



ROLE OF EVIDENCE-BASED PRACTICE IN POSTOPERATIVE PAIN MANAGEMENT: A HOSPITAL-BASED OBSERVATIONAL STUDY

Clinical Research

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ABSTRACT

Postoperative pain management is a vital component of patient care that significantly influences the speed and quality of recovery, functional outcomes, and overall patient satisfaction. Effective pain control not only reduces physiological stress but also minimizes the risk of complications such as delayed healing, chronic pain, and prolonged hospital stays. Evidence-Based Practice (EBP) plays a central role in improving pain management by combining the best available research evidence with clinical expertise and individual patient preferences. This study investigates various pharmacological methods such as opioids, NSAIDs, and local anesthetics, along with non-pharmacological approaches like guided imagery, breathing exercises, and physical therapy. It emphasizes the crucial role of nurses in the assessment, documentation, and management of postoperative pain. Standardized pain assessment tools-such as the Visual Analog Scale (VAS), Numeric Rating Scale (NRS), and FLACC-are highlighted for their role in guiding treatment decisions. Additionally, the study explores existing barriers such as lack of training, resource limitations, and institutional challenges, and underscores the need for ongoing education, policy revision, and interprofessional collaboration to enhance pain management outcomes.

KEYWORDS

Evidence-Based Practice, Postoperative pain management, Pharmacological

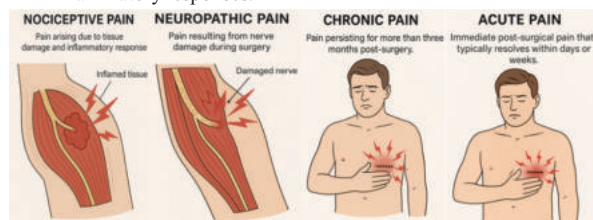
INTRODUCTION

Postoperative pain is one of the most common challenges affecting patients' recovery, mobility, and overall health. Effective pain management reduces complications, enhances patient satisfaction, and accelerates healing. Traditional pain management strategies often rely on opioids, but growing concerns over addiction and side effects have led to the adoption of multimodal analgesia and non-pharmacological interventions. Evidence-Based Practice (EBP) plays a critical role in ensuring that pain management techniques are scientifically validated, safe, and patient-centered. This review explores the latest research on postoperative pain management, emphasizing the significance of EBP.

Understanding Postoperative Pain

Postoperative pain varies depending on the type of surgery, patient-specific factors, and individual pain tolerance. It is categorized into: (figure:1)

- Acute Pain:** Immediate post-surgical pain that typically resolves within days or weeks.
- Chronic Pain:** Pain persisting for more than three months post-surgery.
- Neuropathic Pain:** Pain resulting from nerve damage during surgery.
- Noiceptive Pain:** Pain arising due to tissue damage and inflammatory responses.



Pain Assessment Tools

1. Visual Analog Scale (VAS)

The Visual Analog Scale (VAS) measures subjective conditions like pain, mood, or anxiety. It is a 10-centimeter line with endpoints marked as extremes (e.g., "No pain" to "Worst imaginable pain"). Patients mark their present condition on the line, and the distance from "no sensation" to their mark is measured in millimeters, providing a numerical intensity value. VAS is simple, sensitive, and convenient for evaluating treatment effect or symptom magnitude in clinic and research settings^[1].

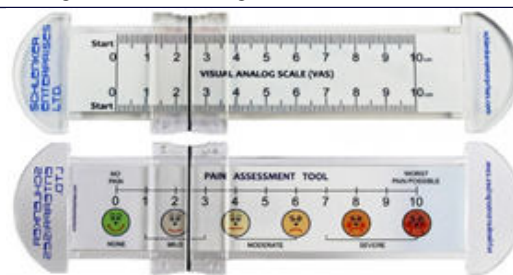


Figure: 2 Visual Analog Scale

2. Numeric Rating Scale (NRS)

One of the simplest and most widely used measures of pain severity is the Numeric Rating Scale (NRS). The NRS typically is a 0 to 10 scale, ranging from "no pain" to "worst possible pain." The patient is asked to select the number that best represents his or her pain at a specific time. The NRS is especially useful in clinical practice because it is simple to administer, can be completed rapidly, and can be used to assess changes in pain over time. It is appropriate for adult and child patients who are able to understand and use numerical concepts^[2].

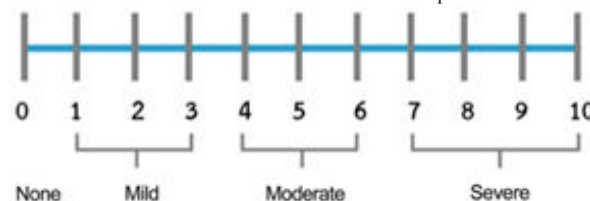


Figure: 3 Numeric Rating Scale

3. McGill Pain Questionnaire

The McGill Pain Questionnaire (MPQ) is a dimensional and multidimensional assessment of the quality and intensity of pain. It consists of descriptive word categories that are separated into sensory, affective, and evaluative parts, thus allowing patients to describe their pain experience more accurately. Patients choose words from each category that best describe their pain, leading to a true picture of the nature of pain suffered. MPQ is of great use in clinical research and the treatment of chronic pain, yielding more information than with mere numerical or visual scales^[3].

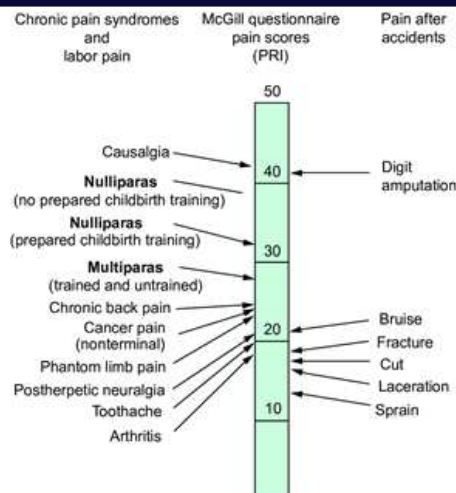


Figure: 4 McGill Pain Questionnaire

4. Brief Pain Inventory (BPI)

The Brief Pain Inventory (BPI) is one of the most commonly used pain measures, particularly in cancer and other chronic pain syndromes. The BPI is a self-report questionnaire that measures both the severity of pain and the impact of pain on functioning. The questions on the BPI typically include pain severity at worst, least, average, and now, as well as how much pain interferes with activities like mood, walking, work, and relationships.

5. FLACC Scale (for non-verbal patients)

The FLACC Scale, or Face, Legs, Activity, Cry, and Consolability, is a behaviour pain scale designed to measure pain only in non-verbal or preverbal patients, such as infants, young children, and cognitively impaired patients. The five categories—Face, Legs, Activity, Cry, and Consolability—are each rated from 0 to 2, resulting in a total score from 0 to 10. The total score reflects the degree of discomfort or pain of the patient. The FLACC Scale allows healthcare workers to effectively quantify and manage pain in patient populations that cannot articulate pain verbally, thus making it a very useful tool in pediatric and critical care.

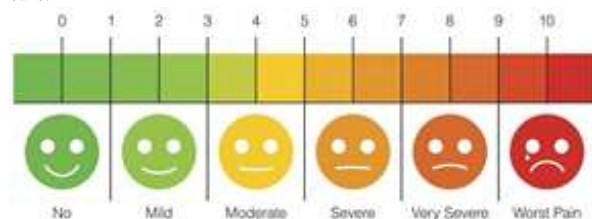


Figure: 5 FLACC Scale (for non-verbal patients)

6. Cries Scale

The CRIES Scale is a pain assessment instrument specifically for neonates (newborns) aged 0 to 6 months, especially NICU neonates. It assesses five behavioral and physiologic measures of pain: Crying, needs oxygen for saturation of more than 95%, Increased vital signs (heart rate and blood pressure), Expression (facial behavior such as grimacing), and Sleeplessness. Each of the five items is rated 0 to 2, and the total rating is 0 to 10. The rating is higher, the greater the pain. The scale is useful for health professionals to assess and manage pain in infants too young to communicate for themselves, so it is a useful instrument in neonatal care^[4].

	0	1	2
Crying	None	High-pitched	Inconsolable
Requires O ₂	None	<30% FIO ₂ needed	>30% FIO ₂ needed
Increased vital signs	Normal HR & BP	Increased HR & BP	Increased HR & BP
Expression	Normal	Grimace	Grimace & grunt
Sleeplessness	None	Wakes frequently	Awake constantly

Figure: 6 Cries Scale

7. Wong-Baker FACES Pain Rating Scale

Wong-Baker FACES Pain Rating Scale is a picture scale that employs cartoon faces to derive self-report of the patient's pain intensity, with particular utility for children. The scale is a continuum scale from 0 to 10, and the faces used each denote varying levels of pain. The scale is especially convenient for those patients who have difficulty expressing their pain experience or for patients who are not readily able to comprehend scales that are presented in the form of numbers^[5].



Figure: 7 Wong-Baker FACES Pain Rating Scale

8. Painad scale (pain assessment in advanced dementia)

The PAINAD (Pain Assessment in Advanced Dementia) scale is a tool to assess pain in those with advanced dementia who cannot verbally report pain. It concentrates on five specific behaviors: breathing, negative vocalizations, facial expression, body language, and Consolability. Each behaviour is assessed and scored as a 0, 1, or 2, which can then be totaled for an overall score between 0 to 10, in which 0 indicates no pain and 10 indicates extreme pain.

	0	1	2	Score
Breathing	Normal	Occasional labored breathing. Short period of hyperventilation	Noisy labored breathing. Long period of hyperventilation. Cheyne-stokes respirations	
Negative Vocalization	None	Occasional moan or groan. Low level speech with a negative or disapproving quality	Repeated troubled calling out. Loud moaning or groaning. Crying	
Facial expression	Smiling, or inexpressive	Sad. Frightened. Frown	Facial grimacing	
Body Language	Relaxed	Tense. Distressed pacing. Fidgeting	Rigid. Fists clenched. Knees pulled up. Pulling or pushing away. Striking out	
Consolability	No need to console	Distracted or reassured by voice or touch	Unable to console, distract or reassure	
				TOTAL

Figure: 8 Painad scale (pain assessment in advanced dementia)

Evidence-Based Pain Management Strategies

Evidence-based pain management (EBPM) is a practice in which the best treatment is delivered to the patient by integrating the patient's preferences, the provider's expertise, and high quality and rigor of scientific evidence. EBPM combines both pharmacological and non-pharmacological approaches and has a multidimensional approach to pain management and pain treatment (Troutman et al., 2016). The pharmacological strategies include: acetaminophen, non-steroidal anti-inflammatory drugs (NSAIDs), cautious use of opioids as indicated, antidepressants and anticonvulsants for neuropathic pain, local anesthetics. The non-pharmacological strategies include: cognitive-behavioral therapy (CBT), physical therapy, acupuncture, transcutaneous electrical nerve stimulation (TENS), mindfulness-based stress reduction (MBSR) and relaxation^[6].

Pharmacological Interventions

Pharmacological interventions refer to the use of medications to relieve or manage symptoms of a disease or condition, such as pain, inflammation, or infection.

- Opioids:** Morphine, Fentanyl, and Oxycodone (used cautiously due to addiction risks)
- Non-opioid analgesics:** Paracetamol (acetaminophen), NSAIDs (e.g., ibuprofen, diclofenac). For mild to moderate pain and inflammation.
- NSAIDs:** Ibuprofen, Diclofenac, and Ketorolac (effective for mild to moderate pain)
- Local Anesthetics:** Lidocaine and Bupivacaine (used in nerve blocks and epidurals)
- Adjuvant Medications:** Anticonvulsants (Gabapentin) and Antidepressants (Amitriptyline) for neuropathic pain.

Non-Pharmacological Interventions

Non-pharmacological interventions refer to therapeutic approaches that do not involve the use of medications, aimed at managing pain, stress, or other symptoms. These strategies include physical methods like physical therapy, massage, heat/cold application, and exercise.

1. **Cognitive Behavioral Therapy (CBT):** Helps reduce pain perception and anxiety.
2. **Music Therapy & Relaxation Techniques:** Enhances psychological well-being.
3. **Acupuncture & Massage Therapy:** Aids in reducing inflammation and muscle tension.
4. **Early Mobilization & Physiotherapy:** Prevents stiffness and improves circulation.
5. **Patient Education & Counselling:** Enhances adherence to pain management strategies.
6. **Mindfulness-Based Stress Reduction (MBSR):** Combines meditation and awareness.
7. **Guided Imagery & Deep Breathing:** Encourages patients to visualize calming scenes and focus on controlled breathing, which can relax the body and distract from pain.
8. **Transcutaneous Electrical Nerve Stimulation (TENS):** Delivers mild electrical impulses through the skin to block pain signals and promote comfort without medication.
9. **Aromatherapy:** Uses soothing essential oils like lavender or peppermint to promote emotional balance and reduce postoperative anxiety.
10. **Support Groups & Peer Interaction:** Connecting with others facing similar recovery journeys can provide emotional support, reduce feelings of isolation, and promote healing^[7].

Multimodal Analgesia Approach

A combination of pharmacological and non-pharmacological methods provides better pain relief and reduces side effects.

Role Of Nurses In Evidence-based Pain Management

Nurses contribute an important role in evidence-based pain management by properly assessing pain levels, developing individual care plans, advocating for patients, communicating with other health professionals, and documenting outcomes. This includes using reliable and valid pain assessment tools, modifying strategies for individual needs, educating patients on approaches to pain management, and employing strategies that bring care together across disciplines. It is also necessary to produce thorough documentation and continuity of care through assessing the effectiveness of pain management plans.

1. **Accurate Assessment of Pain:** Nurses are accountable for the assessment of pain on a regular and systematic basis using valid and reliable tools to measure pain, (e.g., Numeric Rating Scale (NRS), Visual Analog Scale (VAS), Wong-Baker FACES scale). Accurate pain assessment enhances understanding of pain in terms of its intensity, quality, and overall impact on the patient, which is necessary in the identification of proper for interventions.
2. **Individualized Care Plans:** Given that pain will be experienced differently by each individual, nurses create individualized care plans based on patients' particular circumstances, clinical presentation, medical history, and their previous response to interventions. Individualized care plans promote the most beneficial pain management methods with patient-focused care.
3. **Patient Advocate And Educator:** Nurses are the patient's voice by advocating for their needs and wants in clinical decisions. Nurses educate patients and families on the pain management options available based on the needs of the patients; as well as on pharmacological and non-pharmacological options to actively engage patients in their care.
4. **Interprofessional Collaboration:** Effective pain management needs to be a team effort. Pain management requires nurses to work with physicians, physiotherapists, psychologists, and other health care professionals to complete a defined pain management plan. Working collaboratively in this manner addresses the complex issue of pain.
5. **Documentation And Outcome Evaluation:** Nurses have the responsibility to consistently document evaluations of pain, interventions and the patients' responses. Nurses are responsible for evaluating the ongoing use of pain management methods as time goes on and making the required plan modification(s) to optimal patient outcomes and continuity of care^[8].

Challenges in Implementing Evidence-Based Practice

Nursing has various challenges to implementing Evidence-Based Practice (EBP) that limits its effectiveness and implementation into daily clinical practice. The barriers to EBP implementation ranged from knowledge and training, time, organizational structural barriers, and patient issues.

1. **Limited Knowledge & Training:** The main reason nurse is unable to implement EBP include limited knowledge or training. As previously stated, some nurses have never taken an EBP class. EBP involves more critical thinking than nurses are commonly used to. Nurses must learn from research that will allow them to apply to their clinical practice. There needs to be steps to educate the nurses regarding method used to make it more feasible for them and their patients care. Another example of a problem would be the lack of inclusion of an EBP course in nursing program curricula and the lack of continuing education that involves EBP. Next, a hurdle for nurses will be limiting the fear of or feelings of inadequacy concerning their ability to learn and implement EBP into their current practice. So, the bottom line to offer a solution to challenges in EBP, nurses must first be given the training, and second develop a belief that learning is a lifelong process.
2. **Time Constraints & Workload:** Nurses frequently juggle intense workloads, with high patient-to-nurse ratios contributing to little opportunity for them to explore research, engage with evidence-based activities or even change their clinical practice. EBP is difficult to use when time is restricted and nurses have to balance busy patient care responsibilities with staying informed with evidence-based guidelines. The time taken to analyze studies, critique them and put the knowledge into action for an everyday situation can appear unreasonable given the busy and rapidly changing clinical environment. Addressing time constraints will require systemic change - we would need to change workloads and provide dedicated time for research and professional opportunity^[9].
3. **Institutional Barriers:** A related but somewhat different contextual challenge for EBP are institutional barriers. Many healthcare settings often have a lack of standardized protocols or guidelines that incorporate evidence into the regular clinical practice. Recent instances of pain management illustrate this issue; if pain management has no standardized protocols, the care can be inconsistent and may not use the evidence-based interventions that are available. Institutional barriers can also be inadequate resources for instance, access to research databases or simply resistance to change from staff and leadership alike. Healthcare institutions must facilitate EBP by having standardized guidelines that support EBP, considering they have the necessary resources, organizational culture that embraces innovation and continuous improvement^[10].
4. **Patient-Related Factors:** Patient-related factors can present obstacles for evidence-based practice (EBP), particularly when discussing difficult topics such as pain management. Cultural beliefs, preferences, and hesitancy to utilize certain medications are patient-related factors that determine patient participation with evidence-based interventions. For instance, some patients prefer specific pain management techniques and are reluctant to consent to pharmacological treatments for their pain. This can present challenges to nurses who strive to provide patients with the best evidence possible. Therefore, it is important for health care providers to remain culturally competent, engage patients in the decision-making process, and guide patients by exploring options on an individual basis while considering respective values. Overall, patients and health care providers should ensure culturally appropriate solutions while providing the best care possible.

Future Directions & Recommendations

The issue of EBP can be addressed using several narrowed strategies at the health system level:

1. **Improved Training Programs:** EBP should be part of nursing education from the basic level. This way student nurses will develop the capability to think critically and read and apply research to clinical practice from start to beginning of their careers.
2. **Technology Integration:** Incorporating a tool that uses AI pain assessment apps, or giving the nurse an easy way to ascertain and document pain levels ensures nurses are using accurate and timely sometimes evidence-based pain management interventions.
3. **Policy Reforms/Hospital Protocols:** Hospitals should have standardized pain management protocols based on evidence that

will make it more likely patients will have concurrent pain care.

Increased Research Funding: There should be more funding for research targeting non-pharmacological pain management practices such as physiotherapy, yoga and psychological interventions which may be safer and faced less stigmatization.

CONCLUSION

Effective postoperative pain management is essential for patient recovery and overall well-being. Evidence-Based Practice provides a structured approach to integrating research findings into clinical practice, ensuring optimal pain control with minimal risks. Nurses play a pivotal role in implementing EBP strategies, advocating for patient-centered care, and overcoming pain management barriers. Future advancements in training, technology, and policy reforms will further strengthen the application of EBP in postoperative pain management.

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