female	170 (85%)
Male	30 (15%)
Age (years)	
Mean $\pm$ SD	$28.5 \pm 5.2$
Range	21-45
Educational Level	
Diploma	120 (60%)
Bachelor's	80 (40%)
Work Experience (years)	
Mean $\pm$ SD	$5.3 \pm 3.8$
Range	1-20

#### 4.2 Knowledge of Infection Prevention and Control Measures

The mean knowledge score of the participants was  $75.6\% \pm 12.4\%$ , indicating a good level of knowledge regarding IPC measures. The majority of the participants (85%) correctly identified hand hygiene as the most effective measure to prevent the spread of infections. However, gaps in knowledge were observed regarding the proper use of personal protective equipment (PPE) and the transmission routes of common healthcare-associated infections.

#### 4.3 Attitudes Towards Infection Prevention and Control

Positive attitudes towards IPC were observed among the participants. The majority (92%) acknowledged the importance of IPC measures in ensuring patient safety and reducing the risk of healthcare-associated infections. Additionally, 88% of the participants agreed that IPC is a shared responsibility of all healthcare workers. However, 25% of the participants perceived IPC measures as time-consuming and burdensome.

#### 4.4 Practices Related to Infection Prevention and Control

The majority of the participants (85%) reported adherence to hand hygiene practices, such as washing hands before and after patient contact and using alcohol-based hand sanitizers. However, compliance with the proper use of PPE was found to be suboptimal, with only 60% of the participants reporting consistent use of gloves and masks when required. Additionally, 30% of the participants reported difficulties in accessing adequate PPE supplies.

#### 4.5 Factors Associated with IPC Knowledge, Attitudes, and Practices

Significant associations were found between educational level and IPC knowledge, with participants holding a bachelor's degree demonstrating higher knowledge scores compared to those with a diploma ( $p < 0.05$ ). Work experience was positively associated with attitudes towards IPC, with participants having more than 5 years of

experience showing more positive attitudes ( $p < 0.01$ ). No significant associations were found between socio-demographic variables and IPC practices.

## 5. Discussion

The findings of this study provide insights into the knowledge, attitudes, and practices of nursing technicians regarding infection prevention and control (IPC) measures in healthcare facilities of Hafr Al-Batin, Saudi Arabia. The overall knowledge level of the participants was good, indicating a satisfactory understanding of IPC principles. However, gaps in knowledge were identified, particularly in the areas of proper PPE use and transmission routes of healthcare-associated infections. These findings are consistent with previous studies conducted in other regions of Saudi Arabia (Alshammari et al., 2018; Alyami et al., 2020).

Positive attitudes towards IPC were observed among the majority of the participants, highlighting their recognition of the importance of IPC measures in ensuring patient safety. However, a notable proportion of the participants perceived IPC measures as time-consuming and burdensome. This finding underscores the need for strategies to enhance the perceived value and feasibility of IPC practices among nursing technicians.

The self-reported practices of the participants regarding hand hygiene were encouraging, with a high percentage reporting adherence to hand hygiene protocols. However, suboptimal compliance with the proper use of PPE and challenges in accessing adequate PPE supplies were identified. These findings emphasize the need for ongoing training and support to ensure consistent and appropriate use of PPE among nursing technicians.

The associations found between educational level and IPC knowledge, as well as work experience and attitudes towards IPC, suggest the importance of targeted interventions based on these factors. Providing educational programs tailored to the needs of nursing technicians with different educational backgrounds and experience levels may enhance their knowledge and attitudes towards IPC.

The study has several limitations that should be acknowledged. The use of a self-administered questionnaire may have introduced response bias, as participants may have provided socially desirable answers. Additionally, the cross-sectional design of the study limits the ability to establish causal relationships between variables. Future research using observational methods and longitudinal designs is recommended to provide a more comprehensive understanding of IPC practices among nursing technicians.

## 6. Conclusion

This study assessed the knowledge, attitudes, and practices of nursing technicians regarding infection prevention and control measures in healthcare facilities of Hafr Al-Batin, Saudi Arabia. The findings highlight the need for ongoing training and support to address gaps in knowledge, enhance positive attitudes, and improve

compliance with IPC practices. Strategies such as educational interventions, provision of adequate resources, and supportive supervision may contribute to strengthening IPC practices among nursing technicians. Further research is warranted to explore the barriers and facilitators to optimal IPC practices in this setting and to evaluate the effectiveness of interventions aimed at improving IPC knowledge, attitudes, and practices among nursing technicians.

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