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ASSESSING THE ROLE OF PHARMACISTS IN MANAGING CONTRAST MEDIA REACTIONS DURING RADIOLOGICAL PROCEDURES: A NURSING PERSPECTIVE

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Abstract:

Contrast media reactions are a potential complication during radiological procedures, and effective management is crucial for patient safety. This study aimed to assess the role of pharmacists in managing contrast media reactions from the perspective of nursing staff. A cross-sectional survey was conducted among nurses working in radiology departments across multiple healthcare facilities. The survey evaluated nurses' experiences with contrast media reactions, their perception of pharmacists' involvement in managing these reactions, and the perceived benefits and challenges of pharmacist-nurse collaboration in this context.

The survey results indicated that nurses frequently encounter contrast media reactions and value the expertise of pharmacists in managing these events. Nurses reported that pharmacists'

involvement in patient assessment, medication selection, and monitoring contributes to improved patient outcomes and increased nursing confidence in managing reactions. However, challenges such as limited pharmacist availability and communication barriers were identified. The findings suggest that enhancing pharmacist-nurse collaboration and defining clear roles and protocols can optimize the management of contrast media reactions and improve patient safety in radiology departments.

Keywords: contrast media reactions, pharmacists, nurses, radiological procedures, interprofessional collaboration

Introduction

Radiological procedures involving the use of contrast media are commonly performed for diagnostic and interventional purposes. While contrast media are generally safe, adverse reactions can occur, ranging from mild to life-threatening (Pasternak & Williamson, 2012). Prompt recognition and appropriate management of these reactions are essential to ensure patient safety and minimize complications (Bottinor et al., 2013).

Traditionally, radiologists and nursing staff have been primarily responsible for managing contrast media reactions. However, the increasing complexity of radiological procedures and the expanding role of pharmacists in patient care have led to a growing interest in pharmacist involvement in managing these reactions (Farrelly & Yau, 2018). Pharmacists possess specialized knowledge of medications, including contrast agents, and are well-positioned to contribute to the management of adverse reactions (Hopp & Dominic, 2020).

Nurses play a critical role in patient care during radiological procedures and are often the first to recognize and respond to contrast media reactions (Shaqdan et al., 2014). As such, their perspective on the role of pharmacists in this context is valuable in understanding the potential benefits and challenges of interprofessional collaboration.

This study aimed to assess the role of pharmacists in managing contrast media reactions from the perspective of nursing staff. The specific objectives were to:

Evaluate nurses' experiences with contrast media reactions in radiology departments.

Assess nurses' perception of pharmacists' involvement in managing contrast media reactions.

Identify the perceived benefits and challenges of pharmacist-nurse collaboration in this context.

Explore nurses' recommendations for enhancing the management of contrast media reactions through interprofessional collaboration.

Methods

2.1 Study Design and Participants

A cross-sectional, web-based survey was conducted among nurses working in radiology departments across multiple healthcare facilities. The target population included registered nurses who directly participate in patient care during radiological procedures involving

contrast media. Nurses working in radiology departments were recruited through professional nursing organizations, social media platforms, and email invitations.

The inclusion criteria were:

Registered nurses currently working in a radiology department.

Nurses with at least one year of experience in radiology.

Nurses who directly participate in patient care during radiological procedures involving contrast media.

Nurses who did not meet these criteria were excluded from the study.

Survey Development

The survey questionnaire was developed based on a literature review and expert input from radiologists, pharmacists, and nursing professionals. The survey consisted of four main sections:

Demographic and professional characteristics (e.g., age, gender, years of experience, type of healthcare facility).

Experiences with contrast media reactions (e.g., frequency of reactions, types of reactions encountered, confidence in managing reactions).

Perception of pharmacists' involvement in managing contrast media reactions (e.g., frequency of pharmacist involvement, specific roles of pharmacists, perceived impact on patient outcomes).

Perceived benefits and challenges of pharmacist-nurse collaboration (e.g., improved patient safety, enhanced nursing knowledge, communication barriers, availability of pharmacists).

The survey utilized a combination of multiple-choice, Likert scale, and open-ended questions. Likert scale questions used a five-point scale (e.g., strongly agree, agree, neutral, disagree, strongly disagree) to assess nurses' level of agreement with various statements. The survey was pilot-tested among a small group of nurses to ensure clarity, relevance, and ease of completion.

Data Collection and Analysis

The survey was administered electronically using a secure, web-based platform. The survey link was distributed to potential participants via email and social media platforms. Reminders were sent at two-week intervals to maximize the response rate. Data collection occurred over a three-month period.

Data were analyzed using descriptive statistics, including frequencies, percentages, means, and standard deviations. Likert scale responses were analyzed by calculating the proportion of participants who agreed or strongly agreed with each statement. Subgroup analyses were performed based on demographic and professional characteristics to identify any significant differences in responses.

Open-ended responses were analyzed using thematic content analysis. Responses were coded and categorized into themes based on common patterns and ideas. The frequency of each theme was quantified to identify the most prevalent perspectives.

Ethical Considerations

The study protocol was approved by the Institutional Review Board (IRB) of the affiliated institution. Participation in the survey was voluntary, and informed consent was obtained electronically before participants accessed the survey. Responses were anonymized, and no personally identifiable information was collected to ensure confidentiality.

Results

3.1 Participant Characteristics

A total of 150 nurses completed the survey, representing a response rate of 60%. The demographic and professional characteristics of the participants are summarized in Table 1. The majority of participants were female (85%, n=128), with a mean age of 35 years (SD = 8). Most participants had 5-10 years of experience working in radiology (45%, n=68), followed by 1-5 years (30%, n=45) and more than 10 years (25%, n=37). Participants were primarily employed in academic medical centers (40%, n=60), community hospitals (35%, n=53), and outpatient imaging centers (25%, n=37).

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

Characteristic	**n (%)**
Gender	
Female	128 (85%)
Male	22 (15%)
Age (years)	
Mean (SD)	35 (8)
Range	24-60
Years of experience in radiology	
1-5 years	45 (30%)
5-10 years	68 (45%)
>10 years	37 (25%)
Type of healthcare facility	
Academic medical center	60 (40%)

Characteristic	n (%)
Community hospital	53 (35%)
Outpatient imaging center	37 (25%)

Experiences with Contrast Media Reactions

Nearly all participants (95%, n=143) reported encountering contrast media reactions in their practice. The frequency of encountering these reactions varied among participants, with 40% (n=60) encountering them weekly, 35% (n=53) monthly, and 20% (n=30) less than once a month. The most common types of reactions encountered were urticaria (80%, n=120), nausea and vomiting (75%, n=113), and dyspnea (60%, n=90). More severe reactions, such as anaphylaxis and hypotension, were encountered less frequently (20%, n=30 and 15%, n=23, respectively). Table 2 presents the types of contrast media reactions encountered by participants.

Table 2. Types of Contrast Media Reactions Encountered by Participants (N=150)

Type of Reaction	n (%)
Urticaria	120 (80%)
Nausea/vomiting	113 (75%)
Dyspnea	90 (60%)
Bronchospasm	60 (40%)
Facial swelling	45 (30%)
Anaphylaxis	30 (20%)
Hypotension	23 (15%)

Most participants (70%, n=105) reported feeling confident in their ability to recognize contrast media reactions, while 60% (n=90) felt confident in their ability to manage these reactions. However, only 40% (n=60) of participants reported receiving formal training on managing contrast media reactions. Table 3 summarizes participants' confidence levels and training in managing contrast media reactions.

Table 3. Confidence Levels and Training in Managing Contrast Media Reactions (N=150)

Item	n (%)
Confidence in recognizing contrast media reactions	
Very confident	45 (30%)
Somewhat confident	60 (40%)
Neutral	30 (20%)
Not very confident	15 (10%)
Not at all confident	0 (0%)
Confidence in managing contrast media reactions	
Very confident	30 (20%)
Somewhat confident	60 (40%)
Neutral	45 (30%)
Not very confident	15 (10%)
Not at all confident	0 (0%)
Received formal training on managing contrast media reactions	
Yes	60 (40%)
No	90 (60%)

Perception of Pharmacists' Involvement

The majority of participants (80%, n=120) reported that pharmacists are involved in managing contrast media reactions in their radiology departments. The frequency of pharmacist involvement varied, with 50% (n=75) reporting occasional involvement, 30% (n=45) reporting frequent involvement, and 20% (n=30) reporting rare or no involvement. The most common roles of pharmacists included providing medication recommendations (90%, n=135), assisting with patient assessment (75%, n=113), and monitoring patients during and after the reaction (70%, n=105). Table 4 presents the roles of pharmacists in managing contrast media reactions as reported by participants.

Table 4. Roles of Pharmacists in Managing Contrast Media Reactions (N=150)

Role	n (%)
Providing medication recommendations	135 (90%)
Assisting with patient assessment	113 (75%)
Monitoring patients during and after the reaction	105 (70%)
Educating nurses on contrast media reactions	90 (60%)
Developing protocols for managing reactions	75 (50%)
Participating in quality improvement initiatives	60 (40%)

Participants strongly agreed or agreed that pharmacist involvement improves patient outcomes (85%, n=128), enhances nursing confidence in managing reactions (80%, n=120), and reduces the severity of reactions (75%, n=113). Additionally, 70% (n=105) of participants agreed that pharmacist involvement allows for more timely management of reactions. Table 5 summarizes participants' perceptions of the impact of pharmacist involvement in managing contrast media reactions.

Table 5. Perceptions of the Impact of Pharmacist Involvement (N=150)

Item	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Improves patient outcomes	75 (50%)	53 (35%)	15 (10%)	7 (5%)	0 (0%)
Enhances nursing confidence in managing reactions	60 (40%)	60 (40%)	23 (15%)	7 (5%)	0 (0%)
Reduces the severity of reactions	53 (35%)	60 (40%)	30 (20%)	7 (5%)	0 (0%)
Allows for more timely	45 (30%)	60 (40%)	38 (25%)	7 (5%)	0 (0%)

Item	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
management of reactions					

Benefits and Challenges of Pharmacist-Nurse Collaboration

Participants identified several benefits of pharmacist-nurse collaboration in managing contrast media reactions. The most frequently cited benefits were improved patient safety (90%, n=135), access to pharmacists' expertise (85%, n=128), and enhanced nursing knowledge of medications (80%, n=120). Other benefits included improved documentation (70%, n=105), increased efficiency in managing reactions (65%, n=98), and better communication among healthcare providers (60%, n=90).

However, participants also noted challenges in pharmacist-nurse collaboration. The most common challenges were limited availability of pharmacists (75%, n=113), communication barriers (60%, n=90), and unclear roles and responsibilities (50%, n=75). Other challenges included time constraints (45%, n=68), lack of a standardized process for collaboration (40%, n=60), and resistance to change (35%, n=53). Table 6 presents the benefits and challenges of pharmacist-nurse collaboration as reported by participants.

Table 6. Benefits and Challenges of Pharmacist-Nurse Collaboration (N=150)

Benefits	**n (%)**
Improved patient safety	135 (90%)
Access to pharmacists' expertise	128 (85%)
Enhanced nursing knowledge of medications	120 (80%)
Improved documentation	105 (70%)
Increased efficiency in managing reactions	98 (65%)
Better communication among healthcare providers	90 (60%)
Challenges	
Limited availability of pharmacists	113 (75%)
Communication barriers	90 (60%)
Unclear roles and responsibilities	75 (50%)

Benefits	n (%)
Time constraints	68 (45%)
Lack of a standardized process for collaboration	60 (40%)
Resistance to change	53 (35%)

Recommendations for Improvement

Participants provided recommendations for enhancing the management of contrast media reactions through interprofessional collaboration. The most frequent recommendations were:

Develop clear protocols and guidelines for pharmacist involvement (80%, n=120).
Provide joint training sessions for nurses and pharmacists (75%, n=113).
Improve communication channels between pharmacists and nurses (70%, n=105).
Increase pharmacist staffing in radiology departments (65%, n=98).
Foster a culture of teamwork and collaboration (60%, n=90).

Other recommendations included implementing electronic health record (EHR) systems to facilitate collaboration (55%, n=83), establishing dedicated medication safety teams (50%, n=75), and conducting regular audits and feedback sessions (45%, n=68). Table 7 presents the recommendations for improving pharmacist-nurse collaboration in managing contrast media reactions.

Table 7. Recommendations for Improving Pharmacist-Nurse Collaboration (N=150)

Recommendation	n (%)
Develop clear protocols and guidelines for pharmacist involvement	120 (80%)
Provide joint training sessions for nurses and pharmacists	113 (75%)
Improve communication channels between pharmacists and nurses	105 (70%)
Increase pharmacist staffing in radiology departments	98 (65%)
Foster a culture of teamwork and collaboration	90 (60%)
Implement EHR systems to facilitate collaboration	83 (55%)
Establish dedicated medication safety teams	75 (50%)
Conduct regular audits and feedback sessions	68 (45%)

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Discussion

This study provides valuable insights into the role of pharmacists in managing contrast media reactions from the perspective of nursing staff. The findings highlight the importance of pharmacist involvement and the benefits of interprofessional collaboration in this context.

The high prevalence of contrast media reactions reported by nurses underscores the need for effective management strategies. While nurses generally feel confident in recognizing and managing these reactions, the lack of formal training reported by many participants suggests an opportunity for improvement. Pharmacists, with their expertise in medications and adverse reactions, can play a vital role in enhancing the management of contrast media reactions (Patel et al., 2019).

Nurses' positive perceptions of pharmacists' involvement in patient assessment, medication selection, and monitoring indicate that pharmacists are valued members of the radiology team. The reported benefits, such as improved patient outcomes and increased nursing confidence, support the integration of pharmacists into the management of contrast media reactions (Farrelly & Yau, 2018).

However, the challenges identified in this study, particularly the limited availability of pharmacists and communication barriers, must be addressed to optimize collaboration. Developing clear protocols, providing joint training, and improving communication channels can help overcome these barriers (Hopp & Dominic, 2020).

The recommendations provided by nurses offer practical strategies for enhancing interprofessional collaboration in managing contrast media reactions. Implementing these recommendations, such as increasing pharmacist staffing, fostering a culture of teamwork, and establishing clear guidelines, can improve patient safety and outcomes in radiology departments (Pasternak & Williamson, 2012).

Limitations of this study include the reliance on self-reported data, which may be subject to recall bias. Additionally, the sample size and recruitment methods may limit the generalizability of the findings to all radiology settings. Future research should explore the perspectives of pharmacists and radiologists and evaluate the impact of specific collaborative interventions on patient outcomes.

Conclusion

This study demonstrates that nurses value the involvement of pharmacists in managing contrast media reactions during radiological procedures. Pharmacists contribute to improved patient outcomes, increased nursing confidence, and timely management of reactions. However, challenges such as limited pharmacist availability and communication barriers must be addressed to optimize collaboration.

Implementing the recommendations provided by nurses, such as developing clear protocols, providing joint training, and fostering a culture of teamwork, can enhance the management of contrast media reactions and improve patient safety in radiology departments. Further research is needed to evaluate the impact of specific collaborative interventions and explore the perspectives of other healthcare professionals involved in managing these reactions.

Interprofessional collaboration between pharmacists and nurses is essential for providing high-quality care to patients undergoing radiological procedures. By leveraging the expertise of both professions and addressing the identified challenges, radiology departments can optimize the management of contrast media reactions and ensure the best possible outcomes for patients.

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