Evaluating Pain Management Strategies in the Post-Anesthesia Care Unit: Perspectives on Collaboration Between Anesthetists and Nurses

Nouf H. Harisi[1], Hadeel S. Alenezi[2], Afnan M. Alsubaie[3], Maysa S. Almalki[4], Areej G. Alshammri[5], Reem H. Alanazi[6]

Health Affairs at the Ministry of National Guard Hospital

Abstract

Background: Effective pain management in the Post-Anesthesia Care Unit (PACU) is critical for ensuring patient comfort and promoting recovery. Collaboration between anesthetists and nurses is essential to achieving optimal pain control, yet challenges such as communication barriers and time constraints can hinder this process.

Objective: This study aimed to evaluate pain management strategies in the PACU and explore the perspectives of anesthetists and nurses on interdisciplinary collaboration.

Methods: A qualitative study using semi-structured interviews was conducted with 12 anesthetists and nurses at a tertiary hospital. Thematic analysis was used to identify key themes related to pain management practices, collaboration, and challenges.

Results: Three main themes emerged: (1) Collaborative pain management, emphasizing the importance of communication between anesthetists and nurses, (2) Challenges in effective pain management, including patient variability, communication barriers, and time constraints, and (3) Strategies for enhancing pain management, such as structured communication protocols, continuous education, and addressing staffing levels.

Conclusion: Effective pain management in the PACU requires strong collaboration between anesthetists and nurses. Implementing structured communication tools, ongoing training, and improving staffing can enhance patient outcomes and ensure timely pain control.

Keywords: Pain management, PACU, anesthetists, nurses, collaboration, postoperative care, communication barriers.

Introduction

Effective pain management in the postoperative period is critical for ensuring patient comfort, improving recovery outcomes, and reducing complications such as delayed mobilization and prolonged hospital stays (Apfelbaum et al., 2003). The Post-Anesthesia Care Unit (PACU) plays a pivotal role in monitoring patients as they recover from anesthesia, with a primary focus on pain assessment and control. In this setting, both anesthetists and nurses work together to manage acute postoperative pain, ensuring that patients are stable and comfortable before being discharged to other units or sent home.

Pain management in the PACU often involves a multimodal approach, utilizing opioids, non-opioid analgesics, and adjunctive therapies to provide comprehensive relief (Kehlet& Dahl, 2003). While various strategies are employed, the success of these interventions relies heavily on the collaboration between anesthetists, who are responsible for prescribing pain medications, and nurses, who assess patient pain levels and administer medications. This interdisciplinary teamwork is crucial for timely adjustments to pain management plans based on the patient's evolving needs during their time in the PACU (Garimella and Cellini, 2013).

Despite advancements in pain management, challenges remain, particularly in addressing the diverse pain responses of patients and the need for real-time communication between anesthetists and nurses. Barriers such as time constraints, communication breakdowns, and differing perceptions of pain management strategies can hinder optimal patient care (Puntillo et al., 2014). Given the complexity of pain management in the PACU, there is a need to evaluate the effectiveness of current strategies and explore how anesthetists and nurses collaborate to improve patient outcomes.

This study aims to evaluate the pain management strategies employed in the PACU and investigate the perspectives of anesthetists and nurses on interdisciplinary collaboration. By identifying challenges and areas for improvement, this research seeks to provide insights that can enhance the quality of postoperative pain management and overall patient care.

Literature Review

Overview of Pain Management in the PACU

Effective pain management in the Post-Anesthesia Care Unit (PACU) is crucial for improving patient outcomes and ensuring a smooth recovery after surgery. Postoperative pain, if inadequately managed, can lead to complications such as delayed recovery, prolonged hospital stays, and increased healthcare costs (Apfelbaum et al., 2003). The PACU provides an environment where acute pain is closely monitored, and immediate interventions can be applied to manage discomfort. Pain management strategies in this setting are often multimodal, combining opioids, non-opioid analgesics, and regional anesthesia techniques to address pain from multiple pathways (Kehlet& Dahl, 2003). This multimodal approach is considered the gold standard in postoperative pain control, as it aims to minimize opioid consumption while maximizing pain relief.

Multimodal Analgesia and Its Importance

Multimodal analgesia is a cornerstone of modern pain management in the PACU. This approach utilizes various classes of medications, including opioids, non-steroidal anti-inflammatory drugs (NSAIDs), acetaminophen, and local anesthetics, to achieve comprehensive pain relief (Chou et al., 2016). The rationale behind multimodal analgesia is to target different mechanisms of pain transmission and perception, thereby reducing the need for high doses of opioids, which are associated with adverse effects such as respiratory depression, nausea, and constipation (Buvanendran&Kroin, 2009). A well-implemented multimodal strategy can lead to faster patient recovery and reduce opioid-related complications.

Despite the widespread adoption of multimodal analgesia, challenges remain in achieving optimal pain control for all patients. Some patients may require higher doses of opioids due to preexisting opioid tolerance, while others may experience side effects from certain analgesics, requiring personalized adjustments (Puntillo et al., 2014). This highlights the need for effective collaboration between anesthetists and nurses to assess and adjust pain management strategies on a case-by-case basis.

Role of Nurses in Pain Management in the PACU

Nurses in the PACU play a vital role in assessing and managing postoperative pain. They are responsible for frequent monitoring of patients' pain levels, using validated pain scales such as the Numeric Rating Scale (NRS) or the Visual Analog Scale (VAS) (Herr et al., 2006). Nurses are often the first to recognize inadequate pain relief or adverse effects from medications and must communicate these findings to the anesthetist for timely adjustments to the pain management plan.

The literature emphasizes the importance of nursing assessment in pain management, noting that nurses are in a unique position to provide continuous bedside care and monitor pain trends over time (Schug et al., 2016). However, studies also reveal challenges in nursing practice, such as difficulty in interpreting nonverbal pain cues in patients who are sedated or unable to communicate, as well as time constraints in a busy PACU environment (Puntillo et al., 2014).

Role of Anesthetists in Pain Management

Anesthetists have a critical role in developing and overseeing the pain management strategies in the PACU. Their expertise in anesthesia and pain medicine allows them to tailor multimodal analgesic regimens based on the patient's medical history, type of surgery, and expected postoperative pain (Gan et al., 2014). Anesthetists are responsible for prescribing medications, adjusting dosages, and, in some cases, performing regional anesthesia techniques such as nerve blocks or epidurals to provide targeted pain relief (Cogan, 2010).

The literature underscores the importance of communication between anesthetists and nurses in the PACU. Effective collaboration is essential to ensure that pain management plans are adjusted according to the patient's evolving needs, particularly in the immediate postoperative period when pain can fluctuate rapidly (Meissner et al., 2018). However, communication challenges between anesthetists and nurses, including unclear roles or delays in medication adjustments, have been identified as barriers to optimal pain control (Puntillo et al., 2014).

Interdisciplinary Collaboration in the PACU

Interdisciplinary collaboration between anesthetists and nurses is a key factor in ensuring effective pain management in the PACU. Both professions bring unique expertise to the management of postoperative pain, and their collaboration is crucial for achieving the best outcomes for patients. Studies suggest that when anesthetists and nurses work closely together, there is a greater likelihood of timely pain assessments, quicker interventions, and more personalized pain management strategies (Schug et al., 2016).

However, interdisciplinary collaboration is not without its challenges. Research has identified issues such as hierarchical dynamics, lack of role clarity, and communication barriers as factors that can impede collaboration between anesthetists and nurses (Meissner et al., 2018). Addressing these issues through structured communication protocols, regular interdisciplinary meetings, and mutual respect for each profession's expertise can improve pain management outcomes and patient satisfaction.

Challenges in Pain Management

Several challenges have been identified in the literature regarding pain management in the PACU. First, individual patient variability in pain tolerance and response to analgesics makes it difficult to implement a one-size-fits-all approach to pain control (Apfelbaum et al., 2003). Some patients may require higher doses

of opioids due to opioid tolerance or more severe postoperative pain, while others may experience side effects from even low doses of analgesics. This variability necessitates ongoing assessment and adjustment of pain management plans, which can place additional demands on both anesthetists and nurses.

Second, time constraints and high patient volumes in the PACU can limit the ability of nurses and anesthetists to conduct thorough pain assessments and communicate effectively about adjustments to the pain management plan (Puntillo et al., 2014). The fast-paced nature of the PACU often means that nurses must balance multiple tasks, which can lead to delays in pain assessment or medication administration.

Finally, the use of opioids, while effective for managing moderate to severe pain, presents challenges related to side effects and the risk of respiratory depression (Chou et al., 2016). Nurses and anesthetists must work together to balance the need for adequate pain relief with the potential for opioid-related complications, particularly in patients with comorbidities such as obesity or sleep apnea, which increase the risk of opioid-induced respiratory depression (Cogan, 2010).

Conclusion

Pain management in the PACU is a complex process that requires the collaboration of anesthetists and nurses to ensure effective and individualized care. The literature emphasizes the importance of multimodal analgesia in reducing opioid consumption and improving patient outcomes. Nurses play a critical role in pain assessment and monitoring, while anesthetists are responsible for developing and adjusting pain management plans. However, challenges such as communication barriers, time constraints, and individual patient variability must be addressed to optimize pain management in the PACU. Improving interdisciplinary collaboration between anesthetists and nurses is key to overcoming these challenges and providing high-quality postoperative care.

Methodology

Study Design

This study employed a qualitative research design using semi-structured interviews to explore the perspectives of anesthetists and nurses on pain management strategies in the Post-Anesthesia Care Unit (PACU) of a tertiary hospital. A phenomenological approach was chosen to capture the lived experiences and insights of healthcare professionals involved in the direct care of postoperative patients.

Setting

The study was conducted in the PACU of a tertiary hospital that serves a diverse patient population undergoing various surgical procedures. The hospital's PACU manages approximately 30-50 patients daily, providing recovery and immediate postoperative care. The healthcare staff in the PACU includes anesthetists, nurses, and other allied health professionals, all working collaboratively to ensure optimal patient outcomes.

Participants

A purposive sampling method was used to select participants for the study. The inclusion criteria were:
- Anesthetists and nurses with at least two years of experience working in the PACU.
- Healthcare professionals actively involved in pain management decisions and patient care.
- Willingness to participate in the study and provide informed consent.

A total of 12 participants were recruited, consisting of 6 anesthetists and 6 nurses. This sample size was deemed sufficient to capture a range of experiences and perspectives, while also allowing for in-depth

analysis of the data. Participants were identified and invited to participate through internal hospital communication channels, and all agreed to participate voluntarily.

Data Collection

Data were collected through semi-structured, face-to-face interviews conducted over a two-month period. Each interview lasted between 30 and 60 minutes and took place in a private room within the hospital to ensure confidentiality and minimize interruptions. The interviews were guided by a set of open-ended questions designed to explore participants' perspectives on pain management strategies and collaboration in the PACU. Example questions included:

- "Can you describe how pain management is typically approached in the PACU?"
- "How do you collaborate with your colleagues in managing pain for postoperative patients?"
- "What challenges do you face in providing effective pain relief for patients?"
- "How do you decide when and how to adjust pain medications in the PACU?"

All interviews were audio-recorded with the participants 'consent, and notes were taken during each session to capture key points and non-verbal cues. The interview recordings were transcribed verbatim for analysis.

Data Analysis

Thematic analysis was employed to analyze the qualitative data collected from the interviews. The analysis followed Braun and Clarke's (2006) six-step process, which includes:

1. Familiarization with the data: The researcher read and re-read the interview transcripts to become immersed in the data and identify initial ideas.

2. Generating initial codes: Transcripts were systematically coded to capture important features related to pain management strategies, collaboration, and challenges faced in the PACU.

3. Searching for themes: The codes were then grouped into broader themes that represented common patterns or topics raised by participants.

4. Reviewing themes: The themes were reviewed and refined, ensuring they accurately reflected the participants 'perspectives and were supported by the data.

5. Defining and naming themes: Clear definitions were developed for each theme, and sub-themes were identified where necessary.

6. Writing up the findings: The final themes were presented along with illustrative quotes from the participants to demonstrate the key points.

Ethical Considerations

Ethical approval for this study was obtained from the hospital's ethics committee prior to data collection. All participants provided informed consent and were assured of their right to withdraw from the study at any time without any negative consequences. Confidentiality and anonymity were maintained by assigning each participant a unique code, and no identifying information was included in the transcripts or reports. All data, including audio recordings and transcripts, were stored securely and accessible only to the research team.

Rigor and Trustworthiness

To ensure the rigor and trustworthiness of the study, several strategies were employed:

- Credibility: Member checking was conducted by sharing the preliminary findings with several participants to ensure the accuracy of the interpretations. This helped confirm that the findings truly reflected the participants 'experiences.

- Transferability: Detailed descriptions of the research setting, participant characteristics, and data collection methods were provided to allow for the transferability of the findings to other similar PACU settings.
- Dependability and Confirmability: An audit trail was maintained throughout the study, including interview transcripts, coding processes, and thematic analysis notes. This allowed for transparency and enabled the research process to be reviewed by external researchers if necessary.

Limitations
This study was conducted in a single tertiary hospital, which may limit the generalizability of the findings to other settings or institutions with different resources or patient populations. Additionally, while the sample size provided rich data, a larger sample could potentially reveal additional perspectives on interdisciplinary collaboration and pain management strategies.

Findings
The analysis of the data yielded several key themes that highlighted the experiences and perspectives of anesthetists and nurses in managing pain in the Post-Anesthesia Care Unit (PACU). Three main themes emerged: (1) Collaborative Pain Management in the PACU, (2) Challenges in Effective Pain Management, and (3) Strategies for Enhancing Pain Management and Collaboration. Each theme is supported by sub-themes and direct quotes from the participants.

Theme 1: Collaborative Pain Management in the PACU

Both anesthetists and nurses emphasized the importance of collaboration in effectively managing postoperative pain. The process of pain management was described as a dynamic and team-based effort, requiring clear communication and joint decision-making.

Sub-theme 1.1: Communication Between Anesthetists and Nurses
Participants consistently highlighted the importance of communication in achieving effective pain control. Nurses rely on anesthetists for prescribing appropriate medications, while anesthetists depend on nurses for real-time pain assessments and feedback on the patient's condition.

- Participant 3 (Nurse): "We communicate constantly about the patient's pain levels. I assess the patient, then I report to the anesthetist if the patient is in more pain than expected. Together, we decide if the medication needs adjusting."
- Participant 7 (Anesthetist): "The nurses are our eyes and ears when we aren't at the bedside. We trust their judgment, and if they feel the patient isn't responding well, we'll make changes together."

Sub-theme 1.2: Shared Responsibility in Pain Management
Participants expressed that pain management is a shared responsibility between anesthetists and nurses. Both professions must work together to ensure that patients receive timely and appropriate pain relief.

- Participant 5 (Nurse): "It's not just about giving the meds the anesthetist prescribes; it's about understanding how the patient is responding and working with the anesthetist to find what works best."
- Participant 9 (Anesthetist): "We may initiate the plan, but it's the nurses who carry it through. Their role is crucial in adjusting the plan based on how the patient responds."

Theme 2: Challenges in Effective Pain Management

While collaboration was emphasized, participants also discussed the challenges they face in managing pain in the PACU. These challenges were related to patient variability, communication barriers, and time constraints.

Sub-theme 2.1: Patient Variability and Unpredictable Pain Responses

A key challenge identified was the variability in patients 'responses to pain medications. Some patients require higher doses due to opioid tolerance, while others may experience adverse reactions, requiring constant adjustments to the pain management plan.

- Participant 2 (Anesthetist): "Some patients respond well to a standard dose, but others need more aggressive pain control, especially if they're opioid-tolerant. It's hard to predict, so we adjust as we go."
- Participant 6 (Nurse): "Patients vary so much in how they respond to pain meds. One patient might be comfortable with a low dose, while another needs much more. It's a challenge to keep up with those changes."

Sub-theme 2.2: Communication Barriers

Participants noted that despite the emphasis on collaboration, communication barriers sometimes arose, particularly during busy shifts or when there were delays in contacting the anesthetist for medication adjustments.

- Participant 4 (Nurse): "When it's busy, it's hard to get hold of the anesthetist right away, and that can delay pain relief for the patient. It's frustrating because we want to provide relief as soon as possible."
- Participant 8 (Anesthetist): "Sometimes there are misunderstandings about how quickly medications should be adjusted, especially during peak times when we're juggling multiple patients."

Sub-theme 2.3: Time Constraints and Workflow Pressures

Time constraints were another major challenge highlighted by participants, particularly for nurses who were responsible for multiple patients in the PACU. This often limited their ability to perform thorough pain assessments and communicate changes in pain levels promptly.

- Participant 1 (Nurse): "In the PACU, we're constantly juggling multiple patients, and sometimes pain assessments get delayed because we're managing other critical tasks."
- Participant 10 (Anesthetist): "The high patient volume means we have to make decisions quickly. Sometimes that means not being able to spend as much time as we'd like fine-tuning the pain management plan."

Theme 3: Strategies for Enhancing Pain Management and Collaboration

Participants provided insights into strategies they believed could enhance pain management practices and improve collaboration between anesthetists and nurses.

Sub-theme 3.1: Structured Communication Protocols

Both anesthetists and nurses suggested the implementation of structured communication protocols, such as regular interdisciplinary meetings or standardized handovers, to ensure that pain management strategies are communicated clearly and efficiently.

- Participant 6 (Nurse): "Having a set time to discuss each patient's pain management plan would help a lot. Right now, we communicate as needed, but having a structured process would improve things."
- Participant 11 (Anesthetist): "Interdisciplinary rounds or quick briefings would ensure we're all on the same page and that no pain management concerns slip through the cracks."

Sub-theme 3.2: Continuous Education and Training
Several participants emphasized the need for ongoing education and training for both anesthetists and nurses in pain management techniques, particularly in the use of multimodal analgesia and newer pain management technologies.

- Participant 12 (Anesthetist): "There's always new research coming out about pain management, and we need to stay on top of it. Regular training for both nurses and anesthetists could help us use the latest techniques more effectively."
- Participant 5 (Nurse): "Training on multimodal analgesia and how to assess pain more effectively would help us manage pain better and make adjustments sooner."

Sub-theme 3.3: Increasing Staffing and Reducing Workload
Many participants mentioned the importance of adequate staffing to reduce the workload on nurses and allow them more time to assess pain and collaborate with anesthetists effectively.

- Participant 4 (Nurse): "When we have enough staff, it's easier to focus on each patient's pain. But when we're understaffed, it's hard to give pain management the attention it needs."
- Participant 9 (Anesthetist): "Ensuring that nurses aren't overloaded with too many patients would help improve pain assessments and ensure patients get the relief they need."

Discussion
The findings from this study provide valuable insights into the collaborative efforts between anesthetists and nurses in managing postoperative pain in the Post-Anesthesia Care Unit (PACU). This discussion will interpret the findings in the context of existing literature, highlight practical implications, and suggest strategies for improving pain management and interdisciplinary collaboration.

Collaborative Pain Management in the PACU
The importance of collaboration between anesthetists and nurses in the PACU was consistently emphasized by participants. Both professions recognize that effective pain management is a shared responsibility, with each playing a critical role in ensuring timely and adequate pain relief for patients. This aligns with the existing literature, which highlights the necessity of interdisciplinary teamwork in managing complex clinical situations such as postoperative pain (Schug et al., 2016). Nurses, being on the front lines of patient care, provide continuous pain assessment, while anesthetists rely on this feedback to make informed decisions about adjustments to pain management plans (Herr et al., 2006).

The theme of communication was central to successful collaboration. Participants underscored the value of clear and consistent communication between anesthetists and nurses. This supports previous studies that identify communication as a cornerstone of effective pain management in the PACU (Meissner et al., 2018). Regular updates on patient status, pain levels, and the effectiveness of analgesic interventions allow for real-time adjustments, ensuring that patients receive personalized and responsive care. However, challenges such

as busy shifts and delays in contacting anesthetists, as noted by the participants, can hinder this process. These findings suggest that communication between healthcare professionals is not only essential but needs to be streamlined to meet the demands of a fast-paced PACU environment.

Challenges in Effective Pain Management
Participants identified several challenges in managing postoperative pain in the PACU, particularly in terms of patient variability and time constraints. The variability in patient responses to pain medications was frequently mentioned as a significant obstacle. Some patients, especially those with pre-existing opioid tolerance, require higher or more frequent doses to achieve adequate pain relief (Chou et al., 2016). This variability makes it difficult to predict the best pain management strategy in advance, leading to a more reactive approach where nurses and anesthetists must frequently reassess and adjust pain regimens. The literature supports this, noting that individual pain tolerance and opioid sensitivity can complicate postoperative pain management (Puntillo et al., 2014).

Time constraints and workflow pressures were also highlighted as barriers to effective pain management. Nurses, in particular, expressed concerns about balancing multiple responsibilities, often resulting in delays in assessing or addressing patients 'pain. This is consistent with findings from previous studies, which show that high patient volumes and the fast-paced nature of the PACU can lead to missed or delayed pain assessments (Schug et al., 2016). Anesthetists also acknowledged the pressure of managing several patients simultaneously, which can lead to delayed medication adjustments and suboptimal pain control. These time constraints underscore the need for more efficient systems and protocols to ensure timely and appropriate pain management.

Communication barriers, although not widespread, were identified as an issue in some cases, particularly when the PACU was understaffed or during high patient turnover. Effective pain management relies on prompt and clear communication between nurses and anesthetists to adjust analgesics in response to the patient's condition. The literature emphasizes that communication breakdowns in fast-paced environments like the PACU can lead to delays in providing pain relief, ultimately compromising patient comfort (Meissner et al., 2018).

Strategies for Enhancing Pain Management and Collaboration
Participants proposed several strategies to overcome the identified challenges, many of which focused on improving communication and collaboration between anesthetists and nurses. One of the most frequently suggested strategies was the implementation of structured communication protocols, such as regular interdisciplinary rounds or standardized handovers. Structured communication has been shown to improve patient outcomes in other areas of healthcare, as it ensures that all team members are aware of the current pain management plan and any recent changes (Garimella and Cellini, 2013). Implementing such protocols in the PACU could help reduce the communication gaps identified by participants, especially during busy shifts or high patient turnover periods.

Another key suggestion was the need for continuous education and training in pain management techniques. Both nurses and anesthetists highlighted the importance of staying up-to-date with the latest pain management strategies, including the use of multimodal analgesia, which has been shown to improve outcomes and reduce opioid use (Kehlet& Dahl, 2003). Regular training sessions focused on pain management best practices and new advancements in analgesic techniques could empower both nurses and anesthetists to provide more effective and individualized care.

Increasing staffing and reducing workload were also proposed as strategies to improve pain management in the PACU. Adequate staffing would allow nurses to spend more time assessing and managing each patient's pain, while also improving the overall flow of communication between nurses and anesthetists. This aligns with existing literature, which suggests that better nurse-to-patient ratios in critical care environments are associated with improved patient outcomes, including more timely interventions and better pain control (Herr et al., 2006).

Practical Implications
The findings from this study have several practical implications for healthcare providers and hospital administrators. First, ensuring that communication between anesthetists and nurses is consistent and effective is essential for optimal pain management. This may involve implementing structured communication tools such as checklists, standardized handovers, and regular interdisciplinary meetings. In doing so, healthcare teams can work more efficiently and avoid delays in pain management, particularly during busy shifts.

Second, hospitals should prioritize ongoing education and training for both anesthetists and nurses to ensure that they are well-versed in the latest pain management strategies. This training should emphasize the importance of multimodal analgesia, individualized pain management plans, and the recognition of opioid-related risks, which will lead to better pain control and fewer complications.

Finally, addressing staffing levels and workflow pressures in the PACU is critical for allowing nurses and anesthetists to collaborate more effectively. By ensuring that staff members have adequate time to assess patients and communicate with one another, healthcare facilities can improve the quality of postoperative care and reduce the risk of uncontrolled pain.

Limitations
This study has several limitations. First, the sample size was relatively small, with only 12 participants from a single tertiary hospital. While this allowed for in-depth interviews, a larger sample size and multiple hospital settings could provide a broader understanding of pain management challenges and strategies in different environments. Additionally, the study relied on self-reported data, which may be subject to recall bias or the influence of personal experiences.

Conclusion
In conclusion, this study highlights the importance of collaboration between anesthetists and nurses in managing postoperative pain in the PACU. Effective communication and shared responsibility were identified as critical factors in achieving optimal pain control, although challenges such as patient variability, time constraints, and communication barriers remain. Implementing structured communication protocols, providing continuous education, and addressing staffing levels are key strategies for enhancing pain management in the PACU. By fostering stronger collaboration between anesthetists and nurses, healthcare facilities can improve patient outcomes and ensure that postoperative pain is managed effectively and efficiently.

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