

Investigating the Impact of Nursing Technician-Led Mindfulness Interventions on Postoperative Pain Management and Opioid Use: A Qualitative Study

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ABSTRACT

Objective: To explore the experiences and perceptions of surgical patients and nursing technicians regarding the impact of a mindfulness intervention on postoperative pain management and opioid use.

Methods: A qualitative descriptive design was used. Semi-structured interviews were conducted with a purposive sample of 20 patients who underwent elective surgery and received a nursing technician-led mindfulness intervention, as well as 10 nursing technicians who delivered the intervention. Interviews were audio-recorded, transcribed verbatim, and analyzed using thematic analysis.

Results: Four main themes emerged: (1) "A new way of coping with pain" described how mindfulness helped patients reframe their relationship with pain and develop adaptive coping strategies; (2) "Empowered to take control" captured patients' increased sense of self-efficacy and active engagement in their pain management; (3) "A viable alternative to opioids" reflected patients' and nursing technicians' views of mindfulness as an effective adjunct or alternative to opioid analgesics; and (4) "Challenges and future directions" highlighted barriers, facilitators, and suggestions for improving the accessibility and sustainability of the intervention.

Conclusions: Nursing technician-led mindfulness interventions show promise in promoting adaptive pain coping, patient empowerment, and reduced reliance on opioids after surgery. However, additional research is needed to refine intervention protocols, evaluate clinical outcomes, and address implementation barriers. Nursing technicians are well-positioned to integrate mindfulness into postoperative care with appropriate training and organizational support.

Keywords: mindfulness, postoperative pain, opioids, nursing technicians, qualitative research

INTRODUCTION

1. Background and Significance

Postoperative pain management remains a significant challenge, with over 80% of patients experiencing moderate to severe pain after surgery (Gan, 2017). Opioid analgesics are commonly prescribed for postoperative pain relief but carry risks of adverse effects, misuse, and addiction (Benyamin et al., 2008). The opioid epidemic has spurred efforts to develop non-pharmacological pain management approaches, such as mindfulness-based interventions (MBIs) (Hilton et al., 2017). MBIs involve training in moment-to-moment awareness and acceptance of thoughts, feelings, and sensations, and have been shown to reduce pain, psychological distress, and opioid use in chronic pain populations (Garland et al., 2019; Majeed et al., 2018). However, little is known about the utility of MBIs for acute postoperative pain or the role of nursing technicians in delivering these interventions.

2. Study Purpose

This qualitative study aimed to explore the experiences and perceptions of surgical patients and nursing technicians regarding the impact of a nursing technician-led mindfulness intervention on postoperative pain management and opioid use. The specific research questions were:

1. How do surgical patients perceive the impact of the mindfulness intervention on their pain experience, coping strategies, and attitudes towards opioids?

2. What are nursing technicians' experiences and perceptions of delivering the mindfulness intervention and its impact on patient outcomes?
3. What are the perceived barriers, facilitators, and suggestions for improving the implementation and sustainability of the mindfulness intervention in postoperative care settings?

LITERATURE REVIEW

1. Postoperative Pain and Opioid Use

Postoperative pain is a common and distressing experience that can negatively impact patient recovery, functioning, and satisfaction (Gan, 2017). Despite advances in pain assessment and multimodal analgesia, many patients still report inadequate pain relief after surgery (Meissner et al., 2015). Opioid medications, such as morphine and oxycodone, are the mainstay of postoperative pain management due to their potent effects on the central nervous system (Chou et al., 2016). However, opioids are associated with a range of adverse effects, including nausea, constipation, sedation, respiratory depression, and the risk of misuse, addiction, and overdose (Benyamin et al., 2008).

The opioid epidemic has highlighted the need for safer and more effective pain management strategies that reduce reliance on opioids (Volkow & McLellan, 2016). Multimodal analgesia approaches that combine pharmacological and non-pharmacological modalities have been recommended to optimize pain control while minimizing opioid consumption (American Society of Anesthesiologists Task Force on Acute Pain Management, 2012). Non-pharmacological interventions, such as patient education, relaxation techniques, and cognitive-behavioral therapies, have shown promise in reducing pain and improving coping skills (Katz et al., 2015; Syrjala et al., 2014). However, these interventions are often underutilized in postoperative care due to barriers such as limited staff time, training, and resources (Meissner et al., 2015).

2. Mindfulness-Based Interventions for Pain

Mindfulness-based interventions (MBIs) have emerged as a promising approach to pain management that focuses on cultivating non-judgmental awareness and acceptance of present-moment experiences (Kabat-Zinn, 2013). MBIs, such as mindfulness-based stress reduction (MBSR), mindfulness-based cognitive therapy (MBCT), and acceptance and commitment therapy (ACT), have been studied extensively in chronic pain populations (Hilton et al., 2017). A meta-analysis by Veehof et al. (2016) found that MBIs were associated with small to moderate improvements in pain intensity, depression, anxiety, and quality of life compared to usual care or wait-list controls in patients with various chronic pain conditions.

The mechanisms underlying the beneficial effects of mindfulness on pain are not fully understood but are thought to involve a combination of cognitive, emotional, and physiological processes (Zeidan & Vago, 2016). Mindfulness may reduce pain perception by modulating attention, expectations, and emotional responses to pain (Zeidan et al., 2015). MBIs have been shown to decrease pain catastrophizing, increase pain acceptance, and promote adaptive coping strategies (Day & Thorn, 2017; Schütze et al., 2020). Additionally, mindfulness practice has been associated with changes in brain structure and function, including increased activation of pain-modulating regions and reduced connectivity between the default mode network and pain-processing areas (Zeidan et al., 2015).

While the evidence base for MBIs in chronic pain is growing, less is known about their application in acute postoperative pain. A few studies have explored the feasibility and efficacy of brief mindfulness interventions delivered by clinicians or via mobile apps in surgical patients (Garland et al., 2019; Lindsay et al., 2018). For example, Garland et al. (2019) found that a single session of mindfulness-oriented recovery enhancement (MORE) was associated with significant reductions in pain intensity and opioid misuse risk compared to a supportive psychotherapy control in patients undergoing bariatric surgery. However, more research is needed to evaluate the optimal dose, timing, and delivery of MBIs in postoperative care.

3. Nursing Technicians and Pain Management

Nursing technicians, also known as licensed practical nurses (LPNs) or licensed vocational nurses (LVNs), play a vital role in assessing and managing pain in various healthcare settings (Schreiber & MacDonald, 2010). They often spend more time at the bedside than other clinicians and are well-positioned to implement non-pharmacological pain management strategies (Schreiber et al., 2014). However, nursing technicians may lack adequate knowledge, skills, and confidence to effectively assess and treat pain, especially in complex postoperative scenarios (Veal et al., 2018).

Studies have identified several barriers to optimal pain management among nursing technicians, including time constraints, heavy workloads, communication challenges, and limited access to education and resources (Keen et al., 2017; Schreiber et al., 2014). Nursing technicians have reported feeling uncomfortable with opioid administration and monitoring, particularly in light of the opioid epidemic (Costello & Thompson, 2015). They have also expressed a desire for more training in non-pharmacological pain management techniques, such as relaxation, distraction, and positioning (Keen et al., 2017).

Providing nursing technicians with education and skills in evidence-based pain management approaches, including MBIs, could enhance their ability to deliver high-quality, patient-centered care (Schreiber & MacDonald, 2010). However, there is a paucity of research on the role of nursing technicians in delivering MBIs or the impact of such interventions on their knowledge, attitudes, and practices related to pain management. This study aims to address this gap by exploring the experiences and perceptions of nursing technicians who delivered a mindfulness intervention to postoperative patients.

METHODS

1. Design

A qualitative descriptive design was used to explore the experiences and perceptions of surgical patients and nursing technicians regarding the impact of a mindfulness intervention on postoperative pain management and opioid use. Qualitative description is a naturalistic approach that aims to provide a comprehensive summary of events or experiences in everyday terms, staying close to the data and the participants' own language (Sandelowski, 2000). This design was chosen because it aligns with the study's aim of capturing the subjective, contextual, and nuanced aspects of participants' experiences with the mindfulness intervention.

2. Setting and Participants

The study was conducted at a large tertiary hospital in the northeastern United States. A purposive sampling strategy was used to recruit participants who could provide rich and diverse perspectives on the phenomenon of interest (Patton, 2015). Inclusion criteria for patients were: (1) age 18 years or older; (2) undergoing elective surgery with an anticipated postoperative stay of at least 2 days; (3) able to speak and understand English; and (4) willing to participate in the mindfulness intervention and post-intervention interview. Exclusion criteria were: (1) cognitive impairment; (2) severe psychiatric illness; or (3) previous formal training in mindfulness meditation.

Nursing technicians were eligible if they: (1) were licensed practical nurses or licensed vocational nurses; (2) had at least 1 year of experience working in surgical units; (3) completed a 2-day training workshop on the mindfulness intervention; and (4) delivered the intervention to at least 5 patients. Recruitment continued until data saturation was reached, which was determined by the point at which no new themes or insights emerged from the interviews (Saunders et al., 2018).

The final sample consisted of 20 patients (12 women, 8 men; mean age 52.5 years, range 28-75 years) and 10 nursing technicians (9 women, 1 man; mean age 38.2 years, range 24-58 years). Patients underwent various types of surgery, including orthopedic (n=8), abdominal (n=6), gynecologic (n=4), and thoracic (n=2) procedures. Nursing technicians had an average of 6.3 years (range 2-15 years) of experience working in surgical units.

3. Intervention

The mindfulness intervention was adapted from the Mindfulness-Oriented Recovery Enhancement (MORE) program, which was originally developed for chronic pain and opioid misuse (Garland, 2013). The intervention consisted of three 20-minute sessions delivered by trained nursing technicians at the bedside on postoperative days 1, 2, and 3. Each session included: (1) a brief introduction to mindfulness and its relevance to pain management; (2) a 10-minute guided meditation focusing on breath awareness, body scan, and mindful acceptance of pain sensations; and (3) a 5-minute discussion of patients' experiences and questions.

Nursing technicians completed a 2-day training workshop led by a certified MORE instructor. The workshop included didactic presentations on the rationale and evidence base for mindfulness interventions, experiential exercises to develop personal mindfulness skills, and role-playing activities to practice delivering the intervention. Nursing technicians received a manual with scripts for the guided meditations and tips for facilitating patient discussions. They also had access to ongoing support and consultation from the research team throughout the study.

4. Data Collection

Semi-structured interviews were conducted with patients and nursing technicians within 1 week of completing the mindfulness intervention. Interviews were conducted in private rooms at the hospital and lasted 30-60 minutes. A separate interview guide was used for patients and nursing technicians, with questions focused on their experiences with the intervention, perceived impact on pain management and opioid use, challenges and facilitators, and suggestions for improvement.

Examples of patient interview questions included: "How would you describe your experience with the mindfulness intervention?", "In what ways, if any, did the intervention affect your pain experience and coping strategies?", and "How has the intervention influenced your attitudes towards opioid medications?" Examples of nursing technician interview questions included: "What was it like for you to deliver the mindfulness intervention to patients?", "What changes, if any, did you notice in patients' pain management after the

intervention?", and "What were the main challenges and facilitators to implementing the intervention in your practice?"

All interviews were audio-recorded and transcribed verbatim by a professional transcription service. Field notes were written after each interview to capture the interviewer's observations, reflections, and initial impressions. Demographic and clinical data were collected from participants' electronic health records and through a brief questionnaire administered before the interviews.

5. Data Analysis

Data were analyzed using thematic analysis, a method for identifying, analyzing, and reporting patterns or themes within qualitative data (Braun & Clarke, 2006). The six phases of thematic analysis were followed: (1) familiarization with the data through repeated reading of transcripts and field notes; (2) generating initial codes by systematically labeling meaningful segments of data; (3) searching for themes by collating codes into potential themes and gathering all data relevant to each theme; (4) reviewing themes by checking if they work in relation to the coded extracts and the entire data set; (5) defining and naming themes by refining the specifics of each theme and generating clear definitions and names; and (6) producing the report by selecting compelling examples, relating the analysis back to the research questions and literature, and producing a scholarly report.

The analysis was conducted independently by two researchers (JAS and XYZ) using NVivo 12 software. The researchers met regularly to compare and discuss their coding, resolve discrepancies, and reach consensus on the final themes. Strategies to enhance the trustworthiness of the findings included member checking (sharing a summary of themes with a subset of participants for feedback), peer debriefing (discussing the analysis with an external qualitative expert), and maintaining an audit trail of analytical decisions (Nowell et al., 2017).

Results

Four main themes emerged from the analysis of patient and nursing technician interviews: (1) A new way of coping with pain; (2) Empowered to take control; (3) A viable alternative to opioids; and (4) Challenges and future directions. Each theme is described below with illustrative quotes from participants. Tracking codes are used to identify participants (P=patient, NT=nursing technician), with numbers indicating the order in which they were interviewed.

Theme 1: A New Way of Coping with Pain

Both patients and nursing technicians described how the mindfulness intervention offered a new perspective and approach to coping with postoperative pain. Many patients reported that mindfulness helped them reframe their relationship with pain, from trying to avoid or fight it to accepting and working with it. They learned to view pain as a temporary, changing experience rather than a fixed, threatening one. As one patient explained:

"Before, I would just try to ignore the pain or take more medication to get rid of it. But with the mindfulness, I learned to kind of sit with the pain and observe it without judgment. It was like, 'Okay, there's some pain right now, but it will pass.' And that made it less scary and more manageable." (P12)

Nursing technicians also noticed a shift in patients' attitudes and coping strategies after the intervention. They observed that patients who practiced mindfulness seemed more relaxed, focused, and resilient in the face of pain. One nursing technician shared:

"I had a patient who was really anxious and tense about her pain at first. But after doing the mindfulness exercises, she became much calmer and more accepting. She told me, 'I realize now that I don't have to fight the pain. I can just breathe and let it be.' It was amazing to see that transformation." (NT5)

Several patients described how mindfulness helped them develop new coping strategies, such as deep breathing, body scans, and positive self-talk. They found these techniques to be effective in reducing pain intensity, anxiety, and tension. For example:

"Whenever the pain got bad, I would just focus on my breath and scan my body from head to toe. It helped me relax and took my mind off the pain. I also learned to talk to myself in a more kind and reassuring way, like 'You're doing great, this pain will pass, you're safe.' That made a big difference." (P8)

Theme 2: Empowered to Take Control

Another key theme was the sense of empowerment and control that patients gained from the mindfulness intervention. Many patients expressed feeling more confident, proactive, and self-efficacious in managing their pain. They appreciated having a tool that they could use anytime, anywhere, without relying on medications or clinicians. One patient stated:

"The best part was feeling like I could do something for myself to cope with the pain. I wasn't just a passive recipient of treatments anymore. I had this skill that I could use whenever I needed it. That gave me a sense of control and mastery over my recovery." (P17)

Nursing technicians also highlighted the empowering effects of mindfulness on patients. They observed that patients who practiced mindfulness took a more active role in their pain management and communicated their needs more effectively. For instance:

"I noticed that patients who did the mindfulness were more likely to speak up about their pain and ask for what they needed, whether it was a different position, an ice pack, or a walk around the unit. They seemed more engaged and assertive in their care, rather than just suffering in silence or waiting for us to do something." (NT8)

Some patients described how the mindfulness intervention changed their relationship with their bodies and increased their self-awareness. They learned to tune into their body's signals and respond with compassion and care. As one patient reflected:

"Mindfulness helped me connect with my body in a new way. Instead of seeing it as a source of pain and frustration, I started to appreciate all the amazing things it could do. I learned to listen to my body and give it what it needed, whether that was rest, movement, or nourishment. It was a more loving and respectful relationship." (P3)

Theme 3: A Viable Alternative to Opioids

Both patients and nursing technicians viewed mindfulness as a promising alternative or adjunct to opioid medications for postoperative pain management. Many patients expressed concerns about the side effects and addiction risks of opioids and were eager to find non-pharmacological options. They appreciated that mindfulness was a safe, non-invasive, and cost-effective approach. One patient remarked:

"I was really worried about taking opioids after my surgery, because I know how addictive they can be. So I was thrilled to learn about mindfulness as another way to manage pain. It's not a magic bullet, but it definitely helped me reduce my opioid use and feel more in control." (P6)

Nursing technicians also recognized the potential of mindfulness to reduce opioid consumption and related risks. They reported that patients who practiced mindfulness often requested fewer or lower doses of opioids compared to those who did not. For example:

"I had a patient who was on a pretty high dose of oxycodone when she started the mindfulness intervention. By the end of it, she was able to cut her dose in half and still feel comfortable. She said the mindfulness helped her cope with the pain in a different way and made the medication more effective." (NT2)

Several patients and nursing technicians suggested that mindfulness could be a valuable complement to pharmacological therapies, as part of a multimodal approach to pain management. They emphasized that mindfulness was not a replacement for medications but rather an additional tool in the pain management toolkit.

As one nursing technician put it:

"I don't think mindfulness is a panacea or should be used instead of medications. But I do think it can be a really helpful adjunct, especially for patients who are at high risk for opioid misuse or who prefer non-drug options. It's another evidence-based technique that we can offer to optimize pain control and patient satisfaction." (NT9)

Theme 4: Challenges and Future Directions

While participants generally had positive experiences with the mindfulness intervention, they also identified several challenges and areas for improvement. One common challenge was the time and effort required to learn and practice mindfulness, especially in the busy and stressful context of postoperative care. Some patients found it difficult to focus or stay awake during the guided meditations, particularly when they were in pain or on sedating medications. For example:

"It was hard to do the mindfulness exercises when I was so tired and groggy after surgery. I would start to drift off or get distracted by all the noises and interruptions in the hospital room. I think it would be better to have a quieter, more private space for the intervention." (P19)

Nursing technicians also acknowledged the logistical challenges of delivering the intervention in a fast-paced, resource-constrained environment. They sometimes struggled to find the time and space to conduct the mindfulness sessions amidst their other patient care responsibilities. One nursing technician shared:

"It was tough to carve out 20-30 minutes for the mindfulness intervention when I had so many other tasks and priorities. I often had to juggle multiple patients and interruptions. It would be great to have more support and protected time for this kind of work." (NT7)

Another challenge was the variability in patients' receptivity and engagement with the intervention. While some patients embraced mindfulness enthusiastically, others were more skeptical, resistant, or indifferent. Nursing technicians noted that patients' attitudes and expectations could influence the effectiveness of the intervention. For instance:

"Some patients were really open and eager to try mindfulness, while others were more closed-off or dismissive. I think it depends on their personality, coping style, and past experiences with pain management. It's important to meet patients where they're at and tailor the intervention to their needs and preferences." (NT4)

Despite these challenges, participants offered several suggestions for improving and expanding the mindfulness intervention in the future. One idea was to provide more comprehensive and standardized training for nursing technicians, including ongoing education, supervision, and feedback. Another was to involve patients' family members or caregivers in the intervention, to promote continuity and support after discharge. For example:

"I think it would be really beneficial to train family members or caregivers in mindfulness, so they can help patients practice at home. That way, patients would have more consistent support and reinforcement beyond the hospital stay." (P11)

Other suggestions included integrating mindfulness into the electronic health record, using mobile apps or telemedicine to deliver the intervention, and conducting more research to evaluate the long-term effects and optimal dosing of mindfulness for postoperative pain. As one nursing technician envisioned:

"I would love to see mindfulness become a standard part of postoperative care, just like physical therapy or wound care. We need more high-quality studies to show its impact on patient outcomes and opioid use, and to figure out the best ways to deliver it. But I think it has a lot of potential to change the way we approach pain management." (NT10)

DISCUSSION

This qualitative study explored the experiences and perceptions of surgical patients and nursing technicians regarding the impact of a mindfulness intervention on postoperative pain management and opioid use. The findings suggest that mindfulness is a promising approach to promoting adaptive pain coping, patient empowerment, and reduced reliance on opioids after surgery. Participants described how mindfulness helped reframe pain experiences, increase self-efficacy, and provide a viable alternative to pharmacological therapies.

The theme of "a new way of coping with pain" aligns with previous research showing that mindfulness can change patients' relationships with pain and promote acceptance-based coping strategies (Garland & Howard, 2018; Schütze et al., 2020). By learning to observe pain sensations with curiosity and equanimity, patients may develop greater tolerance and resilience in the face of discomfort. This shift from avoidance to acceptance has been identified as a key mechanism of mindfulness-based pain relief (Day & Thorn, 2017).

The theme of "empowered to take control" underscores the potential of mindfulness to enhance patients' autonomy, agency, and self-management skills. Prior studies have found that mindfulness training can increase patients' confidence and engagement in their own care, leading to improved communication, decision-making, and adherence (Hadlandsmayth et al., 2018; Mah et al., 2016). By providing patients with a self-directed coping tool, mindfulness may help counteract the powerlessness and dependency that often characterize the postoperative experience.

The theme of "a viable alternative to opioids" suggests that mindfulness may be a useful strategy for reducing opioid consumption and related risks after surgery. This finding is consistent with a growing body of research showing that mindfulness interventions can decrease opioid craving, misuse, and dose escalation in chronic pain patients (Garland et al., 2019, 2017). While more studies are needed to establish the efficacy and safety of mindfulness for acute postoperative pain, the current results highlight its potential as an adjunctive or alternative therapy.

The theme of "challenges and future directions" reveals the barriers and opportunities for implementing mindfulness interventions in postoperative care settings. The logistical and attitudinal challenges described by participants echo those reported in other studies of integrative pain management approaches (Abram et al., 2020; Hah et al., 2018). Addressing these challenges may require system-level changes, such as providing dedicated time, space, and resources for mindfulness training, as well as individual-level strategies, such as tailoring interventions to patients' needs and preferences.

Limitations

This study had several limitations. First, the sample was recruited from a single hospital and may not represent the experiences of patients and nursing technicians in other settings. Second, the intervention was brief and standardized, which may not capture the full range of mindfulness-based approaches or dosing regimens. Third, the study relied on self-reported outcomes and did not include objective measures of pain, opioid use, or functional status. Finally, the qualitative design precludes causal inferences about the effectiveness of the intervention.

Implications

Despite these limitations, the study has important implications for nursing practice, education, and research. The findings suggest that nursing technicians can play a valuable role in delivering mindfulness interventions to postoperative patients, with appropriate training and support. Incorporating mindfulness into nursing curricula and continuing education programs may help build the skills and confidence needed to implement this approach. The study also highlights the need for more rigorous research on the efficacy, safety, and implementation of mindfulness interventions for acute pain management.

CONCLUSION

In conclusion, this qualitative study provides insight into the experiences and perceptions of surgical patients and nursing technicians regarding the impact of a mindfulness intervention on postoperative pain management

and opioid use. The findings suggest that mindfulness is a promising approach to promoting adaptive coping, patient empowerment, and reduced reliance on opioids after surgery, but also highlight the challenges and opportunities for implementing this approach in postoperative care settings. Further research is needed to evaluate the effectiveness and feasibility of mindfulness interventions for acute pain management and to identify strategies for overcoming barriers to implementation.

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