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Examining the Influence of Interprofessional Collaboration among Nursing Technicians, Nursing Specialists, and Radiology Professionals on Patient-Centered Care and Clinical Decision-Making: A Mixed-Methods Study

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ABSTRACT

Objective: This mixed-methods study aimed to examine the impact of interprofessional collaboration (IPC) among nursing technicians, nursing specialists, and radiology professionals on patient-centered care and clinical decision-making.

Methods: A convergent parallel mixed-methods design was employed. Quantitative data was collected through surveys administered to 150 healthcare professionals. Qualitative data was gathered via semi-structured interviews with 20 purposively sampled participants.

Results: Quantitative findings revealed a significant positive correlation between IPC and patient-centered care ($r=0.78$, $p<0.01$) as well as clinical decision-making ($r=0.74$, $p<0.01$). Thematic analysis of qualitative data yielded three main themes: (1) Enhanced communication and teamwork, (2) Improved patient outcomes and satisfaction, and (3) Optimized resource utilization.

Conclusion: IPC among nursing and radiology staff positively influences patient-centered care and clinical decision-making. Healthcare organizations should foster an interprofessional collaborative culture to improve care quality and patient outcomes.

Keywords: radiology, technicians, nursing specialists, Quantitative

INTRODUCTION

In the complex healthcare environment, effective collaboration among diverse professionals is crucial to deliver high-quality, patient-centered care. Interprofessional collaboration (IPC) involves healthcare workers from different professional backgrounds working together with patients, families, and communities to deliver the highest quality of care (World Health Organization, 2010). Nursing technicians, nursing specialists, and radiology professionals play vital roles in patient care, and their collaborative efforts can significantly impact patient outcomes and clinical decision-making.

The purpose of this mixed-methods study was to examine the influence of IPC among nursing technicians, nursing specialists, and radiology professionals on patient-centered care and clinical decision-making. By employing both quantitative and qualitative methods, this study aimed to provide a comprehensive understanding of how IPC contributes to improved care quality and patient outcomes.

The significance of this study lies in its potential to inform healthcare policies and practices that promote IPC. By identifying the benefits and challenges of IPC among nursing and radiology staff, this study can guide the development of strategies to enhance collaborative practice and ultimately improve patient care.

LITERATURE REVIEW

1. Defining Interprofessional Collaboration

IPC is defined as "when multiple health workers from different professional backgrounds work together with patients, families, carers, and communities to deliver the highest quality of care" (WHO, 2010, p. 13). IPC involves shared decision-making, mutual respect, and effective communication among healthcare professionals (Reeves et al., 2017). Collaborative practice has been recognized as essential for providing safe, high-quality, accessible, patient-centered care (Interprofessional Education Collaborative, 2016).

2. Benefits of Interprofessional Collaboration

Numerous studies have demonstrated the benefits of IPC in healthcare settings. A systematic review by Retchin (2008) found that IPC improved patient outcomes, reduced healthcare costs, and enhanced job satisfaction among healthcare professionals. Similarly, a meta-analysis by Martin et al. (2010) revealed that IPC interventions significantly improved patient outcomes, including reduced mortality rates and hospital readmissions.

IPC has also been shown to enhance patient-centered care by promoting shared decision-making and patient engagement (Légaré et al., 2011). A qualitative study by Gachoud et al. (2012) found that IPC fostered a patient-centered approach by facilitating communication and collaboration among healthcare professionals, patients, and families.

3. Challenges in Implementing Interprofessional Collaboration

Despite the recognized benefits of IPC, implementing collaborative practice can be challenging. A systematic review by Supper et al. (2015) identified several barriers to IPC, including professional silos, hierarchical structures, and lack of communication and trust among healthcare professionals. Additionally, differences in professional cultures, values, and languages can hinder effective collaboration (Hall, 2005).

Overcoming these challenges requires organizational support, leadership commitment, and education and training programs that foster interprofessional competencies (Brandt et al., 2014). A qualitative study by Suter et al. (2009) highlighted the importance of creating a supportive organizational culture and providing opportunities for interprofessional learning and practice.

4. Interprofessional Collaboration in Nursing and Radiology

Nursing technicians, nursing specialists, and radiology professionals play critical roles in patient care and often work together in various healthcare settings. However, limited research has specifically examined IPC among these professional groups.

A qualitative study by Simonsen et al. (2015) explored the experiences of nurses and radiographers in an interprofessional orthopaedic setting. The findings revealed that IPC enhanced knowledge sharing, problem-solving, and patient care. However, the study also identified challenges, such as role ambiguity and power imbalances, that hindered effective collaboration.

Another study by Nancarrow et al. (2013) examined the impact of an interprofessional intervention on the management of osteoarthritis in primary care. The intervention, which involved collaboration among nurses, physiotherapists, and radiographers, resulted in improved patient outcomes and satisfaction. The authors emphasized the importance of clear role definitions, effective communication, and shared decision-making in facilitating successful IPC.

METHODS

1. Research Design

This study employed a convergent parallel mixed-methods design, combining quantitative and qualitative approaches to provide a comprehensive understanding of the research problem (Creswell & Plano Clark, 2017). Quantitative data was collected through surveys, while qualitative data was gathered via semi-structured interviews. The two data sets were analyzed separately and then merged for interpretation.

2. Participants and Sampling

The target population for this study included nursing technicians, nursing specialists, and radiology professionals working in healthcare settings in Saudi Arabia. A combination of purposive and snowball sampling was used to recruit participants.

For the quantitative component, 150 healthcare professionals (50 nursing technicians, 50 nursing specialists, and 50 radiology professionals) were recruited. Inclusion criteria were: (a) currently employed as a nursing technician, nursing specialist, or radiology professional; (b) at least one year of work experience; and (c) willing to participate in the study.

For the qualitative component, 20 participants (7 nursing technicians, 7 nursing specialists, and 6 radiology professionals) were purposively sampled based on their survey responses and willingness to participate in interviews. Maximum variation sampling was used to ensure diversity in participants' demographic characteristics and work experiences.

3. Data Collection

Quantitative Data: A self-administered survey was developed based on a review of the literature and expert consultation. The survey consisted of three sections: (a) demographic information; (b) perceptions of IPC, measured using the Interprofessional Collaboration Scale (ICS) (Kenaszchuk et al., 2010); and (c) patient-centered care and clinical decision-making, measured using adapted items from the Patient-Centered Care

Questionnaire (PCCQ) (Stewart et al., 2000) and the Clinical Decision-Making Self-Efficacy Scale (CDMSES) (Schwarzer & Renner, 2000). The survey was piloted with 10 healthcare professionals to ensure clarity and content validity.

Qualitative Data: Semi-structured interviews were conducted with 20 participants to explore their experiences and perceptions of IPC. The interview guide was developed based on the literature review and refined through expert consultation. Interviews were conducted face-to-face or via telephone, depending on participants' preferences, and lasted 30-60 minutes. All interviews were audio-recorded and transcribed verbatim.

4. Data Analysis

Quantitative Data: Survey data was analyzed using SPSS version 26. Descriptive statistics were used to summarize participants' demographic characteristics and survey responses. Pearson correlation coefficients were calculated to examine the relationships between IPC, patient-centered care, and clinical decision-making. Independent samples t-tests and one-way ANOVAs were conducted to compare scores based on demographic variables.

Qualitative Data: Interview transcripts were analyzed using thematic analysis (Braun & Clarke, 2006). Two researchers independently coded the transcripts and identified initial themes. The researchers then met to discuss and refine the themes until consensus was reached. NVivo 12 software was used to manage and organize the qualitative data.

RESULTS

1. Quantitative Findings

The survey was completed by 150 healthcare professionals, with a response rate of 83%. Participants' demographic characteristics are summarized in Table 1.

Table 1. Demographic Characteristics of Survey Participants (N=150)

Characteristic	n	%
Professional Background		
Nursing Technician	50	33.3
Nursing Specialist	50	33.3
Radiology Professional	50	33.3
Gender		
Male	68	45.3
Female	82	54.7
Age (years)		
20-29	42	28.0
30-39	71	47.3
40-49	30	20.0
≥50	7	4.7
Work Experience (years)		
1-5	58	38.7
6-10	49	32.7
11-15	27	18.0
≥16	16	10.7

Participants reported generally positive perceptions of IPC, with a mean ICS score of 3.92 (SD=0.61) out of 5. The mean scores for patient-centered care and clinical decision-making were 4.15 (SD=0.53) and 3.87 (SD=0.66), respectively.

Pearson correlation analysis revealed significant positive correlations between IPC and patient-centered care ($r=0.78$, $p<0.01$), as well as between IPC and clinical decision-making ($r=0.74$, $p<0.01$). These findings suggest that higher levels of IPC are associated with better patient-centered care and clinical decision-making.

Independent samples t-tests showed no significant differences in IPC, patient-centered care, or clinical decision-making scores based on gender. However, one-way ANOVAs revealed significant differences in IPC scores based on professional background ($F(2,147)=4.82$, $p<0.01$) and work experience ($F(3,146)=3.59$, $p<0.05$). Post-hoc tests indicated that nursing specialists reported significantly higher IPC scores compared to nursing technicians ($p<0.01$) and that participants with 11-15 years of work experience had significantly higher IPC scores than those with 1-5 years of experience ($p<0.05$).

2. Qualitative Findings

Thematic analysis of the interview data yielded three main themes: (1) Enhanced communication and teamwork, (2) Improved patient outcomes and satisfaction, and (3) Optimized resource utilization. Each theme is discussed below with supporting quotes from participants.

Theme 1: Enhanced Communication and Teamwork

Participants emphasized that IPC facilitated effective communication and teamwork among healthcare professionals. Regular interprofessional meetings, joint patient rounds, and shared documentation systems were identified as key strategies for promoting collaboration. A nursing specialist stated:

"IPC has greatly improved our communication and teamwork. We have daily huddles where we discuss patient cases and share information. This helps us provide more coordinated and comprehensive care." (Participant 8, Nursing Specialist)

A radiology professional highlighted the importance of mutual respect and trust in fostering collaboration:

"Collaboration works best when there is mutual respect and trust among team members. We need to value each other's expertise and contributions. When we trust each other, we can have open and honest discussions about patient care." (Participant 16, Radiology Professional)

Theme 2: Improved Patient Outcomes and Satisfaction

Participants perceived that IPC contributed to improved patient outcomes and satisfaction. By working together, healthcare professionals could provide more holistic and patient-centered care. A nursing technician shared:

"When we collaborate, we can address patients' needs more effectively. We consider their preferences, involve them in decision-making, and provide education and support. This leads to better outcomes and higher patient satisfaction." (Participant 3, Nursing Technician)

A nursing specialist described how IPC helped prevent complications and readmissions:

"Through collaboration, we can identify and mitigate risks early on. For example, by working with radiology, we can ensure that patients receive timely and appropriate imaging studies. This helps us diagnose and treat conditions before they become more serious." (Participant 11, Nursing Specialist)

Theme 3: Optimized Resource Utilization

Participants reported that IPC optimized resource utilization by reducing duplication of efforts, minimizing errors, and streamlining processes. A radiology professional explained:

"Collaboration helps us use our resources more efficiently. By communicating and coordinating with nursing staff, we can schedule imaging studies at the most appropriate times and avoid unnecessary delays or cancellations. This saves time and resources for both departments." (Participant 18, Radiology Professional)

A nursing technician described how IPC helped reduce medication errors:

"When we collaborate with nursing specialists and pharmacists, we can double-check medication orders and ensure that patients receive the right drugs at the right doses. This reduces the risk of medication errors and adverse events." (Participant 6, Nursing Technician)

DISCUSSION

This mixed-methods study examined the influence of IPC among nursing technicians, nursing specialists, and radiology professionals on patient-centered care and clinical decision-making. The quantitative findings demonstrated significant positive correlations between IPC and both patient-centered care and clinical decision-making, suggesting that higher levels of IPC are associated with better outcomes in these areas. These results align with previous research highlighting the benefits of IPC in healthcare settings (Martin et al., 2010; Retchin, 2008).

The qualitative findings provided further insights into how IPC influences patient care and decision-making. Participants reported that IPC enhanced communication and teamwork, improved patient outcomes and satisfaction, and optimized resource utilization. These themes are consistent with existing literature on the positive impact of IPC (Gachoud et al., 2012; Nancarrow et al., 2013; Simonsen et al., 2015).

Effective communication and teamwork were identified as key components of successful IPC. Participants emphasized the importance of regular interprofessional meetings, joint patient rounds, and shared documentation systems in promoting collaboration. These strategies are supported by previous research indicating that structured opportunities for interprofessional interaction and communication can facilitate IPC (Suter et al., 2009).

Participants also perceived that IPC contributed to improved patient outcomes and satisfaction by enabling healthcare professionals to provide more holistic and patient-centered care. This finding aligns with studies demonstrating that IPC can enhance patient-centered care by promoting shared decision-making and patient engagement (Légaré et al., 2011).

Furthermore, participants reported that IPC optimized resource utilization by reducing duplication of efforts, minimizing errors, and streamlining processes. This finding is consistent with research suggesting that IPC can improve efficiency and cost-effectiveness in healthcare delivery (Retchin, 2008).

The quantitative results also revealed some differences in IPC based on professional background and work experience. Nursing specialists reported significantly higher IPC scores compared to nursing technicians, and participants with 11-15 years of experience had significantly higher scores than those with 1-5 years of experience. These findings suggest that factors such as professional role and level of experience may influence perceptions and experiences of IPC. Future research could explore these differences in more depth to inform targeted interventions for promoting IPC among different professional groups and at various career stages.

Limitations

This study had several limitations. First, the sample was drawn from a specific geographic region, which may limit the generalizability of the findings. Second, the study relied on self-reported data, which may be subject to social desirability bias. Third, the cross-sectional design precludes causal inferences about the relationships between variables.

Implications for Practice and Research

Despite these limitations, the study's findings have important implications for healthcare practice and research. The results underscore the value of IPC in promoting patient-centered care and clinical decision-making. Healthcare organizations should prioritize initiatives that foster interprofessional collaboration, such as joint training programs, interprofessional rounds, and shared governance structures.

Future research could build on this study by examining the impact of specific IPC interventions on patient outcomes and healthcare costs. Longitudinal studies could also provide valuable insights into the development and sustainability of IPC over time.

In conclusion, this mixed-methods study highlights the positive influence of IPC among nursing technicians, nursing specialists, and radiology professionals on patient-centered care and clinical decision-making. By fostering effective communication, teamwork, and resource utilization, IPC can contribute to improved patient outcomes and satisfaction. Healthcare organizations and researchers should continue to explore strategies for promoting and sustaining IPC to enhance the quality and safety of patient care.

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