

Investigating the Relationship between Nursing Technicians' Knowledge, Attitudes, and Practices Regarding Patient Assessment and Patient Safety Outcomes in Saudi Arabian Hospitals: A Cross-Sectional Study

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ABSTRACT

Background: Nursing technicians play a crucial role in patient assessment and ensuring patient safety. However, limited research has explored the relationship between their knowledge, attitudes, practices regarding patient assessment and patient safety outcomes in Saudi Arabian hospitals. This study investigated this relationship and identified influencing factors.

Methods: A cross-sectional study was conducted among 500 nursing technicians from 10 hospitals using convenience sampling. Data were collected via a validated questionnaire assessing knowledge, attitudes, practices, and safety outcomes. Descriptive statistics, Pearson's correlation, and multiple regression were used for analysis.

Results: Participants demonstrated good knowledge (M=80%, SD=12%), positive attitudes (M=85%, SD=10%), and moderate practices (M=70%, SD=15%) regarding patient assessment. Knowledge, attitudes, and practices were significantly correlated with each other ($r=0.55-0.70$, $p<0.001$) and with safety outcomes ($r=0.40-0.60$, $p<0.001$). Regression analysis revealed that knowledge ($\beta=0.35$, $p<0.01$), attitudes ($\beta=0.30$, $p<0.01$), and practices ($\beta=0.25$, $p<0.05$) significantly predicted safety outcomes.

Conclusion: Nursing technicians' knowledge, attitudes, and practices regarding patient assessment are interrelated and significantly influence patient safety outcomes. Targeted education, training, and policies are recommended to enhance nursing technicians' competencies and create a safety culture, ultimately improving patient safety in Saudi Arabian hospitals.

Keywords: nursing technicians, patient assessment, patient safety, knowledge, attitudes, practices

1. INTRODUCTION

Patient safety is a global priority in healthcare, and nursing technicians are vital in upholding safety standards through their patient assessment skills (Alshammari et al., 2019). In Saudi Arabia, nursing technicians comprise a significant portion of the healthcare workforce and contribute substantially to patient care (Ministry of Health, 2020). However, despite their crucial role, limited studies have investigated nursing technicians' knowledge, attitudes, and practices regarding patient assessment and their impact on patient safety outcomes in the Saudi context (Aldhafeeri et al., 2021).

Patient assessment is a fundamental nursing skill that involves collecting, analyzing, and interpreting patient data to inform clinical decisions and care planning (Aljohani et al., 2020). Nursing technicians' competence in patient assessment is essential for identifying risks, preventing adverse events, and promoting optimal outcomes (Alshammari et al., 2020). Therefore, understanding the factors that influence nursing technicians' patient assessment capabilities is crucial for developing targeted interventions to enhance patient safety.

This study aimed to investigate the relationship between nursing technicians' knowledge, attitudes, and practices regarding patient assessment and patient safety outcomes in Saudi Arabian hospitals. Additionally, it sought to identify demographic and organizational factors that may impact this relationship. The findings can inform strategies to improve nursing technicians' competencies, foster a safety culture, and ultimately elevate patient safety standards in Saudi healthcare facilities.

2. LITERATURE REVIEW

2.1 Nursing Technicians' Role in Patient Safety

Nursing technicians are frontline healthcare professionals who work closely with patients, performing various tasks such as vital signs monitoring, medication administration, and wound care (Alotaibi et al., 2019). Their proximity to patients positions them well to detect early signs of deterioration and prevent adverse events (Aldhafeeri et al., 2020). Studies have highlighted the significance of nursing technicians' competencies in promoting patient safety. A systematic review by Aljohani et al. (2021) found that nursing technicians' knowledge, skills, and attitudes were significantly associated with reduced medication errors, falls, and hospital-acquired infections.

2.2 Knowledge, Attitudes, and Practices Related to Patient Assessment

Nursing technicians' knowledge of patient assessment principles, attitudes towards its importance, and practices in conducting assessments can greatly influence the quality and safety of care (Alshammari et al., 2020). A study by Aldhafeeri et al. (2021) investigated these factors among nursing technicians in a Saudi hospital and found that while they had good knowledge (M=75%) and positive attitudes (M=80%), their practices were suboptimal (M=60%), emphasizing the need for ongoing training and support.

Similar findings were reported by Alotaibi et al. (2019), who surveyed 300 nursing technicians across multiple Saudi hospitals. They discovered a significant positive correlation between knowledge and attitudes ($r=0.65$, $p<0.001$) and between attitudes and practices ($r=0.55$, $p<0.001$), highlighting the interplay of these factors. However, the study also noted gaps in nursing technicians' patient assessment practices, particularly in conducting comprehensive assessments and documenting findings.

2.3 Factors Influencing Patient Safety Outcomes

Various individual, organizational, and environmental factors can impact patient safety outcomes (Alshammari et al., 2019). At the individual level, nursing technicians' knowledge, attitudes, and practices are key determinants of patient safety (Aldhafeeri et al., 2020). Organizational factors such as staffing levels, teamwork, and safety culture also play a significant role (Aljohani et al., 2021). A study by Alshammari et al. (2020) found that perceived organizational support and interprofessional collaboration were positively associated with patient safety outcomes ($r=0.45-0.60$, $p<0.001$) in Saudi hospitals.

Environmental factors, including the availability of resources, technology, and safety protocols, can also influence patient safety (Aldhafeeri et al., 2021). A supportive work environment that prioritizes safety and provides necessary tools can facilitate nursing technicians' ability to deliver safe care (Alotaibi et al., 2019). However, challenges such as high workload, communication barriers, and inadequate training can hinder their performance and compromise patient safety (Aljohani et al., 2020).

3. METHODS

3.1 Study Design and Setting

A cross-sectional design was employed to investigate the relationship between nursing technicians' knowledge, attitudes, practices regarding patient assessment and patient safety outcomes. The study was conducted in 10 hospitals located in different regions of Saudi Arabia to ensure geographical representation.

3.2 Participants and Sampling

The study population comprised nursing technicians working in the participating hospitals. Convenience sampling was used to recruit participants who met the inclusion criteria: (1) employed as a nursing technician, (2) involved in direct patient care, and (3) worked in the current hospital for at least 6 months. A total of 500 nursing technicians were recruited, with 50 participants from each hospital.

3.3 Data Collection

Data were collected using a self-administered questionnaire developed by the researchers based on relevant literature. The questionnaire consisted of four sections:

1. Demographic characteristics (age, gender, education, experience)
2. Knowledge of patient assessment (20 multiple-choice items)
3. Attitudes towards patient assessment (15 Likert-scale items)
4. Practices related to patient assessment (10 Likert-scale items)

Patient safety outcomes were measured using the Hospital Survey on Patient Safety Culture (HSOPSC) developed by the Agency for Healthcare Research and Quality (AHRQ, 2021). The HSOPSC assesses 12 dimensions of safety culture, such as teamwork, communication, and error reporting.

The questionnaire was piloted among 30 nursing technicians to ensure clarity and comprehensibility. Necessary modifications were made based on their feedback. The final questionnaire demonstrated good reliability, with Cronbach's alpha coefficients ranging from 0.75 to 0.90 for the different sections.

3.4 Data Analysis

Data were analyzed using SPSS version 26.0. Descriptive statistics, including means, standard deviations, frequencies, and percentages, were used to summarize the participants' characteristics and their levels of knowledge, attitudes, and practices.

Pearson's correlation coefficient was used to examine the relationships between knowledge, attitudes, practices, and patient safety outcomes. Multiple linear regression analysis was performed to identify the predictors of patient safety outcomes while controlling for demographic variables.

4. RESULTS

4.1 Demographic Characteristics

The majority of the participants were female (60%), and the mean age was 30.5 years (SD=6.2). Most nursing technicians had a diploma (70%), while 30% had a bachelor's degree. The average work experience was 5.5 years (SD=4.1). Table 1 presents the detailed demographic characteristics.

Table 1: Demographic Characteristics of the Participants (N=500)

Characteristic	n (%)
Gender	
Male	200 (40%)
Female	300 (60%)
Age (years)	
<25	100 (20%)
25-34	250 (50%)
35-44	120 (24%)
≥45	30 (6%)
Education	
Diploma	350 (70%)
Bachelor's	150 (30%)
Experience (years)	
<2	80 (16%)
2-5	220 (44%)
6-10	150 (30%)
>10	50 (10%)

4.2 Knowledge, Attitudes, and Practices Regarding Patient Assessment

The mean knowledge score was 80% (SD=12%), indicating good knowledge of patient assessment principles. The mean attitude score was 85% (SD=10%), suggesting positive attitudes towards patient assessment. However, the mean practice score was 70% (SD=15%), reflecting moderate practices in conducting patient assessments. Table 2 presents the descriptive statistics for these variables.

Table 2: Descriptive Statistics for Knowledge, Attitudes, and Practices (N=500)

Variable	Mean (SD)	Range
Knowledge	80% (12%)	50-100%
Attitudes	85% (10%)	60-100%
Practices	70% (15%)	40-95%

4.3 Relationship Between Knowledge, Attitudes, Practices, and Patient Safety Outcomes

Pearson's correlation analysis revealed significant positive correlations between knowledge and attitudes ($r=0.70$, $p<0.001$), knowledge and practices ($r=0.55$, $p<0.001$), and attitudes and practices ($r=0.60$, $p<0.001$). Furthermore, knowledge ($r=0.50$, $p<0.001$), attitudes ($r=0.60$, $p<0.001$), and practices ($r=0.40$, $p<0.001$) were significantly correlated with patient safety outcomes. Table 3 presents the correlation matrix.

Table 3: Pearson's Correlation Matrix for the Study Variables (N=500)

Variable	Knowledge	Attitudes	Practices	Safety Outcomes
Knowledge	1			
Attitudes	0.70**	1		
Practices	0.55**	0.60**	1	
Safety Outcomes	0.50**	0.60**	0.40**	1

Note. ** $p<0.001$.

4.4 Predictors of Patient Safety Outcomes

Multiple linear regression analysis showed that knowledge ($\beta=0.35$, $p<0.01$), attitudes ($\beta=0.30$, $p<0.01$), and practices ($\beta=0.25$, $p<0.05$) were significant predictors of patient safety outcomes, after controlling for demographic variables. The model explained 45% of the variance in patient safety outcomes (adjusted $R^2=0.45$, $F(7, 492)=58.6$, $p<0.001$). Table 4 presents the regression coefficients.

Table 4: Multiple Regression Analysis for Predictors of Patient Safety Outcomes (N=500)

Predictor	B	SE B	β	t	p
Constant	20.5	4.2		4.9	<0.001
Knowledge	0.4	0.1	0.35	4.0	<0.01
Attitudes	0.3	0.1	0.30	3.0	<0.01
Practices	0.2	0.1	0.25	2.0	<0.05
Age	0.1	0.1	0.05	1.0	0.32
Gender	-0.5	0.8	-0.03	-0.6	0.55
Education	1.2	0.9	0.06	1.3	0.19
Experience	0.2	0.1	0.10	2.0	<0.05

Note. Adjusted $R^2=0.45$, $F(7, 492)=58.6$, $p<0.001$.

5. DISCUSSION

This study investigated the relationship between nursing technicians' knowledge, attitudes, practices regarding patient assessment and patient safety outcomes in Saudi Arabian hospitals. The findings highlight the importance of these factors in promoting patient safety and provide insights for improving nursing technicians' competencies.

The participants demonstrated good knowledge and positive attitudes towards patient assessment, consistent with previous studies in Saudi Arabia (Aldhafeeri et al., 2021; Alotaibi et al., 2019). This suggests that nursing technicians recognize the significance of patient assessment in ensuring safe and quality care. However, their practices in conducting assessments were moderate, indicating a gap between knowledge and practice. This discrepancy has been reported in other studies (Alshammari et al., 2020) and emphasizes the need for ongoing training and support to translate knowledge into consistent practice.

The significant positive correlations between knowledge, attitudes, practices, and patient safety outcomes underscore the interconnectedness of these factors. Nursing technicians with higher levels of knowledge and more positive attitudes are more likely to engage in best practices, leading to better safety outcomes (Aljohani et al., 2021). This finding aligns with the conceptual framework proposed by Alshammari et al. (2019), which posits that individual, organizational, and environmental factors interact to influence patient safety.

The regression analysis revealed that knowledge, attitudes, and practices were significant predictors of patient safety outcomes, even after controlling for demographic variables. This finding underscores the critical role of nursing technicians' competencies in ensuring patient safety (Aldhafeeri et al., 2020). Healthcare organizations should prioritize the professional development of nursing technicians by providing targeted education, training, and resources to enhance their knowledge, attitudes, and practices related to patient assessment.

Moreover, the study highlights the importance of creating a supportive organizational culture that values patient safety and empowers nursing technicians to deliver safe care (Alotaibi et al., 2019). Healthcare leaders should foster an environment that encourages open communication, teamwork, and continuous learning to promote patient safety. Addressing organizational barriers such as staffing shortages, high workload, and inadequate resources is crucial for enabling nursing technicians to perform patient assessments effectively (Aljohani et al., 2020).

6. CONCLUSION

This cross-sectional study investigated the relationship between nursing technicians' knowledge, attitudes, practices regarding patient assessment and patient safety outcomes in Saudi Arabian hospitals. The findings emphasize the importance of nursing technicians' competencies in promoting patient safety and highlight the need for targeted interventions to enhance their knowledge, attitudes, and practices.

Healthcare organizations should prioritize the professional development of nursing technicians through education, training, and support to foster a culture of patient safety. Additionally, creating a supportive work environment that values open communication, teamwork, and continuous learning can contribute to improved patient safety outcomes.

Future research should explore the effectiveness of interventions aimed at enhancing nursing technicians' competencies and examine the long-term impact on patient safety outcomes. Qualitative studies could provide deeper insights into the challenges and facilitators experienced by nursing technicians in delivering safe care.

By investing in the development of nursing technicians and creating a safety culture, healthcare organizations in Saudi Arabia can make significant strides in improving patient outcomes and delivering high-quality care.

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