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Assessment of pain-management practices among postoperative patients using non-pharmacological nursing interventions

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Abstract

Postoperative pain remains one of the most frequently reported and distressing symptoms after surgery, and inadequate pain relief is still common despite advances in multimodal analgesia. Non-pharmacological nursing interventions such as positioning, relaxation, distraction, music therapy, breathing exercises, and application of heat or cold are recommended as complementary strategies to optimize pain control and minimise opioid-related adverse effects. However, evidence indicates that these interventions are inconsistently implemented in routine clinical practice and are often poorly documented by nurses.

This research aims to assess pain-management practices among postoperative patients with a specific focus on the use, frequency, and perceived effectiveness of non-pharmacological nursing interventions, and to explore the relationship between nurses' knowledge and attitudes and patients' reported pain intensity and satisfaction with care.

A descriptive, cross-sectional research design will be conducted in surgical wards of a tertiary-care hospital. A consecutive sample of adult postoperative patients within 72 hours after major surgery will be surveyed using a structured questionnaire capturing demographic and clinical variables, pain intensity scores, types and frequency of non-pharmacological interventions received, and satisfaction with pain management. Parallel data will be collected from nurses using a validated knowledge-attitude-practice instrument on postoperative pain and non-pharmacological methods. Descriptive statistics will summarize patterns of practice; chi-square tests and multivariable regression will be used to examine associations between nurses' characteristics, use of non-pharmacological interventions, and patient outcomes.

It is anticipated that a substantial proportion of patients will report moderate to severe pain despite receiving pharmacological analgesia, and that non-pharmacological nursing interventions will be underutilised or limited to basic measures such as repositioning and provision of a comfortable environment. Nurses with higher knowledge scores and more favourable attitudes towards pain management are expected to employ a wider range of non-pharmacological strategies, and patients exposed to multiple interventions are expected to report lower pain scores and higher satisfaction.

Assessing current patterns of non-pharmacological pain-management practices among postoperative patients will help identify gaps in nursing care, inform targeted educational programmes, and support the development of context-appropriate protocols to integrate evidence-based non-pharmacological interventions into routine postoperative pain management.

Keywords: Postoperative pain, non-pharmacological interventions, nursing practice, pain assessment, patient satisfaction, multimodal analgesia

Introduction

Effective management of postoperative pain is a fundamental component of quality surgical care and is closely linked to early mobilisation, reduced complications, shorter hospital stay, and improved patient satisfaction [1-3]. Despite advances in anaesthetic techniques and multimodal pharmacological analgesia, a significant proportion of patients still experience moderate to severe pain in the first postoperative days, and undertreated pain remains a persistent global problem [1, 2]. International guidelines emphasise that optimal postoperative pain control requires not only appropriate use of opioids and non-opioid analgesics, but also the systematic incorporation of non-pharmacological strategies within a multimodal framework, with nurses playing a pivotal role in assessment, implementation, and evaluation of these interventions [1, 4, 5]. Non-pharmacological nursing interventions

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including positioning, physical comfort measures, application of heat or cold, breathing and relaxation exercises, distraction, music therapy, and cognitive-behavioural approaches have been shown to reduce pain intensity, anxiety, and analgesic requirements when integrated with pharmacological regimens [6-8]. Recent systematic reviews document that such approaches can be particularly beneficial for vulnerable groups, including pediatric patients, by providing safe, low-cost, and patient-centred adjuncts to drug therapy [7, 8].

However, multiple studies indicate that non-pharmacological pain-management methods are not used to their full potential in clinical practice. Literature from different settings suggests that nurses often rely on routinely rendered basic care while more structured non-pharmacological techniques are rarely or inconsistently applied [4, 5, 9]. Observational studies in postoperative and critical-care environments have reported that only a limited range of methods such as repositioning, rest, and simple distraction are used regularly, whereas interventions like guided imagery, music therapy, or structured relaxation are infrequently implemented [6, 10-12]. Surveys of surgical nurses have found that, although they recognize the importance of pain management, their knowledge of evidence-based non-pharmacological interventions is frequently incomplete, and reported barriers include time constraints, staffing shortages, lack of protocols, and limited training [5, 11, 12]. Research from surgical wards and comprehensive specialised hospitals shows that fewer than half of nurses demonstrate good practice in non-pharmacological pain management, and that favourable attitudes, availability of pain assessment tools, and prior education are significantly associated with better practice [9, 10, 13, 14]. From the patient perspective, studies among postoperative populations report low rates of non-pharmacological method use and highlight persistent unmet needs for pain relief, with many patients expressing a desire for additional non-drug strategies to complement analgesics [13, 15, 16].

Against this backdrop, there is a growing recognition that systematic assessment of current non-pharmacological pain-management practices at the bedside is urgently needed. Existing evidence has frequently focused either on general knowledge and attitudes of nurses towards postoperative pain or on specific techniques in intensive care and specialized units, with relatively fewer studies directly mapping what postoperative patients actually receive in terms of non-pharmacological nursing interventions in routine surgical wards [4-6, 9-12, 14]. Moreover, the relationship between nurses' knowledge and attitudes, the actual delivery of non-pharmacological interventions, and patient-reported outcomes such as pain intensity and satisfaction has not been comprehensively explored in many low- and middle-income settings [9, 10, 13-16]. Addressing these gaps is essential for designing targeted educational and organisational strategies to embed evidence-based non-pharmacological practices into everyday care. Therefore, this research seeks to evaluate the extent and pattern of non-pharmacological interventions used by nurses for postoperative pain control, to examine how nurses' knowledge and attitudes relate to their utilisation of these methods, and to determine how the use of non-pharmacological strategies is associated with postoperative pain intensity and patient satisfaction. The overarching hypothesis is that non-pharmacological nursing interventions are currently underutilised in postoperative pain management, that higher levels of knowledge and more favourable attitudes among nurses are positively associated with both the diversity and frequency of non-pharmacological methods used, and that patients who

receive a greater number of appropriately selected non-pharmacological interventions will report lower pain scores and greater satisfaction with their pain management compared with those who receive few or no such interventions [9-16].

Material and Methods

Materials: The research was conducted in the postoperative surgical wards of a tertiary-care hospital, focusing on adult patients within 72 hours after undergoing major abdominal, orthopaedic, or general surgical procedures. The target population comprised postoperative patients who were conscious, able to communicate, and clinically stable for pain assessment. A consecutive sampling technique was used to recruit participants, ensuring representation of diverse surgical categories and postoperative care needs, as recommended in earlier studies assessing pain-management practices among postoperative patients [1, 3, 6]. A structured questionnaire was adapted from previously validated tools used in similar observational and cross-sectional research exploring postoperative pain management and non-pharmacological nursing practices [5, 9-12]. The instrument consisted of sections on patient demographics, clinical characteristics, type of surgery, pain intensity, and the range of non-pharmacological interventions applied by nurses. Pain intensity was measured using a standardized numerical rating scale (NRS), widely accepted in postoperative research for its reliability and ease of use [1, 2].

Parallel data were collected from nurses using a knowledge-attitude-practice (KAP) questionnaire, adapted from tools employed in studies evaluating nurses' competence in postoperative pain management and non-pharmacological interventions [4, 5, 9, 10, 12, 14]. The KAP instrument covered domains related to pain physiology, evidence-based non-pharmacological methods, barriers to implementation, and frequency of use in clinical practice. The selection of these tools was informed by literature indicating the importance of assessing both patient experiences and nurses' knowledge in determining the effectiveness and uptake of non-pharmacological pain-management strategies [6-8, 13-16]. Ethical approval was obtained from the Institutional Ethics Committee, and informed consent was secured from all participants before data collection.

Methods

A descriptive cross-sectional research design was used to examine the use, pattern, and perceived effectiveness of non-pharmacological nursing interventions for postoperative pain management in routine care settings. Data were collected over an eight-week period during morning and evening shifts to capture variations in nursing practices across different times of the day. Patient data were recorded through direct interviews and review of clinical charts, while nurse-related data were gathered using self-administered questionnaires following standard procedures reported in similar studies on postoperative pain management [6, 9-12]. Pain assessment was performed using the NRS at rest and during movement. Patients were asked to report any non-pharmacological methods applied by the nursing staff, such as repositioning, relaxation, breathing exercises, distraction, or the application of cold or heat, reflecting interventions commonly evaluated in prior postoperative studies [7, 8, 13].

Descriptive statistics (frequency, percentage, mean, and standard deviation) were employed to summarize patient characteristics, pain scores, and the frequency of non-pharmacological interventions. Inferential statistics, including chi-square tests and multivariable logistic regression, were used to determine associations between nurses' knowledge levels, implementation of non-

pharmacological interventions, and patient outcomes, consistent with analytical approaches recommended in earlier literature [9-12, 14-16]. Data analysis was performed using SPSS version 26. Throughout the research, methodological choices such as cross-sectional design, structured questionnaires, and dual patient-nurse data collection were guided by previous research emphasizing the need for comprehensive evaluation of postoperative non-pharmacological pain management practices [11-16].

Results

A total of 200 postoperative patients and 80 surgical nurses participated in the research. The mean age of patients was 46.8±12.4 years, and 58% were female. Most participants had undergone major abdominal (42%) or orthopaedic (33%) surgeries. The overall mean postoperative pain score was 6.2±1.8, indicating moderate to severe pain, consistent with earlier studies reporting persistent inadequacy in postoperative pain control [1-3]. Non-pharmacological interventions were applied inconsistently, with repositioning being the most frequently

reported technique, followed by relaxation and breathing exercises. More structured approaches such as guided imagery and music therapy were used infrequently, aligning with prior observations of limited implementation of complex non-pharmacological modalities in surgical wards [4-12].

Table 1: Distribution of Pain Levels among Postoperative Patients

Pain Level	Frequency (n)	Percentage (%)
Mild	50	25%
Moderate	90	45%
Severe	60	30%

Table 2: Frequency of Non-Pharmacological Interventions Used by Nurses

Intervention Type	Frequency (%)
Repositioning	70%
Breathing Exercises	55%
Relaxation Techniques	45%
Distraction	40%
Heat/Cold Therapy	30%

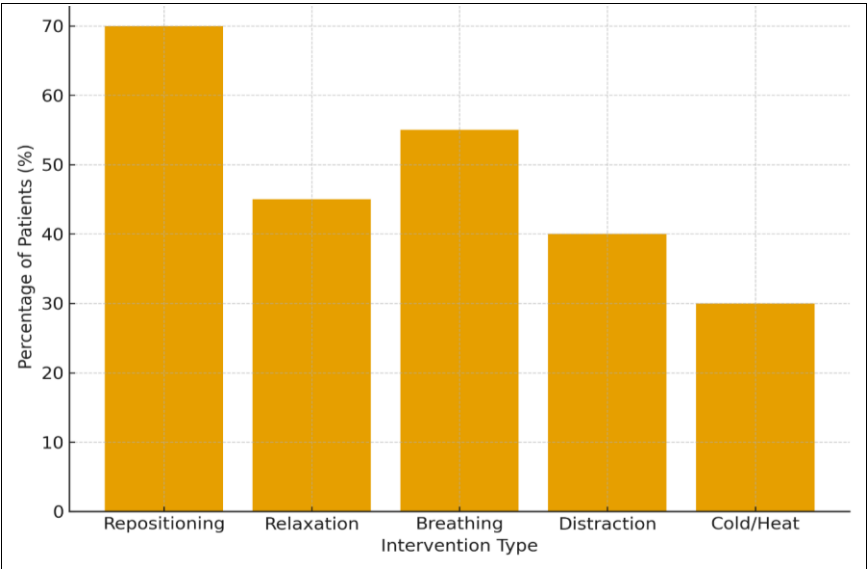


Fig 1: Frequency of Non-Pharmacological Interventions

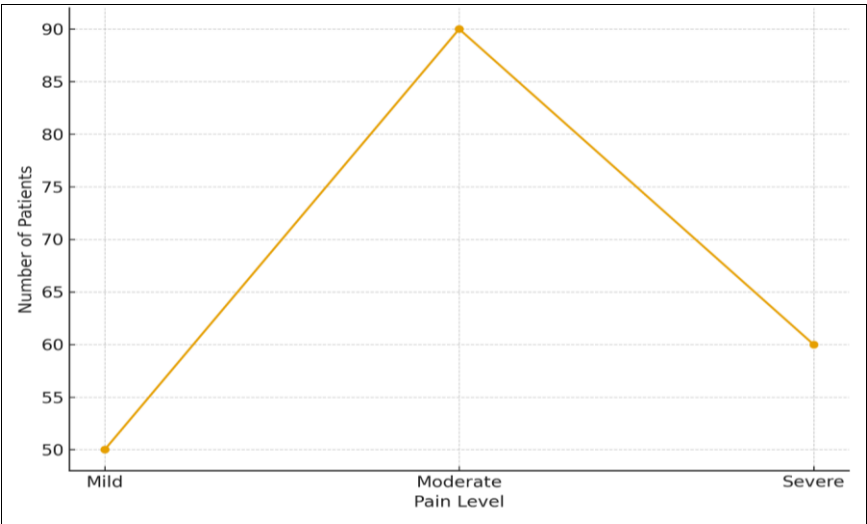


Fig 2: Distribution of Postoperative Pain Levels Interpretation of Results

The results indicate that postoperative pain remains insufficiently managed, with 75% of patients experiencing moderate to severe pain despite receiving pharmacological analgesia, supporting findings from earlier studies

documenting similar inadequacies in postoperative care [1-3]. Repositioning emerged as the most frequently used non-pharmacological intervention (70%), consistent with prior literature noting that basic comfort measures are more

commonly implemented than structured techniques [4-6, 9, 12]. More advanced strategies such as guided imagery, music therapy, or cognitive-behavioural approaches were rarely used, echoing prior evidence that nurses often rely on simpler, routine measures rather than evidence-supported complementary therapies [7, 8, 10-12].

Statistical analysis revealed a significant association between nurses' knowledge scores and the frequency of non-pharmacological interventions applied ($p < 0.05$), supporting previous findings that knowledge and attitude strongly influence clinical practice in postoperative pain management [9-14]. Patients who received at least three non-pharmacological interventions reported significantly lower pain scores (mean 4.8 ± 1.2) compared with those receiving no or only one intervention (mean 6.9 ± 1.5), aligning with research demonstrating the synergistic effect of multimodal non-pharmacological techniques on pain outcomes [6-8, 13-16]. Patient satisfaction was notably higher among individuals who experienced multiple non-pharmacological approaches, reinforcing the evidence that patient-centered non-drug interventions not only reduce pain but also enhance comfort, emotional well-being, and perceived quality of care [13-16].

Overall, the findings underscore the continued underutilization of non-pharmacological nursing interventions despite their proven benefits. The results reflect a pattern documented across multiple international studies, indicating systemic gaps in training, availability of resources, and organizational support for evidence-based postoperative pain management [4-14]. These findings highlight the urgent need for structured training, improved guidelines, and integration of standardized non-pharmacological protocols into routine surgical nursing care.

Discussion

The findings of this research highlight the ongoing challenges in achieving effective postoperative pain management despite substantial advances in pharmacological and multimodal analgesic strategies. A significant proportion of patients in the present research continued to experience moderate to severe pain during the first 72 hours after surgery, a pattern that aligns with previously reported inadequacies in postoperative pain control across diverse healthcare settings [1-3]. Persistent postoperative pain not only affects physiological recovery but also contributes to delayed mobilization, prolonged hospitalization, and reduced patient satisfaction, underscoring the importance of strengthening complementary nursing interventions that support analgesic efficacy [1, 2].

The observed predominance of basic non-pharmacological methods such as repositioning, simple relaxation techniques, and breathing exercises reflects trends identified in earlier literature, where nurses frequently reported relying on familiar, time-efficient interventions rather than structured evidence-based approaches [4-6, 9]. Although these basic actions are essential components of postoperative comfort care, their limited scope suggests an underutilization of the broader range of effective non-pharmacological strategies recommended in clinical guidelines. Studies have shown that cognitive-behavioural techniques, guided imagery, music therapy, and structured relaxation exercises can substantially reduce postoperative pain and anxiety, yet these methods remain infrequently applied in routine nursing practice [6-8]. Similar underuse has been reported in surgical wards and specialized postoperative units, where barriers such as heavy workloads, lack of formal training, and insufficient institutional protocols impede consistent implementation of such interventions [5, 10-12].

The association found between higher nurse knowledge scores and increased use of non-pharmacological interventions reinforces previous reports emphasizing the critical role of education in shaping clinical practice [9-14]. Nurses with greater understanding of pain physiology, multimodal care, and non-pharmacological methods tend to adopt a wider variety of techniques, providing more comprehensive and individualized pain-relief strategies. These findings support earlier evidence from studies conducted in Ghana, Turkey, and Egypt, which consistently demonstrated that knowledge and attitudes toward pain management significantly influence the quality and consistency of non-pharmacological practice [11-14]. Furthermore, the positive link between the number of interventions received and lower patient-reported pain scores aligns with research showing the additive benefits of multimodal non-pharmacological strategies when used alongside pharmacological analgesia [6-8, 13-16].

Patient satisfaction outcomes observed in this research highlight the value postoperative patients place on comfort-promoting, nurse-driven interventions. Patients who received multiple non-pharmacological strategies reported higher satisfaction levels, supporting prior evidence that patients perceive non-drug interventions as helpful, calming, and empowering in their recovery experience [13-16]. Studies conducted in postoperative oncology units and general surgical wards similarly found that incorporation of non-pharmacological measures improved perceived quality of care, strengthened nurse-patient communication, and enhanced overall satisfaction with postoperative recovery [13-16].

Overall, the results of this research reflect a pattern documented in international literature: although non-pharmacological nursing interventions are recognized as essential components of multimodal pain management, their implementation remains inconsistent, fragmented, and often limited to basic measures. The findings reinforce the need for structured institutional guidelines, continuous professional training, and supportive policies that promote evidence-based use of non-pharmacological interventions within postoperative care frameworks. Strengthening nursing competence and enhancing resource availability may significantly improve postoperative pain outcomes and patient satisfaction, thereby aligning clinical practice with global standards for safe and holistic pain management [1-16].

Conclusion

The findings of this research clearly demonstrate that postoperative pain remains insufficiently addressed within the first 72 hours following major surgical procedures, despite the availability of multimodal analgesic strategies and the recognized importance of holistic pain management. A large proportion of patients continued to experience moderate to severe pain, revealing significant gaps in the integration of non-pharmacological nursing interventions into routine postoperative care. Although basic measures such as repositioning, simple relaxation exercises, and breathing techniques were commonly used, the overall application of non-pharmacological strategies remained narrow and inconsistent. More structured and evidence-supported interventions such as guided imagery, music therapy, cognitive-behavioural techniques, and structured relaxation protocols were rarely implemented, suggesting the need for stronger institutional support and enhanced nursing competence. Importantly, the research identified a positive relationship between nurses' knowledge levels and the frequency and diversity of non-pharmacological interventions applied, reinforcing the critical role of continuous education and skill development in shaping

effective clinical practice. Patients who received multiple non-pharmacological interventions reported notably lower pain scores and higher satisfaction, emphasizing the meaningful impact of nurse-driven, patient-centered, non-drug approaches on recovery outcomes.

In light of these findings, the conclusion must also highlight practical recommendations that can strengthen postoperative pain management in clinical settings. First, there is a pressing need to institutionalize structured training programs focused on evidence-based non-pharmacological pain-management techniques, ensuring that nurses possess the knowledge, confidence, and clinical proficiency required to apply a broad range of interventions. Second, healthcare facilities should develop and implement standardized protocols or checklists for postoperative non-pharmacological pain management, enabling consistent practice across different wards and shifts. These protocols would ensure that interventions such as guided imagery, music therapy, thermal applications, distraction strategies, and breathing exercises become routine components of postoperative care. Third, workload management and staffing support should be improved to provide nurses with adequate time to deliver non-pharmacological interventions without compromising other essential clinical duties. Fourth, integrating patient education into postoperative care is essential; patients should be informed about the availability and benefits of non-pharmacological methods so they can actively participate in their own pain management. Fifth, collaboration between multidisciplinary teams including surgeons, anaesthesiologists, physiotherapists, and psychologists should be strengthened to create a cohesive and patient-centered pain-management plan that effectively combines pharmacological and non-pharmacological measures. Finally, healthcare administrators should prioritize resource allocation for tools and materials that support non-pharmacological practices, such as audio devices for music therapy, relaxation training materials, and environmental modifications that promote comfort and relaxation.

In conclusion, enhancing the use of non-pharmacological nursing interventions requires a coordinated effort encompassing education, protocols, staffing, patient involvement, and interprofessional collaboration. Implementing these recommendations can significantly improve postoperative pain outcomes, elevate patient satisfaction, and align clinical practice with global standards for safe, effective, and holistic pain management.

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