International Journal of Medical Toxicology & Legal Medicine Volume 27, No. 4, 2024
e-ISSN: 0974-4614
p-ISSN: 0972-0448

Investigating the Relationship between Nurses' Health Informatics Competencies, Participation in Administrative Decision-Making, and Quality of Patient Care in Hafr Al-Batin: A Cross-Sectional Survey Study

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Received: 18.08.2024 Revised: 25.09.2024 Accepted: 16.10.2024

ABSTRACT

Introduction: The integration of health informatics in nursing practice has become increasingly important in enhancing the quality of patient care. This study aimed to investigate the relationship between nurses' health informatics competencies, their participation in administrative decision-making, and the quality of patient care in Hafr Al-Batin, Saudi Arabia.

Methods: A cross-sectional survey study was conducted among 250 nurses working in various healthcare facilities in Hafr Al-Batin. The survey questionnaire assessed nurses' health informatics competencies, participation in administrative decision-making, and perceived quality of patient care. Descriptive statistics, Pearson's correlation, and multiple linear regression analysis were used to analyze the data.

Results: The majority of nurses demonstrated moderate to high levels of health informatics competencies. Nurses' participation in administrative decision-making was found to be significantly associated with their health informatics competencies ($r=0.68$, $p<0.001$). Additionally, both health informatics competencies ($\beta=0.42$, $p<0.001$) and participation in administrative decision-making ($\beta=0.35$, $p<0.001$) were significant predictors of the quality of patient care.

Conclusion: The findings highlight the importance of enhancing nurses' health informatics competencies and promoting their participation in administrative decision-making to improve the quality of patient care in Hafr Al-Batin. Healthcare organizations should invest in training programs and create supportive environments that foster nurses' involvement in decision-making processes.

Keywords: health informatics, nursing, decision-making, patient care quality, Saudi Arabia

1. INTRODUCTION

The rapid advancements in health information technology have revolutionized the healthcare industry, transforming the way healthcare professionals deliver patient care. Nurses, being at the forefront of patient care, play a crucial role in leveraging health informatics to enhance the quality and efficiency of healthcare services (Smith et al., 2020). Health informatics competencies, which encompass the knowledge, skills, and attitudes required to effectively use information technology in healthcare, have become essential for nurses to navigate the increasingly digital landscape of healthcare (Jones et al., 2019).

In addition to possessing health informatics competencies, nurses' participation in administrative decision-making has been recognized as a key factor in improving patient outcomes and organizational performance (Lee & Kim, 2021). When nurses are actively involved in decision-making processes, they can contribute their clinical expertise and insights, leading to more informed and effective decisions that positively impact patient care (Alghamdi et al., 2019).

The Kingdom of Saudi Arabia has been actively investing in the digitalization of its healthcare system, with a focus on integrating health informatics to enhance the quality of patient care (Alharbi et al., 2020). However, there is limited research examining the relationship between nurses' health informatics competencies, their participation in administrative decision-making, and the quality of patient care in the Saudi Arabian context, particularly in the city of Hafr Al-Batin.

This study aims to address this gap by investigating the relationship between nurses' health informatics competencies, their participation in administrative decision-making, and the quality of patient care in Hafr Al-Batin. The findings of this study will provide valuable insights into the factors that influence the quality of patient care and inform strategies to enhance nurses' roles in the digital healthcare environment.

2. LITERATURE REVIEW

2.1 Health Informatics Competencies in Nursing

Health informatics competencies have become increasingly important for nurses in the digital age. These competencies enable nurses to effectively use information technology to support patient care, improve clinical decision-making, and enhance communication among healthcare teams (Wang et al., 2020). The American Nurses Association (ANA) has identified a set of essential health informatics competencies for nurses, including computer literacy, information management, and the ability to use electronic health records (EHRs) (ANA, 2015).

Several studies have highlighted the positive impact of nurses' health informatics competencies on patient care. For example, a study by Kim et al. (2019) found that nurses with higher levels of health informatics competencies were more likely to use EHRs effectively, resulting in improved patient safety and reduced medication errors. Similarly, a systematic review by Jeon and Choi (2020) concluded that nurses' proficiency in health informatics contributed to better patient outcomes, increased efficiency, and enhanced communication among healthcare professionals.

However, despite the recognized importance of health informatics competencies, research has shown that nurses often face challenges in acquiring and applying these skills. A study by Hsu et al. (2021) identified barriers such as lack of training, limited access to technology, and resistance to change as factors hindering nurses' adoption of health informatics. Addressing these challenges through targeted training programs and organizational support is crucial to ensure that nurses can effectively leverage health informatics to improve patient care.

2.2 Nurses' Participation in Administrative Decision-Making

Nurses' participation in administrative decision-making has been identified as a key factor in promoting positive patient outcomes and organizational performance. When nurses are actively involved in decision-making processes, they can contribute their clinical expertise and insights, leading to more informed and effective decisions (Alghamdi et al., 2019). Participative decision-making also empowers nurses, enhances their job satisfaction, and fosters a sense of ownership in the organization (Lee & Kim, 2021).

Research has demonstrated the benefits of nurses' participation in administrative decision-making. A study by Park and Choi (2020) found that nurses' involvement in decision-making was positively associated with patient satisfaction and quality of care. Similarly, a systematic review by Wu et al. (2019) concluded that nurses' participation in decision-making led to improved patient safety, reduced adverse events, and better organizational outcomes.

However, barriers to nurses' participation in administrative decision-making have been identified in the literature. These barriers include hierarchical organizational structures, lack of support from management, and limited opportunities for nurses to provide input (Alotaibi et al., 2020). Overcoming these barriers requires a shift towards a more inclusive and collaborative organizational culture that values nurses' contributions and actively seeks their involvement in decision-making processes.

2.3 Quality of Patient Care

The quality of patient care is a multi-dimensional concept that encompasses various aspects of healthcare delivery, including patient safety, effectiveness, patient-centeredness, timeliness, efficiency, and equity (Donabedian, 1988). Ensuring high-quality patient care is a primary goal of healthcare organizations and a key indicator of their performance (Mitchell et al., 2019).

Nurses play a vital role in promoting the quality of patient care through their direct interactions with patients and their involvement in various aspects of healthcare delivery. Studies have shown that nurses' competencies, including health informatics skills and clinical expertise, are essential for providing high-quality patient care (Wang et al., 2020). Additionally, nurses' participation in administrative decision-making has been linked to improved patient outcomes and enhanced quality of care (Park & Choi, 2020).

Measuring the quality of patient care is crucial for identifying areas for improvement and evaluating the effectiveness of interventions. Various tools and frameworks have been developed to assess the quality of patient care, such as the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey and the National Quality Forum (NQF) measures (Fujita et al., 2019). These tools provide valuable insights into patients' experiences and perceptions of the care they receive, enabling healthcare organizations to make data-driven decisions to enhance the quality of patient care.

3. METHODS

3.1 Study Design and Setting

A cross-sectional survey study was conducted to investigate the relationship between nurses' health informatics competencies, their participation in administrative decision-making, and the quality of patient care in Hafr Al-Batin, Saudi Arabia. The study was carried out in various healthcare facilities, including public and private hospitals, primary healthcare centers, and specialized clinics.

3.2 Study Population and Sampling

The study population consisted of registered nurses working in healthcare facilities in Hafr Al-Batin. A convenience sampling technique was used to recruit participants. Nurses who met the inclusion criteria (i.e., registered nurses with at least one year of clinical experience) were invited to participate in the study. A total of 250 nurses were recruited for the study.

3.3 Data Collection

Data were collected using a self-administered survey questionnaire. The questionnaire consisted of four sections:

1. Demographic and professional characteristics
2. Health informatics competencies
3. Participation in administrative decision-making
4. Perceived quality of patient care

The health informatics competencies section was adapted from the Nursing Informatics Competency Assessment Tool (NICAT) developed by Yoon et al. (2016). The participation in administrative decision-making section was based on the Decision-Making Involvement Scale (DMIS) developed by Havens and Vasey (2003). The perceived quality of patient care section was adapted from the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey (Centers for Medicare & Medicaid Services, 2021).

The questionnaire was reviewed by a panel of experts to ensure its validity and relevance to the study objectives. A pilot study was conducted with 30 nurses to assess the clarity and reliability of the questionnaire. The Cronbach's alpha coefficients for the health informatics competencies, participation in administrative decision-making, and perceived quality of patient care sections were 0.87, 0.92, and 0.89, respectively, indicating good internal consistency.

3.4 Data Analysis

Data were analyzed using IBM SPSS Statistics version 26. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the demographic and professional characteristics of the participants and their responses to the survey questionnaire.

Pearson's correlation coefficient was used to examine the relationships between nurses' health informatics competencies, participation in administrative decision-making, and perceived quality of patient care. Multiple linear regression analysis was conducted to identify the predictors of the quality of patient care, with health informatics competencies and participation in administrative decision-making as independent variables.

4. RESULTS

4.1 Demographic and Professional Characteristics

The majority of the participants were female (85%), and the mean age was 32.5 years (SD = 6.2). More than half of the nurses (58%) held a bachelor's degree in nursing, while 32% had a diploma and 10% had a master's degree. The average years of clinical experience was 8.3 years (SD = 5.1). Table 1 presents the demographic and professional characteristics of the participants.

Table 1: Demographic and Professional Characteristics of Participants (N = 250)

Characteristic	Category	Frequency (%)
Gender	Male	38 (15.2%)
	Female	212 (84.8%)
Age (years)	20-29	92 (36.8%)
	30-39	118 (47.2%)
	40-49	35 (14.0%)
	≥50	5 (2.0%)
Educational Level	Diploma	80 (32.0%)
	Bachelor's	145 (58.0%)
	Master's	25 (10.0%)
Years of Clinical Experience	1-5	78 (31.2%)
	6-10	96 (38.4%)

	11-15	52 (20.8%)
	>15	24 (9.6%)

4.2 Health Informatics Competencies

The majority of nurses demonstrated moderate to high levels of health informatics competencies. The mean score for health informatics competencies was 3.72 (SD = 0.68) on a 5-point Likert scale. Table 2 presents the mean scores for each domain of health informatics competencies.

Table 2: Mean Scores for Health Informatics Competencies (N = 250)

Domain	Mean (SD)
Computer Literacy	3.85 (0.72)
Information Management	3.68 (0.79)
Information Systems	3.59 (0.81)
Informatics Attitudes	3.77 (0.75)
Overall Health Informatics Competencies	3.72 (0.68)

4.3 Participation in Administrative Decision-Making

Nurses reported moderate levels of participation in administrative decision-making. The mean score for participation in administrative decision-making was 3.28 (SD = 0.92) on a 5-point Likert scale. Table 3 presents the mean scores for each item of the participation in administrative decision-making scale.

Table 3: Mean Scores for Participation in Administrative Decision-Making (N = 250)

Item	Mean (SD)
Involvement in unit-level decision-making	3.42 (1.02)
Involvement in organization-level decision-making	3.15 (1.08)
Opportunity to provide input in decision-making	3.36 (0.98)
Influence on decision-making outcomes	3.19 (1.05)
Overall Participation in Administrative Decision-Making	3.28 (0.92)

4.4 Quality of Patient Care

Nurses perceived the quality of patient care to be high. The mean score for perceived quality of patient care was 4.12 (SD = 0.56) on a 5-point Likert scale. Table 4 presents the mean scores for each domain of the quality of patient care.

Table 4: Mean Scores for Quality of Patient Care (N = 250)

Domain	Mean (SD)
Patient Safety	4.25 (0.62)
Effectiveness	4.08 (0.67)
Patient-Centeredness	4.19 (0.58)
Timeliness	3.98 (0.71)
Efficiency	4.05 (0.64)
Equity	4.16 (0.61)
Overall Quality of Patient Care	4.12 (0.56)

4.5 Relationships Between Variables

Pearson's correlation analysis revealed significant positive relationships between nurses' health informatics competencies, participation in administrative decision-making, and perceived quality of patient care. Nurses' health informatics competencies were significantly correlated with their participation in administrative decision-making ($r = 0.68$, $p < 0.001$) and perceived quality of patient care ($r = 0.59$, $p < 0.001$). Participation in administrative decision-making was also significantly correlated with perceived quality of patient care ($r = 0.62$, $p < 0.001$).

4.6 Predictors of Quality of Patient Care

Multiple linear regression analysis was conducted to identify the predictors of the quality of patient care. The results showed that both health informatics competencies ($\beta = 0.42$, $p < 0.001$) and participation in administrative decision-making ($\beta = 0.35$, $p < 0.001$) were significant predictors of the quality of patient care. Together, these variables explained 52% of the variance in the perceived quality of patient care ($R^2 = 0.52$, $F(2, 247) = 133.86$, $p < 0.001$).

5. DISCUSSION

The findings of this study highlight the importance of nurses' health informatics competencies and participation in administrative decision-making in promoting the quality of patient care in Hafr Al-Batin, Saudi Arabia. Nurses demonstrated moderate to high levels of health informatics competencies, which is consistent with previous studies that emphasize the growing importance of these skills in the digital healthcare environment (Wang et al., 2020; Kim et al., 2019).

The positive relationship between nurses' health informatics competencies and their participation in administrative decision-making suggests that nurses who are proficient in using information technology are more likely to be involved in decision-making processes. This finding aligns with previous research that highlights the role of health informatics in empowering nurses and enabling them to contribute their expertise to organizational decisions (Lee & Kim, 2021).

Moreover, the study found that both health informatics competencies and participation in administrative decision-making were significant predictors of the quality of patient care. This finding underscores the importance of equipping nurses with the necessary skills and involving them in decision-making processes to enhance patient outcomes and improve the overall quality of care (Park & Choi, 2020; Wu et al., 2019).

The results of this study have several implications for nursing practice and healthcare organizations. First, healthcare organizations should invest in training programs to enhance nurses' health informatics competencies and ensure that they are well-prepared to navigate the increasingly digital healthcare landscape. Second, organizations should foster a culture that values nurses' contributions and actively seeks their involvement in administrative decision-making. This can be achieved by creating opportunities for nurses to provide input, establishing collaborative decision-making structures, and providing support and resources to facilitate their participation.

Furthermore, the findings highlight the need for healthcare organizations to adopt a multi-faceted approach to improving the quality of patient care. While enhancing nurses' health informatics competencies and promoting their participation in decision-making are crucial, organizations should also focus on other aspects of quality improvement, such as patient safety initiatives, evidence-based practice, and patient-centered care.

This study had several limitations that should be considered when interpreting the results. First, the cross-sectional design of the study limits the ability to establish causal relationships between the variables. Future research should employ longitudinal designs to examine the long-term impact of nurses' health informatics competencies and participation in decision-making on patient care quality. Second, the study relied on self-reported data, which may be subject to social desirability bias. Objective measures of health informatics competencies and patient care quality could be incorporated in future studies to validate the findings.

Despite these limitations, this study provides valuable insights into the relationship between nurses' health informatics competencies, participation in administrative decision-making, and the quality of patient care in Hafr Al-Batin, Saudi Arabia. The findings underscore the importance of investing in nurses' skills and empowering them to contribute to organizational decisions to enhance patient outcomes and improve the overall quality of healthcare delivery.

6. CONCLUSION

This study investigated the relationship between nurses' health informatics competencies, their participation in administrative decision-making, and the quality of patient care in Hafr Al-Batin, Saudi Arabia. The findings revealed that nurses demonstrated moderate to high levels of health informatics competencies, which were positively associated with their participation in decision-making processes. Both health informatics competencies and participation in administrative decision-making were significant predictors of the quality of patient care.

The results highlight the importance of equipping nurses with the necessary health informatics skills and involving them in decision-making processes to enhance patient outcomes and improve the overall quality of care. Healthcare organizations should invest in training programs to enhance nurses' health informatics competencies and foster a culture that values their contributions to administrative decisions.

Future research should employ longitudinal designs and incorporate objective measures to further examine the impact of nurses' health informatics competencies and participation in decision-making on patient care quality. Additionally, exploring the barriers and facilitators to nurses' involvement in decision-making processes and identifying effective strategies to overcome these challenges would provide valuable insights for healthcare organizations.

In conclusion, this study contributes to the growing body of knowledge on the role of nurses' health informatics competencies and participation in administrative decision-making in promoting the quality of patient care. The findings underscore the need for healthcare organizations to adopt a multi-faceted approach to quality improvement, with a focus on enhancing nurses' skills and empowering them to contribute to organizational decisions.

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